

PARAGRAPH	TITLE OF CONTENTS	PAGE
1.	PURPOSE . . . . .	1
2.	PREREQUISITES . . . . .	1
2.1	PROGRAM PREREQUISITES	
2.2	EQUIPMENT PREREQUISITES	
3.	USE PROCEDURE . . . . .	1A
3.1	PROGRAM LOADING	
3.2	OPERATING PROCEDURE	
3.3	OPERATING OPTIONS	
3.4	PROGRAM WAITS	
3.4.1	NORMAL WAITS	
3.4.2	ERROR WAITS	
3.5	PROGRAM TERMINATION	
3.6	RESTART PROCEDURE	
4.	PRINTOUTS . . . . .	3
4.1	NORMAL PRINTOUTS	
4.2	ERROR PRINTOUTS	
5.	COMMENTS . . . . .	3
5.1	PROGRAM DESCRIPTION	
5.2	TEST ROUTINES DESCRIPTION	
5.3	DESCRIPTION OF OTHER ROUTINES	

1. PURPOSE

THE CORE FUNCTION TESTS TEST THE CORES, CORE READ/WRITE CIRCUITRY, AND THE CORE ADDRESSING CIRCUITRY IN THE 1131 CENTRAL PROCESSING UNIT. THE CORE FUNCTION TESTS CONSIST OF TWO PROGRAMS WHICH ARE NORMALLY LOADED AND EXECUTED IN THE FOLLOWING SEQUENCE.

- A. HIGH CORE FUNCTION TEST (PID 03B0) TESTS ALL CORE LOCATIONS ABOVE ADDRESS /0800, AND CORE LOCATIONS /0000 THRU /0009.
- B. LOW CORE FUNCTION TEST (PID 03B1) TESTS CORE LOCATIONS /0000 THRU /0900 AND THE TEN HIGHEST LOCATIONS IN CORE.

2. PREREQUISITES

2.1 PROGRAM PREREQUISITES

THE CORE FUNCTION TESTS ARE LOADED BY THE 1130 RELOCATING LOADER.

2.2 EQUIPMENT PREREQUISITES

- A. 1131 CPU
- B. CARD OR PAPER TAPE INPUT TO THE 1131

3. USE PROCEDURE

3.1 PROGRAM LOADING

TO LOAD FROM CARDS

- A. PLACE THE RELOCATING LOADER, THE HIGH CORE TEST, AND THE LOW CORE TEST IN THE READER IN THAT ORDER. (SEE NOTE)
- 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 THE READER READY.
- C. PRESS THE 1131 RESET KEY.
- D. PRESS THE 1131 PROGRAM LOAD KEY.
- E. LOADER WILL LOAD AND HALT AT WAIT 30F6 (B REG).
- F. PLACE THE HIGH CORE TEST IN THE READER. (SEE NOTE)
- G. MAKE THE READER READY.
- H. MANUALLY SET IAR TO /0078.
- I. SET MODE SWITCH TO RUN AND PRESS PROGRAM START.
- J. IF PROGRAM FAILS TO LOAD OR STOPS AT A WAIT BELOW ADDRESS /0160 REFER TO RELOCATING LOADER DOCUMENTATION.
- K. AFTER HIGH CORE TEST IS LOADED, PLACE THE LOW CORE TEST TAPE IN THE READER AND MAKE READER READY.

NOTE...IF DESIRED EITHER OF THE TWO PROGRAMS MAY BE LOADED AND EXECUTED INDEPENDENTLY. IF THE PROGRAMS ARE TO BE RUN IN SEQUENCE THE HIGH CORE TEST MUST BE EXECUTED FIRST. EXECUTION OF THE LOW CORE TEST DESTROYS THE LOADER.

3.2. OPERATING PROCEDURE

- A. THE HIGH CORE TEST WILL LOAD AND STOP AT WAIT 3001 (B REG). THE CORE SIZE WILL BE DISPLAYED IN THE ACCUMULATOR.
- B. SET SWITCH OPTIONS IF DESIRED. (NORMAL--ALL SMS OFF)
- C. PRESS PROGRAM START.
- D. THE HIGH CORE TEST WILL RUN ABOUT 1 TO 5 MINUTES DEPENDING ON CORE SIZE AND, IF NO ERRORS OCCUR, STOP AT THE END OF PROGRAM WAIT 3002. SET SWITCH OPTIONS IF DESIRED AND PRESS PROGRAM START. IF SW 15 IS ON THE HIGH CORE TEST WILL BE RERUN.
- E. IF SW 15 IS OFF THE LOW CORE TEST WILL LOAD AND STOP AT WAIT 3001. THE CORE SIZE WILL BE DISPLAYED IN THE ACCUMULATOR.
- F. SET OPTIONS IF DESIRED. (NORMAL--ALL SMS OFF)
- G. PRESS PROGRAM START.
- H. THE LOW CORE TEST WILL RUN ABOUT 1 MINUTE AND, IF NO ERRORS OCCUR, STOP AT THE END OF PROGRAM WAIT 3002. PRESS START TO RERUN THE LOW CORE TEST.
- I. ERRORS WILL BE INDICATED BY ERROR WAITS AND PRINTOUTS.
- J. PROGRAM OPTIONS MAY BE SELECTED OR CHANGED AT ANY TIME.
- K. SEE SECTION 3.6 FOR RESTART PROCEDURE.

3.3 PROGRAM OPERATING OPTIONS

ALL OPTIONS EXCEPT SWT 15 APPLY TO BOTH THE HIGH AND LOW CORE TESTS.  
NORMAL SWITCH SETTINGS---ALL OFF

SWT	FUNCTION
15	ON..RERUN HIGH CORE TEST WHEN START IS PRESS AT THE END OF PROGRAM WAIT (3002). OFF..LOAD LOW CORE TEST WHEN PROGRAM START IS PRESSED AT END OF PROGRAM WAIT (3002).  NOTE..SWT 15 SETTING HAS NO EFFECT ON LOW CORE TEST.
14	ON..BYPASS DATA ERROR WAITS (3004 AND 3005).
13	ON..BYPASS ALL PRINTOUTS.
12	ON..LOCK ON ERROR FUNCTION. IF AN ERROR OCCURS WHILE SWITCH 12 IS ON THE FAILING FUNCTION WILL BE LOOPED CONTINUOUSLY UNTIL SWT 12 IS TURNED OFF. SWITCH MAY BE TURNED ON WHILE AT AN ERROR WAIT TO LOCK ON THE ERROR.
11	ON..LOOP ENTIRE PROGRAM. THE START AND END WAITS (3001 AND 3002) WILL BE BYPASSED.
10	ON..LOOP ROUTINE. IF A VALID ROUTINE NUMBER (1 THRU 6) IS ENTERED IN SWS 0-7 THAT ROUTINE WILL BE LOOPED CONTINUOUSLY. IF NO VALID ROUTINE NUMBER IS ENTERED IN SWS 0-7 THE TEST ROUTINE WHICH IS CURRENTLY BEING EXECUTED WILL BE LOOPED. THE ROUTINE WILL BE LOOPED UNTIL SWS 0-7 ARE CHANGED OR SWITCH 10 IS TURNED OFF.
9	ON..PRINT ROUTINE START MESSAGE. IF SWT 9 IS ON A START MESSAGE WILL BE PRINTED AT THE START OF EACH ROUTINE.
8	ON..LOCK ON ERROR ADDRESS. IF AN ERROR OCCURS WHILE SWT 8 IS ON THE PROGRAM WILL ALTERNATELY STORE THE LAST GOOD DATA AND THE LAST DATA WORD THAT FILED AT THE ADDRESS THAT FAILED. SWT 8 MAY BE TURNED ON WHILE AT AN ERROR WAIT TO LOCK ON THE ERROR.
0-7	ROUTINE NUMBER...USED WITH SWT 10 OPTION. SEE SWT 10.

3.4 PROGRAM WAITS

ALL WAITS APPLY TO BOTH THE HIGH AND LOW CORE TESTS.

3.4.1 NORMAL WAITS

WAIT NO. (B REG)	DESCRIPTION	RESTART ACTION
30F6	END OF PAPER TAPE LOADER. THIS IS AN ERROR CONDITION EXCEPT AT THE END OF PAPER TAPE LOADER. REFER TO RELOCATING LOADER DOCUMENTATION.	A. PLACE PROGRAM TAPE IN READER AND MAKE READY. B. MANUALLY SET IAR TO 0078. C. SET MODE SWT TO RUN AND PRESS PROGRAM START.
3001	START OF PROGRAM. ACCUMULATOR CONTAINS CORE SIZE.	A. SELECT OPTIONS IF DESIRED. B. PRESS PROGRAM START.
3002	END OF TEST PROGRAM.	A. SELECT OPTIONS IF DESIRED. B. PRESS PROGRAM START.

3.4.2 ERROR WAITS

WAIT NO. (B REG)	DESCRIPTION	RESTART ACTION
3003	PROGRAM COULD NOT DETERMINE CORE SIZE. WRAP-AROUND FAILURE.	PRESS PROGRAM START TO RETRY.
3004	DATA ERROR. FIRST WAIT. A REG CONTAINS INCORRECT DATA. Q REG CONTAINS CORRECT DATA.	PRESS PROGRAM START TO ADVANCE TO WAIT 3005.
3005	DATA ERROR SECOND WAIT. A REG CONTAINS ADDRESS THAT FAILED. Q REG BITS 0-7 CONTAINS RTN NO. Q REG BITS 8-15 CONTAINS FUNC. NO.	SELECT OPTIONS IF DESIRED. PRESS PROGRAM START.
3006	CONSOLE PRINTER FAILURE. SELECT BYPASS PRINT OPTION IF FAILURE PERSISTS.	PRESS PROGRAM START.
3007	ILLEGAL SWITCH COMBINATION. SWS 8, 10, AND 12 ARE OFF AND SWS 13 AND 14 ARE ON. THIS COMBINATION OF SWS WOULD PREVENT ERROR DETECTION.	CHANGE SWITCH SETTINGS. PRESS PROGRAM START.

3.5 PROGRAM TERMINATION

BOTH THE LOW AND HIGH CORE TESTS WILL TERMINATE IN A WAIT INSTRUCTION WITH 3002 INT EH B REG.

### 3.6 RESTART PROCEDURE

RESTART FROM ANY WAIT BY PRESSING START.

NO RESTART LINKAGE IS AVAILABLE FROM A SYSTEM RESET CONDITION.  
TO RESTART PROGRAM MANUALLY SET THE INSTRUCTION ADDRESS REGISTER  
AS SHOWN BELOW, GO TO RUN MODE, AND PRESS PROGRAM START.

HIGH CORE TEST...SET IAR TO /0161 TO RESTART.  
LOW CORE TEST....SET IAR TO /0961 TO RESTART.

## 4. PRINTOUTS

### 4.1 NORMAL PRINTOUTS

START HIGH CORE TEST THIS MESSAGE IS PRINTED AT THE START OF THE HIGH  
CORE TEST PROGRAM.  
END HIGH CORE TEST THIS MESSAGE IS PRINTED AT THE END OF THE HIGH CORE  
TEST PROGRAM.  
START LOW CORE TEST THIS MESSAGE IS PRINTED AT THE START OF THE LOW CORE  
TEST PROGRAM.  
END LOW CORE TEST THIS MESSAGE IS PRINTED AT THE END OF THE LOW CORE  
TEST PROGRAM.  
START RTN XX THIS MESSAGE IS PRINTED AT THE START OF EACH TEST  
ROUTINE IF SWT 9 IS TURNED ON. XX IS THE ROUTINE NUMBER.

### 4.2 ERROR PRINTOUTS

ERR CORE SIZE THIS MESSAGE IS PRINTED IF THE PROGRAM IS UNABLE TO  
DETERMINE THE CORE SIZE. CORE WRAP-AROUND FEATURE FAILED.  
ERR RTN XX FUNC YY A DATA ERROR WAS DETECTED. XX IS THE ROUTINE NUMBER  
AND YY IS THE FUNCTION NUMBER. REGISTER DISPLAYS  
WILL PROVIDE FURTHER INFORMATION AT ERROR WAITS.  
SEE ERROR WAITS SECTION 3,4,2 AND ROUTINES DESCRIPTION  
SECTION 5.2.

## 5. COMMENTS

### 5.1 PROGRAM DESCRIPTION

THE CORE FUNCTION TEST CONSISTS OF TWO NEARLY IDENTICAL PROGRAMS.  
THE ONLY DIFFERENCES BETWEEN THE TWO PROGRAMS ARE THE CORE LOCATIONS  
INTO WHICH THEY ARE LOADED AND THE CORE LOCATIONS WHICH THEY TEST.

THE HIGH CORE TEST LOADS STARTING AT ADDRESS /0161 AND TESTS CORE  
FROM ADDRESS /0800 UP TO AN ADDRESS 10 LOCATIONS HIGHER THAN THE  
HIGHEST ADDRESS IN CORE. THIS PROCEDURE TESTS THE WRAP-AROUND  
FEATURE OF CORE.

THE LOW CORE TEST LOADS STARTING AT ADDRESS /0961 AND TESTS CORE  
STARTING AT AN ADDRESS 10 POSITIONS LOWER THAN ADDRESS /0000 UP TO  
ADDRESS /0900. THIS ALSO TESTS THE WRAP-AROUND FEATURE AND OVERLAPS  
THE AREA TESTED BY THE HIGH CORE TEST.

### 5.2 TEST ROUTINES DESCRIPTION

BOTH THE HIGH AND LOW CORE TESTS USE IDENTICAL TEST ROUTINES. THERE  
ARE SIX TEST ROUTINES AND EACH ROUTINE IS DIVIDED INTO TWO TEST  
FUNCTIONS. EACH TEST FUNCTION IS EXECUTED TWICE BEFORE GOING TO  
THE NEXT ROUTINE OR FUNCTION.

#### RTN 1...ONES AND ZEROS PATTERN

RTN 1 IS INITIALIZED BY FILLING CORE WITH ONES.

FUNC. 1 CHECKS THEN COMPLEMENTS EACH CORE LOCATION STARTING AT THE  
LOWEST ADDRESS AND PROGRESSING TOWARD THE HIGHEST.  
FUNC. 2 CHECKS THEN COMPLEMENTS EACH CORE LOCATION STARTING AT THE  
HIGHEST ADDRESS AND PROGRESSING TOWARD THE LOWEST.

#### RTN 2...ADDRESSING PATTERN

RTN 2 IS INITIALIZED BY FILLING EACH CORE LOCATION WITH ITS OWN  
ADDRESS.

FUNC. 1 SAME AS RTN 1 FUNC 1.  
FUNC. 2 SAME AS RTN 1 FUNC 2.

#### RTN 3...CHECKERBOARD PATTERN

RTN 3 IS INITIALIZED BY FILLING CORE WITH ALTERNATE 5555 AND AAAA  
CHARACTERS.

FUNC. 1 SAME AS RTN 1 FUNC 1.  
FUNC. 2 SAME AS RTN 1 FUNC 2.

#### RTN 4...BIT ISOLATION PATTERN

RTN 4 HAS NO INITIALIZATION STEP.

FUNC. 1 FLOATING ONE PATTERN. BIT 0 IS SET ON AND ALL OTHER BITS  
OFF IN THE CORE LOCATION BEING TESTED. THE BIT IS THEN  
CHECKED AND SHIFTED RIGHT ONE POSITION SO THAT THE CORE  
LOCATION ALWAYS CONTAINS 15 BITS OFF AND ONE ON. ALL 16  
POSITIONS OF EACH CORE LOCATION ARE CHECKED BEFORE  
ADVANCING TO THE NEXT CORE LOCATION.

FUNC. 2 FLOATING ZERO PATTERN. THIS TEST IS PERFORMED THE SAME  
AS RTN 4 FUNCTION 1 EXCEPT THAT A ZERO IS SHIFTED RIGHT  
KEEPING 15 BITS ON AND ONE OFF.

#### RTN 5...WORST CASE (MAXIMUM NOISE) PATTERN

RTN 5 IS INITIALIZED BY FILLING CORE WITH THE WORST CASE PATTERN.  
THIS PATTERN CONSISTS OF BLOCKS OF ONES AND ZEROS.

FUNC 1 RAPIDLY SCANS CORE CHECKING EACH CORE LOCATION.  
FUNC 2 CHECKS AND COMPLEMENTS EACH CORE LOCATION FOUR TIMES  
BEFORE PROCEEDING TO THE NEXT ADDRESS.

#### RTN 6...COMPLEMENT WORST CASE PATTERN

RTN 6 IS INITIALIZED BY FILLING CORE WITH THE COMPLEMENT WORST  
CASE PATTERN.

FUNC. 1 SAME AS RTN 5 FUNCTION 1.  
FUNC. 2 SAME AS RTN 5 FUNCTION 2.

5.3 DESCRIPTION OF OTHER ROUTINES

PROGRAM INITIALIZATION ROUTINE--DETERMINES CORE SIZE AND WAITS AT THE START OF PROGRAM WAIT.

ROUTINE SEQUENCE CONTROL ROUTINE--CHECKS SWITCH OPTIONS AND CONTROLS THE SEQUENCE IN WHICH TEST ROUTINES ARE EXECUTED.

PROGRAM END ROUTINE--CHECKS SWITCH OPTIONS AND WAITS AT THE END OF PROGRAM WAIT.

PRINT ROUTINE--PRINTS ALL MESSAGES USED BY THE PROGRAM.

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

HIGH CORE FUNCTION TEST

HIGH CORE FUNCTION TEST

```

0000          ABS          38000020
0160 0 0380   ORG        /0160 38000030
          DC          /0380  PID 38000040
          *          38000050
          ***** 38000060
          *          38000070
          *          PROGRAM INITIALIZATION 38000080
          *          38000090
          ***** 38000100
          *          38000110
          *          FIND CORE SIZE 38000120
          *          38000130
          *          38000140
0161 0 C075   CRSIZ LD      H1000 38000150
0162 0 D073   STD      SIZE      SET 8K CORE SIZE 38000160
0163 0 1010   SLA      16          38000170
0164 0 D400 0000 STD L 0      CLEAR ADDRS 0000 38000180
0166 0 CC00 03F4 LDD L LINK 38000190
0168 0 DC80 01D6 STD I SIZE  STO RESTART LINKAGE 38000200
016A 0 C400 0000 LD L 0      DID WRAP-AROUND OCCUR 38000210
016C 0 4C20 0185 BSC L FNDSZ,Z *YES, BRANCH 38000220
          *          38000230
          *          LD      SIZE 38000240
016E 0 C067   SLA      1      INCRE SIZE BY 4K 38000250
016F 0 1001   STD      SIZE  IS SIZE OVER 32K 38000260
0170 0 D065   BSC L CRSIZ+2,- *NO, BRANCH 38000270
0171 0 4C10 0163 *          38000280
          *          LDD L LINK 38000290
          *          STD I SIZE  STO RESTART LINKAGE 38000300
0173 0 CC00 03F4 LD L 0      DID WRAP-AROUND OCCUR 38000310
0175 0 DC80 01D6 BSC L FNDSZ,Z *YES, BRANCH 38000320
0177 0 C400 0000 *          38000330
0179 0 4C20 0185 *          LDD L LINK 38000340
          *          STD L 0      38000350
017B 0 CC00 03F4 BSI L PRINT  PRINT ERROR MSG 38000360
017D 0 DC00 0000 DC      MSG05+/8000 38000370
017F 0 4400 043B DC      MSG04 38000380
0181 0 8492   *          38000390
0182 0 048C   *          WAIT 3      ERR, CANNOT FIND CORE SIZE 38000400
          *          MDX  CRSIZ  RETRY 38000410
          *          38000420
          *          FNDSZ LD      SIZE 38000430
          *          S      L H0001  CORRECT CORE SIZE 38000440
          *          STD      SIZE 38000450
          *          A      H000A  ADD TEN 38000460
          *          STD L UPRLM  SET UPPER TEST LIMIT 38000470
          *          LD      SIZE 38000480
          *          WAIT 1      WAIT FOR SMS, SIZE IN ACC 38000490
          *          38000500
018E 0 4400 043B START BSI L PRINT  PRINT START MSG 38000510
0190 0 847D   DC      MSG01+/8000 38000520
0191 0 0484   DC      MSG03 38000530
          *          38000540
          *          SLA      16 38000550
          *          STD      RID 38000560
          *          STO L ERRSW 38000570
          *          ***** 38000580
          *          ***** 38000590
          *          ***** 38000600
          *          ***** 38000610
          *          ***** 38000620
          *          ***** 38000630
          *          ***** 38000640
          *          ***** 38000650
          *          ***** 38000660
          *          ***** 38000670
          *          ***** 38000680
          *          ***** 38000690
          *          ***** 38000690
0196 0 1010   CNTRL SLA  16 38000640
0197 0 D400 0280 STD L ALTNT 38000650
0199 0 D400 0284 STD L PASS 38000660
019B 0 D400 0282 STD L COMPL 38000670
019D 0 D400 040E STD L FUNNO 38000680
019F 0 0C00 03F6 XIO L RDSWS  READ SWS 38000690

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01A1 0 C400 040F LD L SWS 38000700
01A3 0 1805   SRA  5 38000710
01A4 0 4C04 01C4 BSC L SLRTN,E  BR IF LOOP RTN SELECTED 38000720
          *          38000730
          *          ADVNC MDX L RID,1  ADVANCE TO NEXT RTN 38000740
          *          LD      RID 38000750
          *          S      LRTN 38000760
          *          BSC L END,-Z  BR IF END OF PROGRAM 38000770
          *          38000780
          *          LPRTN LD      RID 38000790
          *          BSC L ADVNC,+  BR IF RID IS ZERO 38000800
          *          A      RTTBL 38000810
          *          STD      STRTN+1  SET RTN START ADDR 38000820
          *          LD      RID 38000830
          *          A      L NOTBL 38000840
          *          STD      *+1  ENTER RTN NUMBER IN MSG 38000850
          *          LD L *-* 38000860
          *          STO L MSG06+2 38000870
          *          38000880
          *          LD L SWS 38000890
          *          SLA  9      RTN START MSG SELECTED 38000900
          *          BSC L STRTN,- *NO, BRANCH 38000910
          *          38000920
          *          BSI L PRINT  PRINT RTN START MSG 38000930
          *          DC      MSG01+/8000 38000940
          *          DC      MSG06 38000950
          *          38000960
          *          STRTN BSC I *-*  START TEST ROUTINE 38000970
          *          *          38000980
          *          SLRTN SRA  3 38000990
          *          BSC L LPRTN,+  BR IF NO RTN SELECTED 38001000
          *          *          38001010
          *          S      LRTN 38001020
          *          BSC L LPRTN,Z- BR IF INVALID RTN NO. 38001030
          *          *          38001040
          *          LD L SWS 38001050
          *          SRA  8 38001060
          *          STD      RID  SELECT ROUTINE 38001070
          *          MDX  LPRTN 38001080
          *          *          38001090
          *          *          ROUTINE ADDRESS TABLE 38001100
          *          *          38001110
          *          *          RTTBL DC  RTTBL 38001120
          *          *          DC  RTN1 38001130
          *          *          DC  RTN2 38001140
          *          *          DC  RTN3 38001150
          *          *          DC  RTN4 38001160
          *          *          DC  RTN5 38001170
          *          *          DC  RTN6 38001180
          *          *          38001190
          *          *          PROGRAM CONSTANTS 38001200
          *          *          38001210
          *          *          SIZE DC  *-*  CORE SIZE 38001220
          *          *          H1000 DC /1000 38001230
          *          *          H000A DC /000A 38001240
          *          *          RID DC  *-*  ROUTINE NUMBER 38001250
          *          *          FFFF DC /FFFF 38001260
          *          *          H5555 DC /5555 38001270
          *          *          LRTN DC  6 38001280
          *          *          38001290
          *          *          ***** 38001300
          *          *          ***** 38001310
          *          *          ***** 38001320
          *          *          ***** 38001330
          *          *          ***** 38001340
          *          *          ***** 38001350
          *          *          ***** 38001360
          *          *          ***** 38001370
          *          *          ***** 38001370
01D6 0 0000   SIZE DC  *-*  CORE SIZE 38001220
01D7 0 1000   H1000 DC /1000 38001230
01D8 0 000A   H000A DC /000A 38001240
01D9 0 0000   RID DC  *-*  ROUTINE NUMBER 38001250
01DA 0 FFFF   FFFF DC /FFFF 38001260
01DB 0 5555   H5555 DC /5555 38001270
01DC 0 0006   LRTN DC  6 38001280
          *          38001290
          *          ***** 38001300
          *          ***** 38001310
          *          ***** 38001320
          *          ***** 38001330
          *          ***** 38001340
          *          ***** 38001350
          *          ***** 38001360
          *          ***** 38001370
01DD 0 C0FC   RTN1 LD  FFFF 38001360
01DE 0 4400 0285 BSI L FILL  FILL CORE WITH FFFF 38001370

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HIGH CORE FUNCTION TEST

```

*
01E0 0 4400 02DE FUN11 BSI L UP INCRE LOW TO HIGH CORE 38001380
01E2 0 4400 0293 BSI L FLIP CK AND STORE 0000 38001390
*
01E4 0 4400 0378 BSI L LOKFN CK FOR LOCK ON ERR FUNC 38001410
01E6 0 70F9 MDX FUN11 38001420
*
01E7 0 7401 040E MDX L FUNNO,1 38001430
01E9 0 4400 02F1 FUN12 BSI L DOWN DECRE HIGH TO LOW CORE 38001440
01E8 0 4400 0293 BSI L FLIP CK CORE AND STORE 0000 38001450
*
01ED 0 4400 0378 BSI L LOKFN CK FOR LOCK ON ERR FUNC 38001460
01EF 0 70F9 MDX FUN12 38001470
*
01FO 0 70A5 MDX CNTRL GO TO CONTROL 38001480
*
*****
*
* TEST ROUTINE TWO
*
*****
01F1 0 C400 02EF RTN2 LD L LWRLM FILL EACH CORE 38001500
01F3 0 D400 02E7 STO L ADDRS LOCATION WITH 38001510
01F5 0 D480 02E7 STO I ADDRS ADDRESS 38001520
01F7 0 F400 02F0 EOR L UPRLM 38001530
01F9 0 4C18 0200 BSC L **5,+-- BR LAST ADDRESS 38001540
*
01FB 0 C400 02E7 LD L ADDRS 38001550
01FD 0 8400 02E8 A L H0001 INCRE ADDRESS BY ONE 38001560
01FF 0 70F3 MDX RTN2+2 38001570
*
0200 0 4400 02DE FUN21 BSI L UP INCRE LOW TO HIGH CORE 38001580
0202 0 4400 02AB BSI L ADRCK CK AND COMPLEMENT 38001590
*
0204 0 4400 0378 BSI L LOKFN CK FOR LOCK ON ERR 38001600
0206 0 70F9 MDX FUN21 38001610
*
0207 0 7401 040E MDX L FUNNO,1 38001620
0209 0 4400 02F1 FUN22 BSI L DOWN DECRE HIGH TO LOW CORE 38001630
0208 0 4400 02AB BSI L ADRCK CK AND COMPLEMENT 38001640
*
020D 0 4400 0378 BSI L LOKFN LOCK ON FUNCTION 38001650
020F 0 70F9 MDX FUN22 38001660
*
0210 0 7085 MDX CNTRL 38001670
*
*****
*
* TEST ROUTINE THREE
*
*****
0211 0 C0C9 RTN3 LD H5555 38001680
0212 0 D400 0282 STO L COMPL 38001690
0214 0 4400 02DE BSI L UP INCRE LOW TO HIGH CORE 38001700
*
0216 0 D400 02E7 STO L ADDRS 38001710
0218 0 C400 0282 LD L COMPL 38001720
021A 0 D480 02E7 STO I ADDRS STORE 5555 AAAA PATTERN 38001730
021C 0 F0BD EOR FFFF COMPLEMENT 38001740
021D 0 D400 0282 STO L COMPL SET UP NEXT WORD 38001750
021F 0 C400 02E7 LD L ADDRS 38001760
0221 0 F400 02F0 EOR L UPRLM 38001770
0223 0 4C18 022A BSC L **5,+-- BR IF LAST ADDR 38001780
*
0225 0 C400 02E7 LD L ADDRS 38001790
0227 0 8400 02E8 A L H0001 INCRE ADDRESS BY ONE 38001800

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HIGH CORE FUNCTION TEST

```

0229 0 70EC MDX RTN3+5 38002060
*
022A 0 C080 LD H5555 38002070
022B 0 D400 0282 STO L COMPL 38002080
*
022D 0 C400 0282 FUN31 LD L COMPL 38002090
022F 0 D400 02E6 STO L SLDBE 38002100
0231 0 4400 02DE BSI L UP INCRE LOW TO HIGH CORE 38002110
0233 0 4400 02C5 BSI L CHEX CK AND COMPLEMENT 38002120
*
0235 0 4400 0378 BSI L LOKFN CK LOCK ON ERR 38002130
0237 0 70F5 MDX FUN31 38002140
*
0238 0 7401 040E MDX L FUNNO,1 38002150
023A 0 C400 02E6 LD L SLDBE 38002160
023C 0 D400 0282 STO L COMPL 38002170
*
023E 0 C400 0282 FUN32 LD L COMPL 38002180
0240 0 D400 0282 STO L COMPL 38002190
0242 0 D400 02E6 STO L SLDBE 38002200
0244 0 4400 02F1 BSI L DOWN DECRE HIGH TO LOW CORE 38002210
0246 0 4400 02C5 BSI L CHEX CK AND COMPLEMENT 38002220
*
0248 0 4400 0378 BSI L LOKFN CK LOCK ON ERROR 38002230
024A 0 70F3 MDX FUN32 38002240
*
024B 0 4C00 0196 BSC L CNTRL 38002250
*
*****
*
* TEST ROUTINE FOUR
*
*****
024D 0 C400 02E8 RTN4 LD L H0001 38002260
024F 0 D030 STO ALTNT 38002270
0250 0 1010 SLA 16 CK EACH CORE LOCATION 38002280
0251 0 4400 02F9 BSI L FLOAT BIT BY BIT, ONE BIT ON 38002290
*
0253 0 4400 0378 BSI L LOKFN CK FOR LOCK ON ERR 38002300
0255 0 70F7 MDX RTN4 38002310
*
0256 0 7401 040E MDX L FUNNO,1 38002320
*
0258 0 C028 FUN42 LD H0002 38002330
0259 0 D026 STO ALTNT 38002340
025A 0 C400 01DA LD L FFFF 38002350
025C 0 D400 0282 STO L COMPL CK EACH CORE LOCATION 38002360
025E 0 4400 02F9 BSI L FLOAT BIT BY BIT, ONE BIT OFF. 38002370
*
0260 0 4400 0378 BSI L LOKFN CK FOR LOCK ON ERR 38002380
0262 0 70F5 MDX FUN42 38002390
*
0263 0 4C00 0196 BSC L CNTRL 38002400
*
*****
*
* TEST ROUTINE FIVE
*
*****
0265 0 1010 RTN5 SLA 16 38002410
0266 0 D400 027F STO L COUNT 38002420
0268 0 4400 0315 BSI L WORST STORE WORST CASE PATTERN 38002430
*
026A 0 4400 0323 FUN61 BSI L CHECK CK EACH CORE LOCATION 38002440
*
026C 0 4400 0378 BSI L LOKFN CK LOCK ON ERROR 38002450

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HIGH CORE FUNCTION TEST

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02E1 0 C00E      LD      UPRLM      38004100
02E2 0 D008      STO      ENDPT      SET LAST ADDRESS 38004110
02E3 0 C008      LD      LWRLM      SET FIRST ADDRESS 38004120
02E4 0 4C80 02DE BSC I  UP      38004130
*
*
*          PROGRAM CONSTANTS
*
02E6 0 0000      SLDBE DC  *--      38004140
02E7 0 0000      ADDRS DC  *--      38004150
02E8 0 0001      H0001 DC  /0001   38004160
02E9 0 FFFF      HFFFF DC  /FFFF   38004170
02EA 0 0000      WAS  DC  *--      38004180
02EB 0 0000      ENDPT DC  *--      38004190
02EC 0 0000      INCRE DC  *--      38004200
02ED 0 0000      TEMP  DC  *--      38004210
02EE 0 8000      H8000 DC  /8000   38004220
02EF 0 0800      LWRLM DC  /0800   38004230
02F0 0 0000      UPRLM DC  *--      38004240
*
*          DECREMENT FROM UPPER TO LOWER CORE
*
02F1 0 0000      DOWN DC  *--      38004250
02F2 0 C0F6      LD      HFFFF      SET UP ADDRESS INCRE 38004260
02F3 0 D0F8      STO      INCRE      38004270
02F4 0 C0FA      LD      LWRLM      38004280
02F5 0 D0F5      STO      ENDPT      SET UP LAST ADDRESS 38004290
02F6 0 C0F9      LD      UPRLM      SET UP FIRST ADDRESS 38004300
02F7 0 4C80 02F1 BSC I  DOWN      38004310
*
*          CHECK BIT BY BIT PATTERN
*
02F9 0 0000      FLOAT DC *--      38004320
02FA 0 C0F4      LD      LWRLM      38004330
02FB 0 D0EB      STO      ADDRS      SAVE ADDRESS      38004340
02FC 0 C0F1      LD      H8000      38004350
02FD 0 F084      EOR      COMPL     38004360
02FE 0 D0E7      STO      SLDBE     38004370
02FF 0 D480 02E7 STO I  ADDRS      STORE DATA WORD  38004380
0301 0 C480 02E7 LD I  ADDRS      38004390
0303 0 D0E6      STO      WAS       38004400
0304 0 F0E1      EOR      SLDBE     DATA CORRECT  38004410
0305 0 4420 0392 BSI L  ERROR,Z   *NO, BRANCH  38004420
*
*
0307 0 CODE      LD      SLDBE     38004430
0308 0 F400 0282 EOR L  COMPL     LAST SHIFT      38004440
030A 0 4C04 030E BSC L  **2,E     *NO, BRANCH  38004450
*
*
030C 0 1801      SRA      1         SHIFT DATA  38004460
030D 0 70EF      MDX     FLOAT+4  38004470
*
*
030E 0 C0D8      LD      ADDRS     38004480
030F 0 F0E0      EOR      UPRLM    38004490
0310 0 4C98 02F9 BSC I  FLOAT,+-- BR IF LAST ADDRESS 38004500
*
*
0312 0 C0D4      LD      ADDRS     38004510
0313 0 80D4      A        H0001    INCRE ADDRESS  38004520
0314 0 70E6      MDX     FLOAT+2  38004530
*
*          STORE WORST CASE PATTERN
*
0315 0 0000      WORST DC *--      38004540
0316 0 C0D8      LD      LWRLM     38004550
0317 0 D0CF      STO      ADDRS     SAVE ADDRESS  38004560
0318 0 4400 0352 BSI L  FIND      FIND IF 0000 OR FFFF 38004570
031A 0 D480 02E7 STO I  ADDRS     STORE DATA  38004580
031C 0 C0CA      LD      ADDRS     38004590
031D 0 F0D2      EOR      UPRLM    38004600
031E 0 4C98 0315 BSC I  WORST,+-- BR IF LAST ADDRESS 38004610

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HIGH CORE FUNCTION TEST

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0320 0 C0C6      LD      ADDRS     38004780
0321 0 80C6      A        H0001    INCRE ADDRESS  38004790
0322 0 70F4      MDX     WORST+2  38004800
*
*          CHECK WORST CASE PATTERN
*
0323 0 0000      CHECK DC *--      38004810
0324 0 C0CA      LD      LWRLM     38004820
0325 0 D0C1      STO      ADDRS     SAVE ADDRESS  38004830
0326 0 C480 02E7 LD I  ADDRS     38004840
0328 0 D0C1      STO      WAS       38004850
0329 0 4C18 032E BSC L  **3,+--  BR IF DATA ZERO  38004860
*
*
0328 0 F0BD      EOR      HFFFF    COMPLEMENT DATA 38004870
032C 0 4420 036D BSI L  ERR,Z     BR TO ERROR RTN IF NOT 0 38004880
*
*
032E 0 C0B8      LD      ADDRS     38004890
032F 0 F0C0      EOR      UPRLM    38004900
0330 0 4C98 0323 BSC I  CHECK,+-- BR IF LAST ADDRESS 38004910
*
*
0332 0 C0B4      LD      ADDRS     38004920
0333 0 80B4      A        H0001    INCRE ADDRESS  38004930
0334 0 70F0      MDX     CHECK+2  38004940
*
*          CK AND COMPLEMENT 4 TIMES
*
0335 0 0000      SHAKE DC *--      38004950
0336 0 C0B8      LD      LWRLM     38004960
0337 0 D0AF      STO      ADDRS     SAVE ADDRESS  38004970
0338 0 C480 02E7 LD I  ADDRS     38004980
033A 0 D0AF      STO      WAS       38004990
0338 0 4C18 0350 BSC L  INVRT,+-- BR DATA WORD ZERO 38005000
*
*
033D 0 F0AB      EOR      HFFFF    COMPL DATA  38005010
033E 0 4420 036D BSI L  ERR,Z     BR IF NOT ZERO      38005020
*
*
0340 0 D480 02E7 STORE STO I  ADDRS  STORE NEW DATA  38005030
0342 0 74FF 027F MDX L  COUNT,-1  38005040
0344 0 70F3      MDX     SHAKE+3  38005050
*
*
0345 0 C0A1      LD      ADDRS     38005060
0346 0 F0A9      EOR      UPRLM    38005070
0347 0 4C98 0335 BSC I  SHAKE,+-- BR IF LAST ADDRESS 38005080
*
*
0349 0 C400 0283 LD L  H0004      38005090
0348 0 D400 027F STO L  COUNT     38005100
0340 0 C099      LD      ADDRS     38005110
034E 0 8099      A        H0001    INCRE ADDRESS  38005120
034F 0 70E7      MDX     SHAKE+2  38005130
*
*
0350 0 F098      INVRT EOR      HFFFF  COMPLEMENT DATA 38005140
0351 0 70EE      MDX     STORE     38005150
*
*          DETERMINE IF DATA S/B 0000 OR FFFF
*
0352 0 0000      FIND DC *--      38005160
0353 0 C093      LD      ADDRS     38005170
0354 0 1806      SRA      6         38005180
0355 0 D097      STO      TEMP     38005190
0356 0 1802      SRA      2         ADDRS BITS 7 AND 9 38005200
0357 0 F095      EOR      TEMP     BOTH 0 OR BOTH 1  38005210
0358 0 4C04 035C BSC L  **2,E     *NO, BRANCH  38005220
*
*
035A 0 1010      SLA      16        38005230
0358 0 7001      MDX     **1       38005240
*
*
035C 0 C08C      LD      HFFFF     COMPLEMENT DATA FOR 38005250

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HIGH CORE FUNCTION TEST

HIGH CORE FUNCTION TEST

