

SCOPE LOOP PROGRAMS

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WHERE THERE ARE TWO OR MORE SCOOP LOOPS FOR THE SAME DEVICE, THE ADDITIONAL ONES ARE FOR DEVICES ON ANOTHER AREA CODE OR SECOND DEVICE.			
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XL I	41	STORAGE CHECK	
XL II	42	PROCESS INTERRUPT	
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XL IV	44	1800 CH-CH	
XL V	45	360 CH-CH (15 CARDS)	

SCOPE LOOP PROGRAMS

XLVI	46	SEL CHAN
XLVII	47	2311
XLVIII	48	2790 SCOPE LOOP
XLIX	49	2790 SINGLE-STEP SCOPE LOOP*
L-LVII	50-57	COMM ADAPTER (8 CARDS)

1. PURPOSE

ONE CARD PROGRAMS THAT PROVIDE THE C.E. WITH THE ABILITY TO EXERCISE (WITH LIMITED CHECKING) ANY D.P. OR PROCESS I/O FEATURE. EACH CARD IS IDENTIFIED BY THE IMAGE OF A ROMAN NUMERAL PUNCHED IN CARD ROWS 6-9. EACH PAPER TAPE STRIP IS IDENTIFIED BY A LEADER JUST AHEAD OF THE PROGRAM.
2. PREREQUISITES
 - 2.1 PROGRAM

EACH SCOPE LOOP IS PUNCHED ON AN INDIVIDUAL CARD. THE CARD IS PUNCHED IN 8-8 FORMAT AND IS LOADED IN THE I.P.L. MODE. FOR PAPER TAPE INPUT, THE TAPE IS PUNCHED IN I.P.L. FORMAT (4 BITS PER FRAME).
 - 2.2 EQUIPMENT

SYSTEM MUST HAVE A 1442 OR A PAPER TAPE READER.
3. USE PROCEDURE

WHERE THERE ARE TWO OR MORE SCOOP LOOPS FOR THE SAME DEVICE, THE ADDITIONAL ONES ARE FOR DEVICES ON ANOTHER AREA CODE OR SECOND DEVICE.

 - 3.1 PROGRAM LOADING

THE LOADING PROCEDURE IS SIMILAR FOR ALL SCOPE LOOPS.

 1. PREPARE THE I/O DEVICE AND MAKE 'READY'.
 2. LOAD THE CARD/PAPER TAPE IN I.P.L. MODE. PROGRAM WILL GO TO WAIT 1. (B REG = 3001).
 3. SET THE CONSOLE SWITCHES.
 4. PRESS START BUTTON. PROGRAM IS NOW RUNNING.
 - 3.2 PROGRAM OPERATION

A DETAILED OPERATING PROCEDURE FOR EACH SCOPE LOOP CAN BE FOUND IN APPENDIX B. (SEE TABLE OF CONTENTS)
 - 3.3 TERMINATION

MOST SCOPE LOOPS HAVE THE OPTION OF LOOPING OR STOPPING AT A WAIT AFTER ONE COMPLETE LOOP. IN ALL CASES THIS IS WAIT 2 (B REG. = 3002).
 - 3.4 RESTART

PRESS THE P.C. STOP, RESET AND START BUTTONS. THE PROGRAM WILL GO TO WAIT 1 (SET THE CONSOLE SWS.). FOR RELOCATED PROGRAMS, SET THE I COUNTER AND PRESS START.
 - 3.5 PROGRAM HALTS

MOST PROGRAMS USE WAITS. THE WAITS ARE IDENTIFIED BY REFERENCING THE CONTENTS OF THE B REGISTER. ALL WAITS WILL BE OF THE FORM 300X. FOR QUICK IDENTIFICATION, THE LOW ORDER HEX DIGIT HAS THE

FOLLOWING DESIGNATION,

- 3001 = SET THE DESIRED SWITCHES. PRESS THE START BUTTON TO CONTINUE.
- 3002 = END OF ONE COMPLETE LOOP. PRESS THE START BUTTON TO CONTINUE.
- 3006 AND 3007 = AN ERROR HAS BEEN DETECTED BY THE PROGRAM. THE DSW IS IN THE A REGISTER IF THE DEVICE HAS A DSW.
- 3008 = AN INTERNAL ERROR HAS OCCURRED. IF THE 'CHECK STOP' SW. IS ON, A 'CAR CHECK' ERROR CAUSED THE WAIT. IN MOST CASES THE ERROR ILSW IS SENSED JUST PRIOR TO WAIT 8. IF SO, THE A REGISTER WILL CONTAIN THE ERROR BITS. IF THE ILSW IS NOT SENSED, ONE OF THE RED CONSOLE CHECK LIGHTS WILL BE ON.

4. PRINTOUTS

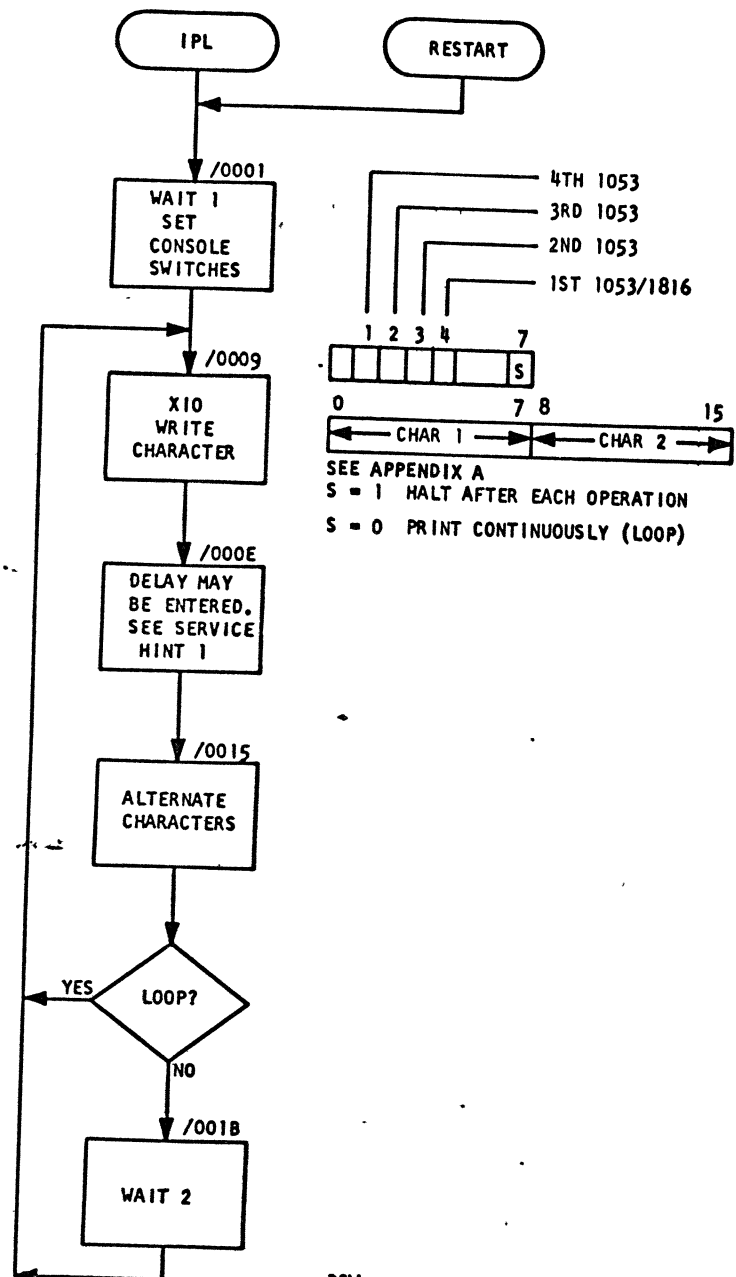
THERE ARE NO PRINTOUTS.