```

035D 0 F400 0282      EOR L COMPL      COMPLEMENT WORST CASE 38005460
035F 0 D086          STO L SLDBE      38005470
0360 0 C400 027F      LD L COUNT      DATA COMPL ODD NO. TIMES 38005480
0362 0 4C04 0367      BSC L **+3,E    *YES, BRANCH 38005490
*                               38005500
0364 0 C081          LD L SLDBE      38005510
0365 0 4C80 0352      BSC I FIND      38005520
*                               38005530
0367 0 C400 02E6      LD L SLDBE      38005540
0369 0 F400 02E9      EOR L HFFFF     COMPLEMENT DATA 38005550
0368 0 4C80 0352      BSC I FIND      38005560
*                               38005570
*                               ERROR IN WORST CASE PATTERN 38005580
*                               38005590
ERR DC **-*        38005600
036E 0 4400 0352      BSI L FIND      FIND GOOD DATA 38005610
0370 0 D400 02E6      STO L SLDBE     38005620
0372 0 4400 0392      BSI L ERROR     GO TO ERROR RTN 38005630
0374 0 F400 02E9      EOR L HFFFF     38005640
0376 0 4C80 0360      BSC I ERR       38005650
*                               38005660
*                               CK PASS COUNT AND LOCK ON ERR 38005670
*                               38005680
0378 0 0000          LOKFN DC **-*   38005690
0379 0 7401 0284      MDX L PASS,1    38005700
0378 0 C400 0284      LD L PASS       38005710
037D 0 4C84 0378      BSC I LOKFN,E   BR IF COUNT ODD 38005720
037F 0 1010          SLA 16          38005730
0380 0 D400 0284      STO L PASS      38005740
0382 0 7400 040D      MDX L ERRSW     ERROR SW ON 38005750
0384 0 7004          MDX **+4       *YES BRANCH 38005760
*                               38005770
*                               38005780
0385 0 7401 0378      MDX L LOKFN,1   ADD ONE TO RETURN 38005790
0387 0 4C80 0378      BSC I LOKFN     38005800
*                               38005810
0389 0 086C          XIO RDSWS       READ SWITCHES 38005820
038A 0 C400 040F      LD L SWS        38005830
038C 0 100C          SLA 12          LOCK ON ERR FUNC SELECTED 38005840
038D 0 4CA8 0378      BSC I LOKFN,Z+ *YES, BRANCH 38005850
*                               38005860
038F 0 1010          SLA 16          38005870
0390 0 D07C          STO ERRSW       CLEAR ERROR SW 38005880
0391 0 70F3          MDX LOKFN+13   38005890
*                               38005900
*****
*                               ERROR ROUTINE 38005910
*                               38005920
*                               38005930
*****
0392 0 0000          ERROR DC **-*   38005940
0393 0 CC00 0000      LDD L 0         38005950
0395 0 DC00 0404      STD L SAVE1     38005960
0397 0 C85C          LDD LINK        38005970
0398 0 DC00 0000      STD L 0         SET UP RESTART 38005980
039A 0 085B          XIO RDSWS       READ SWS 38005990
039B 0 C073          LD SWS          38006000
039C 0 E06E          AND H00AE       38006010
039D 0 F06E          EOR H0006       ILLEGAL SWITCH COMBINATION 38006020
039E 0 4C20 03A2      BSC L **+2,Z    *NO, BRANCH 38006030
*                               38006040
*                               38006050
03A0 0 3007          WAIT 7          ERR-ILLEGAL SWS 38006060
03A1 0 70F5          MDX ERROR+5    38006070
*                               38006080
*                               38006090
03A2 0 C400 040E      LD L FUNNO      38006100
03A4 0 8400 02E8      A L H0001       38006110
03A6 0 8069          A NOTBL         38006120
03A7 0 D001          STO **+1       38006130

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03A8 0 C400 0000      LD L **-*       38006140
03AA 0 D400 049E      STO L MSG07+3   PUT FUNC. NO. IN MSG 38006150
03AC 0 4400 043B      BSI L PRINT     PRINT ERROR MSG 38006160
03AE 0 8492          DC MSG05+/8000 38006170
03AF 0 8496          DC MSG06+/8000 38006180
03B0 0 049B          DC MSG07        38006190
*                               38006200
03B1 0 C05D          LD SWS          38006210
03B2 0 100E          SLA 14          38006220
03B3 0 4C28 03C6      BSC L NWAIT,Z+ BY IF BYPASS WAIT 38006230
*                               38006240
03B5 0 C400 02E6      LD L SLDBE      GET GOOD DATA 38006250
03B7 0 1890          SRT 16          PUT IN Q 38006260
03B8 0 C400 02EA      LD L WAS        BAD DATA IN A 38006270
03BA 0 3004          WAIT 4          ERROR WAIT 38006280
*                               38006290
03BB 0 C400 040E      LD L FUNNO      38006300
03BD 0 8400 02E8      A L H0001       38006310
03BF 0 1888          SRT 8           PUT FUNCTION NO. 38006320
03C0 0 C400 01D9      LD L RID        AND RTN NO. 38006330
03C2 0 1888          SRT 8           IN Q REG 38006340
03C3 0 C400 02E7      LD L ADDRS      ADDRS IN ACC 38006350
03C5 0 3005          WAIT 5          ERROR WAIT 38006360
*                               38006370
03C6 0 082F          NWAIT XIO RDSWS READ SWS 38006380
03C7 0 C047          LD SWS          38006390
03C8 0 D044          STO ERRSW       SET ERROR SWITCH 38006400
03C9 0 1008          SLA 8           38006410
03CA 0 4C28 03D6      BSC L LOOPA,Z+ BR TO LOOP ADDRESS 38006420
*                               38006430
03CC 0 CC00 0404      LDD L SAVE1     38006440
03CE 0 DC00 0000      STD L 0         38006450
03D0 0 C400 02E6      LD L SLDBE      38006460
03D2 0 D480 02E7      STO I ADDRS     38006470
03D4 0 4C80 0392      BSC I ERROR     38006480
03D6 0 C400 0280      LOOPA LD L ALTNT 38006490
*                               38006500
03D8 0 8031          A H7000         FIND LAST GOOD DATA 38006510
03D9 0 D001          STO **+1        WORD STORED 38006520
03DA 0 C400 02E6      LD L SLDBE      38006530
03DC 0 7000          MDX *           38006540
*                               38006550
03DD 0 7011          MDX ALTO0       38006560
03DE 0 7013          MDX ALTO1       38006570
*                               38006580
03DF 0 1001          ALTO2 SLA 1     38006590
03E0 0 8400 02E8      A L H0001       38006600
03E2 0 D480 02E7      STO I ADDRS     STO LAST GOOD DATA 38006610
03E4 0 C400 02E6      LD L SLDBE      38006620
03E6 0 D480 02E7      STO I ADDRS     STO LAST BAD DATA 38006630
03E8 0 C480 02E7      LD I ADDRS      38006640
03EA 0 F400 02E6      EOR L SLDBE     DATA GOOD NOW 38006650
03EC 0 4C20 0393      BSC L ERROR+1,Z *NO,BRANCH 38006660
*                               38006670
03EE 0 70D7          MDX NWAIT       38006680
*                               38006690
03EF 0 F400 02E9      ALTO0 EOR L HFFFF 38006700
03F1 0 70F0          MDX ALTO2+3     38006710
*                               38006720
03F2 0 1001          ALTO1 SLA 1     38006730
03F3 0 70EE          MDX ALTO2+3     38006740
*                               38006750
*                               CONSTANTS IOCC TABLE 38006760
*                               38006770
03F4 0 0000          BSS E           38006780
03F4 0 4C00 0161      LINK BSC L CRSIZ 38006790
03F6 0 040F          RDSWS DC SWS    38006800
03F7 0 3A00          DC /3A00        38006810

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HIGH CORE FUNCTION TEST

HIGH CORE FUNCTION TEST

047D 0 9A9E	MSG01 DC	/9A9E	ST	38008180
047E 0 3E62	DC	/3E62	AR	38008190
047F 0 9E21	DC	/9E21	T	38008200
0480 0 FFFF	DC	/FFFF		38008210
	*			38008220
0481 0 3676	MSG02 DC	/3676	EN	38008230
0482 0 3221	DC	/3221	D	38008240
0483 0 FFFF	DC	/FFFF		38008250
	*			38008260
0484 0 2622	MSG03 DC	/2622	HI	38008270
0485 0 1626	DC	/1626	GH	38008280
0486 0 211E	DC	/211E	C	38008290
0487 0 5262	DC	/5262	OR	38008300
0488 0 3621	DC	/3621	E	38008310
0489 0 9E36	DC	/9E36	TE	38008320
048A 0 9A9E	DC	/9A9E	ST	38008330
048B 0 FFFF	DC	/FFFF		38008340
	*			38008350
048C 0 1E52	MSG04 DC	/1E52	CO	38008360
048D 0 6236	DC	/6236	RE	38008370
048E 0 219A	DC	/219A	S	38008380
048F 0 22A2	DC	/22A2	IZ	38008390
0490 0 3621	DC	/3621	E	38008400
0491 0 FFFF	DC	/FFFF		38008410
	*			38008420
0492 0 0936	MSG05 DC	/0936	SR E	38008430
0493 0 6262	DC	/6262	RR	38008440
0494 0 2121	DC	/2121		38008450
0495 0 FFFF	DC	/FFFF		38008460
	*			38008470
0496 0 629E	MSG06 DC	/629E	RT	38008480
0497 0 7621	DC	/7621	N	38008490
0498 0 0000	DC	*--	XX	38008500
0499 0 2121	DC	/2121		38008510
049A 0 FFFF	DC	/FFFF		38008520
	*			38008530
049B 0 2112	MSG07 DC	/2112	F	38008540
049C 0 8276	DC	/8276	UN	38008550
049D 0 1E21	DC	/1E21	C	38008560
049E 0 0000	DC	*--	YY	38008570
049F 0 FFFF	DC	/FFFF		38008580
04A0 0 0431	END	LDLNK		38008590

NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY

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

NAME	VALUE	REFERENCES
ADDRS	02E7	01F3,01F5,01FB,0216,021A,021F,0225,0288,028A,028C,0290,0294,0295,029C,029E,02A2,02AC,02AF,02B7,02B9,02BD,02C6,02C7,02CF,02D2,02D6,02FB,02FF,0301,030E,0312,0317,031A,031C,0320,0325,0326,032E,0332,0337,0338,0340,0345,034D,0353,03C3,03D2,03E2,03E6,03E8
ADRCK	02AB	0202,0208,02BF,02C3
ADVNC	01A6	01AD
ALTNT	0280	0197,024F,0259,03D6
ALTOO	03EF	03DD
ALTO1	03F2	03DE
ALTO2	03DF	03F1,03F3
CHAR1	0402	03FE,045C
CHAR2	0403	0400,045E
CHECK	0323	026A,0330,0334
CHEX	02C5	0233,0246,02D8,02DC
CNTRL	0196	01F0,0210,024B,0263,0279
COMPL	0282	0198,0212,0218,021D,022B,022D,023C,023E,0240,025C,027D,029B,02A6,02AD,02C0,02C2,02D9,02DB,02FD,0308,035D
COUNT	027F	0266,0272,0342,034B,0360
CR	0408	03FC
CRSIZ	0161	0171,0184,03F4,0427,0437
DOWN	02F1	01E9,0209,0244,02F7
END	0418	01AA
ENDPT	02EB	029F,028A,02D3,02E2,02F5
ERR	036D	032C,033E,0376
ERROR	0392	0299,0283,02CB,0305,0372,03A1,03D4,03EC
ERRSW	040D	0194,0382,0390,03C8
FFFF	01DA	01DD,021C,025A
FILL	0285	01DE,028E,0292
FIND	0352	0318,0365,0368,036E
FLIP	0293	01E2,01EB,02A4,02A9
FLOAT	02F9	0251,025E,030D,0310,0314
FNDSZ	0185	016C,0179
FUNND	040E	019D,01E7,0207,0238,0256,026F,03A2,038B
FUN11	01E0	01E6
FUN12	01E9	01EF
FUN21	0200	0206
FUN22	0209	020F
FUN31	022D	0237
FUN32	023E	024A
FUN42	0258	0262
FUN61	026A	026E
FUN62	0271	0278
GTADR	0451	0465,046C
GTOUT	0441	0447
HFFFF	02E9	027B,02A7,02B6,02C1,02CE,02DA,02F2,032B,033D,0350,035C,0369,0374,03EF,0456,045A
H00AE	040B	039C
H000A	01D8	0189
H0001	02E8	0186,01FD,0227,024D,0291,02DF,0313,0321,0333,034E,03A4,03BD,03E0
H0002	0281	0258
H0004	0283	0271,0349
H0006	040C	039D
H1000	01D7	0161
H5555	01D8	0211,022A
H7000	040A	03D8
H8000	02EE	02FC
INCRE	02EC	02A3,02BE,02D7,02E0,02F3
INT	0475	03F8,0477
INVRT	0350	033B
LDLNK	0431	04A0
LINK	03F4	0166,0173,017B,0397,041C
LOKFN	0378	01E4,01ED,0204,020D,0235,0248,0253,0260,026C,0276,037D,0385,0387,038D,0391
LOOPA	03D6	03CA
LPRTN	01AC	01C5,01C8,01CE
LRTN	01DC	01A9,01C7

LWRLM 02EF 01F1,0287,02E3,02F4,02FA,0316,0324,0336  
MSGAD 0409 0453,0454,0463  
MSGEN 0466 0458  
MSG01 047D 0190,01C0  
MSG02 0481 041A  
MSG03 0484 0191,041B  
MSG04 048C 0182  
MSG05 0492 0181,03AE  
MSG06 0496 0187,01C1,03AF  
MSG07 049B 03AA,03B0  
NOTBL 0410 01B2,03A6,0410  
NWAIT 03C6 03B3,03EE  
OUT 046D 0445,0468  
PASS 0284 0199,0379,037B,0380  
PRINT 043B 017F,018E,018E,03AC,0418,0441,0443,0451,0466,046A,046D,0473  
PRNIT 0448 043F  
PRNT1 03FE 045F  
PRNT2 0400 0461  
RDSWS 03F6 019F,0389,039A,03C6,041F,0425,043C  
RETRN 03FC 044F  
RIU 01D9 0193,01A6,01A8,01AC,01B1,01CD,03C0  
RTN1 01DD 01D0  
RTN2 01F1 01D1,01FF  
RTN3 0211 01D2,0229  
RTN4 024D 01D3,0255  
RTN5 0265 01D4,027E  
RTN6 027B 01D5  
RTTBL 01CF 01AF,01CF  
SAVE1 0404 0395,03CC  
SAVE2 0406 044A,046F  
SENSE 03FA 0476  
SHAKE 0335 0274,0344,0347,034F  
SIZE 01D6 0162,0168,016E,0170,0175,0185,0188,018C  
SLDBE 02E6 022F,023A,0242,0286,0289,0298,02A5,02A8,02AE,02B2,02B5,02CA,02CD  
02D1,02FE,0304,0307,035F,0364,0367,0370,0385,03D0,03DA,03E4,03EA  
SLRTN 01C4 01A4  
START 018E 0422  
STOP 0479 03F9,047B  
STURE 0340 0351  
STKTN 01C2 0180,018C  
SVINT 0439 0429,042C,0433,0436  
SWS 040F 01A1,01B9,01CA,038A,039B,03B1,03C7,03F6,0420,0426,043D  
TEMP 02ED 0355,0357  
UP 02DE 01E0,0200,0214,0231,02E4  
UPRLM 02F0 018A,01F7,0221,028D,02E1,02F6,030F,031D,032F,0346  
VECTR 03F8 044C  
WAS 02EA 0297,02B1,02C9,0303,0328,033A,03B8  
WORST 0315 0268,031E,0322

END OF ASSEMBLY

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

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0000          ABS          3B100020
0960 0 03B1   ORG          3B100030
          DC /0960         3B100040
          PID /03B1
*****
          PROGRAM INITIALIZATION
*****
          FIND CORE SIZE
0961 0 C071   CRSIZ LD     H1000
0962 0 D06F   STO      SIZE      SET 8K CORE SIZE
0963 0 1010   SLA      16
0964 0 D400 0000 STO L 0      CLEAR ADDRS 0000
0966 0 CC00 0BF0 LDD L LINK
0968 0 DC80 09D2 STD I SIZE    STO RESTART LINKAGE
096A 0 C400 0000 LD L 0        DID WRAP-AROUND OCCUR
096C 0 4C20 0985 BSC L FNDSZ,Z *YES, BRANCH
*****
          LD      SIZE
          SLA     1      INCRE SIZE BY 4K
          STD    SIZE    IS SIZE OVER 32K
          BSC L CRSIZ+2,- *NO, BRANCH
*****
          LDD L LINK
          STD I SIZE    STO RESTART LINKAGE
          LD L 0        DID WRAP-AROUND OCCUR
          BSC L FNDSZ,Z *YES, BRANCH
*****
          LDD L LINK
          STD L 0
          BSI L PRINT   PRINT ERROR MSG
          DC   MSG05+/8000
          DC   MSG04
*****
          WAIT 3      ERR, CANNOT FIND CORE SIZE
          MDX CRSIZ  RETRY
*****
          FNDSZ LD     SIZE
          S L H0001  CORRECT CORE SIZE
          STD    SIZE
          WAIT 1      WAIT FOR SMS, SIZE IN ACC
*****
          START BSI L PRINT   PRINT START MSG
          DC   MSG01+/8000
          DC   MSG03
*****
          SLA     16
          STD    RID
          STD L ERRSW
*****
          ROUTINE SEQUENCE CONTROL
*****
          CNTRL SLA 16
          STD L ALTNT
          STD L PASS
          STD L COMPL
          STD L FUNND
          XID L RDSWS  READ SMS
          LD L SWS
          SRA 5
          BSC L SLRTN,E BR IF LOOP RTN SELECTED

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09A2 0 7401 09D5 * ADVNC MDX L RID,1 ADVANCE TO NEXT RTN 3B100700
09A4 0 C030      LD RID 3B100710
09A5 0 9032      S LRTN 3B100720
09A6 0 4C30 0C14 BSC L END,-Z BR IF END OF PROGRAM 3B100730
          * 3B100740
          LPRTN LD RID 3B100750
09A8 0 C02C      BSC L ADVNC,+ BR IF RID IS ZERO 3B100760
09A9 0 4C08 09A2 A RTTBL 3B100770
09AB 0 801F      STO STRTN+1 SET RTN START ADDR 3B100780
09AC 0 D012      LD RID 3B100790
09AD 0 C027      A L NOTBL 3B10080C
09AE 0 8400 0C0C STO **1 ENTER RTN NUMBER IN MSG 3B100810
0980 0 D001      LD L ** 3B100820
09B1 0 C400 0000 STO L MSG06+2 3B100830
09B3 0 D400 0C80 * 3B100840
          LD L SWS 3B100850
09B5 0 C400 0C0B SLA 9 RTN START MSG SELECTED 3B100860
09B7 0 1009      BSC L STRTN,- *NO,BRANCH 3B100870
09B8 0 4C10 09BE * 3B100880
          BSI L PRINT PRINT RTN START MSG 3B100890
          DC MSG01+/8000 3B100900
          DC MSG06 3B100910
          * 3B100920
          STRTN BSC I ** START TEST ROUTINE 3B100930
          * 3B100940
          SLRTN SRA 3 3B100950
          BSC L LPRTN,+ BR IF NO RTN SELECTED 3B100960
          * 3B100970
          S LRTN 3B100980
          BSC L LPRTN,Z- BR IF INVALID RTN NO. 3B100990
          * 3B101000
          LD L SWS 3B101010
          SRA 8 3B101020
          STD RID SELECT ROUTINE 3B101030
          MDX LPRTN 3B101040
          * 3B101050
          * 3B101060
          * ROUTINE ADDRESS TABLE 3B101070
          * 3B101080
          RTTBL DC RTTBL 3B101090
          DC RTN1 3B101100
          DC RTN2 3B101110
          DC RTN3 3B101120
          DC RTN4 3B101130
          DC RTN5 3B101140
          DC RTN6 3B101150
          * 3B101160
          * PROGRAM CONSTANTS 3B101170
          * 3B101180
          SIZE DC ** CORE SIZE 3B101190
          H1000 DC /1000 3B101200
          H000A DC /000A 3B101210
          RID DC ** ROUTINE NUMBER 3B101220
          FFFF DC /FFFF 3B101230
          H5555 DC /5555 3B101240
          LRTN DC 6 3B101250
          * 3B101260
          * 3B101270
          * 3B101280
          * TEST ROUTINE ONE 3B101290
          * 3B101300
          * 3B101310
          * 3B101320
          RTN1 LD FFFF 3B101330
          BSI L FILL FILL CORE WITH FFFF 3B101340
          * 3B101350
          FUN11 BSI L UP INCRE LOW TO HIGH CORE 3B101360
          BSI L FLIP CK AND STORE 0000 3B101370

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LOW CORE FUNCTION TEST

LOW CORE FUNCTION TEST

```

09E0 0 4400 0B74      *      BSI L LOKFN      CK FOR LOCK ON ERR FUNC      38101380
09E2 0 70F9           MDX      FUN11      38101390
                                38101400
                                38101410
09E3 0 7401 0C0A      *      MDX L FUNNO,1      38101420
09E5 0 4400 0AED      FUN12 BSI L DOWN      DECRE HIGH TO LOW CORE      38101430
09E7 0 4400 0A8F      BSI L FLIP      CK CORE AND STORE 0000      38101440
                                38101450
09E9 0 4400 0B74      *      BSI L LOKFN      CK FOR LOCK ON ERR FUNC      38101460
09EB 0 70F9           MDX      FUN12      38101470
                                38101480
09EC 0 70A5           *      MDX      CNTRL      GO TO CONTROL      38101490
                                38101500
                                *****
                                *
                                *      TEST ROUTINE TWO
                                *
                                *****
RTN2  LD L LWRLM      FILL EACH CORE      38101510
      STO L ADDR      LOCATION WITH      38101520
09F1 0 D480 0AE3      STO I ADDR      ADDRESS      38101530
09F3 0 F400 0AEC      EOR L UPRLM      38101540
09F5 0 4C18 09FC      BSC L **5,+--    BR LAST ADDRESS      38101550
                                38101560
                                38101570
09F7 0 C400 0AE3      *      LD L ADDR      38101580
09F9 0 8400 0AE4      A L H0001      INCRE ADDRESS BY ONE      38101590
09FB 0 70F3           MDX      RTN2+2      38101600
                                38101610
                                38101620
                                38101630
09FC 0 4400 0ADA      *      BSI L UP      INCRE LOW TO HIGH CORE      38101640
09FE 0 4400 0AA7      BSI L ADRCK      CK AND COMPLEMENT      38101650
                                38101660
                                38101670
0A00 0 4400 0B74      *      BSI L LOKFN      CK FOR LOCK ON ERR      38101680
0A02 0 70F9           MDX      FUN21      38101690
                                38101700
0A03 0 7401 0C0A      *      MDX L FUNNO,1      38101710
0A05 0 4400 0AED      FUN22 BSI L DOWN      DECRE HIGH TO LOW CORE      38101720
0A07 0 4400 0AA7      BSI L ADRCK      CK AND COMPLEMENT      38101730
                                38101740
0A09 0 4400 0B74      *      BSI L LOKFN      LOCK ON FUNCTION      38101750
0A0B 0 70F9           MDX      FUN22      38101760
                                38101770
0A0C 0 7085           *      MDX      CNTRL      38101780
                                38101790
                                38101800
                                38101810
                                *****
                                *
                                *      TEST ROUTINE THREE
                                *
                                *****
RTN3  LD H5555      38101820
      STO : COMPL      38101830
0A0E 0 D400 0A7E      BSI L UP      INCRE LOW TO HIGH CORE      38101840
0A10 0 4400 0ADA      *      38101850
                                38101860
                                38101870
                                38101880
                                38101890
                                38101900
                                38101910
                                38101920
                                38101930
0A12 0 D400 0AE3      *      STO L ADDR      STORE 5555 AAAA PATTERN      38101940
0A14 0 C400 0A7E      LD L COMPL      COMPLEMENT      38101950
0A16 0 D480 0AE3      STO I ADDR      SET UP NEXT WORD      38101960
0A18 0 F0BD      EOR L FFFF      38101970
0A19 0 D400 0A7E      STO L COMPL      38101980
0A1B 0 C400 0AE3      LD L ADDR      38101990
0A1D 0 F400 0AEC      EOR L UPRLM      38102000
0A1F 0 4C18 0A26      BSC L **5,+--    BR IF LAST ADDR      38102010
                                38102020
0A21 0 C400 0AE3      *      LD L ADDR      INCRE ADDRESS BY ONE      38102030
0A23 0 8400 0AE4      A L H0001      38102040
0A25 0 70EC           MDX      RTN3+5      38102050
                                38102060
0A26 0 C0B0           *      LD H5555      38102070
                                38102080
                                38102090
                                38102100
                                38102110
                                38102120
                                38102130
                                38102140
                                38102150
                                38102160
                                38102170
                                38102180
                                38102190
                                38102200
                                38102210
                                38102220
                                38102230
                                38102240
                                38102250
                                38102260
                                38102270
                                38102280
                                38102290
                                38102300
                                38102310
                                38102320
                                38102330
                                38102340
                                38102350
                                38102360
                                38102370
                                38102380
                                38102390
                                38102400
                                38102410
                                38102420
                                38102430
                                38102440
                                38102450
                                38102460
                                38102470
                                38102480
                                38102490
                                38102500
                                38102510
                                38102520
                                38102530
                                38102540
                                38102550
                                38102560
                                38102570
                                38102580
                                38102590
                                38102600
                                38102610
                                38102620
                                38102630
                                38102640
                                38102650
                                38102660
                                38102670
                                38102680
                                38102690
                                38102700
                                38102710
                                38102720
                                38102730

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0A27 0 D400 0A7E      *      STO L COMPL      38102060
                                38102070
                                38102080
0A29 0 C400 0A7E      FUN31 LD L COMPL      38102090
0A2B 0 D400 0AE2      STO L SLDBE      38102100
0A2D 0 4400 0ADA      BSI L UP      INCRE LOW TO HIGH CORE      38102110
0A2F 0 4400 0AC1      BSI L CHEX      CK AND COMPLEMENT      38102120
                                38102130
0A31 0 4400 0B74      *      BSI L LOKFN      CK LOCK ON ERR      38102140
0A33 0 70F5           MDX      FUN31      38102150
                                38102160
0A34 0 7401 0C0A      *      MDX L FUNNO,1      38102170
0A36 0 C400 0AE2      LD L SLDBE      38102180
0A38 0 D400 0A7E      STO L COMPL      38102190
                                38102200
0A3A 0 C400 0A7E      *      FUN32 LD L COMPL      38102210
0A3C 0 D400 0A7E      STO L COMPL      38102220
0A3E 0 D400 0AE2      STO L SLDBE      38102230
0A40 0 4400 0AED      BSI L DOWN      DECRE HIGH TO LOW CORE      38102240
0A42 0 4400 0AC1      BSI L CHEX      CK AND COMPLEMENT      38102250
                                38102260
0A44 0 4400 0B74      *      BSI L LOKFN      CK LOCK ON ERROR      38102270
0A46 0 70F3           MDX      FUN32      38102280
                                38102290
0A47 0 4C00 0992      *      BSC L CNTRL      38102300
                                *****
                                *
                                *      TEST ROUTINE FOUR
                                *
                                *****
RTN4  LD L H0001      38102310
      STO ALTNT      38102320
0A49 0 C400 0AE4      SLA 16      CK EACH CORE LOCATION      38102330
0A4B 0 D030      16      BIT BY BIT, ONE BIT ON      38102340
0A4C 0 1010      BSI L FLOAT      38102350
0A4D 0 4400 0AF5      *      38102360
                                38102370
                                38102380
0A4F 0 4400 0B74      *      BSI L LOKFN      CK FOR LOCK ON ERR      38102390
0A51 0 70F7           MDX      RTN4      38102400
                                38102410
                                38102420
0A52 0 7401 0C0A      *      MDX L FUNNO,1      38102430
                                38102440
                                38102450
0A54 0 C028      *      FUN42 LD H0002      38102460
0A55 0 D026      STO ALTNT      38102470
0A56 0 C400 09D6      LD L FFFF      38102480
0A58 0 D400 0A7E      STO L COMPL      CK EACH CORE LOCATION      38102490
0A5A 0 4400 0AF5      BSI L FLOAT      BIT BY BIT, ONE BIT OFF.      38102500
                                38102510
                                38102520
0A5C 0 4400 0B74      *      BSI L LOKFN      CK FOR LOCK ON ERR      38102530
0A5E 0 70F5           MDX      FUN42      38102540
                                38102550
0A5F 0 4C00 0992      *      BSC L CNTRL      38102560
                                38102570
                                38102580
                                38102590
                                38102600
                                38102610
                                38102620
                                38102630
                                38102640
                                38102650
0A61 0 1010      *      RTN5 SLA 16      38102660
0A62 0 D400 0A7B      STO L COUNT      STORE WORST CASE PATTERN      38102670
0A64 0 4400 0B11      BSI L WORST      38102680
                                38102690
0A66 0 4400 0B1F      *      FUN61 BSI L CHECK      CK EACH CORE LOCATION      38102700
                                38102710
                                38102720
0A68 0 4400 0B74      *      BSI L LOKFN      CK LOCK ON ERROR      38102730
0A6A 0 70FB           MDX      FUN61      38102740
                                38102750
0A6B 0 7401 0C0A      *      MDX L FUNNO,1      38102760
                                38102770
                                38102780
                                38102790
                                38102800
                                38102810
                                38102820
                                38102830
                                38102840
                                38102850
                                38102860
                                38102870
                                38102880
                                38102890
                                38102900
                                38102910
                                38102920
                                38102930
                                38102940
                                38102950
                                38102960
                                38102970
                                38102980
                                38102990
                                38103000

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LOW CORE FUNCTION TEST

LOW CORE FUNCTION TEST

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0A6D 0 C011      FUN62 LD      H0004      3B102740
0A6E 0 D400 0A7B  STO L      COUNT      3B102750
0A70 0 4400 0B31  BSI L      SHAKE      CK AND COMPL 4 TIMES 3B102760
*
0A72 0 4400 0B74  *      BSI L      LOKFN      CK LOCK ON ERROR 3B102770
0A74 0 70F8      MDX      FUN62      3B102780
*
0A75 0 4C00 0992  *      BSC L      CNTRL      3B102790
*
*****
*
*          TEST ROUTINE SIX
*
*****
0A77 0 C400 0AE5  RTN6 LD      L      HFFFF      SET UP COMPLEMENT 3B102800
0A79 0 D004      STO      COMPL      WORST CASE PATTERN 3B102810
0A7A 0 70E6      MDX      RTN5      3B102820
*
*****
*
*          SUBROUTINES FOR RTNS 1-6
*
*****
*
*          PROGRAM CONSTANTS
*
0A7B 0 0000      COUNT DC      *--
0A7C 0 0000      ALTNT DC     *--
0A7D 0 0002      H0002 DC     /0002
0A7E 0 0000      COMPL DC     *--
0A7F 0 0004      H0004 DC     /0004
0A80 0 0000      PASS DC     *--
*
*          FILL CORE WITH ONES
*
0A81 0 0000      FILL DC      *--
0A82 0 D05F      STO      SLDBE
0A83 0 C067      LD      LWRLM      GET STARTING ADDRESS 3B103100
0A84 0 D05E      STO      ADDRS
0A85 0 C05C      LD      SLDBE      GET DATA WORD 3B103110
0A86 0 D480 0AE3  STO I      ADDRS      STO DATA WORD 3B103120
0A88 0 C05A      LD      ADDRS
0A89 0 F062      EOR      UPRLM
0A8A 0 4C98 0A81  BSC I      FILL,+--  BR IF LAST ADDRESS 3B103130
*
0A8C 0 C056      LD      ADDRS
0A8D 0 8056      A      H0001      INCRE ADDRESS BY ONE 3B103140
0A8E 0 70F5      MDX      FILL+3      3B103150
*
*          CK AND COMPLEMENT 0000/FFFF PATTERN:
*
0A8F 0 0000      FLIP DC      *--
0A90 0 D052      STO      ADDRS      SAVE STARTING ADDRESS 3B103160
0A91 0 C480 0AE3  LD I      ADDRS
0A93 0 D052      STO      WAS
0A94 0 F04D      EOR      SLDBE      DATA WORD CORRECT 3B103170
0A95 0 4420 0B8E  BSI L      ERROR,Z  *NO, BRANCH TO ERROR RTN 3B103180
*
0A97 0 C0E6      LD      COMPL
0A98 0 D480 0AE3  STO I      ADDRS      STORE NEW WORD 3B103190
0A9A 0 C048      LD      ADDRS
0A9B 0 F04B      EOR      ENDPT
0A9C 0 4C18 0AA1  BSC L      *+3,+--  BR IF LAST ADDRESS 3B103200
*
0A9E 0 C044      LD      ADDRS
0A9F 0 8048      A      INCRE
0AA0 0 70EF      MDX      FLIP+1      INCRE ADDRESS 3B103210

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```

*
0AA1 0 C040      LD      SLDBE      3B103420
0AA2 0 D0DB      STO      COMPL      3B103430
0AA3 0 F041      EOR      HFFFF      3B103440
0AA4 0 D03D      STO      SLDBE      3B103450
0AA5 0 4C80 0A8F  BSC I      FLIP      3B103460
*
*          CK AND COMPLEMENT ADDRESS PATTERN
*
0AA7 0 0000      ADRCK DC     *--
0AA8 0 D03A      STO      ADDRS      3B103470
0AA9 0 F0D4      EOR      COMPL      3B103480
0AAA 0 D037      STO      SLDBE      3B103490
0AAB 0 C480 0AE3  LD I      ADDRS      3B103500
0AAD 0 D038      STO      WAS        3B103510
0AAE 0 F033      EOR      SLDBE      DATA WORD CORRECT 3B103520
0AAF 0 4420 0B8E  BSI L      ERROR,Z  *NO, BRANCH 3B103530
*
0AB1 0 C030      LD      SLDBE      3B103540
0AB2 0 F032      EOR      HFFFF      3B103550
0AB3 0 D480 0AE3  STO I      ADDRS      STORE COMPLEMENT 3B103560
0AB5 0 C02D      LD      ADDRS      3B103570
0AB6 0 F030      EOR      ENDPT      3B103580
0AB7 0 4C18 0ABC  BSC L      *+3,+--  BR IF LAST ADDRESS 3B103590
*
0AB9 0 C029      LD      ADDRS      3B103600
0ABA 0 802D      A      INCRE      INCRE ADDRESS 3B103610
0ABB 0 70EC      MDX      ADRCK+1    3B103620
*
0ABC 0 C0C1      LD      COMPL      3B103630
0ABD 0 F027      EOR      HFFFF      3B103640
0ABE 0 D0BF      STO      COMPL      3B103650
0ABF 0 4C80 0AA7  BSC I      ADRCK      3B103660
*
*          CK AND COMPLEMENT 5555/AAAA PATTERN
*
0AC1 0 0000      CHEX DC     *--
0AC2 0 D020      STO      ADDRS      3B103670
0AC3 0 C480 0AE3  LD I      ADDRS      3B103680
0AC5 0 D020      STO      WAS        3B103690
0AC6 0 F01B      EOR      SLDBE      DATA WORD CORRECT 3B103700
0AC7 0 4420 0B8E  BSI L      ERROR,Z  *NO, BRANCH 3B103710
*
0AC9 0 C018      LD      SLDBE      3B103720
0ACA 0 F01A      EOR      HFFFF      3B103730
0ACB 0 D480 0AE3  STO I      ADDRS      STORE COMPLEMENT, 3B103740
0ACD 0 D014      STO      SLDBE      3B103750
0ACE 0 C014      LD      ADDRS      3B103760
0ACF 0 F017      EOR      ENDPT      3B103770
0ADO 0 4C18 0AD5  BSC L      *+3,+--  BR IF LAST ADDRESS 3B103780
*
0AD2 0 C010      LD      ADDRS      3B103790
0AD3 0 8014      A      INCRE      INCRE ADDRESS 3B103800
0AD4 0 70ED      MDX      CHEX+1     3B103810
*
0AD5 0 C0A8      LD      COMPL      3B103820
0AD6 0 F00E      EOR      HFFFF      3B103830
0AD7 0 D0A6      STO      COMPL      3B103840
0AD8 0 4C80 0AC1  BSC I      CHEX      3B103850
*
*          INCREMENT FROM LOWER TO UPPER CORE
*
0ADA 0 0000      UP      DC      *--
0ADB 0 C008      LD      H0001
0ADC 0 D00B      STO      INCRE      SET UP ADDRS INCREMENT 3B104000
0ADD 0 C00E      LD      UPRLM
0ADE 0 D008      STO      ENDPT      SET LAST ADDRESS 3B104010
0ADF 0 C00B      LD      LWRLM      SET FIRST ADDRESS 3B104020

```

LOW CORE FUNCTION TEST

LOW CORE FUNCTION TEST

```

OAE0 0 4C80 OADA      BSC I UP
*
* PROGRAM CONSTANTS
*
OAE2 0 0000      SLDBE DC  *--
OAE3 0 0000      ADDRS DC  *--
OAE4 0 0001      H0001 DC  /0001
OAE5 0 FFFF      HFFFF DC  /FFFF
OAE6 0 0000      WAS DC    *--
OAE7 0 0000      ENDPT DC  *--
OAE8 0 0000      INCRE DC  *--
OAE9 0 0000      TEMP DC   *--
OAEA 0 8000      H8000 DC  /8000
OAEB 0 FFF6      LWRLM DC  /LWRLM
OAEC 0 0900      UPRLM DC  /0900
*
* DECREMENT FROM UPPER TO LOWER CORE
*
OAE4 0 0000      DOWN DC   *--
OAE5 0 C0F6      LD        HFFFF      SET UP ADDRESS INCRE
OAE6 0 D0F8      STO        INCRE
OAE7 0 C0FA      LD        LWRLM
OAE8 0 D0F5      STO        ENDPT      SET UP LAST ADDRESS
OAE9 0 C0F9      LD        UPRLM      SET UP FIRST ADDRESS
OAF0 0 4C80 OAF0      BSC I DOWN
*
* CHECK BIT BY BIT PATTERN
*
OAF5 0 0000      FLOAT DC  *--
OAF6 0 C0F4      LD        LWRLM
OAF7 0 D0EB      STO        ADDRS      SAVE ADDRESS
OAF8 0 C0F1      LD        H8000
OAF9 0 F0B4      EDR        COMPL
OAF0 0 D0E7      STO        SLDBE
OAF1 0 D480 OAE3   STO I    ADDRS      STORE DATA WORD
OAF2 0 C480 OAE3   LD I    ADDRS
OAF3 0 D0E6      STO        WAS
OAF4 0 F0E1      EDR        SLDBE      DATA CORRECT
OAF5 0 4420 O88E   BSI L   ERROR,Z    *NO, BRANCH
*
OAF6 0 CODE      LD        SLDBE
OAF7 0 F400 OAF7   EOR L   COMPL      LAST SHIFT
OAF8 0 C0C4 O80A   BSC L   *+2,E     *NO, BRANCH
*
OAF9 0 1801      SRA        1        SHIFT DATA
OAF0 0 70EF      MDX        FLOAT+4
*
OAF1 0 C0D8      LD        ADDRS
OAF2 0 F0E0      EOR        UPRLM
OAF3 0 4C98 OAF5   BSC I   FLOAT,+-- BR IF LAST ADDRESS
*
OAF4 0 C0D4      LD        ADDRS
OAF5 0 80D4      A        H0001      INCRE ADDRESS
OAF6 0 70E6      MDX        FLOAT+2
*
* STORE WORST CASE PATTERN
*
OAF7 0 0000      WORST DC  *--
OAF8 0 C0D8      LD        LWRLM
OAF9 0 D0CF      STO        ADDRS      SAVE ADDRESS
OAF0 0 4400 O84E   BSI L   FIND        FIND IF 0000 OR FFFF
OAF1 0 D480 OAE3   STO I    ADDRS      STORE DATA
OAF2 0 C0CA      LD        ADDRS
OAF3 0 F0D2      EOR        UPRLM
OAF4 0 4C98 O811   BSC I   WORST,+-- BR IF LAST ADDRESS
*
OAF5 0 C0C6      LD        ADDRS
OAF6 0 80C6      A        H0001      INCRE ADDRESS

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38104100
38104110
38104120
38104130
38104140
38104150
38104160
38104170
38104180
38104190
38104200
38104210
38104220
38104230
38104240
38104250
38104260
38104270
38104280
38104290
38104300
38104310
38104320
38104330
38104340
38104350
38104360
38104370
38104380
38104390
38104400
38104410
38104420
38104430
38104440
38104450
38104460
38104470
38104480
38104490
38104500
38104510
38104520
38104530
38104540
38104550
38104560
38104570
38104580
38104590
38104600
38104610
38104620
38104630
38104640
38104650
38104660
38104670
38104680
38104690
38104700
38104710
38104720
38104730
38104740
38104750
38104760
38104770