5. COMMENTS

IN MOST CASES A NOP MAY BE SUBSTITUTED FOR A WAIT AND THE PROGRAM WILL CONTINUE TO RUN FOR SCOOPING.

6. APPENDIX

SENSE 1 2 3 4
 TYPEWR 4 3 2 1
 10900
 8 7 6 5 17900



- DSW
- 0 PTR. SERV. REQ.
 - 4 PTR. BUSY
 - 5 PTR. NOT RDY.
 - 9 PTR. PARITY
 - 12 C.E. BUSY
 - 13 C.E. NOT RDY.

1. PROGRAM DESCRIPTION
 WILL PRINT TWO CHARACTERS ONE OF TWO WAYS:
 1. HALT AFTER EACH PRINT OPERATION
 2. PRINT CONTINUOUSLY

2. OPERATING PROCEDURE

1. PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP "READY". FOR PAPER TAPE INPUT, PLACE THE DELETE HOLE SECTION OF THE PAPER TAPE OVER THE READ STATION.
2. SET "CHECK STOP" SW. ON.
3. PRESS "RESET" AND "PROGRAM LOAD" CONSOLE BUTTONS. THE PROGRAM SHOULD LOAD AND STOP AT WAIT 1.
4. SELECT THE PRINTER IN SENSE/PROG. SWS. 1-4. SW. 1 = PTR. 4, SW. 2 = PTR. 3, ETC.
5. SET SENSE/PROG. SW. 7 = 1 TO HALT AFTER EACH PRINTER OPERATION. SET SW. 7 = 0 TO PRINT CONTINUOUSLY.
6. SET DATA ENTRY SWS. 0-7 AND 8-15 TO THE CHARACTERS DESIRED. (SEE TABLES IN APPENDIX A)
7. PRESS "START" BUTTON. PRINTER WILL PRINT CHAR. 1, THEN CHAR. 2.

3. SERVICE HINTS

1. THERE ARE TWO XR'S USED IN THE DELAY LOOP. DELAY 1 DECREMENTS XR-1 BY 1 AND DELAY 2 DECREMENTS XR-2 BY 1. DELAY 2 CONTROLS THE NUMBER OF COMPLETE CYCLES THAT DELAY 1 TAKES. NORMALLY BOTH XR'S ARE SET FOR NO DELAY. TO ENTER A DELAY:
 - a. ENTER /7FFF (OR ANY SMALLER POSITIVE NUMBER) INTO LOC. /0010. /7FFF WILL CAUSE DELAY 1 TO BE 1/6 SEC.
 - b. ENTER INTO XR-2 THE NUMBER OF TIMES THAT XR-1 SHOULD BE LOADED AND LOOPED. TO LOAD XR-2, SET LOC. /0008 TO 62XX. (XX = NUMBER OF LOOPS. /01 - /7F).