```

```

OB1E 0 70F4      MDX        WORST+2
*
* CHECK WORST CASE PATTERN
*
OB1F 0 0000      CHECK DC  *--
OB20 0 C0CA      LD        LWRLM
OB21 0 D0C1      STO        ADDRS      SAVE ADDRESS
OB22 0 C480 OAE3  LD I    ADDRS
OB24 0 D0C1      STO        WAS
OB25 0 4C18 O82A  BSC L   *+3,+-- BR IF DATA ZERO
*
OB27 0 F0BD      EOR        HFFFF      COMPLEMENT DATA
OB28 0 4420 O869  BSI L   ERR,Z      BR TO ERROR RTN IF NOT 0
*
OB2A 0 C0B8      LD        ADDRS
OB2B 0 F0C0      EOR        UPRLM
OB2C 0 4C98 O81F  BSC I   CHECK,+-- BR IF LAST ADDRESS
*
OB2E 0 C0B4      LD        ADDRS
OB2F 0 80B4      A        H0001      INCRE ADDRESS
OB30 0 70F0      MDX        CHECK+2
*
* CK AND COMPLEMENT 4 TIMES
*
OB31 0 0000      SHAKE DC  *--
OB32 0 C0B8      LD        LWRLM
OB33 0 D0AF      STO        ADDRS      SAVE ADDRESS
OB34 0 C480 OAE3  LD I    ADDRS
OB36 0 D0AF      STO        WAS
OB37 0 4C18 O84C  BSC L   INVRT,+-- BR DATA WORD ZERO
*
OB39 0 F0AB      EOR        HFFFF      COMPL DATA
OB3A 0 4420 O869  BSI L   ERR,Z      BR IF NOT ZERO
*
OB3C 0 D480 OAE3  STORE STO I  ADDRS      STORE NEW DATA
OB3E 0 74FF OAF7  MDX L   COUNT,-1
OB40 0 70F3      MDX        SHAKE+3
*
OB41 0 C0A1      LD        ADDRS
OB42 0 F0A9      EOR        UPRLM
OB43 0 4C98 O831  BSC I   SHAKE,+-- BR IF LAST ADDRESS
*
OB45 0 C400 OAF7  LD L   H0004
OB47 0 D400 OAF7  STO L   COUNT
OB49 0 C099      LD        ADDRS
OB4A 0 8099      A        H0001      INCRE ADDRESS
OB4B 0 70E7      MDX        SHAKE+2
*
OB4C 0 F098      INVRT EOR   HFFFF      COMPLEMENT DATA
OB4D 0 70EE      MDX        STORE
*
* DETERMINE IF DATA S/B 0000 OR FFFF
*
OB4E 0 0000      FIND DC  *--
OB4F 0 C093      LD        ADDRS
OB50 0 1806      SRA        6
OB51 0 D097      STO        TEMP
OB52 0 1802      SRA        2        ADDRS BITS 7 AND 9
OB53 0 F095      EOR        TEMP      BOTH 0 OR BOTH 1
OB54 0 4C04 O858  BSC L   *+2,E     *NO, BRANCH
*
OB56 0 1010      SLA        16
OB57 0 7001      MDX        *+1
*
OB58 0 C08C      LD        HFFFF      COMPLEMENT DATA FOR
OB59 0 F400 OAF7  EOR L   COMPL      COMPLEMENT WORST CASE
OB5B 0 D086      STO        SLDBE
OB5C 0 C400 OAF7  LD L   COUNT      DATA COMPL ODD NO. TIMES

```

```

38104780
38104790
38104800
38104810
38104820
38104830
38104840
38104850
38104860
38104870
38104880
38104890
38104900
38104910
38104920
38104930
38104940
38104950
38104960
38104970
38104980
38104990
38105000
38105010
38105020
38105030
38105040
38105050
38105060
38105070
38105080
38105090
38105100
38105110
38105120
38105130
38105140
38105150
38105160
38105170
38105180
38105190
38105200
38105210
38105220
38105230
38105240
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38105270
38105280
38105290
38105300
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38105360
38105370
38105380
38105390
38105400
38105410
38105420
38105430
38105440
38105450

```







LOW CORE FUNCTION TEST

```

*
OC7A 0 0936      MSG05 DC    /0936      SR E
OC7B 0 6262      DC      /6262      RR
OC7C 0 2121      DC      /2121
OC7D 0 FFFF      DC      /FFFF
*
OC7E 0 629E      MSG06 DC    /629E      RT
OC7F 0 7621      DC      /7621      N
OC80 0 0000      DC      *--*      XX
OC81 0 2121      DC      /2121
OC82 0 FFFF      DC      /FFFF
*
OC83 0 2112      MSG07 DC    /2112      F
OC84 0 B276      DC      /B276      UN
OC85 0 1E21      DC      /1E21      C
OC86 0 0000      DC      *--*      YY
OC87 0 FFFF      DC      /FFFF
OC88 0 0961      END    CRS1Z
    
```

NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY

```

3B108180
3B108190
3B108200
3B108210
3B108220
3B108230
3B108240
3B108250
3B108260
3B108270
3B108280
3B108290
3B108300
3B108310
3B108320
3B108330
3B108340
3B108350
    
```

LOW CORE FUNCTION TEST

C R D S S R E F E R E N C E

```

NAME VALUE REFERENCES
ADDRS 0AE3 09EF,09F1,09F7,0A12,0A16,0A1B,0A21,0A84,0A86,0A88,0A8C,0A90,0A91
      0A98,0A9A,0A9E,0AA8,0AAB,0AB3,0AB5,0AB9,0AC2,0AC3,0ACB,0ACE,0AD2
      0AF7,0AFB,0AFD,0B0A,0B0E,0B13,0B16,0B18,0B1C,0B21,0B22,0B2A,0B2E
      0B33,0B34,0B3C,0B41,0B49,0B4F,0BBF,0BCE,0BDE,0BE2,0BE4
ADRCX 0AA7 09FE,0A07,0ABB,0ABF
ADVNC 09A2 09A9
ALTNT 0A7C 0993,0A4B,0A55,0BD2
ALTO0 0BEB 0BD9
ALTO1 0BEE 0BDA
ALTO2 0BDB 0BED,0BEF
CHAR1 0BFE 0BFA,0C44
CHAR2 0BFF 0BFC,0C46
CHECK 0B1F 0A66,0B2C,0B30
CHEX 0AC1 0A2F,0A42,0AD4,0AD8
CNTRL 0992 09EC,0A0C,0A47,0A5F,0A75
      0997,0A0E,0A14,0A19,0A27,0A29,0A38,0A3A,0A3C,0A58,0A79,0A97,0AA2
      0AA9,0ABC,0ABE,0AD5,0AD7,0AF9,0B04,0B59
COUNT 0A7B 0A62,0A6E,0B3E,0B47,0B5C
CR 0C04 0BF8
CRS1Z 0961 0971,0984,0BF0,0C21,0C88
DOWN 0AED 09E5,0A05,0A40,0AF3
END 0C14 09A6
ENDPT 0AE7 0A9B,0AB6,0ACF,0ADE,0AF1
ERR 0B69 0B28,0B3A,0B72
ERROR 0B8E 0A95,0AAF,0AC7,0B01,0B6E,0B9D,0BDO,0BE8
ERRSW 0C09 0990,0B7E,0B8C,0BC4
FFFF 09D6 09D9,0A18,0A56
FILL 0A81 09DA,0A8A,0A8E
FIND 0B4E 0B14,0B61,0B67,0B6A
FLIP 0A8F 09DE,09E7,0AA0,0AA5
FLOAT 0AF5 0A4D,0A5A,0B09,0B0C,0B10
FNDSZ 0985 096C,0979
FUNNO 0C0A 0999,09E3,0A03,0A34,0A52,0A6B,0B9E,0BB7
FUN11 09DC 09E2
FUN12 09E5 09EB
FUN21 09FC 0A02
FUN22 0A05 0A0B
FUN31 0A29 0A33
FUN32 0A3A 0A46
FUN42 0A54 0A5E
FUN61 0A66 0A6A
FUN62 0A6D 0A74
GTADR 0C39 0C4D,0C54
GTOUT 0C29 0C2F
HFFFF 0AE5 0A77,0AA3,0AB2,0ABD,0ACA,0AD6,0AEE,0B27,0B39,0B4C,0B58,0B65,0B70
      0BEB,0C3E,0C42
H00AE 0C07 0B98
H000A 09D4
H0001 0AE4 0986,09F9,0A23,0A49,0A8D,0ADB,0B0F,0B1D,0B2F,0B4A,0BA0,0BB9,0BDC
H0002 0A7D 0A54
H0004 0A7F 076D,0B45
H0006 0C08 0B99
H1000 09D3 0961
H5555 09D7 0A0D,0A26
H7000 0C06 0BD4
H8000 0AEA 0AF8
INCRE 0AE8 0A9F,0ABA,0AD3,0ADC,0AEF
INT 0C5D 0BF4,0C5F
INVRT 0B4C 0B37
LINK 0BF0 0966,0973,097B,0B93,0C18
LOKFN 0B74 09E0,09E9,0A00,0A09,0A31,0A44,0A4F,0A5C,0A68,0A72,0B79,0B81,0B83
      0B89,0B8D
LOUPA 0BD2 0BC6
LPRTN 09A8 09C1,09C4,09CA
LRTN 09D8 09A5,09C3
LWRLM 0AEB 09ED,0A83,0ADF,0AF0,0AF6,0B12,0B20,0B32
    
```

## LOW CORE FUNCTION TEST

MSGAD 0C05 0C3B,0C3C,0C4B  
MSGEN 0C4E 0C40  
MSG01 0C65 098C,098C  
MSG02 0C69 0C16  
MSG03 0C6C 098D,0C17  
MSG04 0C74 0982  
MSG05 0C7A 0981,0BAA  
MSG06 0C7E 0983,098D,0BAB  
MSG07 0C83 0BA6,0BAC  
NOTBL 0C0C 09AE,0BA2,0C0C  
NWAIT 0BC2 0BAF,0BEA  
OUT 0C55 0C2D,0C50  
PASS 0A20 0995,0B75,0B77,0B7C  
PRINT 0C23 097F,098A,098A,0BA8,0C14,0C29,0C2B,0C39,0C4E,0C52,0C55,0C5B  
PRNIT 0C30 0C27  
PRNT1 0BFA 0C47  
PRNT2 0BFC 0C49  
RDSWS 0BF2 0998,0B85,0B96,0BC2,0C18,0C24  
RETRN 0BF2 0C37  
RID 09D5 098F,09A2,09A4,09A8,09AD,09C9,0B8C  
RTN1 09D9 09CC  
RTN2 09ED 09CD,09FB  
RTN3 0A0D 09CE,0A25  
RTN4 0A49 09CF,0A51  
RTN5 0A61 09D0,0A7A  
RTN6 0A77 09D1  
RTTBL 09CB 09AB,09CB  
SAVE1 0C00 0B91,0BC8  
SAVE2 0C02 0C32,0C57  
SENSE 0BF6 0C5E  
SHAKE 0B31 0A70,0B40,0B43,0B48  
SIZE 09D2 0962,0968,096E,0970,0975,0985,0988  
SLDBE 0AE2 0A2B,0A36,0A3E,0A82,0A85,0A94,0AA1,0AA4,0AAA,0AAE,0AB1,0AC6,0AC9  
0ACD,0AFA,0B00,0B03,0B5B,0B60,0B63,0B6C,0B81,0BCC,0BD6,0BE0,0BE6  
SLRTN 09C0 09A0  
START 098A 0C1E  
STUP 0C61 0BF5,0C63  
STURE 0B3C 0B4D  
STRTN 09BE 09AC,0988  
SWS 0C0B 099D,0985,09C6,0B86,0B97,0BAD,0BC3,0BF2,0C1C,0C25  
TEMP 0AE9 0B51,0B53  
UP 0ADA 09DC,09FC,0A10,0A2D,0AE0  
UPRLM 0AEC 09F3,0A1D,0A89,0ADD,0AF2,0B0B,0B19,0B2B,0B42  
VECTR 0BF4 0C34  
WAS 0AE6 0A93,0AAD,0AC5,0AFF,0B24,0B36,0BB4  
WORST 0B11 0A64,0B1A,0B1E

END OF ASSEMBLY

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

TABLE OF CONTENTS

PARAGRAPH	PAGE
1. PURPOSE. . . . .	01
2. PREREQUISITES. . . . .	01
2.1 PROGRAM	
2.2 EQUIPMENT	
3. USE PROCEDURE. . . . .	01A
3.1 LOADING	
3.2 OPERATION	
3.2.1 SYSTEMS I/O CONFIGURATION	
3.2.2 I/O READY	
3.2.3 NUMBER OF TEST LOOPS	
A. CE METER TEST	
B. CUSTOMER METER TEST	
3.2.4 CONTROL CIRCUITRY	
3.3 TABLE OF WAITS	
3.4 TERMINATIONS	
4. PRINTOUTS (NONE)	
5. COMMENTS (METHOD OF TEST) . . . . .	03
6. APPENDIX (NONE)	
1. PURPOSE	
A. TO CHECK THE ACCURACY OF ALL OF THE USE METERS.	
B. WHEN THE 1131 USE METER IS SWITCHED TO C.E MODE, ONLY THE C.E. METER ADVANCES.	
2. PREREQUISITES	
2.1 PROGRAM	
THIS PROGRAM DOES NOT RUN UNDER CONTROL OF THE 1130 DIAGNOSTIC MONITOR. USES THE RELOCATABLE DIANOSTIC LOADER FOR THE 1442 OR THE 2501.	
2.2 EQUIPMENT	
CUSTOMER ENGINEER USE METER KEY.	

3. USE PROCEDURE

3.1 PROGRAM LOADING

TO LOAD FROM CARDS

- A. PLACE THE RELOCATING LOADER, AND THE METER 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 THE READER READY.
- C. PRESS THE 1131 RESET KEY.
- D. PRESS THE 1131 PROGRAM LOAD KEY.
- E. LOADER WILL LOAD AND HALT AT WAIT 30F6 (B REG).
- F. PLACE THE METER TEST IN THE READER.
- G. MAKE THE READER READY.

**H** PRESS PROGRAM START.  
**I** IF PROGRAM FAILS TO LOAD OR STOPS AT A WAIT BELOW ADDRESS /0160 REFER TO RELOCATING LOADER DOCUMENTATION.

3.2 OPERATION

- A. CPU SPEED -- WAIT -1 (30FF = WAIT FF)

SET /FFFF FOR 2.2 US CPU SPEED. SET /0000 FOR 3.6 US CPU SPEED IN ENTRY SWITCHES. PRESS START TO CONTINUE.

- B. FILE AREA CODE SELECT -- WAIT 0 (3000)

WAIT ZERO (3000) IS TO SELECT THE FILE THE PROGRAM IS TO RUN WITH. IF DISK IS TO BE BYPASSED OR THERE IS NOT A DISK ON THE SYSTEM THE CONSOLE ENTRY SWITCHES MUST BE SET TO ZERO (0000).

THE FOLLOWING ENTRY SWITCH SETTINGS WILL SELECT THE FILES. ONLY ONE BIT POSITION SHOULD BE SET HOWEVER, THE RIGHT MOST SWITCH SET ON TAKES PRECEDENCE.

ENTRY SWITCH 15 EQUALS BASE FILE  
ENTRY SWITCH 14 EQUALS FILE ONE (SEE NOTE - SECTION 5.3)  
ENTRY SWITCH 13 EQUALS FILE TWO (SEE NOTE - SECTION 5.3)  
ENTRY SWITCH 12 EQUALS FILE THREE (SEE NOTE - SECTION 5.3)  
ENTRY SWITCH 11 EQUALS FILE FOUR (SEE NOTE - SECTION 5.3)

- C. SELECT SYSTEM I/O UNITS -- WAIT 1 (3001)

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

BIT 15 ON = SYSTEM HAS FILE STORAGE.  
BIT 14 ON = SYSTEM HAS 1442  
BIT 13 ON = SYSTEM HAS 1132  
BIT 12 ON = 1403  
BIT 10 ON = 1442 M5  
BIT 11 ON = 1231  
BIT 9 ON = 2501

FOR EXAMPLE, IF A SYSTEM HAS THREE OF THE I/O DEVICES, THEN THREE BIT SWITCHES WOULD BE TURNED ON. (AN EXAMPLE IS--- 2501,1442 M5 & FILE = /0051)

METER TEST

METER TEST

3.2.2 MAKE THE I/O UNITS READY.

1442- PLACE A FEW CARDS IN THE FEED HOPPER AND PRESS THE 1442 START KEY TO MAKE THE 1442 READY.

1132 - TURN ON THE POWER SWITCH, AND PRESS THE 1132 START KEY TO MAKE THE 1132 READY.

PRESS 1131 START BUTTON. PROGRAM WILL GO TO WAIT 2.

3.2.3 NUMBER OF TEST LOOPS -- WAIT 2 ( 3002 )

THIS SECTION WILL BE EXECUTED EITHER IN THE CUSTOMER METER OR CE METER ENVIRONMENT. CUSTOMER ENVIRONMENT IS WITH CE METER OFF AND CE USE KEY IN OFF POSITION.

A. TO CHECK CE MODE

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

NOTE

SEE 3.3 TABLE OF WAITS IF A WAIT OCCURS.

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

B. TO CHECK CUSTOMER METERS

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

NOTE

SEE 3.3 TABLE OF WAITS IF A WAIT OCCURS.

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

3.2.4 CONTROL CIRCUITRY CHECK

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

- A. THE 1132 METER SHOULD STOP IF THE 1132 CARRIAGE RESTORE OR CARRIAGE SPACE KEY IS PRESSED.
- B. THE 1442 METER SHOULD STOP IF THE 1442 NPRO KEY IS PRESSED.

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

3.3 TABLE OF WAITS

WAIT -1 THIS WAIT IS FOR SETTING CPU SPEED INDICATION. SET ENTRY SWITCHES & PRESS START. DEFAULT IS 3.6 US.

WAIT 0 SELECT FILE AREA CODE. (AREA CODE OF FILE TO BE TESTED.) PRESS START.

WAIT 1 SET THE I/O CONFIGURATION IN THE CONSOLE ENTRY SWITCHES. PRESS THE 1131 START BUTTON.

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

WAIT 3 THE 1442 IS NOT READY OR THE INTERRUPT WAS LOST. TO PROCEED, PRESS START. TO RETRY, PRESS CPU RESET AND START BUTTONS.

WAIT 4 THE 1132 IS NOT READY OR THE INTERRUPT WAS LOST. TO PROCEED, PRESS START. TO RETRY, PRESS CPU RESET AND START BUTTONS.

WAIT 5 THE 1403 IS NOT READY OR THE INTERRUPT WAS LOST. TO PROCEED, PRESS START. TO RETRY, PRESS CPU RESET AND START BUTTONS. THIS IS FOR TRANSFER ONLY.

WAIT 6 THE DISK IS NOT READY OR THE INTERRUPT WAS LOST. TO PROCEED, PRESS START. TO RETRY, PRESS CPU RESET AND START BUTTONS.

WAIT 7 THE 2501 IS NOT READY OR THE INTERRUPT WAS LOST. TO PROCEED, PRESS START. TO RETRY, PRESS CPU RESET AND START BUTTONS.

WAIT 8 THE 1231 IS NOT READY OR THE INTERRUPT WAS LOST. TO PROCEED, PRESS START. TO RETRY, PRESS CPU RESET AND START BUTTONS.

WAIT 9 THE 1442 M5 IS NOT READY OR THE INTERRUPT WAS LOST. TO PROCEED, PRESS CPU RESET AND START BUTTONS.

WAIT A END OF PROGRAM LOOP PASSES USING CPU ONLY. PRESS START TO REPEAT TEST.

WAIT B END OF PROGRAM LOOP PASSES USING CPU AND DISK ONLY. PRESS START TO REPEAT TEST.

WAIT C LOST NTRPT OR ERROR AFTER 80 COLUMN READ. OP COMPLETE FOR END OF CARD. PRESS START TO PROCEED. PRESS CPU RESET & START TO RETRY.

WAIT D LOST NTRPT OR ERROR ON 1403 PRINT OP COMPLETE. PRESS START TO PROCEED. PRESS CPU RESET & START TO RETRY.

## 3.4 TERMINATIONS

THE PROGRAM WILL STOP AT WAIT A OR B WHEN THE TEST IS COMPLETED.  
TO REPEAT TEST, PRESS 1131 START BUTTON.

## 4. PRINTOUTS (NONE)

## 5. COMMENTS

THE TESTING METHOD IS ACCOMPLISHED ONE OF TWO WAYS.

1. IF THE SYSTEM IS EQUIPPED WITH DISK STORAGE, 7.2 SECONDS OF EACH 72 SECOND DELAY LOOP WILL BE USED TO ACCESS THE DISK CARRAIGE. THIS CHECKS THE CIRCUITRY TO THE 'USE METER' FROM THE 'SEEK' CIRCUITS. THE REMAINING 64.8 SECOND DELAY IS ACCOMPLISHED BY ADDITION IN THE ACCUMULATOR. 7.2 SECONDS = ONE DIVISION ON THE 'USE METER'.
2. IF THE SYSTEM IS NOT EQUIPPED WITH DISK STORAGE, THE ENTIRE 72 SECOND DELAY IS ACCOMPLISHED IN THE ACCUMULATOR.
3. NOTE -- THE USE METERS AND THE RUN LITE DO NOT OPERATE CONTINUOUSLY WHEN USING FILES 1,2,3 AND 4. THE RUN LITE WILL GO OUT AND THE USE METERS WILL STOP MOMENTARILY WHILE THE FILES ARE ACCESSING. THIS ACCOUNTS FOR THE DIFFERENCE OR APPARENT ERROR IN METER READINGS. THIS APPLIES ONLY TO THE 1133 FILES AND NOT TO FILE 0.

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

METER TEST - 1130

METER TEST - 1130

```

01F4          ABS
01F4 0 03A4   ORG      500
                DC      /03A4   PID
*
*****
* INTERRUPT TRANSFER VECTORS *
*****
01F5 0 6500 0351 BEGIN LDX L1 INT1
01F7 0 6000 0009 STX  L1 /0009
01F9 0 6500 0356 LDX  L1 INT2
01FB 0 6000 000A STX  L1 /000A
01FD 0 6500 035B LDX  L1 INT4
01FF 0 6000 000C STX  L1 /000C
*
*****
* RE-INITIALIZATION SUBRTN *
*****
0201 0 6500 6004 LDX  L1 /6004   ZERO ADDR INST
0203 0 6000 0000 STX  L1 0       SET IT IN ADDR ZERO
0205 0 6500 6400 LDX  L1 /6400   BR INST
0207 0 6000 0004 STX  L1 4       SET IN ADDR 4
0209 0 6500 01F5 LDX  L1 BEGIN   GET ADDR
020B 0 6000 0005 STX  L1 5       SET IN ADDR 5
020D 0 6100      LDX  L1 0       CLEAR INDEX
020E 0 6000 0001 STX  L1 1       SET IN ADDR 1
0210 0 6200      LDX  L2 2       CLEAR INDEX
0211 0 6E00 0002 STX  L2 2       SET IN ADDR 2
0213 0 6300      LDX  L3 3       CLEAR INDEX
0214 0 6F00 0003 STX  L3 3       SET IN ADDR 3
*
*****
* CPU CLOCK SPEED SUBRTN *
* SET ENTRY SWITCH *
* TO /FFFF FOR 2.2 *
* TO /0000 FOR 3.6 *
*****
0216 0 30FF      WAIT X -1     CPU CLOCK SPEED
*
0217 0 0C00 0364 XIO  L CESWS   READ ENTRY SW DATA
0219 0 C400 0388 LD   L COUNT  GET DATA
021B 0 F400 0497 EOR  L XFFFF  TEST FOR /FFFF
021D 0 4818      BSC  +-      SKIP IF NOT ZERO
021E 0 7002      MDX  CPUXX  BR TO SET 2.2 US SW
021F 0 1010      SLA  16     CLEAR A REG
0220 0 7002      MDX  CPUXX+2 BR TO SET 3.6 US SW
*
0221 0 C400 0497 CPUXX LD  L XFFFF  GET XTNT
0223 0 D400 0496 STU  L CLOCK  SET CLOCK SW IND
*
*****
* CLEAR 1132 AND SET 1403 I/O AREA *
*****
0225 0 6142      LDX  1 66     SET LDX CTRL
0226 0 6200      LDX  2 0     SET ADDR CTRL
0227 0 C400 0498 LD   L X7F7F  GET DATA CHAR
0229 0 D600 0400 PRNTX STU L2 P1403 SET IN I/O AREA
022B 0 7201      MDX  2 1     ADDR ADV
022C 0 71FF      MDX  1 -1    CTRL ADV
022D 0 70FB      MDX  PRNTX  BR LOOP
*

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3A400020
3A400030
3A400040
3A400050
3A400060
3A400070
3A400080
3A400090
3A400100
3A400110
3A400120
3A400130
3A400140
3A400150
3A400160
3A400170
3A400180
3A400190
3A400200
3A400210
3A400220
3A400230
3A400240
3A400250
3A400260
3A400270
3A400280
3A400290
3A400300
3A400310
3A400320
3A400330
3A400340
3A400350
3A400360
3A400370
3A400380
3A400390
3A400400
3A400410
3A400420
3A400430
3A400440
3A400450
3A400460
3A400470
3A400480
3A400490
3A400500
3A400510
3A400520
3A400530
3A400540
3A400550
3A400560
3A400570
3A400580
3A400590
3A400600
3A400610
3A400620
3A400630
3A400640
3A400650
3A400660
3A400670
3A400680
3A400690

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022E 0 6220      LDX  2 32
022F 0 6107      LDX  1 7
0230 0 C400 0362 LD   L DSWR1   SET ACC TO 0
0232 0 D200      CLEAR STO 2    SET PRINT AREA TO 0
0233 0 7201      MDX  2 1
0234 0 71FF      MDX  1 -1
0235 0 70FC      MDX  CLEAR
0236 0 C400 0360 LD   L HOME
0238 0 D200      STO  2 0      SET LOC 39 TO 0001
*
*
*****
* FILE AREA CODE SETUP SUBRTN *
* SW 15 EQ FILE 0 BASE *
* SW 14 EQ FILE 1 *
* SW 13 EQ FILE 2 *
* SW 12 EQ FILE 3 *
* SW 11 EQ FILE 4 *
*****
0239 0 3000      WAITO WAIT 0    SEL FILE WAIT
023A 0 0C00 0364 XIO  L CESWS   READ ENTRY SWITCHES
023C 0 C400 0388 LD   L COUNT  GET SWITCH DATA
023E 0 4804      BSC  E        SKIP IF EVEN
023F 0 700F      MDX  FILE0   SEL BASE FILE
0240 0 1801      SRA  1        SHIFT TO CK NXT POS
0241 0 4804      BSC  E        SKIP IF EVEN
0242 0 700F      MDX  FILE1   SEL FILE 1
0243 0 1801      SRA  1        SHIFT TO CK NXT POS
0244 0 4804      BSC  E        SKIP IF EVEN
0245 0 700F      MDX  FILE2   SEL FILE 2
0246 0 1801      SRA  1        SHIFT TO CK NXT POS
0247 0 4804      BSC  E        SKIP IF EVEN
0248 0 700F      MDX  FILE3   SEL FILE 3
0249 0 1801      SRA  1        SHIFT TO CK NXT POS
024A 0 4804      BSC  E        SKIP IF EVEN
024B 0 700F      MDX  FILE4   SEL FILE 4
024C 0 1010      SLA  16     CLEAR A REG
024D 0 D029      STO  NOFIL  SET FILE SW TO OFF
024E 0 7029      MDX  WAIT1   BR BY FILE SEL
*
*
024F 0 6500 2000 FILE0 LDX L1 /2000 GET AREA CODE
0251 0 700B      MDX  FILAC  BR TO SETUP CTRLS
0252 0 6500 8800 FILE1 LDX L1 /8800 GET AREA CODE
0254 0 7008      MDX  FILAC  BR TO SETUP CTRLS
0255 0 6500 9000 FILE2 LDX L1 /9000 GET AREA CODE
0257 0 7005      MDX  FILAC  BR TO SETUP CTRLS
0258 0 6500 9800 FILE3 LDX L1 /9800 GET AREA CODE
025A 0 7002      MDX  FILAC  BR TO SETUP CTRLS
025B 0 6500 A000 FILE4 LDX L1 /A000 GET AREA CODE
*
*
025D 0 6915      FILAC STX 1 ACHLD  SAVE AREA CODE
025E 0 C014      LD   ACHLD  GET AREA CODE
025F 0 E816      OR   FRSET  OR IN FUNCTION
0260 0 D400 0363 STO  L DSWR1&1 SET NEW INST
0262 0 F013      EOR  FRSET  CLEAR FUNCTION
0263 0 E810      OR   ARMOT  OR IN FUNCTION
0264 0 D400 0377 STO  L DLY2&1 SET NEW INST
0266 0 D400 037B STU  L DLY4&1 SET NEW INST
0268 0 D400 0361 STO  L HOME&1 SET NEW INST
026A 0 F009      EOR  ARMOT  CLEAR FUNCTION
026B 0 E809      OR   ARMIN  OR IN FUNCTION
026C 0 D400 0375 STO  L DLY1&1 SET NEW INST
026E 0 D400 0379 STU  L DLY3&1 SET NEW INST

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METER TEST - 1130

METER TEST - 1130

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0270 0 F004      EOR  ARMIN  CLEAR FUNCTION      3A401380
0271 0 D005      STO  NOFIL  SET FILE SW TO FILE X  3A401390
0272 0 7005      MDX  WAIT1  BR TO CONTINUE    3A401400
*
*
*
0273 0 0000      ACHLD DC    0      AREA CODE HOLDER      3A401410
*
*
0274 0 0404      ARMOT DC    /0404  SEEK OUT INST FNCTN  3A401420
*
*
0275 0 0400      ARMIN DC    /0400  SEEK IN INST FNCTN  3A401430
*
*
0276 0 0701      FRSET DC    /0701  SENSE RESET DSW    3A401440
*
*
0277 0 0000      NOFIL DC    0      NO FILE -- PGM SW    3A401450
*
*
*****
* READ THE CONSOLE ENTRY SWITCHES TO
* DETERMINE THE SYSTEM CONFIGURATION
*
*      BIT 15 # DISK      3A401460
*      BIT 14 # 1442     3A401470
*      BIT 13 # 1132     3A401480
*      BIT 12 # 1403     3A401490
*      BIT 11 # 1231     3A401500
*      BIT 10 # 1442 M 5 3A401510
*      BIT 9 # 2501      3A401520
*****
0278 0 3001      WAIT1 WAIT 1      ENTER SYS CONF.  3A401530
0279 0 0C00 0364 XIO  L  CESWS      3A401540
0278 0 C400 0388 LD  L  COUNT      3A401550
027D 0 D400 0389 STO L  DISK1      3A401560
027F 0 1801      SRA  1      3A401570
0280 0 D400 038A STO L  SRP1      1442  3A401580
0282 0 1801      SRA  1      3A401590
0283 0 D400 038B STO L  PRTR2     1132  3A401600
0285 0 1801      SRA  1      3A401610
0286 0 D400 038C STO L  HPTR1     1403  3A401620
0288 0 1801      SRA  1      3A401630
0289 0 D400 038D STO L  OMR1     1231  3A401640
028B 0 1801      SRA  1      3A401650
028C 0 D400 038E STO L  PU01     1442M5 3A401660
028E 0 1801      SRA  1      3A401670
028F 0 D400 038F STO L  RDHS1    2501  3A401680
0291 0 C400 0389 LD  L  DISK1      3A401690
0293 0 4804      BSC  E      3A401700
0294 0 706C      MDX  DISK  3A401710
*
*****
* READ THE CONSOLE ENTRY SWITCHES
*
* START THE 1132,1442,1403, 1231, 1442M5 AND
* 2501 METERS IF SELECTED.
*****
0295 0 3002      WAIT2 WAIT 2      ENTER NO OF DLY LOOPS 3A401720
0296 0 0C00 0364 SENSE XIO L  CESWS  SENSE CON ENTRY SWS 3A401730
0298 0 C400 0388 LD  L  COUNT      GET COUNT      3A401740
029A 0 4C18 0295 BSC  L  WAIT2,&-  BR IF ZERO    3A401750
*
*
*
029C 0 6780 0388 LDX  I3 COUNT    XR3# LOOP COUNT  3A401760
029E 0 C400 038A LD  L  SRP1      3A401770
02A0 0 4804      BSC  E      3A401780
02A1 0 704E      MDX  SRP2      START 1442  3A401790
*
*
02A2 0 C400 038B SNS1 LD  L  PRTR2  3A401800
02A4 0 4804      BSC  E      3A401810
02A5 0 7056      MDX  PRTR3    START 1132  3A401820
*
*
02A6 0 C400 038C SNS3 LD  L  HPTR1  3A401830

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3A401840
3A401850
3A401860
3A401870
3A401880
3A401890
3A401900
3A401910
3A401920
3A401930
3A401940
3A401950
3A401960
3A401970
3A401980
3A401990
3A402000
3A402010
3A402020
3A402030
3A402040
3A402050

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02A8 0 4804      BSC  E      3A402060
02A9 0 7014      MDX  HPTR2    START 1403  3A402070
*
*
02AA 0 C400 038D SNS6 LD  L  UMR1    3A402080
02AC 0 4804      BSC  E      3A402090
02AD 0 701F      MDX  UMR2    START 1231  3A402100
*
*
02AE 0 C400 038E SNS7 LD  L  PU01    3A402110
02B0 0 4804      BSC  E      3A402120
02B1 0 7026      MDX  PU02    START 1442 M 5 3A402130
*
*
02B2 0 C400 038F SNS8 LD  L  RDHS1   3A402140
02B4 0 4804      BSC  E      3A402150
02B5 0 702E      MDX  RDHS2   START 2501  3A402160
*
*
02B6 0 C0C0      SNS2 LD          NOFIL  GET FILE IND SW  3A402170
02B7 0 4C18 0315 BSC  L  ADD1,+-- BR IF NO FILE IND 3A402180
02B9 0 C400 0389 LD  L  DISK1    GET SEL DISK CTRL 3A402190
02BB 0 4804      BSC  E      TEST          3A402200
02BC 0 7072      MDX  TEST0   BR IF FILE PRESENT & SEL 3A402210
02BD 0 7057      MDX  ADD1    BR IF NO FILE/SEL  3A402220
*
*
02BE 0 6600 0380 HPTR2 LDX L2 DSWR4  3A402230
02C0 0 6E00 035D STX L2 INT4&2     3A402240
02C2 0 0C00 036C XIO L  HPTR      START 1403  3A402250
02C4 0 3005      WAIT5 WAIT 5      NO RESPONSE FROM 1403 3A402260
02C5 0 1001      SLA  1      SHIFT FOR OP CMLPT  3A402270
02C6 0 4810      BSC  -      SKIP IF OP CMLPT   3A402280
02C7 0 70F6      MDX  HPTR2   ERROR BR TO RETRY  3A402290
02C8 0 300D      WAITD WAIT X /OD  NRDY/LST NTRPT WAIT 3A402300
02C9 0 1002      SLA  2      SHIFT TO CK AGAIN  3A402310
02CA 0 4810      BSC  -      SKIP IF OP CMLPT   3A402320
02CB 0 70FC      MDX  WAITD   WAIT LOOP          3A402330
02CC 0 70DD      MDX  SNS6    BR TO CONTINUE     3A402340
*
*
02CD 0 6600 0382 OMR2 LDX L2 DSWR7  3A402350
02CF 0 6E00 035D STX L2 INT4&2     3A402360
02D1 0 0C00 036E XIO L  OMR      START 1231  3A402370
02D3 0 3008      WAIT8 WAIT 8      NO RESPONSE FROM 1231 3A402380
02D4 0 1801      SRA  1      3A402390
02D5 0 4804      BSC  E      3A402400
02D6 0 70F6      MDX  OMR2    BR TO CONTINUE     3A402410
02D7 0 70D6      MDX  SNS7    3A402420
*
*
02D8 0 6600 0384 PU02 LDX L2 DSWR8  3A402430
02DA 0 6E00 035D STX L2 INT4&2     3A402440
02DC 0 0C00 0370 XIO L  PUD      START 1442 M 5  3A402450
02DE 0 3009      WAIT9 WAIT 9      NO RESPONSE FROM 1442M5 3A402460
02DF 0 F400 049A EOR  L  X0800   TEST FOR OK BITS    3A402470
02E1 0 4820      BSC  Z      SKIP IF OK          3A402480
02E2 0 70F5      MDX  PUD2    3A402490
02E3 0 70CE      MDX  SNS8    BR TO CONTINUE     3A402500
*
*
02E4 0 6600 0386 RDHS2 LDX L2 DSWR9 3A402510
02E6 0 6E00 035D STX L2 INT4&2     3A402520
02E8 0 0C00 0372 XIO L  RDHS     3A402530
02EA 0 3007      WAIT7 WAIT X /O7  NRDY/LST NTRPT     3A402540
02EB 0 F400 049A EOR  L  X0800   TEST FOR OK BITS    3A402550
02ED 0 4820      BSC  Z      SKIP IF OK          3A402560
02EE 0 70F5      MDX  RDHS2   BR IF NOT OK        3A402570
02EF 0 70C6      MDX  SNS2    BR TO CONTINUE     3A402580
*
*
02F0 0 6600 037C SRP2 LDX L2 DSWR2  3A402590

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3A402060
3A402070
3A402080
3A402090
3A402100
3A402110
3A402120
3A402130
3A402140
3A402150
3A402160
3A402170
3A402180
3A402190
3A402200
3A402210
3A402220
3A402230
3A402240
3A402250
3A402260
3A402270
3A402280
3A402290
3A402300
3A402310
3A402320
3A402330
3A402340
3A402350
3A402360
3A402370
3A402380
3A402390
3A402400
3A402410
3A402420
3A402430
3A402440
3A402450
3A402460
3A402470
3A402480
3A402490
3A402500
3A402510
3A402520
3A402530
3A402540
3A402550
3A402560
3A402570
3A402580
3A402590
3A402600
3A402610
3A402620
3A402630
3A402640
3A402650
3A402660
3A402670
3A402680
3A402690
3A402700
3A402710
3A402720
3A402730

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METER TEST - 1130

METER TEST - 1130

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02F2 0 6E00 035D      STX L2 INT4&2      SET IT IN NTRPT RTN      3A402740
02F4 0 0C00 0366      XIO L SRP          START 1442              3A402750
02F6 0 3003           WAIT3 WAIT 3       NO RESP. FROM 1442     3A402760
02F7 0 F400 049A      EOR L X0800        TEST FOR OK BITS       3A402770
02F9 0 4820           BSC Z              SKIP IF OK              3A402780
02FA 0 70F5           MDX SRP2           3A402790
02FB 0 70A6           MDX SNS1           3A402800
*
*
02FC 0 0C00 0368      PRTR3 XIO L PRTR   START 1132.            3A402810
02FE 0 3004           WAIT4 WAIT 4       NO RESP. FROM 1132     3A402820
02FF 0 086A           XIO PKTR1          STOP THE 1132 INTR     3A402830
0300 0 70A5           MDX SNS3          BR TO CONTINUE         3A402840
*
*
*****
* SET DISK TO HOME *
*****
0301 0 C400 0277      DISK LD L NOFIL    GET NO FILE SW         3A402850
0303 0 4C18 0295      BSC L WAIT2,&-    BR IF NO FILE SEL     3A402860
0305 0 0C00 0362      XIO L DSWR1       SENSE DISK DSW        3A402870
0307 0 1002           SLA 2             3A402880
0308 0 4C28 0313      BSC L WAIT6,Z&   IF NOT RDY GO TO WR6  3A402890
030A 0 1002           SLA 2             3A402900
030B 0 4C28 0295      BSC L WAIT2,&Z   IS CARR HOME          3A402910
030D 0 6600 0362      SEEK LDX L2 DSWR1 3A402920
030F 0 6E00 0358      STX L2 INT2&2    3A402930
0311 0 0C00 0360      XIO L HOME        SEEK -1 CYL           3A402940
0313 0 3006           WAIT6 WAIT X /O6  DISK LOST NTRPT/NRDY 3A402950
0314 0 70F0           MDX DISK&4       BR TO RETRY           3A402960
*****
* METER TEST *
* 72 SECOND DELAY USING ONLY THE CPU *
*****
0315 0 C400 0496      ADD1 LD L CLOCK    GET CPU SPEED SW      3A402970
0317 0 4820           BSC Z             SKIP IF 3.6 US        3A402980
0318 0 700C           MDX FASTX        BR FOR 2.2 US RTN     3A402990
*
*
0319 0 6148           LDX 1 72         CONSTANT              3A403000
031A 0 C075           ADD2 LD NUM       3A403010
031B 0 8044           ADD3 A HOME      ADD 1 TO ACCUM        3A403020
031C 0 4820           BSC Z             3A403030
031D 0 70FD           MDX ADD3         3A403040
031E 0 71FF           MDX 1 -1         MODIFY CONSTANT       3A403050
031F 0 70FA           MDX ADD2         3A403060
0320 0 73FF           MDX 3 -1         MODIFY LOOP COUNT     3A403070
0321 0 70F3           MDX ADD1         3A403080
0322 0 300A           WAITA WAIT X /OA CPU ONLY E.O.P. 3A403090
0323 0 4C00 0239      BSC L WAITO      BR TO REPEAT TEST    3A403100
*
*
0325 0 6158           FASTX LDX 1 88    LOOP CTRL NDX CNT     3A403110
0326 0 10A0           SLT 32           CLEAR A & Q REG       3A403120
*
*
0327 0 8400 0360      A L HOME         ADD ONE TO COUNT      3A403130
0329 0 4C02 032C      BSC L ADD4,C     BRANCH IF CARRY ON   3A403140
032B 0 70FB           MDX FASTX&2     BR LOOP               3A403150
*
*
032C 0 71FF           ADD4 MDX 1 -1    DEC CTRL              3A403160
032D 0 70F8           MDX FASTX&1     BR TO REDO CTR RTN   3A403170
032E 0 70F1           MDX WAITA-2     BR TU PGM END CTRL   3A403180
*
*
*****
* METER TEST *
* 72 SECOND DELAY USING THE DISK AND THE CPU*
*****
032F 0 6500 0362      TESTO LDX L1 DSWR1 GET INTERRUPT ADDR 3A403190
0331 0 6D00 0358      STX L1 INT2&2   SET ADDR IN NTRPT RTN 3A403200

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3A402740
3A402750
3A402760
3A402770
3A402780
3A402790
3A402800
3A402810
3A402820
3A402830
3A402840
3A402850
3A402860
3A402870
3A402880
3A402890
3A402900
3A402910
3A402920
3A402930
3A402940
3A402950
3A402960
3A402970
3A402980
3A402990
3A403000
3A403010
3A403020
3A403030
3A403040
3A403050
3A403060
3A403070
3A403080
3A403090
3A403100
3A403110
3A403120
3A403130
3A403140
3A403150
3A403160
3A403170
3A403180
3A403190
3A403200
3A403210
3A403220
3A403230
3A403240
3A403250
3A403260
3A403270
3A403280
3A403290
3A403300
3A403310
3A403320
3A403330
3A403340
3A403350
3A403360
3A403370
3A403380
3A403390
3A403400
3A403410

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0333 0 0C00 0374      XIO L DLY1        SEEK&202 CYL          3A403420
0335 0 3000           WAIT             3A403430
0336 0 083F           XIO DLY2         SEEK-202 CYL         3A403440
0337 0 3000           WAIT             3A403450
0338 0 083B           XIO DLY1         SEEK&202 CYL         3A403460
0339 0 3000           WAIT             3A403470
033A 0 083B           XIO DLY2         SEEK-202 CYL         3A403480
033B 0 3000           WAIT             3A403490
033C 0 083B           XIO DLY3         SEEK&76 CYL          3A403500
033D 0 3000           WAIT             3A403510
033E 0 083B           XIO DLY4         SEEK-76 CYL          3A403520
033F 0 3000           WAIT             3A403530
0340 0 C400 0496      LD L CLOCK        GET CPU SPEED         3A403540
0342 0 4820           BSC Z             SKIP IF 3.6 US CLOCK 3A403550
0343 0 7002           MDX TESTX        BR FOR 2.2 US SETUP  3A403560
*
*
0344 0 613C           LDX 1 60         CTRL CNT             3A403570
0345 0 7001           MDX TESTX&1     BR TO SET UP 3.6 US  3A403580
*
*
0346 0 6161           TESTX LDX 1 97   SET 2.2 US CTRL CNT  3A403590
0347 0 8018           ADD A HOME       ADD 1 TO ACCUM        3A403600
0348 0 4820           BSC Z             3A403610
0349 0 70FD           MDX ADD          3A403620
034A 0 71FF           MDX 1 -1         MODIFY CONSTANT       3A403630
034B 0 70FB           MDX ADD          3A403640
034C 0 73FF           MDX 3 -1         MODIFY LOOP COUNT     3A403650
034D 0 70E1           MDX TESTO        3A403660
034E 0 300B           WAITB WAIT X /OB CPU + FILE E.O.P 3A403670
034F 0 4C00 0239      BSC L WAITO      BR TO REPEAT TEST    3A403680
*
*
*****
* INTERRUPT SUBROUTINES *
*****
0351 0 0001           INT1 BSS 1 1132   3A403690
0352 0 0C00 037E      XIO L DSWR3      SENSE DSW            3A403700
0354 0 4CC0 0351      BOSC I INT1      3A403710
0355 0 0001           INT2 BSS 1        DISK                  3A403720
0356 0 0001           INT2 XIO L *-*   SENSE DSW            3A403730
0357 0 0C00 0000      BOSC I INT2      3A403740
0358 0 4CC0 0356      XIO L *-*        INTERRUPT LEVEL 4    3A403750
0359 0 0001           INT4 BSS 1        SENSE DSW            3A403760
035A 0 0C00 0000      XIO L *-*        3A403770
035B 0 4CC0 035B      BOSC I INT4      3A403780
*
*
*****
* I/O CONTROL COMMANDS AND CONSTANTS *
*****
0360 0 0000           BSS E 0          3A403790
0361 0 0001           HOME DC /0001    IOCC TO SEEK HOME    3A403800
0362 0 0000           DC /0000         3A403810
0363 0 0000           DSWR1 DC /0000   IOCC TO SENSE RESET  3A403820
0364 0 0388           DC /0000         3A403830
0365 0 3A00           CESWS DC COUNT   IOCC TO RD BIT SWS   3A403840
0366 0 0000           SRP DC /0000     IOCC TO START 1442   3A403850
0367 0 1402           DC /1402        METER                 3A403860
0368 0 0000           PRTR DC /0000   IOCC TO START 1132   3A403870
0369 0 3480           DC /3480        METER                 3A403880
036A 0 0000           PRTR1 DC /0000  IOCC TO STOP 1132   3A403890
036B 0 3440           DC /3440        EMIT INTERRUPTS      3A403900
036C 0 0400           HPTR DC P1403   START 1403 METER     3A403910
036D 0 AD00           DC /AD00        METER                 3A403920
036E 0 0000           OMR DC /0000    IOCC TO START 1231   3A403930
036F 0 4402           DC /4402        METER                 3A403940
0370 0 0000           PUO DC /0000    IOCC TO START 1442M5 3A403950
0371 0 1402           DC /1402        METER                 3A403960
0372 0 0443           RDHS DC R2501   START 2501 METER     3A403970
0373 0 4E00           DC /4E00        3A404000
0374 0 00CA           DLY1 DC /00CA    IOCC SEEK TO 202     3A404010

```

```

3A403420
3A403430
3A403440
3A403450
3A403460
3A403470
3A403480
3A403490
3A403500
3A403510
3A403520
3A403530
3A403540
3A403550
3A403560
3A403570
3A403580
3A403590
3A403600
3A403610
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3A403630
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3A403700
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3A403960
3A403970
3A403980
3A403990
3A404000
3A404010
3A404020
3A404030
3A404040
3A404050
3A404060
3A404070
3A404080
3A404090

```

METER TEST - 1130

METER TEST - 1130

```

0375 0 0000      DC      /0000      3A404100
0376 0 00CA      DLY2  DC      /00CA      IOCC SEEK TO HOME      3A404110
0377 0 0000      DC      /0000      3A404120
0378 0 004C      DLY3  DC      /004C      IOCC SEEK TO 076      3A404130
0379 0 0000      DC      /0000      3A404140
037A 0 004C      DLY4  DC      /004C      IOCC SEEK TO HOME      3A404150
037B 0 0000      DC      /0000      3A404160
037C 0 0000      DSWR2 DC      /0000      IOCC TO SENSE AND      3A404170
037D 0 1702      DC      /1702      RESET 1442 DSW      3A404180
037E 0 0000      DSWR3 DC      /0000      IOCC TO SENSE AND      3A404190
037F 0 3701      DC      /3701      RESET 1132 DSW      3A404200
0380 0 0000      DSWR4 DC      /0000      IOCC TO SENSE AND      3A404210
0381 0 AF01      DC      /AF01      RESET 1403 DSW      3A404220
0382 0 0000      DSWR7 DC      /0000      IOCC TO SENSE AND      3A404230
0383 0 4701      DC      /4701      RESET 1231      3A404240
0384 0 0000      DSWR8 DC      /0000      IOCC TO SENSE AND      3A404250
0385 0 1702      DC      /1702      RESET 1442M5      3A404260
0386 0 0000      DSWR9 DC      /0000      IOCC TO SENSE AND      3A404270
0387 0 4F01      DC      /4F01      RESET 2501      3A404280
0388 0 0000      COUNT DC      /0000      CON ENTRY SW SETTING 3A404290
0389 0 0000      DISK1 DC      *-*      SYSTEM HAS DISK      BIT 15 3A404300
038A 0 0000      SRP1  DC      *-*      SYSTEM HAS 1442      14 3A404310
038B 0 0000      PRTR2 DC      *-*      SYSTEM HAS 1132      13 3A404320
038C 0 0000      HPTR1 DC      *-*      SYSTEM HAS 1403      12 3A404330
038D 0 0000      OMR1  DC      *-*      SYSTEM HAS 1231      11 3A404340
038E 0 0000      PUQ1  DC      *-*      SYSTEM HAS 1442M5    10 3A404350
038F 0 0000      RDHS1 DC      *-*      SYSTEM HAS 2501      9 3A404360
0390 0 1340      NUM   DC      /1340      3A404370
0400      ORG   /0400      3A404380
*      3A404390
0400 0042      P1403 BSS      66      PRINT AREA      3A404400
0442 0 FFFF      DC      /FFFF      3A404410
*      3A404420
*      3A404430
*      3A404440
0443 0 0050      R2501 DC      80      3A404440
0444 0050      BSS      80      3A404450
0494 0 FFFF      DC      /FFFF      3A404460
*      3A404470
*      3A404480
*      3A404490
*      3A404500
*      3A404510
0496 0000      BSS E      3A404520
*      CPU CLOCK IND      3A404530
*      3A404540
0497 0 FFFF      XXXXXX DC      /FFFF      3A404550
*      3A404560
*      3A404570
*      3A404580
*      3A404590
0499 0 0801      X0801 DC      /0801      3A404600
*      3A404600
049A 0 0800      X0800 DC      /0800      3A404610
*      3A404620
049C 01F5      END      BEGIN      3A404630
NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY

```

```

ACHLD 0273 025D 025E
ADD 0347 0349 0348
ADD1 0315 02B7 02BD 0321
ADD2 031A 031F
ADD3 031B 031D
ADD4 032C 0329
ARMIN 0275 026B 0270
ARMOT 0274 0263 026A
BEGIN 01F5 0209 049C
CESWS 0364 0217 023A 0279 0296
CLEAR 0232 0235
CLOCK 0496 0223 0315 0340
COUNT 0388 0219 023C 027B 0298 029C 0364
CPUXX 0221 021E 0220
DISK 0301 0294 0314
DISK1 0389 027D 0291 02B9
DLY1 0374 026C 0333 0338
DLY2 0376 0264 0336 033A
DLY3 0378 026E 033C
DLY4 037A 0266 033E
DSWR1 0362 0230 0260 0305 030D 032F
DSWR2 037C 02F0
DSWR3 037E 0352
DSWR4 0380 02BE
DSWR7 0382 02CD
DSWR8 0384 02D8
DSWR9 0386 02E4
FASTX 0325 0318 032B 032D
FILAC 025D 0251 0254 0257 025A
FILE0 024F 023F
FILE1 0252 0242
FILE2 0255 0245
FILE3 0258 0248
FILE4 025B 0248
FRSET 0276 025F 0262
HOME 0360 0236 0268 0311 0318 0327 0347
HPTR 036C 02C2
HPTR1 038C 0286 02A6
HPTR2 02BE 02A9 02C7
INT1 0351 01F5 0354
INT2 0356 01F9 030F 0331 0359
INT4 035B 01FD 02C0 02CF 02DA 02E6 02F2 035E
NOFIL 0277 024D 0271 02B6 0301
NUM 0390 031A
OMR 036E 02D1
OMR1 038D 0289 02AA
OMR2 02CD 02AD 02D6
PRNTX 0229 022D
PRTR 0368 02FC
PRTR1 036A 02FF
PRTR2 038B 0283 02A2
PRTR3 02FC 02A5
PUU 0370 02DC
PUQ1 038E 028C 02AE
PUQ2 02D8 02B1 02E2
P1403 0400 0229 036C
RDHS 0372 02E8
RDHS1 038F 028F 02B2
RDHS2 02E4 02B5 02EE
R2501 0443 0372
SEEK 030D
SENSE 0296
SNS1 02A2 02FB
SNS2 02B6 02EF
SNS3 02A6 0300
SNS6 02AA 02CC
SNS7 02AE 02D7
SNS8 02B2 02E3

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METER TEST - 1130

SRP 0366 02F4  
SRP1 038A 0280 029E  
SRP2 02F0 02A1 02FA  
TESTX 0346 0343 0345  
TEST0 032F 02BC 034D  
WAITA 0322 032E  
WAITB 034E  
WAITD 02C8 02CB  
WAIT0 0239 0323 034F  
WAIT1 0278 024E 0272  
WAIT2 0295 029A 0303 030B  
WAIT3 02F6  
WAIT4 02FE  
WAIT5 02C4  
WAIT6 0313 0308  
WAIT7 02EA  
WAIT8 02D3  
WAIT9 02DE  
XFFFF 0497 021B 0221  
X0800 049A 02DF 02EB 02F7  
X0801 0499  
X7F7F 0498 0227  
END OF ASSEMBLY

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

TABLE OF CONTENTS

PARAGRAPH	PAGE
1. PURPOSE . . . . .	1
2. PREREQUISITES . . . . .	1
2.1 PROGRAM PREREQUISITES	
2.2 EQUIPMENT PREREQUISITES	
3. USE PROCEDURE . . . . .	1
3.1 PROGRAM LOADING	
3.2 OPERATING PROCEDURE	
3.3 PROGRAM HALTS	
4. PRINTOUTS (NONE)	
5. COMMENTS . . . . .	2
6. APPENDIX (NONE)	

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 SWT 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.

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

CORE ADJUST PROGRAM

```

***** PROGRAM ID 03A6 3A600020
***** 3A600030
***** 3A600040
*****PROGRAM WAITS***** 3A600050
* 3A600060
* B REG * COMMENTS 3A600070
***** 3A600080
3001 * SET CONSOLE ENTRY SWITCHES 3A600090
* 3A600100
* SWT 15--ON--LOAD CORE WITH COMPLEMENT 3A600110
* BEST CASE PATTERN. 3A600120
* -OFF--LOAD CORE WITH BEST CASE 3A600130
* PATTERN. 3A600140
* 3A600150
* 3A600160
* SWT 14--ON--EXECUTE HIGH CORE ADJUST ROUTINE. 3A600170
* -OFF--EXECUTE LOW CORE ADJUST ROUTINE. 3A600180
* 3A600190
* PRESS START TO CONTINUE. 3A600200
----- 3A600210
3002 * END OF LOW CORE ADJUST ROUTINE. 3A600220
* 3A600230
3003 * END OF HIGH CORE ADJUST ROUTINE. 3A600240
* 3A600250
* ADJUST CORE WHILE CYCLING IN AUTOMATIC 3A600260
* DISPLAY MODE. REFER TO 1130 MAINTENANCE 3A600270
* MANUAL FOR ADJUSTMENT PROCEDURE. 3A600280
* 3A600290
***** 3A600300
* 3A600310
* 3A600320
ABS 3A600330
ORG /015E 3A600340
DC /03A6 PID 3A600350
DC /7FFF 3A600360
ORG /7800 3A600370
***** 3A600380
* 3A600390
* PROGRAM INITIALIZATION 3A600400
***** 3A600410
* 3A600420
7800 0 CC00 01B4 BEGIN LDD L LINKH SET UP RESTART TO 3A600430
7802 0 DC00 0004 STD L 4 HIGH CORE ADJUST 3A600440
7804 0 3001 WAIT 1 WAIT FOR SWITCH SETTING 3A600450
7805 0 085C XIO RDSWS READ SWITCHES 3A600460
7806 0 C06A LD SWS 3A600470
7807 0 1801 SRA 1 3A600480
7808 0 4C04 0160 BSC L STRTH,E BR TO HIGH CORE ADJUST 3A600490
* IF SWT 14 ON. 3A600500
780A 0 C855 LDD LINK SET UP RESTART TO 3A600510
780B 0 DC00 0004 STD L 4 LOW CORE ADJUST 3A600520
* 3A600530
***** 3A600540
* 3A600550
* LOW CORE ADJUST ROUTINE 3A600560
* 3A600570
***** 3A600580
* 3A600590
* DETERMINE SIZE OF CORE 3A600600
780D 0 6104 START LDX 1 4 3A600610
780E 0 1010 SLA 16 3A600620
780F 0 D400 0000 STO L 0 3A600630
7811 0 D400 6000 STO L /6000 CLEAR LOC 6000 OR 4000 3A600640
7813 0 C051 LD K0800 CONSTANT 3A600650
7814 0 1001 LD31 SLA 1 3A600660
7815 0 D056 STO SIZE 3A600670
7816 0 D480 786C STO I SIZE 3A600680
7818 0 7400 0000 MDX L 0,0 3A600690

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CORE ADJUST PROGRAM

```

781A 0 7002 MDX LD32 3A600700
781B 0 71FF MDX 1 -1 3A600710
781C 0 70F7 MDX LD31 3A600720
781D 0 71FF LD32 MDX 1 -1 WILL SKIP IF 24 OR 32K 3A600730
781E 0 7004 MDX **4 4, 8, OR 16K FOUND 3A600740
781F 0 7400 6000 MDX L /6000,0 WILL SKIP IF 32K 3A600750
7821 0 C042 LD K6000 FETCH 24K SIZE CONSTANT 3A600760
7822 0 D049 STO SIZE SET PROPER SIZE 3A600770
7823 0 C04E LD H6004 3A600780
7824 0 D400 0000 STO L 0 3A600790
* 3A600800
* ADJUST CORE SIZE AND 3A600810
* * CONSTANTS 3A600820
* 3A600830
* 3A600840
7826 0 74FF 786C MDX L SIZE,-1 3A600850
7828 0 1000 NOP 3A600860
7829 0 C03D LD LLIM2 ADJUST CONSTANT 3A600870
782A 0 E041 AND SIZE 3A600880
782B 0 D03B STO LLIM2 3A600890
782C 0 C042 LD ULM1 3A600900
782D 0 E03E AND SIZE 3A600910
782E 0 D040 STO ULM1 3A600920
* FIND LOOP CONTROLS 3A600930
782F 0 C03F LD ULM1 3A600940
7830 0 9035 S LLIM1 3A600950
7831 0 D036 STO LOWRL 3A600960
7832 0 C039 LD SIZE 3A600970
7833 0 9033 S LLIM2 3A600980
7834 0 9034 S ONE 3A600990
7835 0 D03A STO UPERL UPPER LIMIT CONTROL 3A601000
* 3A601010
7836 0 082B XIO RDSWS READ SWITCHES 3A601020
7837 0 C039 LD SWS 3A601030
7838 0 4C04 783D BSC L PAT02,E BR IF SW 15 ON 3A601040
* 3A601050
* SET UP BCP OR COMPL. BCP 3A601060
* 3A601070
783A 0 6100 PAT01 LDX 1 0 3A601080
783B 0 62FF LDX 2 -1 3A601090
783C 0 7002 MDX PAT02+2 3A601100
783D 0 61FF PAT02 LDX 1 -1 3A601110
783E 0 6200 LDX 2 0 3A601120
783F 0 C026 LD LLIM1 SET UP TO START AT 3A601130
7840 0 D02A STO PLOC * 1ST LOWER LIMIT 3A601140
7841 0 6780 786B LDX 13 LOWRL SET UP LOOP CONTROL 3A601150
7843 0 4008 BSI BCP SET CORES 3A601160
7844 0 C022 LD LLIM2 SET UP TO START AT 3A601170
7845 0 D025 STO PLOC * 2ND LOWER LIMIT 3A601180
7846 0 6780 7870 LDX 13 UPERL SET UP LOOP CONTROL 3A601190
7848 0 4003 BSI BCP SET CORES 3A601200
* 3A601210
7849 0 3002 WAIT2 WAIT 2 END OF PROGRAM 3A601220
784A 0 4C00 780D BSC L START 3A601230
* 3A601240
* 3A601250
* BCP AND COMPL. BCP SUBRT 3A601260
* 3A601270
784C 0 0000 BCP DC 0 3A601280
784D 0 C01D LD PLOC EXCUSIVE OR BITS 7 3A601290
784E 0 1806 SRA 6 * AND 9 3A601300
784F 0 D01D STO TEMP 3A601310
7850 0 1802 SRA 2 3A601320
7851 0 F01B EOR TEMP 3A601330
7852 0 4C04 7857 BSC L ODD,E 3A601340
7854 0 6D80 786B STX 11 PLOC 3A601350
7856 0 7002 MDX ODD,E 3A601360
7857 0 6E80 786B ODD STX 12 PLOC 3A601370
7859 0 7401 786B MDX L PLOC,1 INCREMENT ADDRESS

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CORE ADJUST PROGRAM

CORE ADJUST PROGRAM

```

785B 0 1000          SLA      0          3A601380
785C 0 73FF          MDX     3 -1        3A601390
785D 0 70EF          MDX     BCP&1      3A601400
785E 0 4C80 784C    BSC     I BCP        3A601410
                          *          3A601420
7860 0000          BSS     E 0          3A601430
7860 0 4C00 780D    LINK    BSC L START      3A601440
7862 0 7871          RDSWS  DC SWS          3A601450
7863 0 3A00          DC      /3A00      3A601460
7864 0 6000          K6000 DC /6000      3A601470
7865 0 0800          K0800 DC /0800      3A601480
7866 0 0006          LLIM1  DC /0006      3A601490
7867 0 7873          LLIM2  DC FIN          3A601500
7868 0 0900          LOWRL  DC 0          3A601510
7869 0 0001          ONE     DC 1          3A601520
786A 0 0000          PATNO  DC 0          3A601530
786B 0 0000          PLOC  DC 0          3A601540
786C 0 0000          SIZE  DC 0          3A601550
786D 0 0000          TEMP  DC 0          3A601560
786E 0 0002          TWO    DC 2          3A601570
786F 0 780D          ULIM1  DC START      3A601580
7870 0 0000          UPERL  DC 0          3A601590
7871 0 0000          SWS   DC 0          3A601600
7872 0 6004          H6004 DC /6004      3A601610
7873 0 0000          FIN   DC 0          3A601620
                          *          3A601630
                          *          3A601640
7874          ORG     /0160      3A601650
*****          3A601660
*          3A601670
*          HIGH CORE ADJUST ROUTINE 3A601680
*          3A601690
*****          3A601700
*          3A601710
*          DETERMINE SIZE OF CORE 3A601720
*          3A601730
STRTH LDX 1 4          3A601740
0161 0 1010          SLA     16          3A601750
0162 0 D400 0000    STO    L 0          3A601760
0164 0 D400 6000    LD     L /6000      CLEAR LOC 6000 OR 4000
0166 0 C052          LD     /K080H      CONSTANT
0167 0 1001          LD31H SLA 1          3A601770
0168 0 D057          STO    SIZEH      3A601780
0169 0 D480 01C0    STO    I SIZEH    3A601790
016B 0 7400 0000    MDX    L 0,0      3A601800
016D 0 7002          MDX    LD32H      3A601810
016E 0 71FF          MDX    1 -1       3A601820
016F 0 70F7          MDX    LD31H      3A601830
0170 0 71FF          LD32H MDX 1 -1     WILL SKIP IF 24 OR 32K
0171 0 7004          MDX    +++        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
                          *          FIND LOOP CONTROLS
0182 0 C040          LD     ULM1H

```

```

0183 0 9036          S      LIM1H      3A602060
0184 0 D037          STO    LWRLH      3A602070
0185 0 C03A          LD     SIZEH      3A602080
0186 0 9034          S      LIM2H      3A602090
0187 0 9035          S      ONEH       3A602100
0188 0 D03B          STO    UPRLH      UPPER LIMIT CONTROL 3A602110
                          *          3A602120
0189 0 082C          *      XIO      RDSWH      READ SWITCHES 3A602130
018A 0 C03A          LD     SWSH      3A602140
018B 0 4C04 0190    BSC    L PAT2H,E  BR IF SW 15 ON 3A602150
                          *          3A602160
                          *          SET UP BCP OR COMPL. BCP 3A602170
                          *          3A602180
018D 0 6100          PAT1H LDX 1 0      3A602190
018E 0 62FF          LDX   2 -1        3A602200
018F 0 7002          MDX   PAT2H+2    3A602210
0190 0 61FF          PAT2H LDX 1 -1    3A602220
0191 0 6200          LDX   2 0        3A602230
0192 0 C027          LD     LIM1H      3A602240
0193 0 D02B          STO    PLOCH      * 1ST LOWER LIMIT 3A602250
0194 0 6780 018C    LDX   13 LWRLH    SET UP LOOP CONTROL 3A602260
0196 0 4008          BSI    BCPH      SET CORES 3A602270
0197 0 C023          LD     LIM2H      SET UP TO START AT 3A602280
0198 0 D026          STO    PLOCH      * 2ND LOWER LIMIT 3A602290
0199 0 6780 01C4    LDX   13 UPRLH    SET UP LOOP CONTROL 3A602300
019B 0 4003          BSI    BCPH      SET CORES 3A602310
                          *          3A602320
019C 0 3003          WAIT3 WAIT 3      END OF PROGRAM 3A602330
019D 0 4C00 0160    BSC    L STRTH    3A602340
                          *          3A602350
                          *          3A602360
                          *          BCP AND COMPL. BCP SUBRT 3A602370
                          *          3A602380
019F 0 0000          BCPH   DC 0        3A602390
01A0 0 C01E          LD     PLOCH      EXCLUSIVE OR BITS 7 3A602400
01A1 0 1806          SRA    6          * AND 9 3A602410
01A2 0 D01E          STO    TEMPH      3A602420
01A3 0 1802          SRA    2          3A602430
01A4 0 F01C          EOR    TEMPH      3A602440
01A5 0 4C04 01AA    BSC    L ODDH,E    3A602450
01A7 0 6D80 01BF    STX   11 PLOCH    3A602460
01A9 0 7002          MDX   ODDH+2      3A602470
01AA 0 6E80 01BF    ODDH  STX 12 PLOCH 3A602480
01AC 0 7401 01BF    MDX   L PLOCH,1  INCREMENT ADDRESS 3A602490
01AE 0 1000          SLA    0          3A602500
01AF 0 73FF          MDX   3 -1        CK FOR END OF LOOP 3A602510
01B0 0 70EF          MDX   BCPH+1      REPEAT 3A602520
01B1 0 4C80 019F    BSC    I BCPH     EXIT 3A602530
                          *          3A602540
01B4 0000          BSS    E 0        3A602550
01B4 0 4C00 0160    LINKH BSC L STRTH  RESTART LINKAGE 3A602560
01B6 0 01C5          RDSWH  DC SWSH    3A602570
01B7 0 3A00          DC     /3A00      READ SWITCHES 3A602580
01B8 0 6000          K600H DC /6000    24K CONSTANT 3A602590
01B9 0 0800          K080H DC /0800    CONSTANT 3A602600
01BA 0 0006          LIM1H DC /0006    3A602610
01BB 0 01C7          LIM2H DC FINH     2ND LOWER LIMIT 3A602620
01BC 0 0000          LWRLH DC 0        LOWER LOOP CONTROL 3A602630
01BD 0 0001          ONEH  DC 1        CONSTANT 1 3A602640
01BE 0 0000          PATNH DC 0        PATTERN NUMBER 3A602650
01BF 0 0000          PLOCH DC 0        PRESENT LOC 3A602660
01C0 0 0000          SIZEH DC 0        CONTAINS CORE SIZE 3A602670
01C1 0 0000          TEMPH DC 0        3A602680
01C2 0 0002          TWOH  DC 2        CONSTANT 2 3A602690
01C3 0 0160          ULMIH DC STRTH    1ST UPPER LIMIT 3A602700
01C4 0 0000          UPRLH DC 0        UPPER LOOP CONTROL 3A602710
01C5 0 0000          SWSH  DC 0        3A602720
01C6 0 6004          H604H DC /6004    3A602730

```



01C7 0 0000 FINH DC 0 LAST LOC OF PROG  
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	0196,0198,0180,0181
BEGIN	7800	01C8
FIN	7873	7867
FINH	01C7	0188
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	0188	017C,017E,0186,0197
LINK	7860	780A
LINKH	0184	7800
LLIM1	7866	7830,783F
LLIM2	7867	7829,782B,7833,7844
LWRL	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	0188,018F
PLOC	786B	7840,7845,784D,7854,7857,7859
PLOCH	01BF	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	7870	7835,7846
UPRLH	01C4	0188,0199
WAIT2	7849	
WAIT3	019C	

END OF ASSEMBLY

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

TABLE OF CONTENTS

PARAGRAPH	PAGE
1. PURPOSE . . . . .	1
2. PREREQUISITES . . . . .	1
2.1 PROGRAM PREREQUISITES	
2.2 EQUIPMENT PREREQUISITES	
3. OPERATING PROCEDURES . . . . .	1A
3.1 PROGRAM LOADING	
3.2 PROGRAM OPERATIONS	
3.3 WAITS AND LOOPS	
3.4 C.E. SCOPE OPTIONS	
4. PRINTOUTS (NONE)	
5. PROGRAM PHILOSOPHY . . . . .	4
6. APPENDIX (NONE)	

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 OF 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 RESETING OF THE INTERRUPT, IF IT OCCURS.

2. PREREQUISITES

2.1 PROGRAM PREREQUISITES  
1130 BASIC DIAGNOSTIC LOADER.

2.2 EQUIPMENT PREREQUISITES  
CARD READER OR PAPER TAPE READER.

3. OPERATING PROCEDURES

3.1 PROGRAM LOADING

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

3.2 PROGRAM OPERATION

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

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

## 1130 INTERRUPT TEST

## 1130 INTERRUPT TEST

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

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

D. DEPRESS START

WAIT 1--DEVICE SELECTION

A. MAKE DESIRED DEVICE READY.

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

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

C. DEPRESS START

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

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

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

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

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

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

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

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

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

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

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

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

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

WAIT 14--A LEVEL 1 INTERRUPT ADDRESS WAS GENERATED. TO GO INTO SCOPE LOOP, PUSH START. LOGIC KM201.

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

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

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

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

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

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

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

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

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

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

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

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

DATE 01MAY66 15APR67 15JUN67  
EC NO. 415490B 419605 420317

PROG ID 03A8-#  
PAGE 2

DATE 01MAY66 15APR67 15JUN67  
EC NO. 415490B 419605 420317

PROG ID 03A8-#  
PAGE 2A

## 2. TABLE B - TEST 2 WAITS AND SCOPE LOOPS

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

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

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

WAIT 24-LESS THAN 80 COLUMN INTERRUPTS WERE RECEIVED WHEN END OP WAS GENERATED. THE ACTUAL NUMBER OF COLUMN INTERRUPTS IS DISPLAYED IN THE A REG. POSSIBLE CAUSE COULD BE DEVICE EMITTER. TO GO INTO SCOPE LOOP, PUSH START.

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

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

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

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

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

## 3. TABLE C - AUTOMATIC LOOP RESET MODE WAITS

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

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

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

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

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

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

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

## 3.4 C.E. SCOPE LOOP OPTIONS

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

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

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

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

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

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

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

130 INTERRUPT TEST

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 SO.

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

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

LEVEL 4 - AT THE END OF A FEED OPERATION, THIS INTERRUPT IS GENERATED. THE TEST TRAPS SUCH FAILURES AS NO INTERRUPT GENERATED DURING A WAIT OP, NO INTERRUPT GENERATED WHILE PROGRAM IS RUNNING, NO TRANSFER OF BSI L 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 -----

DATE 01MAY66 15APR67 15JUN67  
EC NO. 415490B 419605 420317

PROG ID 03A8-\*  
PAGE 4

DATE 01MAY66 15APR67 15JUN67  
EC NO. 415490B 419605 420317

PROG ID 03A8-\*  
PAGE 4A



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 XIO 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 XIO L SENPT SENSE P.T. READY
05C4 0 180A          SRA 10
05C5 0 4C04 05C9      BSC L NRDYB,E  CHK NOT READY
05C7 0 4C00 061F      BSC L SETPT   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 XIO 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*

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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
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3A801690
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3A801800
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3A801970
3A801980
3A801990
3A802000
3A802010
3A802020
3A802030
3A802040
3A802050

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* OR SOME OTHER DEVICE SELECTION VIA CONSOLE*
* ENTRY SWITCHES. PUSH START. *
*****
05D2 0 300C          NRDYC WAIT /C SEL 2501/NOT READY
05D3 0 4C00 0529      BSC L WHICH  CHK DEVICE AGAIN
*
05D5 0 6500 0A5A      SET42 LDX L1 SENSE SET UP 1442 SENSE WD
05D7 0 6D00 06DD      STX L1 BUSY&1
05D9 0 6D00 06EB      STX L1 TEST1&3
05DB 0 6D00 072B      STX L1 WAITG&2
05DD 0 6D00 0737      STX L1 VEC00&2
05DF 0 6D00 0747      STX L1 VEC01&2
05E1 0 6D00 0757      STX L1 VEC02&2
05E3 0 6D00 0767      STX L1 VEC03&2
05E5 0 6D00 0773      STX L1 VEC04&2
05E7 0 6D00 07BE      STX L1 VEC05&2
05E9 0 6D00 07CA      STX L1 CKDOK&2
05EB 0 6D00 07DE      STX L1 BAD12&2
05ED 0 6D00 07EA      STX L1 BAD14&2
05EF 0 6D00 07F6      STX L1 NOADR&2
05F1 0 6D00 0803      STX L1 DSWCK&3
05F3 0 6D00 080C      STX L1 DSWCK&12
*
05F5 0 6580 0A8E      LDX I1 SRA01 SET UP 1442 BUSY CHK
05F7 0 6D00 06DE      STX L1 BUSY&2
*
05F9 0 6580 0A8D      LDX I1 NOPIT SET UP 1442 CONTROL5
05FB 0 6D00 06EC      STX L1 TEST1&4
05FD 0 6D00 0804      STX L1 DSWCK&4
05FF 0 6D00 080D      STX L1 DSWCK&13
*
0601 0 6500 0A6C      LDX L1 FEED SET UP 1442 XIO
0603 0 6D00 06F0      STX L1 TEST1&8
*
0605 0 6500 0A87      LDX L1 K100 SET UP 1442 LOOP CNT
0607 0 6D00 06FF      STX L1 NUMBR&1
0609 0 6D00 0724      STX L1 NUMCK&1
*
060B 0 6500 0A84      LDX L1 K010 SET UP 1442 GOOD CNT
060D 0 6D00 07AA      STX L1 FINSH&1
*
060F 0 6500 082A      LDX L1 SETUP SET UP 1442 TEST VEC
0611 0 6D00 07AC      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. *
*****
0613 0 3005          WAIT 5 1442 SELECTED
0614 0 0C00 0A68      XIO L BITSW READ BIT SWITCHES
0616 0 4C00 0A79      LD L BITS1 LOAD BIT SWITCHES
0618 0 180C          SRA 12
0619 0 9400 0A7A      S L BITS2 LAST DEVICE SELECTED
061B 0 4C18 053F      BSC L CKLOP,&- CHK FOR LEVEL LOOP
061D 0 4C00 0529      BSC L WHICH  NEW DEVICE SELECTED
*
061F 0 6500 0A5C      SETPT LDX L1 SENPT SET UP PT SENSE WD
0621 0 6D00 06DD      STX L1 BUSY&1
0623 0 6D00 06EB      STX L1 TEST1&3
0625 0 6D00 072B      STX L1 WAITG&2
0627 0 6D00 0737      STX L1 VEC00&2

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3A802060
3A802070
3A802080
3A802090
3A802100
3A802110
3A802120
3A802130
3A802140
3A802150
3A802160
3A802170
3A802180
3A802190
3A802200
3A802210
3A802220
3A802230
3A802240
3A802250
3A802260
3A802270
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3A802500
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3A802570
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3A802590
3A802600
3A802610
3A802620
3A802630
3A802640
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3A802660
3A802670
3A802680
3A802690
3A802700
3A802710
3A802720
3A802730

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INTERRUPT TEST

INTERRUPT TEST

0629 0 6D00 0747	STX L1 VEC01&2	3A802740	0689 0 6D00 06DE	STX L1 BUSY&2	3A803420
062B 0 6D00 0757	STX L1 VEC02&2	3A802750			3A803430
062D 0 6D00 0767	STX L1 VEC03&2	3A802760	068B 0 6580 0A8D	* LDX I1 NOPIT SET UP 2501 CONTROLS	3A803440
062F 0 6D00 0773	STX L1 VEC04&2	3A802770	068D 0 6D00 06EC	STX L1 TEST1&4	3A803450
0631 0 6D00 07BE	STX L1 VEC05&2	3A802780	068F 0 6D00 0804	STX L1 DSWCK&4	3A803460
0633 0 6D00 07CA	STX L1 CKDOK&2	3A802790	0691 0 6D00 080D	STX L1 DSWCK&13	3A803470
0635 0 6D00 07DE	STX L1 BAD12&2	3A802800			3A803480
0637 0 6D00 07EA	STX L1 BAD14&2	3A802810	0693 0 6500 0A6E	* LDX L1 FEEDS SET UP 2501 XIO	3A803490
0639 0 6D00 07F6	STX L1 NOADR&2	3A802820	0695 0 6D00 06F0	STX L1 TEST1&8	3A803500
063B 0 6D00 0803	STX L1 DSWCK&3	3A802830			3A803510
063D 0 6D00 080C	STX L1 DSWCK&12	3A802840	0697 0 6500 0A87	* LDX L1 K100 SET UP 2501 CARD CNT	3A803520
		3A802850	0699 0 6D00 06FF	STX L1 NUMBR&1	3A803530
063F 0 6580 0A90	* LDX I1 SRA11 SET UP P.T. BUSY CHK	3A802860	069B 0 6D00 0724	STX L1 NUMCK&1	3A803540
0641 0 6D00 06DE	STX L1 BUSY&2	3A802870	069D 0 6D00 07AA	STX L1 FINSH&1	3A803550
		3A802880			3A803560
0643 0 6580 0A8F	* LDX I1 SRA10 SET UP P.T. RDY CHK	3A802890	069F 0 6500 0913	* LDX L1 WAITA SET UP 2501 TEST VEC	3A803570
0645 0 6D00 06EC	STX L1 TEST1&4	3A802900	06A1 0 6D00 07AC	STX L1 FINSH&3	3A803580
0647 0 6D00 0804	STX L1 DSWCK&4	3A802910			3A803590
0649 0 6D00 080D	STX L1 DSWCK&13	3A802920			3A803600
		3A802930			3A803610
064B 0 6500 0A74	* LDX L1 CNTRL SET UP P.T. XIO	3A802940			3A803620
064D 0 6D00 06F0	STX L1 TEST1&8	3A802950			3A803630
		3A802960			3A803640
064F 0 6500 0A87	* LDX L1 K100 SET UP P.T. CHAR CNT	3A802970			3A803650
0651 0 6D00 06FF	STX L1 NUMBR&1	3A802980			3A803660
0653 0 6D00 0724	STX L1 NUMCK&1	3A802990			3A803670
0655 0 6D00 07AA	STX L1 FINSH&1	3A803000			3A803680
		3A803010			3A803690
0657 0 6500 0913	* LDX L1 WAITA SET UP P.T. TEST VEC	3A803020			3A803700
0659 0 6D00 07AC	STX L1 FINSH&3	3A803030			3A803710
		3A803040	06A3 0 3007	WAIT 7	2501 SELECTED
		3A803050	06A4 0 0C00 0A68	XIO L BITSW	READ BIT SWITCHES
		3A803060	06A6 0 4C00 0A79	LD L BITS1	LOAD BIT SWITCHES
		3A803070	06A8 0 180C	SRA 12	
		3A803080	06A9 0 9400 0A7A	S L BITS2	LAST DEVICE SELECTED
		3A803090	06AB 0 4C18 053F	BSC L CKLOP,&-	CHK FOR LEVEL LOOP
		3A803100	06AD 0 4C00 0529	BSC L WHICH	NEW DEVICE SELECTED
		3A803110			
		3A803120	06AF 0 6300	* CLRIX LDX 3 0	
		3A803130	06B0 0 6200	LDX 2 0	
		3A803140	06B1 0 6100	LDX 1 0	
		3A803150	06B2 0 6500 0771	LDX L1 VEC04	
		3A803160	06B4 0 6D00 000C	STX L1 /000C	
		3A803170	06B6 0 4C00 0728	LD L NUMCK&5	RESTORE LOOP CHK VEC
		3A803180	06B8 0 0400 0740	STO L MOD13&6	
		3A803190	06BA 0 0400 0750	STO L MOD14&6	
		3A803200	06BC 0 0400 0760	STO L MOD15&6	
		3A803210	06BE 0 0400 0770	STO L MOD16&6	
		3A803220	06C0 0 0400 07C7	STO L MOD17&6	
		3A803230	06C2 0 0400 07E7	STO L MOD18&6	
		3A803240	06C4 0 0400 07F3	STO L MOD19&6	
		3A803250	06C6 0 0400 07FF	STO L MOD1A&6	
		3A803260	06C8 0 6500 3013	LDX L1 /3013	
		3A803270	06CA 0 6D00 073A	STX L1 MOD13	RESTORE WAIT 13
		3A803280	06CC 0 6500 3014	LDX L1 /3014	
		3A803290	06CE 0 6D00 074A	STX L1 MOD14	RESTORE WAIT 14
		3A803300	06D0 0 6500 3015	LDX L1 /3015	
		3A803310	06D2 0 6D00 075A	STX L1 MOD15	RESTORE WAIT 15
		3A803320	06D4 0 6500 3016	LDX L1 /3016	
		3A803330	06D6 0 6D00 076A	STX L1 MOD16	RESTORE WAIT 16
		3A803340	06D8 0 6500 3017	LDX L1 /3017	
		3A803350	06DA 0 6D00 07C1	STX L1 MOD17	RESTORE WAIT 17
		3A803360			
		3A803370	06DC 0 0C00 0A5A	* BUSY XIO L SENSE	SENSE DSW
		3A803380	06DE 0 1801	SRA 1	SET UP TO CHK BUSY
		3A803390	06DF 0 4C04 06DC	BSC L BUSY,E	CHECK FOR BUSY
		3A803400	06E1 0 0C00 0A68	XIO L BITSW	SENSE BIT SWITCHES
		3A803410	06E3 0 4C00 0A79	LD L BITS1	LOAD BIT SWITCHES
			06E5 0 180C	SRA 12	CHK FOR WAIT 1 OPT
065B 0 3006	WAIT 6	PAPER TAPE SELECTED			
065C 0 0C00 0A68	XIO L BITSW	READ BIT SWITCHES			
065E 0 4C00 0A79	LD L BITS1	LOAD BIT SWITCHES			
0660 0 180C	SRA 12				
0661 0 9400 0A7A	S L BITS2	LAST DEVICE SELECTED			
0663 0 4C18 053F	BSC L CKLOP,&-	CHK FOR LEVEL LOOP			
0665 0 4C00 0529	BSC L WHICH	NEW DEVICE SELECTED			
0667 0 6500 0A5E	* SET25 LDX L1 SEN25	SET UP 2501 SENSE WD			
0669 0 6D00 06DD	STX L1 BUSY&1				
066B 0 6D00 06EB	STX L1 TEST1&3				
066D 0 6D00 072B	STX L1 WAITG&2				
066F 0 6D00 0737	STX L1 VEC00&2				
0671 0 6D00 0747	STX L1 VEC01&2				
0673 0 6D00 0757	STX L1 VEC02&2				
0675 0 6D00 0767	STX L1 VEC03&2				
0677 0 6D00 0773	STX L1 VEC04&2				
0679 0 6D00 07BE	STX L1 VEC05&2				
067B 0 6D00 07CA	STX L1 CKDOK&2				
067D 0 6D00 07DE	STX L1 BAD12&2				
067F 0 6D00 07EA	STX L1 BAD14&2				
0681 0 6D00 07F6	STX L1 NOADR&2				
0683 0 6D00 0803	STX L1 DSWCK&3				
0685 0 6D00 080C	STX L1 DSWCK&12				
0687 0 6580 0A8E	* LDX I1 SRA01	SET UP 2501 BUSY CHK			



INTERRUPT TEST

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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 C400 0A7E LD L LPCNT LOAD LOOP COUNT
06FA 0 8400 0A81 A L ADDO1 ADD 1 TO LOOP COUNT
06FC 0 D400 0A7E STO L LPCNT STORE LOOP COUNT
06FE 0 9400 0A87 NUMBR 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    RUNDK 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 STEP DOWN DELAY
071C 0 70FE    MDX ERROR
071D 0 C400 0A7E LD L LPCNT LOAD LOOP COUNT
071F 0 8400 0A83 A L K001 ADD 1 TO LOOP CNT
0721 0 D400 0A7E STO L LPCNT STORE LOOP CNT
0723 0 9400 0A87 NUMCK 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
3A804230
3A804240
3A804250
3A804260
3A804270
3A804280
3A804290
3A804300
3A804310
3A804320
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3A804370
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3A804390
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3A804700
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3A804730
3A804740
3A804750
3A804760
3A804770

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0729 0 3002
072A 0 0C00 0A5A
072C 0 6100
072D 0 6D00 0A7E
072F 0 4C00 0716
*
0731 0 0000
0732 0 0C00 0A5C
0734 0 7001
*
0735 0 0000
0736 0 0C00 0A5A
0738 0 4C40 073A

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```

073A 0 3030
*
073B 0 6580 0A92
073D 0 6D00 073A
073F 0 4C00 0503

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```

0741 0 0000
0742 0 0C00 0A64
0744 0 7001

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```

0745 0 0000
0746 0 0C00 0A5A
0748 0 4C40 074A

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074A 0 3031

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074B 0 6580 0A93
074D 0 6D00 074A

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```

* *****
* * WAIT 2 *
* * NORMAL WAIT AFTER DESIRED NUMBER OF LOOPS *
* * PASSES HAVE BEEN MADE. PUSH START TO MAKE *
* * ANOTHER LOOP CYCLE. *
* *****
*
WAITG WAIT 2 STOP SCOPE LOOP
XIO L SENSE
LDX 1 0
STX L1 LPCNT RESET LOOP COUNT
BSC L FDCYC
*
LOOP0 DC 0
XIO L SENPT * LEVEL 0 AUTO *
MDX VEC00&1 * LEVEL RESET LOOP *
* *****
*
VECO0 DC 0 * LEVEL 0 RESET *
XIO L SENSE * SCOPE LOOP *
BOSC L MOD13 * *****
*
* *****
* * INTERRUPT 0 LEVEL*
* * WAIT 30 *
* * RESET DURING AUTO*
* * SCOPE LOOP. *
* * PUSH START TO GO *
* * TO WAIT 1. *
* *****
*
MOD13 WAIT /30 * WAIT 13 *
* DROPPED ADDR BIT *
* 13. PUSH START *
* FOR SCOPE LOOP *
* *****
*
LDX I1 MOFYB MDX ERROR
STX L1 MOD13
BSC L MAPIT
*
LOOP1 DC 0
XIO L PRINT * LEVEL 1 AUTO *
MDX VEC01&1 * LEVEL RESET LOOP *
* *****
*
VECO1 DC 0 * LEVEL 1 RESET *
XIO L SENSE * SCOPE LOOP *
BOSC L MOD14 * *****
*
* *****
* * WAIT 31 *
* * INTERRUPT 1 LEVEL*
* * RESET DURING AUTO*
* * SCOPE LOOP. *
* * PUSH START TO GO *
* * TO WAIT 1. *
* *****
*
MOD14 WAIT /31 * WAIT 14 *
* INTERRUPT CAUSED *
* A LEVEL 1 ADDR TO*
* BE GENERATED. *
* PUSH START FOR *
* SCOPE LOOP. *
* *****
*
LDX I1 MOFYC MDX ERROR
STX L1 MOD14

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```

3A804780
3A804790
3A804800
3A804810
3A804820
3A804830
3A804840
3A804850
3A804860
3A804870
3A804880
3A804890
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3A804990
3A805000
3A805010
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3A805100
3A805110
3A805120
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3A805370
3A805380
3A805390
3A805400
3A805410
3A805420
3A805430
3A805440
3A805450

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INTERRUPT TEST

INTERRUPT TEST

074F 0 4C00 0503	BSC L MAPIT	3A805460	0783 0 6500 3013	LDX L1 /3013	3A806140
*	*	3A805470	0785 0 6D00 073A	STX L1 MOD13	3A806150
*	*****	3A805480	0787 0 6500 3014	LDX L1 /3014	3A806160
*	* WAIT 32 *	3A805490	0789 0 6D00 074A	STX L1 MOD14	3A806170
*	* INTERRUPT 2 LEVEL*	3A805500	0788 0 6500 3015	LDX L1 /3015	3A806180
*	* RESET DURING AUTO*	3A805510	078D 0 6D00 075A	STX L1 MOD15	3A806190
*	* SCOPE LOOP. *	3A805520	078F 0 6500 3016	LDX L1 /3016	3A806200
*	* PUSH START TO GO *	3A805530	0791 0 6D00 076A	STX L1 MOD16	3A806210
*	* TO WAIT 1. *	3A805540	0793 0 6500 3017	LDX L1 /3017	3A806220
*	*****	3A805550	0795 0 6D00 07C1	STX L1 MOD17	3A806230
0751 0 0000	LOOP2 DC 0	3A805560	0797 0 6500 3018	LDX L1 /3018	3A806240
0752 0 0C00 0A60	XIO L DISK	3A805570	0799 0 6D00 07E1	STX L1 MOD18	3A806250
0754 0 7001	MDX VEC02&1	3A805580	079B 0 6500 3019	LDX L1 /3019	3A806260
*	*	3A805590	079D 0 6D00 07ED	STX L1 MOD19	3A806270
0755 0 0000	VEC02 DC 0	3A805600	079F 0 6500 301A	LDX L1 /301A	3A806280
0756 0 0C00 0A5A	XIO L SENSE	3A805610	07A1 0 6D00 07F9	STX L1 MOD1A	3A806290
0758 0 4C40 075A	BOSC L MOD15	3A805620	07A3 0 C400 0A7C	LD L GDCNT	3A806300
*	*	3A805630	07A5 0 8400 0A83	A L K001	3A806310
*	*****	3A805640	07A7 0 D400 0A7C	STO L GDCNT	3A806320
*	* WAIT 15 *	3A805650	07A9 0 9400 0A84	FINSH S L K010	3A806330
075A 0 3032	MOD15 WAIT /32	3A805660	07AB 0 4C50 082A	BOSC L SETUP,-	3A806340
*	*	3A805670	07AD 0 0C00 0A68	XIO L BITSW	3A806350
*	* INTERRUPT CAUSED *	3A805680	07AF 0 C400 0A79	LD L BITS1	3A806360
*	* A LEVEL 2 ADDR TO*	3A805690	07B1 0 180C	SRA 12	3A806370
*	* BE GENERATED. *	3A805700	07B2 0 4C44 0914	BOSC L WAITA&1,E	3A806380
*	* PUSH START FOR *	3A805710	07B4 0 4C40 06AF	BOSC L CLRIX	3A806390
*	* SCOPE LOOP. *	3A805720			3A806400
*	*****	3A805730	07B6 0 4C00 071B	* GAPIT BSC L ERROR	3A806410
075B 0 6580 0A94	LDX I1 MOFYD	3A805740		*	3A806420
075D 0 6D00 075A	STX L1 MOD15	3A805750	07B8 0 0000	LOOP5 DC 0	3A806430
075F 0 4C00 0503	BSC L MAPIT	3A805760	07B9 0 0C00 0A6A	XIO L STOP	3A806440
*	*	3A805770	07BB 0 7001	MDX VEC05&1	3A806450
*	*****	3A805780		*	3A806460
*	* WAIT 33 *	3A805790	07BC 0 0000	VEC05 DC 0	3A806470
*	* INTERRUPT 3 LEVEL*	3A805800	07BD 0 0C00 0A5A	XIO L SENSE	3A806480
*	* RESET DURING AUTO*	3A805810	07BF 0 4C40 07C1	BOSC L MOD17	3A806490
*	* SCOPE LOOP. *	3A805820			3A806500
*	* PUSH START TO GO *	3A805830			3A806510
*	* TO WAIT 1. *	3A805840			3A806520
*	*****	3A805850			3A806530
0761 0 0000	LOOP3 DC 0	3A805860	07C1 0 3035	MOD17 WAIT /35	3A806540
0762 0 0C00 0A62	XIO L PLOT	3A805870			3A806550
0764 0 7001	MDX VEC03&1	3A805880			3A806560
*	*	3A805890	07C2 0 6580 0A96	LDX I1 MOFYF	3A806570
0765 0 0000	VEC03 DC 0	3A805900	07C4 0 6D00 07C1	STX L1 MOD17	3A806580
0766 0 0C00 0A5A	XIO L SENSE	3A805910	07C6 0 4C00 0503	BSC L MAPIT	3A806590
0768 0 4C40 076A	BOSC L MOD16	3A805920			3A806600
*	*	3A805930			3A806610
*	*****	3A805940			3A806620
076A 0 3033	MOD16 WAIT /33	3A805950			3A806630
*	*	3A805960	07C8 0 0000	CKDOK DC 0	3A806640
*	* INTERRUPT CAUSED *	3A805970	07C9 0 0C00 0A5A	XIO L SENSE	3A806650
*	* A LEVEL 3 ADDR TO*	3A805980	07CB 0 4C40 07CD	BOSC L WAITC	3A806660
*	* BE GENERATED. *	3A805990			3A806670
*	* PUSH START FOR *	3A806000	07CD 0 301C	WAITC WAIT /1C	3A806680
*	* SCOPE LOOP. *	3A806010			3A806690
*	*****	3A806020			3A806700
076B 0 6580 0A95	LDX I1 MOFYE	3A806030			3A806710
076D 0 6D00 076A	STX L1 MOD16	3A806040			3A806720
076F 0 4C00 0503	BSC L MAPIT	3A806050			3A806730
*	*	3A806060			3A806740
0771 0 0000	VEC04 DC 0	3A806070			3A806750
0772 0 0C00 0A5A	XIO L SENSE	3A806080			3A806760
0774 0 6100	LDX 1 0	3A806090	07CE 0 6500 3011	LDX L1 /3011	3A806770
0775 0 6D00 0A7E	STX L1 LPCNT	3A806100	07D0 0 6D00 06F1	STX L1 RUNCK	3A806780
0777 0 6580 0A9A	LDX I1 MOFYL	3A806110	07D2 0 6580 0A91	LDX I1 MOFYA	3A806790
0779 0 6D00 06F2	STX L1 MOD11	3A806120	07D4 0 6D00 06F2	STX L1 MOD11	3A806800
077B 0 6500 3011	LDX L1 /3011	3A806130	07D6 0 6500 0771	LDX L1 VEC04	3A806810
077D 0 6D00 06F1	STX L1 RUNCK				
077F 0 6500 3012	LDX L1 /3012				
0781 0 6D00 0702	STX L1 RUNOK				

INTERRUPT TEST

INTERRUPT TEST