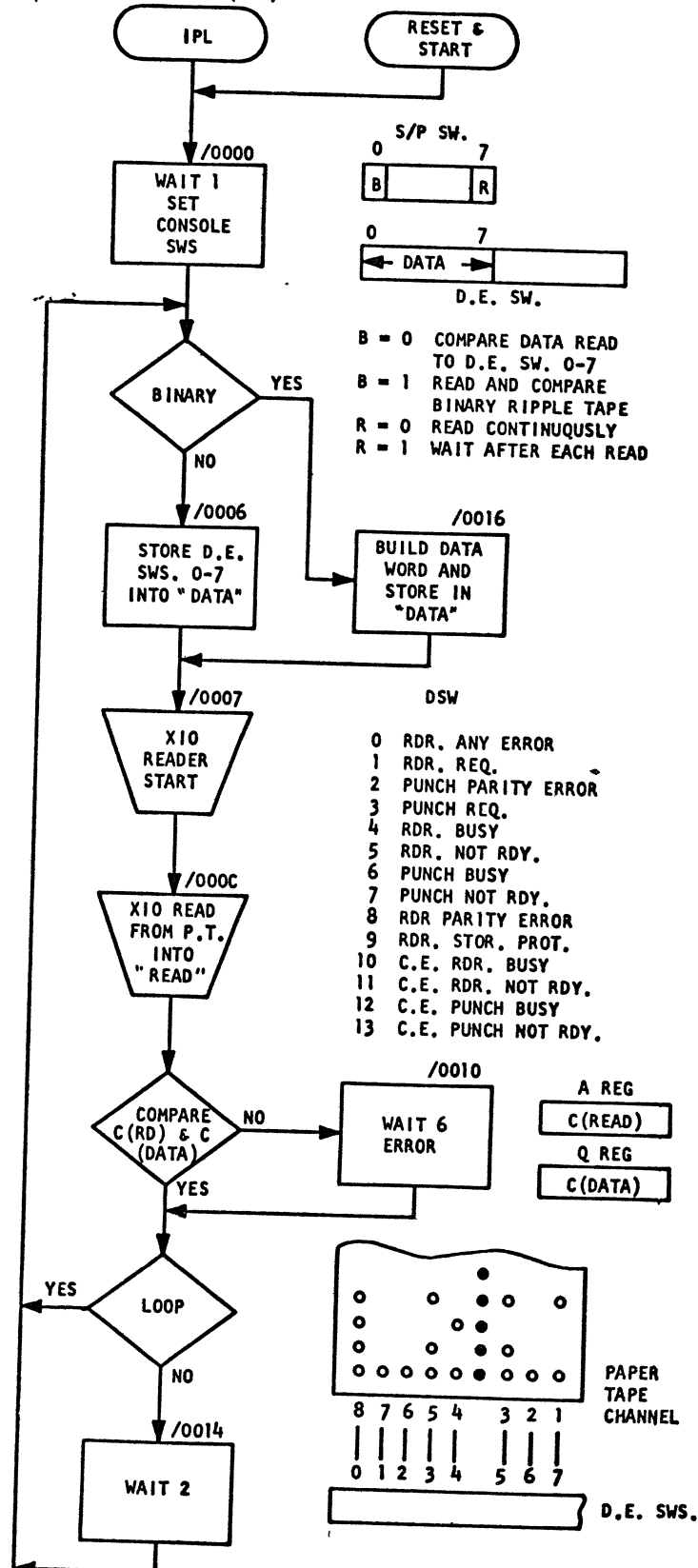
IF THE SYSTEM HAS A 4 μS CYCLE, DELAY 1 WILL BE TWICE AS LONG.