```

07D8 0 6D00 000C      STX  L1 /000C
07DA 0 4C40 06DC      BOSC L  BUSY      ERROR TRAP
*
BAD12 DC      0
XIO  L  SENSE      *****
BOSC L  MOD18      *   WAIT 18   *
MOD18 WAIT      /18 * DROPPED ADDR BIT *
*                 * 12. PUSH START *
*                 * FOR SCOPE LOOP *
*                 *****
LDX  I1 MOFYG      MDX ERROR
STX  L1 MOD18      SCOPE LOOP
BSC  L  FDCYC
*
BAD14 DC      0
XIO  L  SENSE      *****
BOSC L  MOD19      *   WAIT 19   *
MOD19 WAIT      /19 * PICKED ADDR BIT *
*                 * 14. PUSH START *
*                 * FOR SCOPE LOOP *
*                 *****
LDX  I1 MOFYH      MDX ERROR
STX  L1 MOD19      SCOPE LOOP
BSC  L  FDCYC
*
NOADR DC      0
XIO  L  SENSE      *****
BOSC L  MOD1A      *   WAIT 1A   *
MOD1A WAIT      /1A * NO ADDR TRANSFER *
*                 * PUSH START FOR *
*                 * SCOPE LOOP. *
*                 *****
LDX  I1 MOFYJ      MDX ERROR
STX  L1 MOD1A      SCOPE LOOP
BSC  L  FDCYC
*
*****
* OP/CODE 0, WAIT 0.-----NO READOUT OF BSI *
* OR INTERRUPT ADDRESS. *
*****
DSWCK STO  L  DSW1      STORE DSW
XIO  L  SENSE      SENSE FOR READY
NOP
S      L  DSW1      SUBTRACT LAST DSW
BSC  L  DSWCK&11,&-
BSC  L  TEST1&2      DSW CHANGED
XIO  L  SENSE      CHECK FOR READY
NOP
LDX  I1 0
STX  L1 DSW1      RESET STORED DSW
BSC  L  WAIT3,E      NOT READY
BSC  L  TEST1&7      READY
WAIT3 WAIT      3 *****
*                 *   WAIT 3   *
*                 * READER NOT READY *
*                 *****
BSC  L  TEST1&2      READER READY
*
*****
*   WAIT 2   *
* DESIRED NUMBER OF *
* LOOP PASSES,WHILE *
* IN SCOPE LOOP. *
* PUSH START TO *
* ANOTHER SCOPE *

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3A806820
3A806830
3A806840
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3A806860
3A806870
3A806880
3A806890
3A806900
3A806910
3A806920
3A806930
3A806940
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3A806960
3A806970
3A806980
3A806990
3A807000
3A807010
3A807020
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3A807190
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3A807290
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3A807370
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3A807390
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3A807480
3A807490

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```

* LOOP PASS. *
*****
STOP SCOPE LOOP
*
LDX  I1 0
STX  L1 LPCNT      RESET LOOP COUNT
BSC  L  FDCYC      CONTINUE TEST
*
LOOP4 DC      0
XIO  L  SENSE      * LEVEL 4 AUTO *
XIO  L  CONSL      * LEVEL RESET LOOP *
XIO  L  SENPT      *
BOSC L  MOD20      *****
*   WAIT 34   *
* INTERRUPT 4 LEVEL *
* RESET DURING AUTO *
* SCOPE LOOP. *
* PUSH START TO GO *
* TO WAIT 1. *
*****
MOD20 WAIT      /34
BSC  L  MAPIT
*
*****
* INTERRUPT VECTOR SETUP. *
*****
SETUP LDX  I1 0
STX  L1 GDCNT      RESET GOOD PASS CNT
LDX  L1 INT00
STX  L1 /0008
LDX  L1 INT01
STX  L1 /0009
LDX  L1 INT02
STX  L1 /000A
LDX  L1 INT03
STX  L1 /000B
LDX  L1 INT04
STX  L1 /000C
LDX  L1 INT05
STX  L1 /000D
LDX  L1 ADR12
STX  L1 /0000
*
RESET LDX  I1 0
LDX  I2 0
LDX  I3 0
*
BUZY XIO  L  SENSE      SENSE DSW
SRA  I1 1              SET UP TO CHK BIT 14
BSC  L  BUZY,E        CHECK FOR BUSY
XIO  L  BITSW        SENSE BIT SWITCHES
LD  L  BITS1         LOAD BIT SWITCHES
SRA  I2 12           CHK FOR WAIT 1 OPT
BSC  L  CNTOK,E      SET UP FOR RESTORE
*
START LDX  I3 DELAY      SET UP DELAY
XIO  L  SENSE      SENSE FOR READY
BSC  L  CKRDY,E      CHECK FOR READY
XIO  L  RESTR
*
LESS1 MDX  I3 -1
MDX  I3 LESS1
*****
*   WAIT 21   *
*
* NO INTERRUPTS WERE GENERATED WITHIN 500 *

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3A807500
3A807510
3A807520
3A807530
3A807540
3A807550
3A807560
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3A807580
3A807590
3A807600
3A807610
3A807620
3A807630
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3A808120
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3A808150
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3A808170

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INTERRUPT TEST

INTERRUPT TEST

```

* 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 6D00 0A7C STX L1 GDCNT RESET GOOD PASS CNTR
0866 0 6500 1000 LDX L1 /1000 NOP
0868 0 6D00 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 4D00 0A7E STD 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 4D00 0A80 CKRDY STD 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

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3A808180
3A808190
3A808200
3A808210
3A808220
3A808230
3A808240
3A808250
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0896 0 4C00 085A BSC L START&2 READER READY
*
0898 0 0000
0899 0 0C00 0A5A XIO L SENSE
089B 0 7401 0A7D MDX L CLCNT,&1 ADD 1 TO COLUMN CNT
089D 0 6500 08B3 LDX L1 INT04 RESTORE LEVEL 4 VEC.
089F 0 6D00 000C STX L1 /000C
08A1 0 6680 0A9C LDX I2 MDFY3 MDX WAIT 22
08A3 0 6ABE STX 2 MOD21 CHECK FOR LEVEL 4
08A4 0 4C40 08A6 BOSC L COLGO RESET LEVEL 0
*
08A6 0 0C00 0A76 COLGO XIO L READ
08A8 0 4C00 0860 BSC L LESS1
*****
08AA 0 3022 MOD22 WAIT /22 NO LEVEL 4 RECIEVED
*****
* SCOPE LOOP
*
08AB 0 6500 0001 LDX L1 /0001 NOP
08AD 0 6D00 08AA STX L1 MOD22 ALLOW LOOP
08AF 0 6100 LDX 1 0 RESET COLUMN COUNT
08B0 0 6D00 0A7D STX L1 CLCNT
08B2 0 70B0 MDX MOD21&1 BRANCH TO LOOP
*
08B3 0 0000 INTO4 DC 0
08B4 0 0C00 0A5A XIO L SENSE
08B6 0 7401 0A7C MDX L GDCNT,&1 ADD 1 TO GOOD PASS
08B8 0 6500 3021 LDX L1 /3021
08BA 0 6D00 0862 STX L1 MOD21 RESTORE WAIT 21
08BC 0 6500 3022 LDX L1 /3022
08BE 0 6D00 08AA STX L1 MOD22 RESTORE WAIT 22
08C0 0 4C00 0A7D LD L CLCNT LOAD COLUMN COUNT
08C2 0 9400 0A86 S L K080 CHECK FOR 80 COLUMNS
08C4 0 4C58 08DB BOSC L CNTOK,&- CHECKED OK
08C6 0 4C68 0922 BOSC L MOD24,&Z BRANCH LESS THAN 80
08C8 0 4C40 08CA BOSC L CLERR
08CA 0 4C00 0A7D 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.                *
*****
08CC 0 3023 MOD23 WAIT /23 MORE THAN 80 COLUMNS
08CD 0 6100 LDX 1 0 RESET COLUMN COUNT
08CE 0 6D00 0A7D STX L1 CLCNT
08D0 0 6680 0A9D LDX I2 MDFY4
08D2 0 6E00 08CC STX L2 MOD23 ALLOW LOOP
08D4 0 4C40 0863 BOSC L CARDS BRANCH TO LOOP
*
08D6 0 6100 HOPIT LDX 1 0
08D7 0 6D00 0A7D STX L1 CLCNT RESET COLUMN COUNT
08D9 0 4C00 0860 BSC L LESS1
*
08DB 0 6500 3021 CNTOK LDX L1 /3021
08DD 0 6D00 0862 STX L1 MOD21 RESTORE WAIT 21

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3A808860
3A808870
3A808880
3A808890
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3A808990
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3A809110
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3A809370
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3A809510
3A809520
3A809530

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INTERRUPT TEST

INTERRUPT TEST

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08DF 0 6500 3022      LDX L1 /3022
08E1 0 6000 08AA      STX L1 MOD22      RESTORE WAIT 22
08E3 0 6500 3023      LDX L1 /3023
08E5 0 6000 08CC      STX L1 MOD23      RESTORE WAIT 23
08E7 0 6500 3024      LDX L1 /3024
08E9 0 6000 0924      STX L1 MOD24&2    RESTORE WAIT 24
08EB 0 6500 3025      LDX L1 /3025
08ED 0 6000 0939      STX L1 MOD25      RESTORE WAIT 25
08EF 0 6500 3026      LDX L1 /3026
08F1 0 6000 094E      STX L1 MOD26      RESTORE WAIT 26
08F3 0 6500 3027      LDX L1 /3027
08F5 0 6000 0963      STX L1 MOD27      RESTORE WAIT 27
08F7 0 6500 3028      LDX L1 /3028
08F9 0 6000 0978      STX L1 MOD28      RESTORE WAIT 28
08FB 0 6500 3029      LDX L1 /3029
08FD 0 6000 098D      STX L1 MOD29      RESTORE WAIT 29
08FF 0 C400 0A7C      LD L GDCNT        LOAD CARD COUNT
0901 0 9400 0A84      S L K010          SUBTRACT 10
0903 0 4C10 0913      BSC L WAITA,-     CHK NUMBER OF PASSES
0905 0 6100           LDX 1 0
0906 0 6000 0A7D      STX L1 CLCNT      RESET COLUMN COUNT
0908 0 6000 0A7E      STX L1 LPCNT      RESET LOOP CARD CNT
090A 0 0C00 0A68      XIO L BITSW       SENSE BIT SWITCHES
090C 0 C400 0A79      LD L BITS1        LOAD BIT SWITCHES
090E 0 180C           SRA 12            CHK FOR WAIT 1 OPT
090F 0 4C04 0914      BSC L WAITA&1,E   RESTORE/GO TO WAIT 1
0911 0 4C00 082D      BSC L SETUP&3     NOT 10 PASSES

*
*
* *****
*          * WAIT 4 *
* *****
*
*          * DEVICE TESTED, *
*          * RAN SUCCESSFUL. *
* *****
*
*          * RERUN *
* *****
*
* TO RERUN PROGRAM PRESS START.
* *****
0914 0 6100           LDX 1 0
0915 0 6000 0A7D      STX L1 CLCNT      RESET COLUMN COUNT
0917 0 6000 0A7C      STX L1 GDCNT      RESET CARD COUNT
0919 0 0C00 0A68      XIO L BITSW
091B 0 C400 0A79      LD L BITS1
091D 0 180C           SRA 12
091E 0 4C04 0503      MOD12 BSC L MAPIT,E
0920 0 4C00 06AF      BSC L CLRIX       RERUN PROGRAM

*
0922 0 C400 0A7D      MOD24 LD L CLCNT  LOAD COLUMN COUNT
*****
*
*          * 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           RESET COLUMN COUNT
0926 0 6000 0A7D      STX L1 CLCNT
0928 0 6680 0A9E      LDX I2 MDFY5
092A 0 6E00 0922      STX L2 MOD24      ALLOW LOOP
092C 0 4C00 0863      BSC L CARDS       BRANCH TO LOOP

*
092E 0 0000           INT01 DC 0        INTERRUPT 1
092F 0 0C00 0A5A      XIO L SENSE

```

```

3A809540
3A809550
3A809560
3A809570
3A809580
3A809590
3A809600
3A809610
3A809620
3A809630
3A809640
3A809650
3A809660
3A809670
3A809680
3A809690
3A809700
3A809710
3A809720
3A809730
3A809740
3A809750
3A809760
3A809770
3A809780
3A809790
3A809800
3A809810
3A809820
3A809830
3A809840
3A809850
3A809860
3A809870
3A809880
3A809890
3A809900
3A809910
3A809920
3A809930
3A809940
3A809950
3A809960
3A809970
3A809980
3A809990
3A810000
3A810010
3A810020
3A810030
3A810040
3A810050
3A810060
3A810070
3A810080
3A810090
3A810100
3A810110
3A810120
3A810130
3A810140
3A810150
3A810160
3A810170
3A810180
3A810190
3A810200
3A810210

```

```

0931 0 C400 0A7D
0933 0 6600 092E
0935 0 6E00 000C
0937 0 4C40 0939

0939 0 3025

093A 0 6100
093B 0 6000 0A7D
093D 0 6680 0A9F
093F 0 6E00 0939
0941 0 4C00 0863

0943 0 0000
0944 0 0C00 0A5A
0946 0 C400 0A7D
0948 0 6600 0943
094A 0 6E00 000C
094C 0 4C40 094E

094E 0 3026

094F 0 6100
0950 0 6000 0A7D
0952 0 6680 0AA0
0954 0 6E00 094E
0956 0 4C00 0863

0958 0 0000
0959 0 0C00 0A5A
095B 0 C400 0A7D
095D 0 6600 0958
095F 0 6E00 000C
0961 0 4C40 0963

0963 0 3027

0964 0 6100
0965 0 6000 0A7D
0967 0 6680 0AA1
0969 0 6E00 0963
096B 0 4C00 0863

096D 0 0000
096E 0 0C00 0A5A
0970 0 C400 0A7D
0972 0 6600 096D

```

```

LD L CLCNT      LOAD COLUMN COUNT
LDX L2 INT01
STX L2 /000C
BOSC L MOD25
*****
*
*          * WAIT 25 *
* *****
*
* INTERRUPT GENERATED,CAUSED A LEVEL 1 *
* ADDRESS TO BE GENERATED. *
* PUSH START FOR SCOPE LOOP. *
*****
MOD25 WAIT /25      LEV 0 PICKED BIT 15
*
*          * LDX 1 0 *
*          * STX L1 CLCNT *
*          * LDX I2 MDFY6 *
*          * STX L2 MOD25 *
*          * BSC L CARDS *
* *****
INT02 DC 0          INTERRUPT 2
XIO L SENSE
LD L CLCNT      LOAD COLUMN COUNT
LDX L2 INT02
STX L2 /000C
BOSC L MOD26
*****
*
*          * WAIT 26 *
* *****
*
* INTERRUPT GENERATED,CAUSED A LEVEL 2 *
* ADDRESS TO BE GENERATED. *
* PUSH START FOR SCOPE LOOP. *
*****
MOD26 WAIT /26      LEV 0 PICKED BIT 14
*
*          * LDX 1 0 *
*          * STX L1 CLCNT *
*          * LDX I2 MDFY7 *
*          * STX L2 MOD26 *
*          * BSC L CARDS *
* *****
INT03 DC 0          INTERRUPT 3
XIO L SENSE
LD L CLCNT      LOAD COLUMN COUNT
LDX L2 INT03
STX L2 /000C
BOSC L MOD27
*****
*
*          * WAIT 27 *
* *****
*
* INTERRUPT GENERATED,CAUSED A LEVEL 3 *
* ADDRESS TO BE GENERATED. *
* PUSH START FOR SCOPE LOOP. *
*****
MOD27 WAIT /27      LEV 0 PICKED 14&15
*
*          * LDX 1 0 *
*          * STX L1 CLCNT *
*          * LDX I2 MDFY8 *
*          * STX L2 MOD27 *
*          * BSC L CARDS *
* *****
INT05 DC 0          INTERRUPT 5
XIO L SENSE
LD L CLCNT      LOAD COLUMN COUNT
LDX L2 INT05

```

```

3A810220
3A810230
3A810240
3A810250
3A810260
3A810270
3A810280
3A810290
3A810300
3A810310
3A810320
3A810330
3A810340
3A810350
3A810360
3A810370
3A810380
3A810390
3A810400
3A810410
3A810420
3A810430
3A810440
3A810450
3A810460
3A810470
3A810480
3A810490
3A810500
3A810510
3A810520
3A810530
3A810540
3A810550
3A810560
3A810570
3A810580
3A810590
3A810600
3A810610
3A810620
3A810630
3A810640
3A810650
3A810660
3A810670
3A810680
3A810690
3A810700
3A810710
3A810720
3A810730
3A810740
3A810750
3A810760
3A810770
3A810780
3A810790
3A810800
3A810810
3A810820
3A810830
3A810840
3A810850
3A810860
3A810870
3A810880
3A810890

```

INTERRUPT TEST

INTERRUPT TEST

0974 0 6E00 000C  
0976 0 4C40 0978  
  
0978 0 3028  
  
0979 0 6100  
097A 0 6D00 0A7D  
097C 0 6680 0AA2  
097E 0 6E00 0978  
0980 0 4C00 0863  
  
0982 0 0000  
0983 0 0C00 0A5A  
0985 0 4C00 0A7D  
0987 0 6600 0982  
0989 0 6E00 000C  
098B 0 4C40 098D  
  
098D 0 3029  
  
098E 0 6100  
098F 0 6D00 0A7D  
0991 0 6680 0A9B  
0993 0 6E00 098D  
0995 0 4C00 0863  
  
0997 0 4C00 08D6  
  
0999 0 0C00 0A68  
099B 0 4C00 0A79  
099D 0 4C04 0980  
099F 0 1801  
09A0 0 4C04 09B8  
09A2 0 1801  
09A3 0 4C04 09C0  
09A5 0 1801  
09A6 0 4C04 09C8  
09A8 0 6500 0A87  
09AA 0 6D00 06FF  
09AC 0 D500 0724  
09AE 0 4C00 09D0  
  
09B0 0 6500 0A84  
09B2 0 6D00 06FF  
09B4 0 D500 0724  
09B6 0 4C00 09D0  
  
09B8 0 6500 0A85  
09BA 0 6D00 06FF  
09BC 0 D500 0724  
09BE 0 4C00 09D0  
  
09C0 0 6500 0A88

STX L2 /000C  
BOSC L MOD28  
\*\*\*\*\*  
\*  
\* WAIT 28  
\*  
\* INTERRUPT GENERATED,CAUSED A LEVEL 5  
\* ADDRESS TO BE GENERATED.  
\* PUSH START FOR SCOPE LOOP.  
\*\*\*\*\*  
MOD28 WAIT /28 LEV 0 PICKED 13&15  
\*  
LDX 1 0 RESET COLUMN COUNT  
STX L1 CLCNT  
LDX I2 MDFY9 ALLOW LOOP  
STX L2 MOD28  
BSC L CARDS BRANCH TO LOOP  
\*  
ADR12 DC 0  
XIO L SENSE  
LD L CLCNT  
LDX L2 ADR12  
STX L2 /000C  
BOSC L MOD29  
\*\*\*\*\*  
\*  
\* WAIT 29  
\*  
\* BIT 12 WAS DROPPED WHEN INTERRUPT LEVEL  
\* 0 WAS GENERATED.  
\* PUSH START FOR SCOPE LOOP.  
\*\*\*\*\*  
MOD29 WAIT /29 INT 0 DROPPED BIT 12  
\*  
LDX 1 0 RESET COLUMN COUNT  
STX L1 CLCNT  
LDX I2 MDFY2 ALLOW LOOP  
STX L2 MOD29  
BSC L CARDS BRANCH TO LOOP  
\*  
JUMP BSC L HOPIT  
\*  
CNTCK XIO L BITSW READ BIT SWITCHES  
LD L BITS1 LOAD BIT SWITCHES  
BSC L KNT01,E SELECT COUNT OF 10  
SRA 1 CHK COUNT OF 50  
BSC L KNT02,E SELECT COUNT OF 50  
SRA 1 CHK COUNT OF 250  
BSC L KNT03,E SELECT COUNT OF 250  
SRA 1 CHK COUNT OF 25000  
BSC L KNT04,E SEL COUNT OF 25000  
LDX L1 K100  
STX L1 NUMBR&1 SET UP CNT OF 100  
STO L1 NUMCK&1 SET UP LOOP COUNT  
BSC L CKOVR  
\*  
KNT01 LDX L1 K010  
STX L1 NUMBR&1 SET UP CNT OF 10  
STO L1 NUMCK&1 SET UP LOOP COUNT  
BSC L CKOVR  
\*  
KNT02 LDX L1 K050  
STX L1 NUMBR&1 SET UP CNT OF 50  
STO L1 NUMCK&1 SET UP LOOP COUNT  
BSC L CKOVR  
\*  
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  
09C4 0 D500 0724  
09C6 0 4C00 09D0  
  
09C8 0 6500 0A89  
09CA 0 6D00 06FF  
09CC 0 D500 0724  
09CE 0 4C00 09D0  
  
09D0 0 0C00 0A68  
09D2 0 C400 0A79  
09D4 0 1804  
09D5 0 4C04 09E6  
09D7 0 1801  
09D8 0 4C04 09EC  
09DA 0 1801  
09DB 0 4C04 09F2  
09DD 0 1801  
09DE 0 4C04 09F8  
09E0 0 6500 0A7F  
09E2 0 6D00 06E9  
09E4 0 4C00 06DC  
  
09E6 0 6500 0A82  
09E8 0 6D00 06E9  
09EA 0 4C00 06DC  
  
09EC 0 6500 0A8A  
09EE 0 6D00 06E9  
09F0 0 4C00 06DC  
  
09F2 0 6500 0A8B  
09F4 0 6D00 06E9  
09F6 0 4C00 06DC  
  
09F8 0 6500 0A8C  
09FA 0 6D00 06E9  
09FC 0 4C00 06DC  
  
09FE 0 0C00 0A68  
0A00 0 C400 0A79  
0A02 0 4C04 0A13  
0A04 0 1801  
0A05 0 4C04 0A19  
0A07 0 1801  
0A08 0 4C04 0A1F  
0A0A 0 1801  
0A0B 0 4C04 0A25  
0A0D 0 6500 0A84  
0A0F 0 6D00 0873  
0A11 0 4C00 0A2B  
  
0A13 0 6500 0A84  
0A15 0 6D00 0873  
0A17 0 4C00 0A2B  
  
0A19 0 6500 0A85  
0A1B 0 6D00 0873  
0A1D 0 4C00 0A2B  
  
0A1F 0 6500 0A88  
0A21 0 6D00 0873  
0A23 0 4C00 0A2B  
  
0A25 0 6500 0A89  
0A27 0 6D00 0873  
0A29 0 4C00 0A2B

STX L1 NUMBR&1  
STO L1 NUMCK&1  
BSC L CKOVR  
\*  
KNT04 LDX L1 KMAX  
STX L1 NUMBR&1  
STO L1 NUMCK&1  
BSC L CKOVR  
\*  
CKOVR XIO L BITSW  
LD L BITS1  
SRA 4  
BSC L NODLY,E  
SRA 1  
BSC L DLY01,E  
SRA 1  
BSC L DLY02,E  
SRA 1  
BSC L DLY03,E  
LDX L1 DELAY  
STX L1 TEST1&1  
BSC L BUSY  
\*  
NODLY LDX L1 K000  
STX L1 TEST1&1  
BSC L BUSY  
\*  
DLY01 LDX L1 TIME1  
STX L1 TEST1&1  
BSC L BUSY  
\*  
DLY02 LDX L1 TIME2  
STX L1 TEST1&1  
BSC L BUSY  
\*  
DLY03 LDX L1 TIME3  
STX L1 TEST1&1  
BSC L BUSY  
\*  
CNTIT XIO L BITSW  
LD L BITS1  
BSC L CNT01,E  
SRA 1  
BSC L CNT02,E  
SRA 1  
BSC L CNT03,E  
SRA 1  
BSC L CNT04,E  
LDX L1 K010  
STX L1 TOTAL&1  
BSC L ENDCK  
\*  
CNT01 LDX L1 K010  
STX L1 TOTAL&1  
BSC L ENDCK  
\*  
CNT02 LDX L1 K050  
STX L1 TOTAL&1  
BSC L ENDCK  
\*  
CNT03 LDX L1 K250  
STX L1 TOTAL&1  
BSC L ENDCK  
\*  
CNT04 LDX L1 KMAX  
STX L1 TOTAL&1  
BSC L ENDCK  
\*

SET UP CNT OF 250  
SET UP LOOP COUNT  
  
SET UP CNT OF 25000  
SET UP LOOP COUNT  
  
READ BIT SWITCHES  
LOAD BIT SWITCHES  
DELAY CHANGE  
NO DELAY SELECTED  
CHECK FOR DELAY  
SELECTED DELAY  
CHECK FOR DELAY  
SELECTED DELAY  
CHECK FOR DELAY  
SELECTED DELAY  
SET DELAY FOR .5 SEC  
SET UP DELAY  
  
LOAD ZERO  
SET UP NO DELAY  
  
SET UP DELAY  
  
SET UP DELAY  
  
SET UP DELAY  
  
READ BIT SWITCHES  
LOAD BIT SWITCHES  
SEL CARD CNT OF 10  
CHK CARD CNT OF 50  
SEL CARD CNT OF 50  
CHK CARD CNT OF 250  
SEL CARD CNT OF 250  
CHK CARD CNT OF 25K  
SEL CARD CNT OF 25K  
  
SET UP CNT OF 10  
  
SET UP CNT OF 10  
  
SET UP CNT OF 50  
  
SET UP CNT OF 250  
  
SET UP CNT OF 25000  
  
SET UP CNT OF 25000

INTERRUPT TEST

INTERRUPT TEST

```

0A2B 0 0C00 0A68  ENDCK XID L BITSW READ BIT SWITCHES 3A812260
0A2D 0 0C00 0A79  LD L BITSW1 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
* 3A812390
0A41 0 6500 0A82 DLYNO LDX L1 K000 LOAD ZERO 3A812400
0A43 0 6D00 0859 STX L1 START&1 SET UP NO DELAY 3A812410
0A45 0 4C00 086C BSC L RETRN 3A812420
* 3A812430
0A47 0 6500 0A8A DLAY1 LDX L1 TIME1 SET UP DELAY 3A812440
0A49 0 6D00 0859 STX L1 START&1 3A812450
0A4B 0 4C00 086C BSC L RETRN 3A812460
* 3A812470
0A4D 0 6500 0A8B DLAY2 LDX L1 TIME2 SET UP DELAY 3A812480
0A4F 0 6D00 0859 STX L1 START&1 3A812490
0A51 0 4C00 086C BSC L RETRN 3A812500
* 3A812510
0A53 0 6500 0A8C DLAY3 LDX L1 TIME3 SET UP DELAY 3A812520
0A55 0 6D00 0859 STX L1 START&1 3A812530
0A57 0 4C00 086C BSC L RETRN 3A812540
* 3A812550
0A5A 0000 BSS E 0 3A812560
0A5A 0 0000 SENSE DC 0 RESET DSW 3A812570
0A5B 0 1703 DC /1703 3A812580
0A5C 0 0000 SENPT DC 0 3A812590
0A5D 0 1F01 DC /1F01 3A812600
0A5E 0 0000 SEN25 DC 0 SENSE 2501 DSW 3A812610
0A5F 0 4F03 DC /4F03 3A812620
0A60 0 0000 DISK DC 0 3A812630
0A61 0 2701 DC /2701 3A812640
0A62 0 0000 PLOT DC 0 3A812650
0A63 0 2F01 DC /2F01 3A812660
0A64 0 0000 PRINT DC 0 3A812670
0A65 0 3701 DC /3701 3A812680
0A66 0 0000 CONSL DC 0 3A812690
0A67 0 0F01 DC /0F01 3A812700
0A68 0 0A79 BITSW DC BITSW1 3A812710
0A69 0 3A00 DC /3A00 3A812720
0A6A 0 0000 STOP DC 0 3A812730
0A6B 0 3F01 DC /3F01 3A812740
0A6C 0 0000 FEED DC 0 3A812750
0A6D 0 1402 DC /1402 3A812760
0A6E 0 0A70 FEEDS DC TABLE 3A812770
0A6F 0 4E00 DC /4E00 3A812780
0A70 0 0001 TABLE DC 1 3A812790
0A71 0 0000 DC 0 3A812800
0A72 0 0000 RESTR DC 0 3A812810
0A73 0 1404 DC /1404 READER START 3A812820
0A74 0 0000 CNTRL DC 0 3A812830
0A75 0 1C00 DC /1C00 ADVANCE TAPE 3A812840
0A76 0 0A78 READ DC RAREA 3A812850
0A77 0 1200 DC /1200 3A812860
0A78 0001 RAREA BSS 1 3A812870
0A79 0 0000 BITSW1 DC 0 BIT SWITCH SETTINGS 3A812880
0A7A 0 0000 BITSW2 DC 0 LAST DEVICE SELECTED 3A812890
0A7B 0 0000 BITSW3 DC 0 LEVEL ON BITS 3A812900
0A7C 0 0000 GDCNT DC 0 GOOD PASS COUNT 3A812910
0A7D 0 0000 CLCNT DC 0 COLUMN COUNT 3A812920
0A7E 0 0000 LPCNT DC 0 LOOP COUNT 3A812930

```

```

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 NOPIT DC /1000 3A813080
0A8E 0 1801 SRA01 DC /1801 3A813090
0A8F 0 180A SRA10 DC /180A 3A813100
0A90 0 180B SRA11 DC /180B 3A81311C
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

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NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY

INTERRUPT TEST

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
CKDQK	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
COLGD	08A6	08A4
CONSL	0A66	0821
DELAY	0A7F	06E8,0858,09E0,0A3B
DISK	0A60	0752
DLAY1	0A47	0A33
DLAY2	0A4D	0A36
DLAY3	0A53	0A39
DLYND	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
GOLOP	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

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
LOOP0	0731	0581
LOOP1	0741	0587,058B
LOOP2	0751	0591,0595
LOOP3	0761	059B,059F
LOOP4	081E	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,0785,0A92
MOD14	074A	055B,056D,06BA,06CE,0748,074D,0789,0A93
MOD15	075A	055F,056F,06B8,06D2,0758,075D,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

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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
STUP 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
VECT0 0581 0547
VECT1 0587 057F
VECT2 0591 054E
VECT3 059B 057A
VECT4 05A5 0551
VECT5 05AF 057D
VECO0 0735 0503,05DD,0627,066F,0734
VECO1 0745 0507,05DF,0629,0671,0744
VECO2 0755 050B,05E1,062B,0673,0754
VECO3 0765 050F,05E3,062D,0675,0764
VECO4 0771 0513,05E5,062F,0677,06B2,06E6,0703,07D6
VECO5 07BC 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
    
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END OF ASSEMBLY

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

1130 ON LINE DISK ADJUSTMENT PROGRAM

1130 ON LINE DISK ADJUSTMENT PROGRAM

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1. PURPOSE ***** 30A00020
* DISK ADJUSTMENT PROGRAM * 30A00030
***** 30A00040
*
* THE 1130 DISK ACCESS PROGRAM WAS DESIGNED TO BE 30A00050
* USED WITH THE ACCESS ADJUSTMENT PROCEDURE FOUND 30A00060
* IN THE SDS MAINTENANCE MANUAL. 30A00070
* 30A00080
* 30A00090
* THE PROGRAM WILL MOVE THE ACCESS ARM BETWEEN 30A00100
* TRACKS 2 AND 200, AND COMPARE SECTOR ZERO 30A00110
* ADDRESSES AT THOSE TRACKS. 30A00120
* 30A00130
* THE SEEK OPERATION CAN BE SELECTED IN EITHER 10 30A00140
* OR 20 MILL MODE. 30A00150
* 30A00160
***** 30A00170
* 30A00180
* THE C.E. MUST HAVE A 1130 SYSTEM WITH CARD 30A00190
* READER OR PAPER TAPE INPUT. 30A00200
* 30A00210
* THE PROGRAM MUST BE LOADED BY A 30A00220
* RELOCATABLE LOADER, IF 1442 USE 30A00230
* PID 03AA, IF 2501 USE 03AB, IF 30A00240
* PAPER TAPE USE 03AC. 30A00250
* 30A00260
***** 30A00270
3. USE PROCEDURE ***** 30A00280
* 30A00290
3.1.1 PROGRAM 30A00300
LOADING * TO LOAD FROM CARDS. 30A00310
*
* A. PLACE THE RELOCATING LOADER, AND THE DISK 30A00320
* ADJUST TEST IN THE READER IN THAT ORDER. 30A00330
* B. MAKE READER READY. 30A00340
* C. PRESS THE 1131 RESET KEY. 30A00350
* D. PRESS THE 1131 PROGRAM LOAD KEY. 30A00360
* E. IF THE PROGRAM FAILS TO LOAD OR STOPS AT A 30A00370
* WAIT BELOW ADDRESS /0160 REFER TO THE 30A00380
* RELOCATING LOADER DOCUMENTATION. 30A00390
* 30A00400
* TO LOAD FROM PAPER TAPE. 30A00410
* 30A00420
* A. PLACE THE RELOCATING LOADER IN THE READER. 30A00430
* B. MAKE READER READY. 30A00440
* C. PRESS THE 1131 RESET KEY. 30A00450
* D. PRESS THE 1131 PROGRAM LOAD KEY. 30A00460
* E. LOADER WILL LOAD AND HALT AT WAIT 030F6 (BREG) 30A00470
* F. PLACE THE DISK ADJUST TEST IN THE READER. 30A00480
* G. MAKE READER READY. 30A00490
* H. PRESS THE START KEY. 30A00500
* I. IF THE PROGRAM FAILS TO LOAD OR STOPS AT A 30A00510
* WAIT BELOW ADDRESS /0160 REFER TO RELOCATING 30A00520
* LOADER DOCUMENTATION. 30A00530
* 30A00540
* 30A00550
***** 30A00560
3.1.1 SETUP * A. AT WAIT 0, ENTER DISK DRIVE AREA CODE 30A00570
* IN CONSOLE SWITCHES 0 THRU 4 AND CLEAR 30A00580
* BITS 5 THRU 14. 30A00590
*
* DRIVE BIT SW SETTING 30A00600
* 0...../2000 30A00610
* 1...../8800 30A00620
* 2...../9000 30A00630
* 3...../9800 30A00640
* 4...../A000 30A00650
* 30A00660
* B. WAIT ON TRACK ERROR.....SW 15. 30A00670
* THIS SWITCH MAY BE CHANGED AT ANY TIME. 30A00680
* 30A00690

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* C. DEPRESS START. 30A00700
* 30A00710
3.2 OPERATION ***** 30A00720
* 30A00730
* THE PROGRAM WILL START OUT IN 20 MILL MODE. 30A00740
* 30A00750
* THE ACCESS ARM IS FIRST RETURNED HOME. 30A00760
* THE ARM THEN SEEKS TO TRACK 2 WHERE SECTOR 30A00770
* ZERO IS READ AND COMPARED WITH TRACK ADDRESS 2. 30A00780
* A GOOD COMPARE CAUSES THE CONSOLE PRINTER 30A00790
* TO PRINT ONCE AND THE ACCESS ARM TO GO TO 30A00800
* TRACK 200 WHERE THE SAME OPERATION IS REPEATED 30A00810
* FOR TRACK 200. IF COMPARE AT TRACK 200 IS 30A00820
* SUCCESSFUL, THE PRINTER WILL PRINT ONCE AND 30A00830
* THE ACCESS ARM RETURNS TO TRACK 2 WHERE THE 30A00840
* ABOVE OPERATION WILL BE REPEATED. 30A00850
* 30A00860
* IF A COMPARE ERROR IS DETECTED, THE PROGRAM 30A00870
* WILL COME TO A WAIT PROVIDED THAT SW 15 IS ON. 30A00880
* (SEE ERROR WAITS..(3.3)). IF SW 15 IS OFF 30A00890
* AND AN ERROR IS ENCOUNTERED, THE PROGRAM WILL 30A00900
* NOT CONTINUE AND THE PRINTER WILL NOT PRINT. 30A00910
* 30A00920
* TO STOP PROGRAM, DEPRESS IMMEDIATE STOP. 30A00930
* 30A00940
* TO RESTART PROGRAM, DEPRESS STOP. 30A00950
* 30A00960
* TO START PROGRAM, DEPRESS START. 30A00970
* 30A00980
* TO CHANGE FROM 20 MILL MODE OPERATION TO 10 30A00990
* MILL OPERATION, OR VICE VERSA PERFORM THE 30A01000
* FOLLOWING- 30A01010
* 30A01020
* A. DEPRESS IMMEDIATE STOP. 30A01030
* B. DEPRESS PROGRAM RESET. 30A01040
* C. DEPRESS START. 30A01050
* 30A01060
3.3 WAITS ***** 30A01070
* 30A01080
/3000 * ENTER DISK DRIVE AREA CODE. ( SEE 3.1.C ) 30A01090
* 30A01100
ERROR WAITS ***** 30A01110
* 30A01120
/30F1 * THE ADDRESS OF TRACK 2 - SECTOR ZERO WAS READ 30A01130
* AND FOUND INVALID. 30A01140
* 30A01150
* IF ACCESS ARM IS SITTING AT DETENT 2, 30A01160
* DEPRESS START TO CONTINUE ADJUSTMENT, ELSE 30A01170
* DO A SECTOR REWRITE AS FOLLOWS- 30A01180
* A. LOAD I REG TO /018C. 30A01190
* B. PLACE CONSOLE SW IN RUN. 30A01200
* C. DEPRESS START. 30A01210
* 30A01220
* ***** 30A01230
* ***** CAUTION ***** 30A01240
* ***** 30A01250
* 30A01260
* ONLY USE TRACK 2 REWRITE OPTION * 30A01270
* WHEN SITTING AT WAIT /30F1 * 30A01280
* 30A01290
* REWRITE OPTION WILL DESTROY * 30A01300
* ORIGINAL SECTOR DATA. * 30A01310
* 30A01320
* ***** 30A01330
* ***** 30A01340
* ***** 30A01350
* 30A01360
/30F2 * THE ADDRESS OF TRACK 200 - SECTOR ZERO WAS READ 30A01370

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CE UTILITY PROGRAMS

CE UTILITY PROGRAMS

1130 ON LINE DISK ADJUSTMENT PROGRAM

1130 ON LINE DISK ADJUSTMENT PROGRAM

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* AND FOUND INVALID. 30A01380
* 30A01390
* IF ACCESS ARM IS SITTING AT DETENT 200, 30A01400
* DEPRESS START TO CONTINUE ADJUSTMENT, ELSE 30A01410
* DO A SECTOR REWRITE AS FOLLOWS- 30A01420
* A. LOAD I REG TO /018F. 30A01430
* B. PLACE CONSOLE SW IN RUN. 30A01440
* C. DEPRESS START. 30A01450
* 30A01460
* ***** 30A01470
* ***** CAUTION ***** 30A01480
* ***** 30A01490
* 30A01500
* ONLY USE TRACK 200 REWRITE OPTION * 30A01510
* WHEN SITTING AT WAIT /30F2 * 30A01520
* 30A01530
* REWRITE OPTION WILL DESTROY * 30A01540
* ORIGINAL SECTOR DATA. * 30A01550
* 30A01560
* ***** 30A01570
* 30A01580
3.4 TERMINATION ***** 30A01590
* 30A01600
* TO TERMINATE PROGRAM DEPRESS IMMEDIATE STOP. 30A01610
* 30A01620
4.0 PRINTOUTS ***** 30A01630
* 30A01640
* NONE 30A01650
* 30A01660
5.0 COMMENTS ***** 30A01670
* 30A01680
* TO RERUN PROGRAM ON ANOTHER DRIVE, PRESS THE 30A01690
* STOP KEY AND THE PROGRAM WILL STOP AT WAIT 0 30A01700
* SEE SECTION 3.1.C 30A01710
* 30A01720
* ***** 30A01730
* ABS 30A01740
* ORG /0160 30A01750
* ***** 30A01760
* 30A01770
* DISK ADJUSTMENT PROGRAM * 30A01780
* * 30A01790
* ***** 30A01800
* 30A01810
0160 0160 BGN LDX L1 INT2 SET DISK INTERRUPT VECTOR 30A01820
0162 0 6D00 000A STX L1 /000A 30A01830
0164 0 6500 0170 LDX L1 INT5 SET PROGRAM STOP VECTOR 30A01840
0166 0 6D00 000D STX L1 /000D 30A01850
0168 0 6500 01E2 LDX L1 PRTIN SET PRINTER VECTOR 30A01860
016A 0 6D00 000C STX L1 /000C 30A01870
* 30A01880
016C 0 C84F PROG M LDD RESRT * SET AREA CODE IN 30A01890
016D 0 DC00 0000 STD L 0 ** BIT SWITCHES 30A01900
016F 0 7002 MDX WAIT SKIP VECTOR 30A01910
* 30A01920
0170 0 0000 INT5 DC *-* ENTRY POINT 30A01930
0171 0 084C XIO SPDSW SENSE PROGRAM STOP 30A01940
* 30A01950
0172 0 1010 WAIT SLA 16 CLEAR ACC 30A01960
0173 0 D06A STO INT2 CLEAR VECTOR 30A01970
0174 0 D06D STO PRTIN CLEAR VECTOR 30A01980
0175 0 3000 DC /3000 ** 30A01990
0176 0 7400 01DE MDX L INT2,0 TEST VECTOR FOR ZERO 30A02000
0178 0 70F9 MDX WAIT INTERRUPT OCCURRED 30A02010
0179 0 7400 01E2 MDX L PRTIN,0 TEST VECTOR FOR ZERO 30A02020
017B 0 70F6 MDX WAIT INTERRUPT OCCURRED 30A02030
017C 0 4878 BOSC +-Z BRANCHOUT 30A02040
017D 0 1000 NOP FILL WORD 30A02050

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* 30A02060
017E 0 6210 * LDX 2 16 30A02070
017F 0 0858 XIO RDSPS ** 30A02080
0180 0 C068 LD AREA FETCH SW INPUT 30A02090
0181 0 E069 AND F800 CLEAR BITS OTHER THAN AREA 30A02100
0182 0 D066 STO AREA SET AREA CODE 30A02110
0183 0 C600 01C5 AGANI LD L2 SNDSW-1 * * 30A02120
0185 0 E064 AND H07FF 30A02130
0186 0 E862 OR AREA * * SET AREA CODE 30A02140
0187 0 D600 01C5 STO L2 SNDSW-1 * * INTO IOCC 30A02150
0189 0 72FE MDX 2 -2 * * 30A02160
018A 0 70F8 MDX AGANI ** 30A02170
018B 0 7005 MDX SKHME * 30A02180
* 30A02190
018C 0 083B * WTTWO XIO WRT02 * WRITE ADDRESS AT 30A02200
018D 0 4060 BSI TEST * TRACK 2 30A02210
018E 0 7002 MDX SKHME * 30A02220
* 30A02230
018F 0 083A * WTHND XIO WRT20 * WRITE ADDRESS AT 30A02240
0190 0 405D BSI TEST * TRACK 200 30A02250
* 30A02260
0191 0 083C * SKHME XIO HOME * GO HOME 30A02270
0192 0 405B BSI TEST * 30A02280
0193 0 083C XIO TRK2 ** GO TO TRACK 30A02290
0194 0 4059 BSI TEST ** 2 30A02300
0195 0 7063 MDX CHCK2 * 30A02310
* 30A02320
0196 0 C051 * ONWDO LD TOGGL * 30A02330
0197 0 4C20 019F BSC L QNWD1,Z ** BR IF 10 MIL MODE 30A02340
0199 0 C02C LD SNDSW * * 30A02350
019A 0 D037 STO TWHND * * 30A02360
019B 0 D038 STO TWO * * 30A02370
019C 0 6201 LDX 2 1 * * 30A02380
019D 0 6301 LDX 3 1 * * SET PROPER 30A02390
019E 0 7007 MDX CMND1 * * MODE 30A02400
* 30A02410
019F 0 6201 * ONWD1 LDX 2 1 * * 30A02420
01A0 0 6A31 STX 2 TWHND * * 30A02430
01A1 0 6A32 STX 2 TWO * * 30A02440
01A2 0 6680 01C6 LDX 12 SNDSW 30A02450
01A4 0 6780 01C6 LDX 13 SNDSW 30A02460
* 30A02470
01A6 0 082B * CMND1 XIO TWHND * 30A02480
01A7 0 4046 BSI TEST ** GO TO TRACK 200 30A02490
01A8 0 72FF MDX 2 -1 ** 30A02500
01A9 0 70FC MDX CMND1 * 30A02510
* 30A02520
01AA 0 0821 * XIO READ * 30A02530
01AB 0 4042 BSI TEST ** 30A02540
01AC 0 C065 LD INPUT&1 * * 30A02550
01AD 0 F02F EOR OUT20&1 * * READ/COMPARE 30A02560
01AE 0 4C18 01B4 BSC L PRT1,+ - * * ADDR AT TRK 200 30A02570
* 30A02580
01B0 0 4005 * BSI RDSWT TEST FOR SW 15 30A02590
01B1 0 4804 BSC E * * 30A02600
01B2 0 30F2 DC /30F2 ** ERROR, DID NOT 30A02610
01B3 0 70DD MDX SKHME * COMPARE 30A02620
* 30A02630
01B4 0 4054 * PRT1 BSI TPRT SPACE PRINTER 30A02640
01B5 0 703F MDX CMND2 CONTINUE 30A02650
* 30A02660
01B6 0 0000 * RDSWT DC *-* ENTRY POINT 30A02670
01B7 0 081E XIO RDSPT READ SWS 30A02680
01B8 0 C033 LD SWDAT SET DATA TO ACC. 30A02690
01B9 0 4C80 01B6 * BSC I RDSWT EXIT 30A02700
* 30A02710
* 30A02720
01BC 0000 * BSS E 30A02730

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CE UTILITY PROGRAMS

1130 ON LINE DISK ADJUSTMENT PROGRAM

```

01BC 0 4C00 0205 RESRT BSC L RSTRT MODE CHANGE SET/UP 30A02740
01BE 0 0000 SPDSW DC 30A02750
01BF 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 TWD 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 RESTORE 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
01EE 0 0000 TEST DC *-* * 30A03270
01EF 0 08D6 XIO SNDSW ** 30A03280
01F0 0 180D SRA 13 * * CHECK FOR FILE 30A03290
01F1 0 4804 BSC E * * READY 30A03300
01F2 0 70FC MDX TEST&1 ** 30A03310
01F3 0 4C80 01EE BSC I TEST * 30A03320
* 30A03330
01F5 0 08DE CMND2 XIO TWD * 30A03340
01F6 0 40F7 BSI TEST * GO TO TRACK 2 30A03350
01F7 0 73FF MDX 3 -1 * 30A03360
01F8 0 70FC MDX CMND2 * 30A03370
* 30A03380
01F9 0 08D2 CHCK2 XIO READ * 30A03390
01FA 0 40F3 BSI TEST ** 30A03400
01FB 0 C016 LD INPUT&1 * * 30A03410

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CE UTILITY PROGRAMS

1130 ON LINE DISK ADJUSTMENT PROGRAM

```

01FC 0 F0DE EOR OUT02&1 * * READ/COMPARE 30A03420
01FD 0 4C18 0203 BSC L PRT2,+ - * * ADDR AT TRK 2 30A03430
* 30A03440
01FF 0 40B6 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 STO TOGGL ** 30A03550
0208 0 7088 MDX SKHME * 30A03560
* 30A03570
0209 0 0000 TPRT DC *-* ENTRY POINT 30A03580
020A 0 08B7 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 08B1 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

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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
PRUGM 016C
PRTIN 01E2 0168 0174 0179 01E6
PRT11 01C0 020E
PRT1 01B4 01AE
PRT2 0203 01FD
RDSPS 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 018B 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
TW0 01D4 019B 01A1 01F5
WAIT 0172 016F 0178 017B
WRT02 01C8 018C
WRT20 01CA 018F
WTHND 018F
WTTWO 018C
END OF ASSEMBLY

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

1130 SCOPE LOOP PROGRAMS

1130 SCOPE LOOP PROGRAMS

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*****
*
*          T A B L E  O F  C O N T E N T S
*
PARAGRAPH          PAGE
1.  PURPOSE          1A
2.  REQUIREMENTS    1A
3.  USE PROCEDURE   1A
4.  PRINTOUTS       1A
5.  COMMENTS        1A
6.  APPENDIX A      2
  APPENDIX B        3
  6.01 CORE STORAGE CHECK
  6.02 CONSOLE PRINTER
  6.03 KEYBOARD
  6.04 PAPER TAPE PUNCH
  6.05 PAPER TAPE READER
  6.06 1442 PUNCH
  6.07 1442 READER
  6.08 2310 SEEK
  6.09 2310 READ/WRITE/COMPARE
  6.10 1627 PLOTTER
  6.11 2501 READER
  6.12 1403 PRINTER
  6.13 1132 PRINTER
*****
3A000020
3A000030
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

```

```

*****
*
* 1.  PURPOSE          3A000510
* 2.  REQUIREMENTS    3A000520
* 3.  USE PROCEDURE   3A000530
* 3.1 SFTUP AND      3A000540
*     OPERATION      3A000550
* 3.2 LOADING        3A000560
* 3.3 WAITS          3A000570
* 3.4 TERMINATION    3A000580
* 3.5 RESTART        3A000590
* 4.  PRINTOUTS      3A000600
* 5.  COMMENTS        3A000610
*
* ONE CARD PROGRAMS THAT PROVIDE THE C.E. WITH THE
* ABILITY TO EXERCISE VARIOUS FUNCTIONS OF THE
* 1130 SYSTEM. EACH CARD IS IDENTIFIED BY THE
* NUMBER IN COLUMNS 79 AND 80. THIS NUMBER REFERES
* TO A PARAGRAPH WITHIN THE APPENDIX.
*
* THE C.E. MUST HAVE THE 1130 SYSTEM AND A MEANS
* TO ENTER THE PROGRAM.
*
* CHECK EACH WRITE-UP FOR SWITCH SETTINGS BEFORE
* AND AFTER LOADING.
*
* THE PROGRAM IS LOADED IN IPL MODE FROM CARDS,
* PAPER TAPE OR MAY BE BIT-SWITCHED IN.
*
* WAITS ARE IDENTIFIED BY THE B-REGISTER. THEY
* HAVE THE FOLLOWING MEANING,
*
* B-REG 3001 BIT SWITCH SETTINGS REQUIRED.
*
* 3002 ONE PASS OF THE PROGRAM HAS BEEN
* COMPLETED.
*
* 3003 NO INTERRUPT RECEIVED AFTER A
* WRITE COMMAND.
*
* 3004 NO INTERRUPT RECEIVED AFTER A READ
* COMMAND.
*
* 3005 NO INTERRUPT RECEIVED AFTER A
* CONTROL COMMAND.
*
* 3006 ERROR, SEE INDIVIDUAL PROGRAM.
*
* 3007 ERROR, SEE INDIVIDUAL PROGRAM.
*
* PRESS IMMEDIATE STOP. IF PROGRAM STOP IS PRESSED
* THE PROGRAM MAY NOT RUN BY PRESSING START BE-
* CAUSE INTERRUPT 5 IS ON.
*
* PRESS IMMEDIATE STOP AND RESET. PRELOADING
* SWITCHES MAY BE SET AS DESIRED. PRESS START. AT
* WAIT 1 MAKE REQUIRED BIT SWITCH SFTTINGS.
*
* NONE EXCEPT FOR DEVICES THAT PRINT CHARCTERS
* ENTERED FROM THE BIT SWITCHES.
*
* IN MOST CASES A SPECIFIED 'LDX' MAY REPLACE A
* WAIT TO ALLOW RUNNING WITHOUT INTERRUPT. ERROR
* WAITS MAY BE REPLACED BY A 'NOP'. OTHER COMMENTS
* WILL BE FOUND IN EACH PROGRAM. AN INSTRUCTION
* FOLLOWED BY *A* WILL BE ALTERED. THIS IS DUE TO
* THE LIMITATIONS OF 1130 IPL MODE. THE ALTERED
* INSTRUCTION WILL FOLLOW THE *A*.
*****
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

```

6. APPENDIX A	CHAR	1132	1403	KEY/BD	CON/PTR U/C	CON/PTR L/C*	3A001120
*	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	68	8020	26	24	3A001200
*	I	C9	2C	8010	22	20	3A001210
*	J	D1	58	5000	7E	7C	3A001220
*	K	D2	19	4800	5A	58	3A001230
*	L	D3	1A	4400	5E	5C	3A001240
*	M	D4	5B	4200	72	70	3A001250
*	N	D5	1C	4100	76	74	3A001260
*	O	D6	5D	4080	52	50	3A001270
*	P	D7	5E	4040	56	54	3A001280
*	Q	D8	1F	4020	66	64	3A001290
*	R	D9	20	4010	62	60	3A001300
*	S	E2	0D	2800	9A	98	3A001310
*	T	E3	0E	2400	9E	9C	3A001320
*	U	F4	4F	2200	B2	80	3A001330
*	V	E5	10	2100	B6	84	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	*****	3A001420
*	4	F4	43	0200	FO	*****	3A001430
*	5	F5	04	0100	F4	*****	3A001440
*	6	F6	45	0080	D0	*****	3A001450
*	7	F7	46	0040	D4	*****	3A001460
*	8	F8	07	0020	E4	*****	3A001470
*	9	F9	08	0010	E0	*****	3A001480
*	=	7E	4A	00A0	C2	*****	3A001490
*	\$	5B	62	4420	40	*****	3A001500
*	.	4B	6E	8420	00	*****	3A001510
*	'	7D	0B	0120	E6	*****	3A001520
*	,	6B	16	2420	80	*****	3A001530
*	(	4D	57	8120	FE	*****	3A001540
*	-	60	61	4000	84	*****	3A001550
*	)	5D	2F	4120	F6	*****	3A001560
*	+	4E	6D	80A0	DA	*****	3A001570
*	/	61	4C	3000	BC	*****	3A001580
*	*	5C	23	4220	D6	*****	3A001590
*	&	50	15	8000	44	*****	3A001600
*	SPACE	00	7F	0000	21	*****	3A001610
*	NUMBER	*****	*****	0420	C0	*****	3A001620
*	AT	*****	*****	0220	04	*****	3A001630
*	LS THN	*****	*****	8220	DE	*****	3A001640
*	LOG/NOT	*****	*****	4060	F2	*****	3A001650
*	SEM/CLM	*****	*****	40A0	D2	*****	3A001660
*	QUOTE	*****	*****	0060	E2	*****	3A001670
*	LOG/OR	*****	*****	8060	C6	*****	3A001680
*	UNSCORE	*****	*****	2120	BE	*****	3A001690
*	QST MK	*****	*****	2060	86	*****	3A001700
*	COLON	*****	*****	0820	82	*****	3A001710
*	GRT THN	*****	*****	20A0	46	*****	3A001720
*	EXCLAIM	*****	*****	4820	42	*****	3A001730
*	PERCENT	*****	*****	2220	06	*****	3A001740
*	CENT	*****	*****	8820	02	*****	3A001750
*	EOF	*****	*****	0008	*****	*****	3A001760
*	ER CHR	*****	*****	0004	*****	*****	3A001770
*	ER FLD	*****	*****	0002	*****	*****	3A001780
*	0-8-2	*****	*****	2820	*****	*****	3A001790

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

1130 SCOPE LOOP PROGRAMS

1130 SCOPE LOOP PROGRAMS

```

*****
6. 1 STORAGE CHECK * EACH CORE LOCATION IS CHECKED WITH A PATTERN
* SFT 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.
A. PRELOAD SWS * BIT SW 15- HALT AFTER ONE PASS.
* 14- USE ONE ADDRESS
* 3- 4 K MEMORY
* 2- 8 K
* 1- 16 K
* 0- 32 K
B. LOADING * IPL MODE FROM CARDS OR PAPER TAPE.
C. WAIT 1 * SFT PATTERN OR ADDRESS IN BIT SWITCHES.
*
2 * ONE PASS COMPLETED, PRESS START TO CONTINUE.
*
6 * PATTERN CHANGED. THE BIT THAT WAS DROPPED OR
* PICKED IS ON IN THE ACCUMULATOR. FAILING ADDRESS
* IS IN ADDRESS LOCATION 2. PRESS START TO
* CONTINUE OR DO A RESTART.
D. RESTART * PRESS IMMEDIATE STOP AND RESET. PRELOADING
* SWITCHES MAY BE SET AS DESIRED. PRESS START.
E. COMMENTS * THIS PROGRAM WILL WRITE AND READ ALL CORE
* ADDRESSES OUT SIDE THE PROGRAM AREA.
* EACH ADDRESS IS WRITTEN AND CHECKED 2 TIMES.
* IF AN ADDRESS IS FOUND TO BE A PROBLEM, SET BIT
* 14 ON AND RESTART. PLACE THE ADDRESS IN THE BIT
* SWITCHES AT WAIT 1.
* THE PROGRAM WILL CHECK ONLY THAT ADDRESS WITH
* THE PATTERN /5555.
*****
ABS 3A002440
ORG 0 3A002450
LDX STG7 3A002460
STGSW DC *- * BIT SWITCH STG 3A002470
STGLC DC *- * ADRS LOCATION 3A002480
STGPN DC *- * STORAGE PATTERN 3A002490
STGCR DC *- * SIZE OF CORE 3A002500
STGHL DC *- * BIT 15- HALT 3A002510
* BIT 14- USE 1 ADRS 3A002520
STGRD DC /0001 3A002530
DC /003A *A* DC /3A00 RD BIT SW 3A002540
STGXX DC /0015 CONSTANT 3A002550
STGST LDX STGBD *A* LD STGXX 3A002560
SLA 6 * PATTERN TO USE 3A002570
OR STGXX * UNLESS ALTERNATE 3A002580
SLA 6 * IS SELECTED 3A002590
OR STGXX 3A002600
STO STGPN 3A002610
XIO STGRD READ BIT SWS 3A002620
LD STGSW GET BIT SW SETTINGS 3A002630
STO STGHL SET HALT IF B 15 ON 3A002640
SRA 2 3A002650
SLA 2 3A002660
S STGRD ADJ CORE SIZE 3A002670
STO STGCR STORE CORE SIZE 3A002680
WAIT 1 SFT SWS FOR PATTERN 3A002690
* OR ADDRESS 3A002700
XIO STGRD READ BIT SWS 3A002710
LD STGSW GET BIT SW SETTINGS 3A002720
RTE 16 * AND SAVE IN Q REG 3A002730

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```

001A 0 C0EA LD STGHL GET CNTL WORD 3A003120
001B 0 1801 SRA 1 3A003130
001C 0 4804 BSC E USE SWS AS ADRS 3A003140
001D 0 7003 MDX STG7 * YES 3A003150
001E 0 18D0 RTE 16 * NO 3A003160
001F 0 D0E3 STO STGPN 3A003170
0020 0 7002 MDX STG0 3A003180
0021 0 18D0 STG7 RTE 16 3A003190
0022 0 D0E1 STO STGCR SET ADRS IN CORE SIZE 3A003200
0023 0 C0F0 STG0 LD STGCR LD CORE SIZE 3A003210
0024 0 D0D0 STO STGLC STORE IN XR 2 3A003220
0025 0 C0D0 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 EDR 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 EDR STGRD CHG BIT 15 BACK 3A003300
002D 0 F0D5 FDR STGPN CK STARTING PATTERN 3A003310
002E 0 4820 BSC Z IS PATTERN THE SAME 3A003320
002F 0 3006 WAIT 6 * NO 3A003330
0030 0 C0D4 LD STGHL * YES 3A003340
0031 0 1801 SRA 1 3A003350
0032 0 4804 BSC E USE ONLY 1 ADRS 3A003360
0033 0 7006 MDX STG10 * YES 3A003370
0034 0 C0C0 LD STGLC * NO, GET ADRS 3A003380
0035 0 90D0 S STGRD REDUCF ADRS 3A003390
0036 0 D0CB STO STGLC STORE IN XR 2 3A003400
0037 0 9006 S STGPG SUB PRG SIZ 3A003410
0038 0 4830 BSC Z- REACHED LAST ADRS 3A003420
0039 0 70E8 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 70F5 MDX STG0 * NO 3A003470
003E 0 003E STGPG DC STGPG LAST ADRS OF PRG 3A003480
* 3A003490
* 3A003500
* 3A003510
* 3A003520
* 3A003530
* 3A003540
* 3A003550
* 3A003560
* 3A003570
* 3A003580
* 3A003590
* 3A003600
* 3A003610
* 3A003620
* 3A003630
* 3A003640
* 3A003650
* 3A003660
* 3A003670
* 3A003680
* 3A003690

```



```

*****
* 6.02 CONSOLE PRINTER
* 1. THE PROGRAM PRINTS ALTERNATE CHARACTERS OR
*   EXECUTES ALTERNATE CONTROL FUNCTIONS WHICH
*   HAVE BEEN SELECTED IN THE BIT SWITCHES.
* 2. AN OPTION IS AVAILABLE TO SET UP A VARIABLE
*   DELAY BETWEEN XIO WRITE EXECUTIONS.
* 3. AN OPTION IS AVAILABLE TO HALT THE PROGRAM
*   AFTER THE COMPLETION OF THE EXECUTION OF
*   AN ALTERNATE XIO SEQUENCE.
*
* 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 WAIT AFTER EACH PROGRAM PASS IS
*   DESIRED, TURN ON BIT SWITCH 15.
*
* B. LOADING
* LOAD IPL FROM CARD OR PAPER TAPE.
*
* C. WAITS
* 1 * SET DESIRED CHAR/CONTROL CODES IN BIT SWITCHES
*   0 THRU 15. SEE PAGE 2 FOR BIT SW CODES.
*   1ST CHAR/CONTROL IN SWS 0 THRU 7.
*   2ND CHAR/CONTROL IN SWS 8 THRU 15.
*   DEPRESS START.
* 2 * NORMAL PROGRAM WAIT IF 1 PASS OPTION HAS BEEN
*   SELECTED. DEPRESS START TO MAKE ANOTHER PASS.
* 3 * NO INTERRUPT GENERATED AFTER XIO WRITE
*   COMMAND WAS GIVEN. SEE COMMENTS.
*
* 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. IF PROGRAM LOOPS, CHECK Q REG FOR NOT RDY
*   OR BUSY DSW BITS BEING ON.
* 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.
* 4. TO SET UP LOOP TO EXECUTE XIO, LOAD /602D
*   INTO LOCATION /002A AND LOAD /1000 INTO
*   LOCATION /0031 AND DO A PROGRAM RESTART.
*****
0000
0000 0 6012 CPBGN LDX CPBLD
0001 0 0001 CPONE DC 1
0002 0 0006 CPBSW DC CPDSW
0003 0 003A DC /003A
0004 0 0006 CPWRT DC CPDSW
0005 0 9000 DC /9000
0006 0 0000 CPDSW DC *-
0007 0 F010 DC /F010
0008 0 0000 CPSET DC *-
0009 0 601D CPCTL LDX CPRDS
000A 0 0000 DC *-
000B 0 0000 CPDSV DC *-
000C 0 002C DC CPIN4
000D 0 1810 CPALT SRA 16
000E 0 DOFA STO CPCTL
000F 0 7012 MDX CPSEN
0010 0 3002 WAIT 2
0011 0 700F MDX CPSEN-1

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3A003710
3A003720
3A003730
3A003740
3A003750
3A003760
3A003770
3A003780
3A003790
3A003800
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3A003820
3A003830
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3A003870
3A003880
3A003890
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3A003920
3A003930
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3A003950
3A003960
3A003970
3A003980
3A003990
3A004000
3A004010
3A004020
3A004030
3A004040
3A004050
3A004060
3A004070
3A004080
3A004090
3A004100
3A004110
3A004120
3A004130
3A004140
3A004150
3A004160
3A004170
3A004180
3A004190
3A004200
3A004210
3A004220
3A004230
3A004240
3A004250
3A004260
3A004270
3A004280
3A004290
3A004300
3A004310
3A004320
3A004330
3A004340
3A004350
3A004360
3A004370
3A004380
3A004390
3A004400
3A004410
3A004420
3A004430
3A004440
3A004450
3A004460
3A004470
3A004480
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3A004560
3A004570
3A004580
3A004590
3A004600
3A004610
3A004620
3A004630
3A004640
3A004650
3A004660
3A004670
3A004680
3A004690
3A004700
3A004710
3A004720
3A004730
3A004740
3A004750
3A004760
3A004770
3A004780
3A004790
3A004800
3A004810
3A004820
3A004830
3A004840
3A004850
3A004860
3A004870
3A004880
3A004890
3A004900
3A004910
3A004920
3A004930
3A004940
3A004950
3A004960
3A004970
3A004980
3A004990
3A005000
3A005010