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*** 1053 SCOPE LOOP *** I, II
*
ABS
BEGIN NOP
    WAIT 1      WAIT AFTER IPL
    XIO /0022   SENSE PROG. SWS.
                    (SW. 1,2,3,4=FPWR. 4,3,2,1 RESP.)
*
SRA 10
OR /0026   OR IN /0900 OR /7900
STO /0025   STORE IOCC TO WRITE
OR /0022   OR IN /0F01 OR /7F01
STO /002B   STORE IOCC TO SENSE DSW
XIO /0020   READ DE SWS. INTO LOC. /0029
XIO /0024   WRITE FROM LOCATION /0029
XIO /002B   SENSE DSW
SRA 10     PUTS NOT READY AT BIT 15.
BSC E     SKIP IF READY (BIT 15=0)
LDX /000A  BRANCH TO LOCATION /000A.
LDX 2 /0000 PUTS /0000 IN XR2.
LDX L1 /0000 PUTS /0000 IN XR1.
MDX 1 -1   DECR. XR-1 BY 1.
LDX /0011  BRANCH TO LOC. /0011.
MDX 2 -1   DECR. XR-2 BY 1.
LDX /000F  BRANCH TO LOC. /000F
LDD /0029  PUT C(LOC. /0029) IN A AND Q
RTE 8     ALTERNATES CHARACTERS IN A.
STO /0029  STORES ALTERNATED CHARACTERS AT
                    LOCATION /0029.
*
XIO /0022   SENSE S/P SWS.
                    (SW. 7=0 TO TYPE CONTINUOUSLY)
*
SRA 8
BSC E     SKIP IF BIT 15=0
WAIT 2
LD /001F  THESE THREE INSTRUCTIONS CAUSE
EOR /0027 THE BIT 15 POSITION OF LOC. /001F
STO /001F TO ALTERNATE BETWEEN 1 AND 0.
LDX /0008 BRANCH TO LOC. /0008 OR /0009.
*
*** IOCC'S AND CONSTANTS ***
*
DC /0029   IOCC TO READ THE D.E.
DC /0240   SWS. INTO LOCATION /0029.
DC /0F01   CONSTANT (NOTE 1)
DC /0760   IOCC TO SENSE THE S/P SWS.
DC /0029   IOCC TO WRITE FROM
                    LOCATION /0029.
DC /0900   CONSTANT (NOTE 1)
DC /0001   CONSTANT
*
DC
DC
DC
DC
END BEGIN
*
*** NOTE 1 ***
*
*THIS LISTING IS FOR THE FIRST FOUR TYPEWRITERS ONLY.
*FOR TYPEWRITERS 5-8, THE FOLLOWING STORAGE LOCATIONS
*CONTAIN -
* LOCATION CONTENTS
* /0022 /7F01
* /0026 /7900
    
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DATE 01 JUL 66 EC 415178
 DATE 14 NOV 69 EC 431319
 DATE 04 NOV 66 EC 415233
 DATE 31 JUL 70 EC 431326
 DATE 15 FEB 67 EC 415233B
 DATE 15 MAY 67 EC 411731
 DATE 02 DEC 68 EC 411961
 PROG ID 08C8-*
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DATE 01JUL66 04NOV66 15FEB67 15MAY67 02DEC68 14NOV69 31JUL70
 EC NO. 415178 415233 415233B 411731 411961 431319 431326
 PROG ID 08C8-*
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1. PROGRAM DESCRIPTION

WILL READ AND COMPARE DATA ONE OF TWO WAYS:
1. COMPARE THE DATA READ TO THE DATA ENTRY SWS.
2. COMPARE THE DATA READ TO A BINARY RIPPLE PATTERN. (TAPE IS GENERATED WITH 1055 SCOPE LOOP)

2. OPERATING PROCEDURE

- PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO READ THE CARD IN AND ONCE TO BRING UP "READY". FOR PAPER TAPE INPUT, PLACE THE DELETE HOLE SECTION OF THE PAPER TAPE OVER THE READ STATION.
- SET "CHECK STOP" SWITCH ON.
- PRESS "RESET" AND "PROGRAM LOAD" CONSOLE BUTTONS. THE PROGRAM WILL LOAD AND STOP AT WAIT 1.
- SET SENSE/PROG. SW. 0 = 0 TO COMPARE THE DATA TO DATA ENTRY SWS. 0-7.
- SET SENSE/PROG. SW. 0 = 1 TO COMPARE THE DATA TO A BINARY RIPPLE PATTERN. (PATTERN THAT IS PUNCHED WITH 1055 SCOPE LOOP) PLACE THE "ONE" CHARACTER OVER THE READ STATION (ONLY CHANNEL 1 PUNCHED).
- SET SENSE/PROG. SW. 7 = 1 TO HALT AFTER EACH READ OPERATION. SET SW. 7 = 0 TO READ CONTINUOUSLY.
- PRESS CONSOLE "START" BUTTON. 1054 WILL START READING.
- PROGRAM WILL STOP AT WAIT 6 IF A COMPARE ERROR OCCURS.

APPENDIX B

*** 1054 READER SCOPE LOOP *** III

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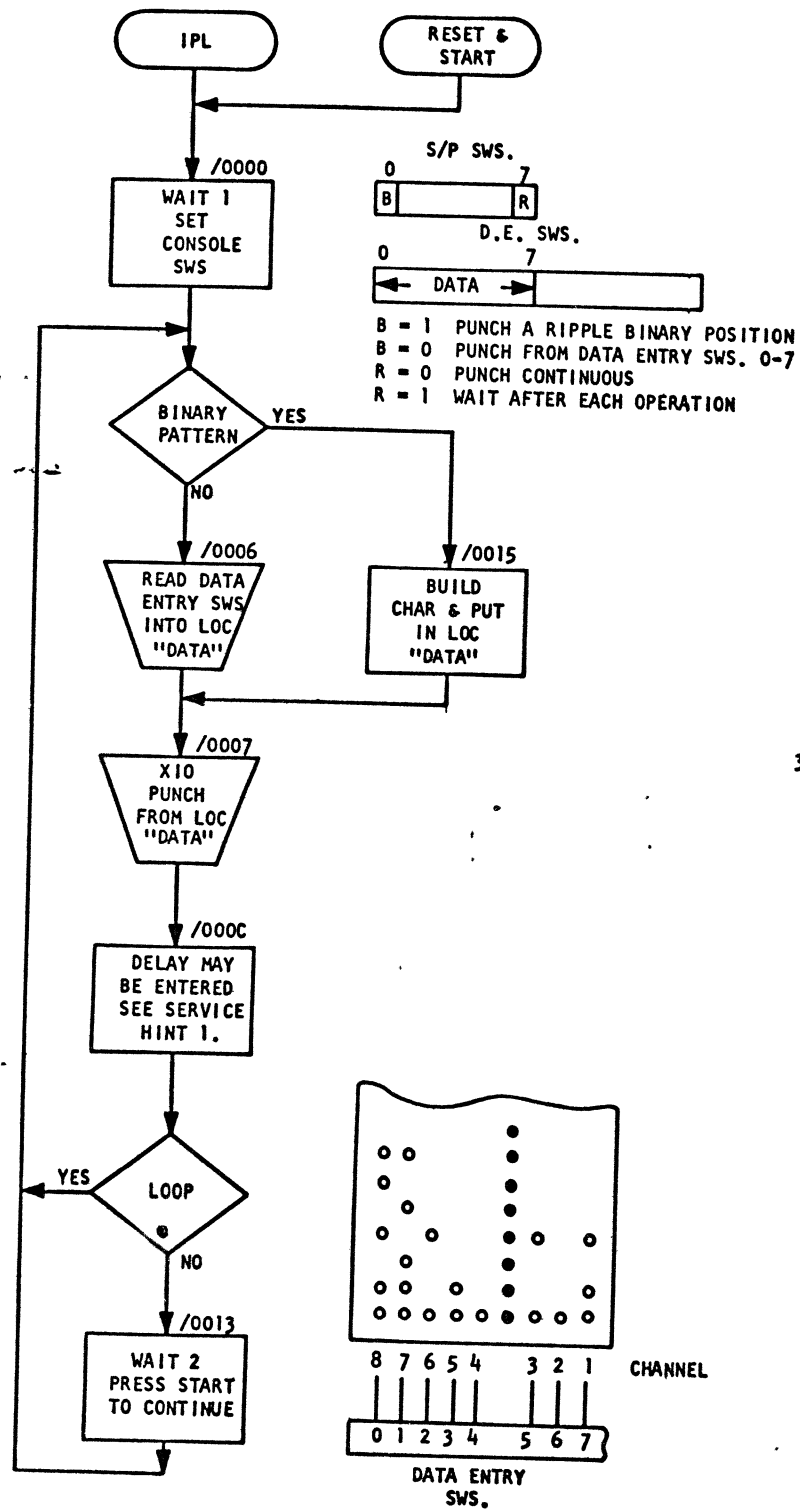
*
0000 0 3001      ABS
0001 0 6300      BEGIN WAIT 1          WAIT AFTER IPL.
0002 0 0819      LDX 3 /0000      PUT 0 IN XR3.
0003 0 1000      XIO /001C      SENSE PROG. SWS. (SW0=1 FOR BINARY)
0004 00 4C280016 NOP
0006 0 0819      BSC L /0016,Z+   BRANCH TO /0016 IF SW. 0=1
0007 0 081A      XIO /0020      READ DATA SW'S INTO LOCATION /0027.
0008 0 0811      XIO /0022      CONTROL, READER START.
0009 0 180B      XIO /001A      SENSE AND RESET DSW.
000A 0 4804      SRA 11          PUTS BUSY AT BIT 15.
000B 0 6008      BSC E          SKIP IS NOT BUSY. (BIT 15=0)
000C 0 0817      LDX /0008      BRANCH TO /0008.
000D 0 C818      XIO /0024      READ PT INTO LOCATION /0026.
000E 0 B018      LDD /0026      A=READER CHAR. Q=COMPARE CHAR.
000F 0 1000      CMP /0027      IS COMPARE CHAR. =READER CHAR.
0010 0 3006      NOP          NO
0011 0 080A      WAIT 6          NO, COMPARE ERROR.
*                               YES, SENSE PROG. SW'S.
*                               (SW7 = 0 TO CONTINUE)
*                               PUTS SW7 AT BIT 15.
*                               SKIP IF BIT 15=0.
0012 0 1808      SRA 8
0013 0 4804      BSC E
0014 0 3002      WAIT 2
0015 0 6002      LDX /0002      BRANCH TO /0002.
0016 00 77000100 MDX L3 /0100      INCR. XR3 BY /0100. (NEXT DATA)
0018 0 1000      NOP