```

6.03 KEYBOARD

A. PRELOAD SWS

B. LOADING

C. WAITS

D. RESTART

E. COMMENTS

```

***** 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
* NONE, SWITCHES MAY BE CHANGED AT ANY TIME. 3A005150
* 3A005160
* LOAD IPL FROM CARD OR PAPER TAPE. 3A005170
* 3A005180
* 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
* 1. TO RESTART PROGRAM, DEPRESS IMMEDIATE STOP 3A005330
* AND RESET PUSH BUTTONS. 3A005340
* 2. DEPRESS START. 3A005350
* 3A005360
* 1. LAST DSW SENSED OR LAST CHARACTER READ IS 3A005370
* DISPLAYED IN THE Q REG. SEE WAIT 1. 3A005380
* 2. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON, 3A005390
* EXECUTE BIT SW 15 OFF OPTION. 3A005400
* 3A005410
***** 3A005420
*****
0000 ORG 0 3A005430
0000 0 6024 KYBGN LDX KYBLD *A* TO /6032 LDX KYRST 3A005440
0001 0 0001 KYONE DC 1 CONSTANT 1 3A005450
0002 0 0004 KYBSW DC KYDSW BIT SW SAVE AREA 3A005460
0003 0 003A DC /003A *A* TO /3A00 RD BIT SWS 3A005470
0004 0 6032 KYDSW LDX KYRST RESET VECT/BIT SWS 3A005480
0005 0 F010 DC /F010 *A* TO /0F01 XIO SENSE DSW 3A005490
0006 0 0000 KYSEL DC 0 3A005500
0007 0 C000 DC /C000 *A* TO /0C00 XIO SEL KYBD 3A005510
0008 0 000A KYRD DC KYKEY KEYED RD/IN AREA 3A005520
0009 0 A000 DC /A000 *A* TO /0A00 XIO KEY RD 3A005530
000A 0 0000 KYKEY DC *-* KEYED RD/IN AREA 3A005540
000B 0 0000 KYDSV DC *-* LAST DSW SENSED 3A005550
000C 0 0011 DC KYIN4 INTERRUPT ADDR 3A005560
000D 0 C8FC KYDCH LDD KYKEY LOAD LAST CHAR READ 3A005570
000E 0 18D0 RTE 16 SWAP LAST CHAR/DSW 3A005580
000F 0 D8FA STD KYKEY * 3A005590
0010 0 7011 MDX KYDSP 3A005600
0011 0 0000 KYIN4 DC *-* INTERRUPT ENTRY 3A005610
0012 0 08EF XIO KYBSW READ BIT SWS 3A005620
0013 0 08F0 XIO KYDSW SENSE RESET DSW 3A005630
0014 0 D0F6 STD KYDSV SAVE DSW 3A005640
0015 0 1001 SLA 1 CK IF RESPONSE 3A005650
0016 0 4850 BOSC - * 3A005660
0017 0 7001 MDX KYRFQ NO, CHK IF REQUEST 3A005670
0018 0 7003 MDX KYRDW YES, READ CHAR CODE 3A005680
0019 0 1001 KYREQ SLA 1 CHECK IF REQUEST 3A005690
001A 0 4850 BOSC - * 3A005700

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001B 0 701A MDX KYSET NO, RESENSE DSW 3A005710
001C 0 08EB KYRDW XIO KYRD YES, READ LAST CHAR 3A005720
001D 0 08E8 XIO KYSEL SELECT KEYBOARD 3A005730
001E 0 C0F5 LD KYDSW CK IF CHAR/DSW IN Q 3A005740
001F 0 100F SLA 14 * 3A005750
0020 0 4829 BSC 8Z * 3A005760
0021 0 70FB MDX KYDCH DISPLAY CHAR IN Q 3A005770
0022 0 C8E7 KYDSP LDD KYKEY DISPLAY DSW IN Q 3A005780
0023 0 7012 MDX KYSET GO SELECT KEYBOARD 3A005790
0024 0 C0DE KYBLD LD KYBSW&1 BUILD IOCCS AND 3A005800
0025 0 1009 SLA 8 * RESFT/START VECT 3A005810
0026 0 D0DC STD KYBSW&1 * 3A005820
0027 0 C0DD LD KYDSW&1 * 3A005830
0028 0 1804 SRA 4 * 3A005840
0029 0 D0DB STD KYDSW&1 * 3A005850
002A 0 C0DC LD KYSEL&1 * 3A005860
002B 0 1804 SRA 4 * 3A005870
002C 0 D0DA STD KYSELE&1 * 3A005880
002D 0 C0DB LD KYRD&1 * 3A005890
002E 0 1804 SRA 4 * 3A005900
002F 0 D0D9 STD KYRD&1 * 3A005910
0030 0 C0D3 LD KYDSW * 3A005920
0031 0 D0CE STD 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 STD 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
*****
003E 0 0000 DC 0 SPACE FILLER 3A006060
003F 0 0000 DC 0 * 3A006070
0040 0 0000 DC 0 * 3A006080
0041 0 0000 DC 0 * 3A006090
0042 0 0000 DC 0 * 3A006100
0043 0 0000 DC 0 * 3A006110
0044 0 0000 DC 0 * 3A006120
0045 0 0000 DC 0 * 3A006130
0046 0 0000 DC 0 * 3A006140
0047 0 0000 DC 0 * 3A006150
0048 0 0000 DC 0 * 3A006160
0049 0 0000 DC 0 * 3A006170
004A 0 0000 DC 0 * 3A006180
004B 0 0040 DC /0040 THE LAST FIVE WORDS ARE 3A006190
004C 0 9000 DC /9000 * USED FOR PROGRAM 3A006200
004D 0 2000 DC /2000 * IDENTIFICATION. THREE 3A006210
004E 0 2000 DC /2000 * FOR THE PID AND TWO FOR 3A006220
004F 0 0040 DC /0040 * SFQUENCE. 3A006230

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1130 SCOPE LOOP PROGRAMS

1130 SCOPE LOOP PROGRAMS

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***** 3A006260
* 3A006270
* 1. THE PROGRAM PUNCHES ALTERNATE CHARACTERS 3A006280
* WHICH HAS BEEN SELECTED IN THE BIT SWS, 3A006290
* OR A BINARY PATTERN. 3A006300
* 2. AN OPTION IS AVAILABLE TO SET UP A VARIABLE 3A006310
* DELAY BETWEEN XIO PUNCH EXECUTIONS. 3A006320
* 3. AN OPTION IS AVAILABLE TO HALT THE PROGRAM 3A006330
* AFTER THE COMPLETION OF THE EXECUTION OF 3A006340
* A PROGRAM PASS. 3A006350
* 4. SEE PAGE 2A FOR BIT SW CONTROL BINARY PATTERN. 3A006360
* 5. THIS TAPE MAY BE USED IN THE PAPER TAPE 3A006370
* READER SCOPE LOOP, 6.05. 3A006380
* 3A006390
A. PRELOAD SWS * 1. IF DELAY IS DESIRED, SET DELAY CONTROL 3A006400
* VALUE IN BIT SWITCHES 1 THRU 13. 3A006410
* *NOTE* SWS 1 THRU 13 ALL ON, MAX DELAY. 3A006420
* SWS 1 THRU 13 ALL OFF, NO DELAY. 3A006430
* 2. IF A BINARY PATTERN IS DESIRED, TURN ON 3A006440
* BIT SWITCH 14. 3A006450
* 3. IF A WAIT AFTER EACH PROGRAM PASS IS 3A006460
* DESIRED, TURN ON BIT SWITCH 15. 3A006470
* 3A006480
B. LOADING * LOAD IPL FROM CARD OR PAPER TAPE. 3A006490
* 3A006500
C. WAITS 1 * SET DESIRED CHARACTERS TO BE PUNCHED IN BIT SWS 3A006510
* 0 THRU 15. SEE PAGE FOR BIT SW CODES. 3A006520
* 1ST CHARACTER IN SWS 0 THRU 7. 3A006530
* 2ND CHARACTER IN SWS 8 THRU 15. 3A006540
* MAKE PAPER TAPE PUNCH READY. 3A006550
* DEPRESS START. 3A006560
* 3A006570
2 * NORMAL PROGRAM WAIT IF 1 PASS OPTION HAS BEEN 3A006580
* SELECTED. DEPRESS START TO MAKE ANOTHER PASS. 3A006590
* 3A006600
3 * NO INTERRUPT GENERATED AFTER XIO PUNCH 3A006610
* COMMAND WAS GIVEN. SEE COMMENTS. 3A006620
* 3A006630
D. RESTART * 1. TO RESTART PROGRAM OR RESET INITIAL PRELOAD 3A006640
* SWITCH SETTINGS, DEPRESS IMMEDIATE 3A006650
* STOP AND RESET PUSH BUTTONS. 3A006660
* 2. SET DESIRED PRELOAD BIT SWITCH SETTINGS. 3A006670
* 3. DEPRESS START. 3A006680
* 3A006690
E. COMMENTS * 1. LAST DSW SENSED IS DISPLAYED IN THE Q REG. 3A006700
* 2. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON 3A006710
* OR TO BYPASS THE INTERRUPT WAIT, LOAD /6034 3A006720
* INTO LOCATION /0031 AND DO A PROGRAM RESTART. 3A006730
* 3. TO SET UP LOOP TO EXECUTE XIO, LOAD /6034 3A006740
* INTO LOCATION /0031 AND LOAD /603A INTO 3A006750
* LOCATION /0039 AND DO A PROGRAM RESTART. 3A006760
* 3A006770
***** 3A006780
0000 ORG 0 3A006790
0000 0 600D TPBGN LDX TPBLD *A* TO LDX TPRDS /6024 3A006800
0001 0 0001 TPONE DC 1 CONSTANT ONE 3A006810
0002 0 0006 TPBSW DC /PDSW BIT SW SAVE AREA 3A006820
0003 0 003A DC /003A *A* TO /3A00 RD BIT SWS 3A006830
0004 0 0006 TPWRT DC /PDSW CHARACTER ADDRESS 3A006840
0005 0 0019 DC /0019 *A* TO /1900 XIO PUNCH 3A006850
0006 0 0000 TPDSW DC *-* BIT SW READIN AREA 3A006860
0007 0 001F DC /001F *A* TO /1F01 SENSE DSW 3A006870
0008 0 0000 TPSET DC *-* SW OPTION/DELAY SAVE 3A006880
0009 0 601C TPCTL LDX TPRDS 2ND CHAR SW/RESET MOD 3A006890
000A 0 0000 TP100 DC *-* *A* TO /0100 PATT BUILD 3A006900
000B 0 0000 TPDSV DC *-* DSW SAVE AREA 3A006910
000C 0 0033 DC TPIN4 INTERRUPT ADDRESS 3A006920
000D 0 C0F7 TPBLD LD TPWRT&1 BUILD WRITE IOCC 3A006930

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000E 0 1008 SLA 8 * 3A006940
000F 0 D0F5 STO TPWRT&1 * 3A006950
0010 0 C0F6 LD TPDSW&1 BUILD SENSE RESET 3A006960
0011 0 1008 SLA 8 * 3A006970
0012 0 E8EE OR TPONE * 3A006980
0013 0 D0F3 STO TPDSW&1 * 3A006990
0014 0 C0EE LD TPBSW&1 BUILD READ BIT SW 3A007000
0015 0 1008 SLA 8 * IOCC 3A007010
0016 0 D0EC STO TPBSW&1 * 3A007020
0017 0 C0E9 LD TPONE BUILD PATTERN WORD 3A007030
0018 0 1008 SLA 8 * 3A007040
0019 0 D0F0 STO TP100 * 3A007050
001A 0 C0EE LD TPCTL SET UP RESET AND 3A007060
001B 0 D0E4 STO TPBGN * START BRANCH 3A007070
001C 0 08E5 TPRDS XIO TPBSW READ BIT SWS FOR 3A007080
001D 0 C0E8 LD TPDSW * PROG OPTS/DELAY 3A007090
001E 0 D0E9 STO TPSET * 3A007100
001F 0 3001 WAIT 1 SET CHARS IN SWS 3A007110
0020 0 1010 SLA 16 CLR PUNCH WD LOC 3A007120
0021 0 D0E4 STO TPDSW 3A007130
0022 0 C0E5 LD TPSET CHK PUNCH OPTION 3A007140
0023 0 100E SLA 14 * 3A007150
0024 0 4828 BSC &Z * 3A007160
0025 0 7002 MDX TPPAT BIT 14 ON, PCH PATT 3A007170
0026 0 08D8 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 TPLOP S TPONE * 3A007400
003D 0 4810 BSC - * 3A007410
003E 0 70FD MDX TPLOP * 3A007420
003F 0 C0C9 LD TPCTL CHK IF 2ND CHAR SW 3A007430
0040 0 4818 BSC &- * CLEARED 3A007440
0041 0 7004 MDX TPNOT YES 3A007450
0042 0 C0C3 LD TPDSW NO, SET UP 2ND CHAR 3A007460
0043 0 1008 SLA 8 * 3A007470
0044 0 D0C1 STO TPDSW * 3A007480
0045 0 70E5 MDX TPALT PUNCH 2ND CHAR 3A007490
0046 0 68C2 TPNOT STX TPCTL SET 2ND CHAR SW 3A007500
0047 0 C0C0 LD TPSET CHK 1 PASS OPTION SW 3A007510
0048 0 4804 BSC E * 3A007520
0049 0 3002 WAIT 2 COMPLETED PROG PASS 3A007530
004A 0 70D7 MDX TPRDS&6 LOOP PROGRAM 3A007540
***** 3A007550
004B 0 0040 DC /0040 THE LAST FIVE WORDS ARE 3A007560
004C 0 9000 DC /9000 * USED FOR PROGRAM 3A007570
004D 0 2000 DC /2000 * IDENTIFICATION. THREE 3A007580
004E 0 2000 DC /2000 * FOR THE PID AND TWO FOR 3A007590
004F 0 0020 DC /0020 * SEQUENCE. 3A007600

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1130 SCOPE LOOP PROGRAMS

1130 SCOPE LOOP PROGRAMS

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*****
6.05 PAPER TAPE READER
* 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 XIC TRDSW SENSE DSW
0003 0 D021 STD TRDSV SAVE DSW
0004 0 1001 SLA 1 CK FOR OP COMPLETE
0005 0 4850 BOSC - *
0006 0 70FB MDX TRIN4&1 NO, RESENSE 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 D000 TRADV DC /D000 BUILD CONSTANT
000B 0 F000 DC /E000 *A* TO /1C00 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 TRSBW BIT SW SAVE ADDR
0011 0 003A DC /003A *A* TO /3A00 RD BIT SWS
0012 0 F010 TRI4A FOR TRSBW *
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 D0ED TRSBW STD TRBSW&1 *A* TO *-* COMP S/B WORD
0024 0 C0F8 TRARA LD TRDSW&1 *A* TO *-* WORD READ
0025 0 1803 TRDSV SRA 3 *A* TO *-* SAVED DSW
0026 0 D0E6 TRCTL STD TRDSW&1 *A* TO *-* ALT CHAR SW
0027 0 1008 SLA 8 *
0028 0 D0F9 STD TR100 *
0029 0 C8E0 LDD TRADV *
002A 0 18C3 RTE 3 *
002B 0 D0E3 STD TRRD&1 *
002C 0 D8DD STD TRADV *
002D 0 C0D3 LD TRIN4 *
002E 0 D0D1 STD TRBGN *
002F 0 08F0 TRRST XIO TRBSW RD SWS DELAY/OPTIONS
0030 0 C0F2 LD TRSBW SAVE DELAY/OPTIONS
0031 0 D0EF STD TRBLD *
0032 0 3001 WAIT 1 SET CHARACTERS IN SWS
0033 0 1010 SLA 16 INITIALIZE S/B WD
0034 0 D0EE STD TRSPW *
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 08D6 XIC 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 D0E2 STD TRSBW SAVE IN S/B
0041 0 08C8 XIC TRADV ADVANCE TAPE
0042 0 3005 WAIT 5 WAIT FOR INTERRUPT
0043 0 1010 TRNOT SLA 16 CL ALT CHAR SW
0044 0 D0E1 STD TRCTL *
0045 0 C0DD LD TRSBW SET UP RIGHT CHAR
0046 0 1808 SRA 8 *
0047 0 70F7 MDX TRALT *
0048 0 C0DA TRPAT LD TRSBW SET UP BINARY PATT
0049 0 80D8 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.
5 * 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
* /7OFF IN THE NEXT LOCATION AFTER THE XIO. THE
* XIO WILL BE EXECUTED AFTER EACH BRANCH.
*****
0000 ORG 0
0000 0 6037 PHFED LDX PHBLD ** TO /600F LDX PH1
0001 0 0003 DC /0003 ** DC /1402 FD A CD
0002 0 0000 PHCTR DC *-* COLUMN COUNTER
0003 0 0000 PHBSW DC *-* BIT SWITCH STG
0004 0 0003 PHBSW DC /0003 READ IN ADRS
0005 0 003A DC /003A *A* DC /3A00
0006 0 0003 PHPCD DC PHBSW PCH I/O AREA
0007 0 0011 DC /0011 *A* DC /1100
0008 0 0011 PHPST DC PHINT COL INTR ADRS
0009 0 A008 DC /A008 *A* DC /1401
000A 0 0008 PHDSW DC /0008 PCH TERMINATOR
000B 0 B818 DC /B818 *A* DC /1703
000C 0 0011 PHSTK DC PHINT OP COMP INTR ADRS
000D 0 0029 DC /0029 *A* DC /1480
000E 0 00F0 PHK50 DC /00F0 80 COLS TIMES 3
000F 0 3001 PH1 WAIT 1 SET BIT SWS
0010 0 701F MDX PH2
0011 0 0000 PHINT DC *-* INTERREPT ENTRY
0012 0 08F7 XIO PHDSW SENSE DSW
0013 0 1001 SLA 1
0014 0 4850 BOSC - COL INTR ON
0015 0 700C MDX PH6 * NO, TRY OP COMP
0016 0 08ED XIO PHBSW
0017 0 COEA LD PHCTR COLUMN COUNTER
0018 0 80EB A PHBSW ADD THREE
0019 0 DOE8 STO PHCTR
001A 0 FOF3 EOR PHK50 CHECK FOR LAST COLUMN
001B 0 4820 BSC Z IS IT LAST COLUMN
001C 0 7003 MDX PH4
001D 0 COE5 LD PHSW GET DATA TO BE PUNCHED

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001E 0 EREB OR PHDSW * AND OR IN PCH TERM 3A009660
001F 0 DOE3 STO PHSW * ANS STORE BACK 3A009670
0020 0 08E5 PH4 XIO PHPCD PUNCH A COLUMN 3A009680
0021 0 3003 WAIT 3 WAIT FOR INTERRUPT 3A009690
0022 0 1003 PH6 SLA 3
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 CODA LD PHSW GET SW SETTING 3A009760
0029 0 4804 BSC E HALT PROGRAM 3A009770
002A 0 3002 WAIT 2 * YES 3A009780
002B 0 1801 SRA 1 * NO 3A009790
002C 0 4804 BSC E DO STACKER SELECT 3A009800
002D 0 7005 MDX PH8 * YES 3A009810
002E 0 1801 SRA 1 * NO 3A009820
002F 0 4804 BSC E WHAT OPERATION 3A009830
0030 0 08CF PH2 XIO PHFED FEED A CARD 3A009840
0031 0 08D6 XIO PHPST START THE PUNCH 3A009850
0032 0 3005 WAIT 5 * PCH FROM SWS 3A009860
0033 0 08D8 PH8 XIO PHSTK GIVE STACKER COMMAND 3A009870
0034 0 COCE LD PHSW RESTORE ACC 3A009880
0035 0 1802 SRA 2 3A009890
0036 0 70F8 MDX PH2-1 3A009900
*
PHRLD LD PHRES BUILD XIO COMMANDS 3A009910
STO 0 SET UP RESTART 3A009920
LD PHPST+1 * INIT PCH 3A009930
SRA 3 * 3A009940
STO PHPST+1 * 3A009950
EOR PHFED&1 * FEED A CARD 3A009960
STO PHFED&1 * 3A009970
LD PHBSW+1 * READ BIT SWITCHES 3A009980
SLA 8 * 3A009990
STO PHBSW+1 * 3A010000
LD PHDSW+1 * SENSE DSW 3A010010
SRA 3 * 3A010020
STO PHDSW+1 * 3A010030
LD PHPCD+1 * PCH A COLUMN 3A010040
SLA 8 * 3A010050
STO PHPCD+1 * 3A010060
LD PHSTK+1 * STACK SELECT 3A010070
SLA 7 * 3A010080
STO PHSTK&1 * 3A010090
PHRES LDX PH1 * 3A010100
*****
DC /0040 THE LAST FIVE WORDS ARE 3A010120
DC /9000 * USED FOR PROGRAM 3A010130
DC /2000 * IDENTIFICATION. THREE 3A010140
DC /2000. * FOR THE PID AND TWO FOR 3A010150
DC /0008 * SEQUENCE. 3A010160

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*****
6.07 1442 READER
* 1. THE PROGRAM READS A COLUMN OF DATA FROM THE CARD AND COMPARES IT WITH THE BIT SWS.
* 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 BYPASS COMPARE ERROR WAIT 6 OPTION IS DESIRED, TURN ON BIT SWITCH 15.
P. LOADING
* LOAD IPL FROM CARD OR PAPER TAPE.
C. WAITS
1 * SET BIT SWITCHES 0 THRU 11 TO EXPECTED COLUMN DATA AND SET BITS 12 THRU 15 OFF.
* LOAD PREPUNCHED CARDS INTO READER AND MAKE RDY.
* DEPRESS START.
4 * NO INTERRUPT GENERATED AFTER XIO READ.
* COMMAND WAS GIVEN. SEE COMMENTS.
6 * COMPARE ERROR. ACCUMULATOR CONTAINS BITS READ.
* IF ACCUMULATOR CONTAINS /00FF, COLUMN READ WAS NOT STORED INTO READ/IN AREA.
* DEPRESS START TO READ NEXT CARD.
* 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 /6010 INTO LOCATION /0037 AND DO A PROGRAM RESTART.
* 3. TO SET UP LOOP TO EXECUTE XIO, LOAD /6010 INTO LOCATION /0037 AND LOAD /1000 INTO LOCATION /003A AND DO A PROGRAM RESTART.
*****
0000 ORG 0
0000 0 601F RDRGN LDX RDBLD *A* TO /6020 LDX RDRST
0001 0 00FF RDARA DC /00FF READ IN AREA
0002 0 0006 RDBSW DC RDBSW BIT SW SAVE AREA
0003 0 003A DC /003A *A* TO /3A00 RD BIT WSW
0004 0 0001 RDRRD DC RDARA READ IN AREA ADDR
0005 0 0012 DC /0012 *A* TO /1200 XIO READ
0006 0 6020 RDDSW LDX RDRST BIT SW SAVE AREA
0007 0 8818 DC /8818 *A* TO /1703 XIO SFNSE
0008 0 000F RDRGO DC RD104 INTERRUPT ADDR
0009 0 2808 DC /2808 *A* TO /1404 XIO START
000A 0 0000 RDERR DC *-# LAST RDR COMPARE ERR
000B 0 0000 RDDSV DC *-# LAST DSW SENSED
000C 0 000F DC RD104 INTERRUPT ADDR
000D 0 00FF RD0FF DC /00FF CONSTANT /00FF
000E 0 0001 RD0NE DC 1 CONSTANT 1
000F 0 0000 RD104 DC *-# INTERRUPT ENTRY
0010 0 08F5 XIO RDBSW SENSE AND SAVE DSW
0011 0 00F9 STO RDBSV *
0012 0 4850 BOSC - CK FOR RD RESPONSE
0013 0 7024 MDX RDCOP NO, CK OP COMPLETE
*****
0014 0 08FF XIO RDRRD YES, READ COLUMN
0015 0 0C0F LD RDDSW CK IF COMPARE TO SWS
0016 0 1804 SRA 4 *
0017 0 1004 SLA 4 *
0018 0 F0E8 EDR RDARA *
0019 0 4818 BSC &- *
001A 0 701C MDX RDINT YES, WAIT NXT INTRPT
001B 0 C0E5 LD RDARA NO,SAVE COL READ
001C 0 D0ED STO RDERR *
001D 0 6802 STX RDESW SET ERR SW
001E 0 7018 MDX RDINT WAIT FOR NXT INTRPT
001F 0 C0E3 RDBLD LD RDBSW&1 BUILD IOCCS AND
0020 0 1008 RDESW SLA 8 * RESET/START BRANCH
0021 0 D0E1 STO RDBSW&1 *
0022 0 C0E4 LD RDDSW&1 *
0023 0 1803 SRA 3 *
0024 0 D0E2 STO RDDSW&1 *
0025 0 C0F3 LD RDRGO&1 *
0026 0 1801 SRA 1 *
0027 0 D0E1 STO RDRGO&1 *
0028 0 C0DC LD RDRRD&1 *
0029 0 1008 SLA 8 *
002A 0 D0DA STO RDRRD&1 *
002B 0 C0DA LD RDDSW *
002C 0 D0D3 STO RDBGN *
002D 0 08D4 RDRST XIO RDBSW READ SWS DELAY/OPT
002E 0 C0D7 LD RDDSW * SAVE DELAY/OPTION
002F 0 D0EF STO RDBLD *
0030 0 3001 WAIT 1 SET READ PATTERN
0031 0 C0DB LD RD0FF *
0032 0 D0CE STO RDARA *
0033 0 1010 SLA 16 INITIALIZE AND READ
0034 0 D0EB STO RDESW * BIT SWS
0035 0 08CC XIO RDBSW *
0036 0 08D1 XIO RDRGO START READER
0037 0 3004 RDINT WAIT 4 WAIT FOR INTERRUPT
0038 0 1004 RDCOP SLA 4 CK FOR OP COMPLETE
0039 0 4850 BOSC - *
003A 0 70D5 MDX RD104&1 NO, RESENSE DSW
003B 0 C8CE LDD RDDSV-1 YES, LOAD DSW IN Q
003C 0 C0E2 LD RDBLD SET UP DELAY
003D 0 1801 SRA 1 *
003E 0 90CF RDL0P S RDONE *
003F 0 4810 BSC - *
0040 0 70FD MDX RDL0P *
0041 0 CODE LD RDESW CK IF ERR SW ON
0042 0 4818 BSC &- *
0043 0 70ED MDX RDRST&4 NO, RD NXT CARD
0044 0 C0DA LD RDRLD YES, CK IF LOOP
0045 0 100F SLA 15 * ON ERROR(BIT 15)
0046 0 4820 BSC 2 *
0047 0 70ED MDX RDINT-2 YES, RD BIT SWS
0048 0 C8C1 LDD RDDSV-1 NO, DISPLAY RD ERR
0049 0 3006 WAIT 6 * AND DSW AT WAIT 6
004A 0 70E6 MDX RDRST&4 RD NEXT CARD
*****
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 TWD FOR
004F 0 0004 DC /0004 * SEQUENCE.

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1130 SCOPE LOOP PROGRAMS

1130 SCOPE LOOP PROGRAMS

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*****
*
* 1. THE PROGRAM ALLOWS THE HEAD TO ACCESS BACK
* AND FORTH BETWEEN 2 CYLINDERS WHICH ARE
* CONTROLLED BY THE OPERATOR.
* 2. AN OPTION IS AVAILABLE TO ALLOW A WAIT AFTER
* EACH SEEK OPERATION.
* 3. THE PROGRAM CAN BE USED TO POSITION THE HEAD
* BEFORE LOADING THE 2310 WRT/RD/COMPARE
* PROGRAM. 6.09
*
A. PRELOAD SWS
* 1. SET DESIRED DISK DRIVE AREA CODE IN BIT
* SWITCHES 0 THRU 7.
* DRIVE 0 --- 20XX
* DRIVE 1 --- 88XX
* DRIVE 2 --- 90XX
* DRIVE 3 --- 98XX
* DRIVE 4 --- A0XX
* 2. IF WAIT AFTER EACH SEEK OPERATION IS DESIRED,
* SET BIT SWITCH 15 ON.
*
B. LOADING
* LOAD IPL FROM CARD OR PAPER TAPE.
*
C. WAITS
1 * SET DESIRED HEX CYLINDER ADDRESS IN BIT
* SWITCHES 0 THRU 7. SEE PAGE 2A.
* SET DESIRED HEX NUMBER OF CYLINDERS TO SEEK IN
* BIT SWITCHES 8 THRU 15.
* DEPRESS START.
*
5 * NO INTERRUPT GENERATED AFTER INITIAL XIO SEEK
* HOME WAS EXECUTED. SEE COMMENTS
*
6 * NO INTERRUPT GENERATED AFTER XIO SEEK WAS
* EXECUTED. SEE COMMENTS
*
D. RESTART
* 1. TO RESTART PROGRAM OR RESET 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
* AND TO BYPASS THE INTERRUPT WAIT, LOAD /6012
* INTO LOCATIONS /0039 AND /0041.
* DO A PROGRAM RESTART.
*****
0000 ORG 0
0000 0 601B DKBGN LDX DKBLD *A* TO /6020 LDX DKRST
0001 0 0000 DKENT DC *-* INTERRUPT ENTRY SW
0002 0 000E DKBSW DC DKBIT BIT SW SAVE
0003 0 003A DC /003A *A* TO /3A00 RD BIT SWS
0004 0 00CA DKHME DC 202 MAX NUMBER OF SEEKS
0005 0 0000 DC *-* IOCC-SEEK HOME
0006 0 0000 DKSEK DC *-* NUMBER OF SEEKS
0007 0 0000 DC *-* IOCC-SEEK
0008 0 0000 DKDSW DC *-* AREA CODE/SW OPTIONS
0009 0 0000 DC *-* IOCC-SENSE RESET DSW
000A 0 0011 DC DKIN2 INTERRUPT ADDRESS
000B 0 0000 DKDSV DC *-* LAST DSW
000C 0 0004 DK004 DC /0004 CONSTANT 4
000D 0 00FF DKOFF DC /00FF CONSTANT FF
000E 0 6020 DKBIT LDX DKRST RESET VECTER
000F 0 7010 DKBD1 DC /7010 DSW BUILD WORD
0010 0 0808 DKBD2 DC /0808 SEEK BUILD WORD
0011 0 0000 DKIN2 DC *-* OP COMPLETE INTRPT
0012 0 08F5 XIO DKDSW SENSE RESET DSW
0013 0 00F7 STO DKDSV SAVE DSW

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0014 0 1002 SLA 2 CK RDY, NOT BUSY
0015 0 4868 BOSC 6Z *
0016 0 6012 LDX DKIN2&1 NO, LOOP
0017 0 C0F9 LD DKENT LD INTERRUPT ENTRY SW
0018 0 4820 BSC Z CHECK IF ON
0019 0 7020 MDX DKMOV NO, SEEK HOME ENTRY
001A 0 7027 MDX DKCON YES, SEEK ENTRY
001B 0 C0F2 DKBLD LD DKBIT BUILD RD BIT SW IOCC
001C 0 D0F3 STO DKBGN * AND SET PRG RESET
001D 0 C0E5 LD DKBSW&1 * AND START VECTER
001E 0 1008 SLA 8 *
001F 0 D0F3 STO DKBSW&1 *
0020 0 08F1 DKRST XIO RD AREA CODE AND
0021 0 C0EC LD DKBIT * PROG OPTIONS
0022 0 D0E5 STO DKDSW SAVE SWS
0023 0 180B SRA 11 SET UP AREA CODE
0024 0 100B SLA 11 *
0025 0 D0E8 STO DKBIT SAVE AREA CODE
0026 0 C0E8 LD DKBD1 BUILD DSW AND SFEK
0027 0 1804 SRA 4 * IOCCS
0028 0 E8E5 OR DKBIT *
0029 0 D0DF STO DKDSW&1 *
002A 0 C0E5 LD DKBD2 *
002B 0 1801 SRA 1 *
002C 0 E8E1 OR DKBIT *
002D 0 D0D7 STO DKHME&1 *
002E 0 D0D8 STO DKSEK&1 *
002F 0 3001 WAIT 1 SET STARTING CYL.
0030 0 08D1 XIO DKBSW * AND NUM OF CYLS.
0031 0 C0DC LD DKBIT * TO SEEK IN BIT SWS
0032 0 1808 SRA 8 SET UP START CYL.
0033 0 D0D2 STO DKSEK *
0034 0 08D3 XIO DKDSW SENSE DSW
0035 0 D0D5 STO DKDSV SAVE DSW
0036 0 C8D3 LDD DKDSV-1 LOAD DSW IN Q REG
0037 0 68C9 STX DKENT TURN ON INTRPT ENTRY SW
0038 0 08CB XIO DKHME SEEK HOME
0039 0 3005 WAIT 5 WAIT FOR INTERRUPT
003A 0 C0CC DKMOV LD DKSEK&1 SET UP SEEK
003B 0 F0D0 EOR DK004 * DIRECTION
003C 0 D0CA STO DKSEK&1 *
003D 0 C8CC LDD DKDSV-1 LOAD DSW IN Q REG
003E 0 1010 SLA 16 TURN OFF INTERRUPT
003F 0 D0C1 STO DKENT * ENTRY SW
0040 0 08C5 XIO DKSEK SEEK
0041 0 3006 WAIT 6 WAIT FOR INTERRUPT
0042 0 C0CB DKCON LD DKBIT SET UP NUM OF SEEKS
0043 0 E0C9 AND DKOFF *
0044 0 D0C1 STO DKSEK *
0045 0 C0C2 LD DKDSW CK FOR SEEK AND WAIT
0046 0 4804 BSC E *
0047 0 3002 WAIT 2 YES, WAIT
0048 0 70F1 MDX DKMOV NO, GO SEEK
*****
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 2000 DC /2000 * FOR THE PID AND TWD FOR
004F 0 0002 DC /0002 * SEQUENCE.

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1130 SCOPE LOOP PROGRAMS

1130 SCOPE LOOP PROGRAMS

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***** 3A012790
*
6.09 2310 WRITE-  * THIS PROGRAM WRITES ON SECTOR 0, A DATA PATTERN 3A012810
READ-COMPARE * WHICH WAS SET IN THE BIT SWS. THE DATA IS THEN 3A012820
* READ AND COMPARED TO THE BIT SWITCHES. THE HEAD 3A012830
* MAY BE POSITIONED WITH SCOPE LOOP 6.08. THIS 3A012840
* WILL DESTROY THE SECTOR ADDRESS. IT MAY BE RE- 3A012850
* STORED BY PLACING THE SECTOR NUMBER IN THE BIT 3A012860
* SWITCHES AND EXECUTING THE PROGRAM ONCE. 3A012870
* THE PROGRAM WILL HALT AT WAIT 2 AFTER EACH PASS. 3A012880
*
A. PRELOAD SWS * SET THE AREA CODE IN 0-7 FOR THE DISC TO BE USED 3A012890
* DRIVE 0 --- 20XX 3A012900
* DRIVE 1 --- 88XX 3A012910
* DRIVE 2 --- 90XX 3A012920
* DRIVE 3 --- 98XX 3A012930
* DRIVE 4 --- A0XX 3A012940
* 3A012950
*
B. LOADING * LOAD IPL FROM CARD OR PAPER TAPE. 3A012960
* 3A012970
* 3A012980
*
C. WAITS 1 * SET DATA IS BE WRITTEN IN SWITCHES 0-15. 3A012990
* 3A013000
* 2 * HALT AFTER ONE PASS. TO LOOP PROGRAM, LOAD /1000 3A013010
* INTO LOCATION /001F. 3A013020
* 3A013030
* 3 * LOST WRITE INTERRUPT. SEE COMMENTS. 3A013040
* 3A013050
* 4 * LOST READ INTERRUPT. SEE COMMENTS. 3A013060
* 3A013070
* 6 * COMPARE ERROR BETWEEN THE DATA READ AND THE BIT 3A013080
* SWITCHES. THE BITS IN ERROR WILL BE ON IN THE 3A013090
* ACCUMULATOR. TO LOOP ON ERROR, LOAD /1000 INTO 3A013100
* LOCATION /0017. 3A013110
* 3A013120
*
D. RESTART * 1. TO RESTART PROGRAM OR RESET SWITCH SETTINGS, 3A013130
* DEPRESS IMMEDIATE STOP AND RESET PUSH BUTTONS 3A013140
* 2. SET DESIRED PRELOAD BIT SWITCH SETTINGS. 3A013150
* 3. DEPRESS START. 3A013160
* 3A013170
*
E. COMMENTS * 1. TO RUN THE PROG WITH INTERRUPT DELAY SWITCH 3A013180
* ON OR BYPASS THE INTERRUPT WAIT LOAD /600C 3A013190
* INTO LOCATION /0047 AND /004A AND RESTART. 3A013200
* 3A013210
* 2. TO GET A FASTER LOOP THAN THE ABOVE PLACE 3A013220
* /70FE IN THE NEXT LOCATION AFTER THE XIO. THE 3A013230
* XIO WILL BE EXECUTED AFTER EACH BRANCH. 3A013240
* 3A013250
* 3. IF INTERRUPT IS LOST, B REG WILL CONTAIN 3A013260
* DATA WORD AND ARITH REG WILL CONTAIN WAIT 3A013270
* NUMBER /0003 OR /0004. 3A013280
* 3A013290
*
***** 3A013300
*
0000 ORG 0 3A013310
0000 0 6020 DCRGN LDX DCBLD GO TO PROG 3A013320
0001 0 0000 DCDSW DC *- * SW READ IN AREA 3A013330
0002 0 003A DCON5 DC /003A CONSTANT 3A013340
0003 0 0000 DCXR3 DC *- * INDEX REG 3 3A013350
0004 0 6000 DCON1 DC /6000 CONSTANT 3A013360
0005 0 7010 DC DC /7010 CONSTANT 3A013370
0006 0 2820 DCON2 DC /2820 CONSTANT 3A013380
0007 0 00C3 DC /00C3 CONSTANT 3A013390
0008 0 0001 DCBSW DC DCDSW SW READ IN ADRS 3A013400
0009 0 0000 DC /0000 *A* DC /3A00 READ BIT SWS 3A013410
000A 0 000B DC DCINT INTERRUPT ADRS 3A013420
000B 0 0000 DCINT DC *- * INTERRUPT ENTRY 3A013430
000C 0 083F XIO DCDSW SENSE DSW 3A013440
000D 0 1001 DCON3 SLA 1 ALSO A CONSTANT 3A013450
000E 0 1001 SLA 1 * 3A013460
000F 0 4868 BOSC 6Z IS DISK READY 3A013470
0010 0 600C LDX DCINT&1 * NO 3A013480
0011 0 C03A LD DCDSW * YES 3A013490
0012 0 4818 BSC 6- WAS LAST OP A READ 3A013500
0013 0 7034 MDX DC6 * NO 3A013510
0014 0 0000 DC5 DC /0000 *A* LD 3 1 3A013520
0015 0 F0EB EOR DCDSW COMPARE SWS 3A013530
0016 0 4820 BSC Z ANY ERRORS 3A013540
0017 0 3006 WAIT 6 * YES 3A013550
0018 0 C0EA LD DCXR3 ADJ I/O ADRS 3A013560
0019 0 80EF A DCBSW * 3A013570
001A 0 D0E8 STO DCXR3 * 3A013580
001B 0 F02F FOR DCEND * 3A013590
001C 0 4820 BSC Z REACHED LIMIT 3A013600
001D 0 70F6 MDX DC5 * NO 3A013610
001E 0 3002 WAIT 2 ONE PASS COMPLETE 3A013620
001F 0 701C MDX DC1 START OVER 3A013630
* 3A013640
* DCBLD LD DC0N5 INITIALIZATION 3A013650
* 8 GET CONSTANT 3A013660
* 8 3A013670
* STO DCBSW&1 READ BIT SW IOCC 3A013680
* XIO DCBSW READ SWS 3A013690
* LDD DCDSW GET AREA CODE 3A013700
* RTE 12 A- /000X Q- /000X 3A013710
* AD DCON1 A- /600X Q- /701X 3A013720
* RTE 4 A- /X600 Q- /X701 3A013730
* STO DCDSW SET DSW IOCC 3A013740
* RTF 16 A- /X701 Q- /X600 3A013750
* LD DCON1 A- /6000 Q- /X600 3A013760
* SRA 8 A- /0060 Q- /X600 3A013770
* STO DCRD SET READ IOCC 3A013780
* RTE 11 A- /C000 Q- /0C0X 3A013790
* EOR DCON1 A- /A000 Q- /0C0X 3A013800
* RTE 21 A- /0060 Q- /X500 3A013810
* STO DCWR SET WRITE IOCC 3A013820
* LDD DCON2 A- /2820 Q- /00C3 3A013830
* SRA 5 A- /0141 Q- /00C3 3A013840
* STO /0060 SET WORD COUNT 3A013850
* A DCWR A- /01A1 Q- /00C3 3A013860
* STO DCXR3 SET INDEX REG 3 3A013870
* STO DCEND SFT LIMIT CNTL 3A013880
* RTE 8 A- /C301 Q- /A100 3A013890
* STO DC5 SET LD 3 1 3A013900
* EOR DCON3 A- /D300 Q- /A100 3A013910
* STO DC3 SET STO 3 0 3A013920
* WAIT 1 SET DATA PATTERN 3A013930
* XIO DCBSW READ BIT SWS 3A013940
* LD DCDSW GET BIT SWS 3A013950
* DC3 DC /0000 *A* STO 3 0 3A013960
* LD DCXR3 ADJ I/O ADRS 3A013970
* S DCBSW * 3A013980
* STO DCXR3 * 3A013990
* FOR DCWR 3A014000
* BSC Z REACHED LIMIT 3A014010
* MDX DC3-1 * NO 3A014020
* STO DCDSW * YES, CLEAR SW 3A014030
* XIO DCWR WRITE A RECORD 3A014040
* WAIT 3 WAIT FOR WRITE INTR 3A014050
* DC6 STX DCDSW SET SWITCH 3A014060
* XIO DCRD READ A RECORD 3A014070
* WAIT 4 WAIT FOR READ INTR 3A014080
* ***** 3A014090
* DCEND DC /0040 THE NEXT FIVE WORDS ARE 3A014100
* DCDSW DC /9000 * USED FOR PROGRAM 3A014110
* DC /2000 * IDENTIFICATION. THREE 3A014120
* DCRD DC /2000 * FOR THE PID AND TWO FOR 3A014130
* DC /0001 * SEQUENCE. 3A014140
* DCWR EQU DCRD&2

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1130 SCOPE LOOP PROGRAMS

1130 SCOPE LOOP PROGRAMS

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***** 3A014160
* 3A014170
* 1. THE PROGRAM EXECUTES ALTERNATE FUNCTIONS 3A014180
* WHICH HAVE BEEN SELECTED IN THE BIT SWS 3A014190
* 2. AN OPTION IS AVAILABLE TO SET UP A VARIABLE 3A014200
* DELAY BETWEEN XIO WRITE EXECUTIONS. 3A014210
* 3. AN OPTION IS AVAILABLE TO HALT THE PROGRAM 3A014220
* AFTER THE COMPLETION OF THE EXECUTION OF 3A014230
* AN ALTERNATE XIO SEQUENCE. 3A014240
* 3A014250
A. PRELOAD SWS * 1. IF DELAY IS DESIRED, SET DELAY CONTROL 3A014260
* VALUE IN BIT SWITCHES 1 THRU 13. 3A014270
* *NOTE* SWS 1 THRU 13 ALL ON, MAX DELAY. 3A014280
* SWS 1 THRU 13 ALL OFF, NO DELAY. 3A014290
* 2. IF A WAIT AFTER EACH PROGRAM PASS IS 3A014300
* DESIRED, TURN ON BIT SWITCH 15. 3A014310
* 3A014320
B. LOADING * LOAD IPL FROM CARD OR PAPER TAPE. 3A014330
* 3A014340
C. WAITS 1 * SET DESIRED FUNCTION CODES IN BIT SWITCHES 3A014350
* 0 THRU 15. SEE PAGE 2A FOR BIT SW CODES. 3A014360
* 1ST FUNCTION CODE IN SWS 0 THRU 5. 3A014370
* 2ND FUNCTION CODE IN SWS 8 THRU 13. 3A014380
* TURN ON PLOTTER AND MAKE READY. 3A014390
* DEPRESS START. 3A014400
* 3A014410
2 * NORMAL PROGRAM WAIT IF 1 PASS OPTION HAS BEEN 3A014420
* SELECTED. DEPRESS START TO MAKE ANOTHER PASS. 3A014430
* 3A014440
3 * NO INTERRUPT GENERATED AFTER XIO WRITE 3A014450
* COMMAND WAS GIVEN. SEE COMMENTS. 3A014460
* 3A014470
D. RESTART * 1. TO RESTART PROGRAM OR RESET INITIAL PRFLOAD 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 D0FA STO PLDSV SAVE DSW 3A014800
000F 0 4850 BOSC - RESET INT LEVEL 3A014810
0010 0 70FC MDX PLIN3&1 RESENSE DSW 3A014820
0011 0 7023 MDX PLRET BRANCH TO DELAY 3A014830

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0012 0 C0F2 PLBLD LD PLOT&1 BUILD WRITE IOCC 3A014840
0013 0 1008 PLCTL SLA 8 * 2ND CHAR SW 3A014850
0014 0 D0F0 STO PLOT&1 * 3A014860
0015 0 C0F1 LD PLDSW&1 BUILD SENSE RESET 3A014870
0016 0 1008 SLA 8 * 3A014880
0017 0 E8E9 OR PLONE * 3A014890
0018 0 D0EE STO PLDSW&1 * 3A014900
0019 0 C0E9 LD PLBSW&1 BUILD READ BIT SW 3A014910
001A 0 1008 SLA 8 * IOCC 3A014920
001B 0 D0E7 STO PLBSW&1 * 3A014930
001C 0 C0EB LD PLRST SET UP RESET AND 3A014940
001D 0 D0E2 STO PLBGN * START BRANCH 3A014950
001E 0 08E3 PLRDS XIO PLBSW READ BIT SWS FOR 3A014960
001F 0 C0E6 LD PLDSW * PROG OPTS/DELAY 3A014970
0020 0 D0E9 STO PLSET * 3A014980
0021 0 3001 WAIT 1 SET CHARS IN SWS 3A014990
0022 0 08DF PLSTR XIO PLBSW READ BIT SWS 3A015000
0023 0 C0E2 LD PLDSW CK FOR NO COMMAND 3A015010
0024 0 180A SRA 10 * ENTERED 3A015020
0025 0 4808 BSC & * 3A015030
0026 0 70FA MDX PLSTR-1 * NO, SENSE SWS 3A015040
0027 0 CODE LD PLDSW * 3A015050
0028 0 1008 SLA 8 * 3A015060
0029 0 180A SRA 10 * 3A015070
002A 0 4808 BSC & * 3A015080
002B 0 70F5 MDX PLSTR-1 * NO, SENSE SWS 3A015090
002C 0 C8DB PLSEN LDD PLDSV-1 LOAD LAST DSW IN Q . 3A015100
002D 0 08D8 XIO PLOSW CHK DEVICE NOT BUSY 3A015110
002E 0 D0DA STO PLDSV SAVE DSW 3A015120
002F 0 1004 SLA 4 * 3A015130
0030 0 4828 BSC &Z * 3A015140
0031 0 70FA MDX PLSEN * 3A015150
0032 0 C8D5 LDD PLDSV-1 LOAD LAST DSW IN Q . 3A015160
0033 0 08D0 XIO PLOT WRITE CHARACTER 3A015170
0034 0 3003 WAIT 3 WAIT FOR 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 E 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 &- * 3A015290
0040 0 70E0 MDX PLSTR-1 NO, GO TO WAIT 1 3A015300
0041 0 100A SLA 10 YES, SET UP 2ND CHAR 3A015310
0042 0 D0C3 STO PLDSW * 3A015320
0043 0 C0CF LD PLCTL CHK IF 2ND CHAR SW 3A015330
0044 0 4820 BSC Z * OFF 3A015340
0045 0 7002 MDX PLALT NO, BRANCH 3A015350
0046 0 68CC STX PLCTL YES, SET 2ND CHAR SW 3A015360
0047 0 70DA MDX PLSTR GO LOOP PROGRAM 3A015370
0048 0 1010 PLALT SLA 16 CLR 2ND CHAR SW 3A015380
0049 0 D0C9 STO PLCTL * 3A015390
004A 0 70E1 MDX PLSEN GO CHK IF PRINT BUSY 3A015400
***** 3A015410
004B 0 0040 DC /0040 THE LAST FIVE WORDS ARE 3A015420
004C 0 9000 DC /9000 * USED FOR PROGRAM 3A015430
004D 0 2000 DC /2000 * IDENTIFICATION. THREE 3A015440
004E 0 1000 DC /1000 * FOR THE PID AND TWO FOR 3A015450
004F 0 2000 DC /2000 * SEQUENCE. 3A015460

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***** 3A015480
*
6.11 2501 READER
* 1. THE PROGRAM READS 80 COLUMNS OF DATA AND
*   COMPARES EACH WORD WITH THE BIT SWITCHES. 3A015490
* 2. AN OPTION IS AVAILABLE TO SET UP A VARIABLE 3A015500
*   DELAY BETWEEN XIO READ EXECUTIONS. 3A015510
* 3. AN OPTION IS AVAILABLE TO BYPASS WAIT 6 3A015520
*   ON COMPARE ERRORS. 3A015530
* 3A015540
* 3A015550
* 3A015560
A. PRELOAD SWS
* 1. IF DELAY IS DESIRED, SET DELAY CONTROL 3A015570
*   VALUE IN BIT SWITCHES 1 THRU 13. 3A015580
*   *NOTE* SWS 1 THRU 13 ALL ON, MAX DELAY. 3A015590
*   SWS 1 THRU 13 ALL OFF, NO DELAY. 3A015600
* 2. IF BYPASS COMPARE ERROR WAIT 6 OPTION IS 3A015610
*   DESIRED, TURN ON BIT SWITCH 15. 3A015620
* 3A015630
B. LOADING
* LOAD IPL FROM CARD OR PAPER TAPE. 3A015640
* 3A015650
C. WAITS
1 * SET BIT SWS 0 THRU 11 TO EXPECTED COLUMN 3A015660
* DATA AND SET BITS 12 THRU 15 OFF. 3A015670
* LOAD PREPUNCHED CARDS INTO READER AND MAKE READY. 3A015680
* DEPRESS START. 3A015690
* 3A015700
4 * NO INTERRUPT GENERATED AFTER XIO READ. 3A015710
* COMMAND WAS GIVEN. SEE COMMENTS. 3A015720
* 3A015730
6 * COMPARE ERROR. ACCUMULATOR CONTAINS BITS READ. 3A015740
* IF ACCUMULATOR CONTAINS /DOCB, COLUMN READ WAS 3A015750
* NOT STORED INTO READ/IN AREA. 3A015760
* DEPRESS START TO COMPARE NEXT COLUMN. 3A015770
* TO BYPASS COMPARE ERROR WAIT, SEE PRELOAD. 3A015780
* 3A015790
D. RESTART
* 1. TO RESTART PROGRAM OR RESET INITIAL PRELOAD 3A015800
* SWITCH SETTINGS, DEPRESS IMMEDIATE 3A015810
* STOP AND RESET PUSH BUTTONS. 3A015820
* 2. SET DESIRED PRELOAD BIT SWITCH SETTINGS. 3A015830
* 3. DEPRESS START. 3A015840
* 3A015850
E. COMMENTS
* 1. LAST DSW SENSED IS DISPLAYED IN THE Q REG. 3A015860
* 2. TO RUN PROGRAM WITH INTERRUPT DELAY SW ON 3A015870
* OR TO BYPASS THE INTERRUPT WAIT, LOAD /600F 3A015880
* INTO LOCATION /002F AND DO A PROGRAM RESTART. 3A015890
* 3. TO SET UP LOOP TO EXECUTE XIO, LOAD /600F 3A015900
* INTO LOCATION /002F AND LOAD /6027 INTO 3A015910
* LOCATION /0013 AND DO A PROGRAM RESTART. 3A015920
* 3A015930
***** 3A015940
0000 ORG 0 3A015950
0000 0 6035 CRBGN LDX CRBLD *A* TO /6030 LDX CRRST 3A015960
0001 0 0001 CRONE DC 1 CONSTANT 1 3A015970
0002 0 0004 CRBSW DC CRDSW BIT SW SAVE ADDR 3A015980
0003 0 003A DC /003A *A* TO /3A00 RD BIT SWS 3A015990
0004 0 6030 CRDSW LDX CRRST BIT SW SAVE AREA 3A016000
0005 0 0027 DC /0027 *A* TO /4F01 XIO SENSE DSW 3A016010
0006 0 0036 CRRDR DC CRARA CARD READ IN ADDR 3A016020
0007 0 0027 DC /0027 *A* TO /4E00 XIO START RDR 3A016030
0008 0 00FF CRERR DC /00FF SAVE READ ERROR 3A016040
0009 0 0000 CRDSV DC *- LAST DSW SENSED 3A016050
000A 0 0000 CREND DC *- *A* TO /D11A END OF RD AREA 3A016060
000B 0 C022 CRSRA DC /C022 LD READ AREA 3A016070
000C 0 000E DC CRIN4 INTERRUPT ADDR 3A016080
000D 0 0005 CR080 DC /0005 *A* TO /0050 CONSTANT 80 3A016090
000E 0 0000 CRIN4 DC *- INTERRUPT ENTRY 3A016100
000F 0 08F4 XIO CRDSW SENSE DSW 3A016110
0010 0 00F8 STO CRDSV SAVE DSW 3A016120
0011 0 1004 SLA 4 CK FOR OP COMPLETE 3A016130
0012 0 4850 BOSC - * 3A016140
0013 0 70FB MDX CRIN4&1 NO, RESENSE DSW 3A016150

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0014 0 C022 CRLD LD CRARA&1 LOAD COLUMN READ 3A016160
0015 0 D0F2 STO CRERR SAVE BITS READ 3A016170
0016 0 F0ED FOR CRDSW COMPARE WITH PATT WD 3A016180
0017 0 4818 BSC &- CK FOR COMPARE ERR 3A016190
0018 0 7006 MDX CRMOD NO, SET UP NEXT CHK 3A016200
0019 0 C01B LD CRBLD YES, CK LOOP OPT 3A016210
001A 0 100F SLA 15 * 3A016220
001B 0 4828 BSC &Z * 3A016230
001C 0 700A MDX CRL0P-3 LOOP ERR OPTION ON 3A016240
001D 0 C8EA LDD CRERR LD DSW AND ERR BITS 3A016250
001E 0 3006 WAIT 6 COMPARE ERROR WAIT 3A016260
001F 0 C0F4 CRMOD LD CRLD SET UP NEXT COMPARE 3A016270
0020 0 80E0 A CRONE * 3A016280
0021 0 D0F2 STO CRLD * 3A016290
0022 0 90E7 S CREND CK IF ALL COLUMNS 3A016300
0023 0 4828 BSC &Z * CHECKED 3A016310
0024 0 70EF MDX CRLD NO, COMPARE NXT COL 3A016320
0025 0 C0F5 LD CRSRA SET UP FOR NXT CARD 3A016330
0026 0 D0ED STO CRLD * 3A016340
0027 0 C8F0 LDD CRERR LOAD LAST DSW IN Q 3A016350
0028 0 C00C LD CRBLD SET UP DELAY 3A016360
0029 0 1801 SRA 1 * 3A016370
002A 0 90D6 CRL0P S CRONE * 3A016380
002B 0 4810 BSC - * 3A016390
002C 0 70FD MDX CRL0P * 3A016400
002D 0 08D4 XIO CRBSW RD BIT SWS PATT WD 3A016410
002E 0 08D7 XIO CRRDR READ A CARD 3A016420
002F 0 3004 WAIT 4 WAIT FOR INTERRUPT 3A016430
0030 0 08D1 CRRST XIO CRBSW RD SWS FOR DELAY/OPT 3A016440
0031 0 C0D2 LD CRDSW SAVE DELAY/OPTIONS 3A016450
0032 0 D002 STO CRBLD * 3A016460
0033 0 3001 WAIT 1 SET PATTERN IN SWS 3A016470
0034 0 70F8 MDX CRSTR GO READ BIT SWS 3A016480
0035 0 C0CD CRBLD LD CRBSW&1 BUILD PROGRAM 3A016490
0036 0 1008 CRARA SLA 8 *A* TO /0050 WD CNT 80 3A016500
0037 0 D0CB STO CRBSW&1 *A* TO *- READ/IN AREA 3A016510
0038 0 C0CB LD CRDSW * 3A016520
0039 0 D0C6 STO CRBGN * 3A016530
003A 0 C0CA LD CRDSW&1 * 3A016540
003B 0 1001 SLA 1 * 3A016550
003C 0 E8C4 OR CRONE * 3A016560
003D 0 1008 SLA 8 * 3A016570
003E 0 E8C2 OR CRONE * 3A016580
003F 0 D0C5 STO CRDSW&1 * 3A016590
0040 0 C0C6 LD CRRDR&1 * 3A016600
0041 0 1009 SLA 9 * 3A016610
0042 0 D0C4 STO CRRDR&1 * 3A016620
0043 0 C0C9 LD CR080 * 3A016630
0044 0 1004 SLA 4 * 3A016640
0045 0 D0F0 STO CRARA * 3A016650
0046 0 80C4 A CRSRA * 3A016660
0047 0 D0C2 STO CREND * 3A016670
0048 0 70E7 MDX CRRST EXECUTE PROGRAM 3A016680
*****
0049 0 0000 DC 0 SPACE FILLER 3A016690
004A 0 0000 DC 0 * 3A016700
004B 0 0040 DC /0040 THE LAST FIVE WORDS ARE 3A016710
004C 0 9000 DC /9000 * USED FOR PROGRAM 3A016720
004D 0 2000 DC /2000 * IDENTIFICATION. THREE 3A016730
004E 0 1000 DC /1000 * FOR THE PID AND TWO FOR 3A016740
004F 0 1000 DC /1000 * SEQUENCE. 3A016750

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1130 SCOPE LOOP PROGRAMS

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***** 3A016780
* 3A016790
6.12 1403 PRINTER * THIS PROGRAM WILL PRINT ANY CHARACTER ENTERED 3A016800
* IN THE BIT SWITCHES 1-7 AND 9-15. IF BIT 14 IS ON 3A016810
* THE BIT SWS 1-12 WILL BE THE CHANNEL THAT THE 3A016820
* CARRIAGE WILL SKIP TO AFTER PRINTING. 3A016830
* 3A016840
A. PRELOAD SWS * BIT SW 15- HALT AFTER ONE PASS. 3A016850
* 14- CARR SKIP FUNCTION. 3A016860
* 1 THRU 12- CHANNEL NUMBER TO USE FOR SKIP. 3A016870
* 3A016880
B. LOADING * IPL MODE FROM CARDS OR PAPER TAPE. 3A016890
* 3A016900
C. WAIT 1 * SET CHARACTER TO PRINT, 1-7 AND 9-15. 3A016910
* 3A016920
2 * ONE PASS COMPLETED, PRESS START TO CONTINUE. 3A016930
* 3A016940
3 * LOST PRINTER INTERRUPT. 3A016950
* 3A016960
5 * LOST CARRIAGE INTERRUPT. 3A016970
* 3A016980
* 3A016990
6 * PARITY ERROR FOUND IN THE DSW. 3A017000
* 3A017010
D. RESTART * PRESS IMMEDIATE STOP AND RESET. PRELOADING 3A017020
* SWITCHES MAY BE SET AS DESIRED. PRESS START. 3A017030
* 3A017040
E. COMMENTS * 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
* /70FE 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 D000 FPD SW 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 FPBSW 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 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 SET CONSOLE SWS 3A017360
* XIO FPBSW READ PRINTER CODE 3A017370
* LD FPOUT GET WORD COUNT 3A017380
* STO FPDSW LOAD XR 2 3A017390
* LD FPSWS GET PRINT CODE 3A017400
* 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

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1130 SCOPE LOOP PROGRAMS

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001D 0 3003 WAIT 3 WAIT FOR PRINT INTERRUPT 3A017460
001E 0 0000 FPINT DC *-* INTERRUPT ENTRY 3A017470
001F 0 08E2 XIO FPD SW SENSE DSW 3A017480
0020 0 4844 BOSC E IS PRINTER READY 3A017490
0021 0 601F LDX FPINT&1 * NO 3A017500
0022 0 4828 BSC &Z PARITY ERROR 3A017510
0023 0 3006 WAIT 6 * YES 3A017520
0024 0 1002 SLA 2 * NO 3A017530
0025 0 4810 BSC - PRINT COMPLETE 3A017540
0026 0 70EC MDX FP1 * NO, CARR INTR 3A017550
0027 0 C0D6 LD FPSWS-3 GET CONTROLS 3A017560
0028 0 4804 BSC E HALT ON 3A017570
0029 0 3002 WAIT 2 * YES 3A017580
002A 0 100E SLA 14 * NO 3A017590
002B 0 4810 BSC - CARR SKIP FUNC 3A017600
002C 0 7002 MDX FP8 * NO 3A017610
002D 0 08DA XIO FPSKP SKIP TO CHAN 3A017620
002E 0 7001 MDX FP&E1 GO WAIT INTERRUPT 3A017630
002F 0 08D4 XIO FPCAR * YES, SPACE 3A017640
0030 0 3005 WAIT 5 WAIT FOR CARR INTR 3A017650
* 3A017660
* FPO01 DC /0001 CONSTANT 3A017670
* FPOUT DC 60 WORD COUNT 3A017680
* 3A017690
* THIS WILL BE THE PRINT AREA AFTER 3A017700
* INITIALIZATION 3A017710
* 3A017720
* 3A017730
* FPBLD LD FPRES 3A017740
* STO 0 * SET RESTART 3A017750
* LDD FPPRT+1 * A- /000A Q- /000A 3A017760
* AD FPCAR * A- /C00A Q- /900A 3A017770
* RTE 4 * A- /AC00 Q- /A900 3A017780
* STD FPCAR * CONTROL IOCC 3A017790
* STO FPSKP&E1 * SKIP IOCC 3A017800
* LDD FPPRT+1 * A- /000A Q- /000A 3A017810
* AD FPD SW * A- /D00A Q- /F01A 3A017820
* RTE 4 * A- /AD00 Q- /AF01 3A017830
* STD FPD SW * SENSE DSW IOCC 3A017840
* STO FPPRT&E1 * PRINT IOCC 3A017850
* LD FPBSW&E1 * 3A017860
* SLA 8 * READ BIT SW IOCC 3A017870
* STO FPBSW&E1 * 3A017880
* LD FP2 * 3A017890
* SLA 8 * 3A017900
* OR FPPRT * 3A017910
* S FPO01 ADJUST DISPLACEMENT 3A017920
* STO FP2 * BUILD STO 2 FPPRT 3A017930
* FPPRT DC FPSTR GO TO PROGRAM 3A017940
***** 3A017950
* DC 0 SPACE FILLER 3A017960
* DC 0 * 3A017970
* DC 0 * 3A017980
* DC /0040 THE LAST FIVE WORDS ARE 3A017990
* DC /9000 * USED FOR PROGRAM 3A018000
* DC /2000 * IDENTIFICATION. THREE 3A018010
* DC /1000 * FOR THE PID AND TWD FOR 3A018020
* DC /0800 * SEQUENCE.

```

```

***** 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 600B AT CORE LOCATIONS 0001 AND 003A. 3A018380
* 3A018390
* TO CHANGE POSITIONS PRINTED..MANUALLY ENTER 3A018400
* DESIRED PATTERN IN CORE LOCATIONS 001E AND 001F. 3A018410
* AT LEAST ONE BIT MUST BE ON IN SECOND WORD 001F. 3A018420
* 3A018430
***** 3A018440
* 3A018450
* 3A018460
* 3A018470
* 3A018480
* 3A018490
* 3A018500
* 3A018510
* 3A018520
* 3A018530
* 3A018540
* 3A018550
* 3A018560
* 3A018570
* 3A018580
* 3A018590
* 3A018600
* 3A018610
* 3A018620
* 3A018630
* 3A018640
* 3A018650
* 3A018660
* 3A018670
* 3A018680
* 3A018690
* 3A018700
* 3A018710

```

```

0000
0000 0 6017
0001 0 3005
0002 0 001A
0003 0 00FF
0004 0 0018
0005 0 E8C8
0006 0 7013
0007 0 4803
0008 0 0020
0009 0 000A
000A 0 0827
000B 0 080C
000C 0 4850
000D 0 7023
000E 0 C018
000F 0 4820
0010 0 7018
0011 0 C039
0012 0 4808
0013 0 7027
0014 0 9034
0015 0 D035
0016 0 7023
0017 0 C0F2
0018 0 D0E7

```

```

PRGO LD 0
PRGO LDX PRDSW-1 *A* XIO PRSPS SPACE PTR
PRGO WAIT 5 WAIT FOR INTERRUPT
*
PRRDS DC PRSWS
DC /00FF *A* DC /3A32 RD SWS
PRRD DC PREMT
DC /E8C8 *A* DC /3200 RD EMITTER
DC /7013
DC /4803
PRIDL DC /0020 MINIMUM IDLE SCAN CYCLES
DC PRINT INTERRUPT ADDRESS
PRINT DC /0827 INTERRUPT ENTRY
XIO PRDSW
BOSC -
MDX PRSPR * NO, TRY SPACE RESPONSE
LD PRSCN+7
BSC Z SCAN FIELD ZERO
MDX PREND * NO, GO STOP PRINTER
LD PRDLY
BSC +
MDX PRPRT LAST IDLE SCAN CYCLE
S PR * YES, GO PRINT
PR PR DECRE IDLE COUNT BY ONE
STO PRDLY
MDX PRWT3
LD PRINT
PRDSW STO PRGO

```

```

0019 0 C8EC
001A 0 18C4 PRSTR RTE
001B 0 D0FD STO
001C 0 18D0 PRSTP RTE
001D 0 D0FD STO
001E 0 F02B PRFLD EOR
001F 0 D0FD STO
0020 0 C8F2 PRSCN LDD
0021 0 18C8 RTE
0022 0 88E0 AD
0023 0 D8FA STD
0024 0 C0E0 LD
0025 0 1802 SRA
0026 0 D0DC STO
0027 0 1008 SLA
0028 0 D0DC PRSPS STO
0029 0 C01C LD
002A 0 1802 SRA
002B 0 D0FD STO
002C 0 D8EF PREND XIO
002D 0 C0FC LD
002E 0 4804 BSC
002F 0 3002 WAIT
0030 0 70CF MDX
001A 0 PRSWS EQU
001B 0 PREMT EQU
0031 0 1002 PRSPR SLA
0032 0 4850 BOSC
0033 0 70D7 MDX
0034 0 10E0 SLC
0035 0 D9EA STD
0036 0 D8FB STD
0037 0 D8EC STD
0038 0 D8ED STD
0039 0 D8E0 XIO
003A 0 3003 PRWT3 WAIT
003B 0 08C6 PRPRT XIO
003C 0 08C7 XIO
003D 0 C0DC LD
003E 0 F8C9 OR
003F 0 18C8 RTE
0040 0 1008 SLA
0041 0 4820 BSC
0042 0 F0D5 FDR
0043 0 4820 BSC
0044 0 70F5 MDX
0045 0 10C8 SLC
0046 0 D004 STD
0047 0 C8D6 LDD
0048 0 70EC MDX
0049 0 0001 PR
004A 0 00C0 DC
*****
004B 0 0040 PRDLY DC
004C 0 9000 DC
004D 0 2000 DC
004E 0 1000 DC
004F 0 0040 DC
0050 0000 END
NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY

```

```

PRRD+2 *A* DC /3701 SENSE DSW
4
PRDSW+1 *A* DC /3480 START PTR
16
PRSTR+1 *A* DC /3440 STOP PTR
PRDLY-1 *A* DC /FFFF
PRSTP+1 *A* DC /FFFF
PRRDS+1
8
PRRDS+1
PRFLD
PRRD+1
2
PRRDS+1
8
PRRDS+1
PR-3 *A* DC /3401 SPACE PTR
2
PRSPS+1
PRSTP STOP PRINTER
LD PRSWS
BSC E BIT SW 15 ON
WAIT 2 * YES, WAIT
MDX PRGO
EQU PRSTR
EQU PRDSW
SLA 2
BOSC - SPACE RESPONSE
MDX PRINT+1 * NO, CHECK DSW AGAIN
32
STD PRSCN CLEAR
STD PRSCN+2 OR SET
STD PRSCN+4 SCAN
STD PRSCN+6 FIELD
XIO PRSTR START PRINTER
WAIT 3 WAIT FOR INTERRUPT
XIO PRRDS READ BIT SWITCHES
XIO PRRD READ EMITTER
LD PRSWS GET SWS
OR PRIDL OR MINIMUM IDLES
8
RTE 8 ISOLATE CHARACTER
SLA 8 SKIP IF NO CHAR ENTERED
BSC Z COMPARE WITH EMITTER
FDR PREMT SKIP IF SAME CHAR
MDX PRWT3
8
STD PRDLY SET IDLE COUNT
LDD PRFLD
MDX PRSPR+4
PR DC /0001
DC /00C0
*****
DC /0040 THE LAST FIVE WORDS ARE
DC /9000 * USED FOR PROGRAM
DC /2000 * IDENTIFICATION. THREE
DC /1000 * FOR THE PID AND TWO FOR
DC /0040 * SEQUENCE.
0

```

1130 SCOPE LOOP PROGRAMS

CPALT 000D 003E 0042  
 CPBGN 0000 001C  
 CPBLD 0012 0000  
 CPBSW 0002 0018 001A 001D 0021  
 CPCTL 0009 000E 001B 003C 003F  
 CPDSV 000B 0022 0024 0028 002E 002F 0032  
 CPDSW 0006 0002 0004 0015 0017 001E 0023 002D 0039 003B  
 CPIN4 002C 000C 0031  
 CPLOP 0036 0038  
 CPONE 0001 0036  
 CPRDS 001D 0009  
 CPRET 0032 002B  
 CPSEN 0022 000F 0011 0027 0043  
 CPSET 0008 001F 0033 0040  
 CPWRT 0004 0012 0014 0029  
 CRARA 0036 0006 0014 0045  
 CRBGN 0000 0039  
 CRBLD 0035 0000 0019 0028 0032  
 CRBSW 0002 002D 0030 0035 0037  
 CROSV 0009 0010  
 CRDSW 0004 0002 000F 0016 0031 0038 003A 003F  
 CREND 000A 0022 0047  
 CRERR 0008 0015 001D 0027  
 CRIN4 000E 000C 0013  
 CRLD 0014 001F 0021 0024 0026  
 CRLOP 002A 001C 002C  
 CRMOD 001F 0018  
 CRONE 0001 0020 002A 003C 003E  
 CRRDR 0006 002E 0040 0042  
 CRRST 0030 0004 0048  
 CRSRA 000B 0025 0046  
 CRSTR 002D 0034  
 CRO80 000D 0043  
 DCBGN 0000  
 DCBLD 0020 0000  
 DCBSW 0008 0019 0022 0023 003C 0040  
 DCDSW 004C 000C 0011 0028 0045 0048  
 DCEND 004B 001B 0036  
 DCINT 000B 000A 0010  
 DCON1 0004 0026 002A 002E  
 DCON2 0006 0031  
 DCON3 000D 0039  
 DCON5 0002 0020  
 DCRD 004E 002C 0049  
 DCSWS 0001 0008 0015 0024 003D  
 DCWR 0050 0030 0034 0042 0046  
 DCXR3 0003 0018 001A 0035 003F 0041  
 DC1 003C 001F  
 DC3 003E 003A 0044  
 DC5 0014 001D 0038  
 DC6 0048 0013  
 DKBD1 000F 0026  
 DKBD2 0010 002A  
 DKBGN 0000 001C  
 DKBIT 000E 0002 001B 0021 0025 0028 002C 0031 0042  
 DKBLD 001B 0000  
 DKBSW 0002 001D 001F 0020 0030  
 DKCON 0042 001A  
 DKDSV 000B 0013 0035 0036 003D  
 DKDSW 0008 0012 0022 0029 0034 0045  
 DKENT 0001 0017 0037 003F  
 DKHME 0004 002D 0038  
 DKIN2 0011 000A 0016  
 DKMOV 003A 0019 0048  
 DKRST 0020 000E  
 DKSEK 0006 002E 0033 003A 003C 0040 0044  
 DKOFF 000D 0043  
 DK004 000C 003B

1130 SCOPE LOOP PROGRAMS

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  
 FP001 0031 0045  
 FP1 0013 0026  
 FP2 0017 001B 0042 0046  
 FP8 002F 002C 002E  
 KYBGN 0000 0031  
 KYBLD 0024 0000  
 KYBSW 0002 0012 0024 0026 0036  
 KYDCH 000D 0021  
 KYDSP 0022 0010  
 KYDSV 000B 0014  
 KYDSW 0004 0002 0013 001E 0027 0029 0030 0037  
 KYIN4 0011 000C 003A 003D  
 KYKEY 000A 0008 000D 000F 0022 0035 003B  
 KYONE 0001  
 KYRD 0008 001C 002D 002F  
 KYRDW 001C 0018  
 KYREQ 0019 0017  
 KYRST 0032 0004  
 KYSEL 0006 001D 002A 002C 0033  
 KYSET 0036 001B 0023  
 PHBLD 0037 0000  
 PHBSW 0004 0016 0018 0027 003E 0040  
 PHCTR 0002 0017 0019 0026  
 PHDSW 000A 0012 001E 0041 0043  
 PHFED 0000 0030 003C 003D  
 PHINT 0011 0008 000C 0024  
 PHK50 000E 001A  
 PHPCH 0006 0020 0044 0046  
 PHPST 0008 0031 0039 003B  
 PHRES 004A 0037  
 PHSTK 000C 0033 0047 0049  
 PHSWS 0003 0006 001D 001F 0028 0034  
 PH1 000F 004A  
 PH2 0030 0010 0036  
 PH4 0020 001C  
 PH6 0022 0015  
 PH8 0033 002D  
 PLALT 0048 0045  
 PLBGN 0000 001D  
 PLBLD 0012 0000  
 PLBSW 0002 0019 001B 001E 0022  
 PLCTL 0013 0043 0046 0049  
 PLDSV 0009 000E 002C 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 0018 0000 000B 001B

1130 SCOPE LOOP PROGRAMS

1130 SCOPE LOOP PROGRAMS

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 0038  
 PRSCN 0020 000E 0035 0036 0037 0038  
 PRSPR 0031 000D 0048  
 PRSPS 0028 002B  
 PRSTP 001C 001F 002C  
 PRSTR 001A 001D 0039  
 PRSWS 001A 0002 002D 003D  
 PRWT3 003A 0016 0044  
 RDARA 0001 0004 0018 001B 0032  
 RDBGN 0000 002C  
 RDBLD 001F 0000 002F 003C 0044  
 RDBSW 0002 001F 0021 002D 0035  
 RDCOP 0038 0013  
 RDDSV 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  
 RDI04 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 0008 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 0018  
 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  
 TPLOP 003C 003E  
 TPNOT 0046 0041  
 TPONE 0001 0012 0017 003C  
 TPPAT 0028 0025  
 TPRDS 001C 0009 004A  
 TPRET 003A 0032  
 TPSEN 002D 0027  
 TPSET 0008 001E 0022 003A 0047  
 TPMRT 0004 000D 000F 0030

TP100 000A 0019 0029  
 TRADV 000A 0029 002C 0041  
 TRALT 003F 0047 004A  
 TRARA 0024 0008 000E 0018 001A  
 TRBGN 0000 002E  
 TRBLD 0021 0000 0015 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  
 TRLOP 001D 0014 0017 001F  
 TRNOT 0043 003C  
 TRPAT 0048 0038  
 TRRD 000E 0007 002B  
 TRRST 002F 0001  
 TRSBW 0023 0010 0012 0030 0034 003E 0040 0045 0048  
 TRSTR 0035 0020  
 TR100 0022 0028 0049  
 END OF ASSEMBLY

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

PARAGRAPH	TABLE OF CONTENTS	PAGE
1.	PURPOSE . . . . .	1A
2.	REQUIREMENTS . . . . .	1A
2.1	PROGRAM REQUIREMENTS	
2.2	EQUIPMENT REQUIREMENTS	
3.	USE PROCEDURE . . . . .	1A
3.1	INITIAL DISK PACK GENERATION. (LOADER/ORGANIZER SECTION)	
3.2	EXISTING DIMAL DISK PACK MODIFICATION (LOADER/ORGANIZER SECTION)	
3.2.1	GENERAL OPERATING INSTRUCTIONS	
3.2.2	ADD PROGRAM TO DIMAL PACK	
3.2.3	DELETE PROGRAM FROM DIMAL PACK	
3.2.4	ENTER HEX PATCH CARDS SEPARATELY	
3.2.5	LIST CONTENTS OF DIMAL LOCATION DIRECTORY	
3.2.6	LIST CONTENTS OF PATCH TABLE	
3.2.7	PUNCH CALL CARDS.	
3.2.8	LIST CALL SEEK COUNT.	
3.2.9	DELETE PATCHES FOR A GIVEN PID	
3.2.10	PUNCH CALL TAPE.	
3.3	DIAGNOSTIC PROGRAM SELECTION AND EXECUTION (SELECT/EXECUTE SECTION)	
3.3.1	GENERAL OPERATING INSTRUCTIONS	
3.3.2	DIAGNOSTIC MONITOR PROGRAMS SELECTION	
3.3.3	NON MONITOR PROGRAMS SELECTION	
3.4	PROGRAM WAITS	
3.5	RESTART PROCEDURES	
4.	PRINTOUTS . . . . .	9
4.1	STATUS MESSAGES	
4.2	COMMAND MESSAGES	
4.3	DATA MESSAGES	
4.4	ERROR MESSAGES	
5.	COMMENTS . . . . .	12A
5.1	INITIAL LOADER	
5.2	DIMAL HEADER SECTION	
5.3	COLD START LOADER	
5.4	DIMAL LOADER/ORGANIZER SECTION	
5.5	DIMAL SELECT/EXECUTE SECTION	
6.	APPENDIX . . . . .	15A
6.1	CONSOLE ENTRY SWITCHES CALL ROUTINE	
6.2	DIMAL HEADER TEST ERROR PROCEDURE	

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. RPQ 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	/A000	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.

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

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 SUMMERIZES THE OPTIONS AVAILABLE WITH THE LOADER/ ORGANIZER SECTION.

OPERATING PROCEDURES FOR THE OPTIONS FOLLOW TABLE 1.

TABLE 1

LOADER/ORGANIZER OPTION SWITCHES

```
*****  
*   CONSOLE ENTRY 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-NPRO 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.

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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

-----  
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 SWS 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 /8080.

- 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.

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I NOTE TO C.E. I  
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-----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 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 AVAIL-ABLE CYLINDERS ON WHICH TO STORE THE DIAGNOSTIC FUNCTION TESTS.	IF THERE HAS BEEN A LARGE AMOUNT OF DELETE PROGRAM ACTIVITY ON THE DIMAL PACK, RELOAD-ING 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 PROG-AMS 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  
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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

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I LOADER/ORGANIZER I  
-----

C001 SET SWS 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 SWS.

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 SWS.

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 SWS 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.

4.3 DATA MESSAGES  
-----

-----  
I LOADER/ORGANIZER I  
-----

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.

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 PID 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.



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 /9F. 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 SUBSTRACT (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, STD 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 /ODAC.

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 TRANSFERING CONTROL TO A MONITOR PROGRAM.

THE MAIN BODY OF THE SELECT/EXECUTE SECTION SHARES CORE LOCATIONS /0160 TO /05DC 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, IT'S 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.

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I   DIAGNOSTIC MONITOR DEPENDENT PROGRAMS   I  
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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 OOFF.

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	0000	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
001B	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		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		RBITS	READ DATA ENT SW
0027	C004		LD		ADRS	LOAD CONTNETS
0028	D0E6		STO		/000F	STORE IN LOC F
0029	7003		MDX		BOOT2	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 FINCTION 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 0.....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 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	<del>BSC-CARRY SKIPPED, SHOULD NOT HAVE</del>
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 OF 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	ADD 8000 + 8000 FAILED
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