0019 0 6B0D      STX 3 /0027      STORE XR3 AT LOCATION /0027.
001A 0 6007      LDX /0007      BRANCH TO /0007.
001B 0 1F01      DC /1F01      SENSE AND RESET DSW.
001C 0 0000      DC          SENSE PROG. SW'S.
001D 0 0760      DC /0760      SENSE DATA SW'S.
001E 0 0000      DC
001F 0 0740      DC /0740
0020 0 0027      DC /0027      READ DATA SWS INTO LOCATION /0027.
0021 0 0240      DC /0240
0022 0 0000      DC
0023 0 1C10      DC /1C10      CONTROL, READER START.
0024 0 0026      DC /0026      READ PT INTO LOCATION /0026.
0025 0 1A00      DC /1A00
0026 0 0000      DC
0027 0 0000      DC          READER CHARACTER, FROM PT.
*                               COMPARE CHARACTER, FROM DATA SW'S
*                               OR XR3.
END BEGIN
    
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APPENDIX B



1. PROGRAM DESCRIPTION
WILL PUNCH ONE OF TWO WAYS:
1. RIPPLE THRU A BINARY PATTERN.
2. PUNCH THE IMAGE OF DATA ENTRY SWS. 0-7.

2. OPERATING PROCEDURE
1. PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP "READY". FOR PAPER TAPE INPUT, PLACE THE DELETE HOLE SECTION OF THE PAPER TAPE OVER THE READ STATION.
2. SET "CHECK STOP" SWITCH ON.
3. PRESS "RESET" AND "PROGRAM LOAD" CONSOLE BUTTONS. THE PROGRAM SHOULD LOAD AND STOP AT WAIT 1.
4. SET SENSE/PROGRAM SW. 0 = 1 TO PUNCH A RIPPLE BINARY PATTERN.
5. SET SENSE/PROGRAM SW. 0 = 0 TO PUNCH THE IMAGE OF DATA ENTRY SWITCHES 0-7.
6. SET SENSE/PROGRAM SW. 7 = 1 TO WAIT AFTER EACH PUNCH OPERATION OR SW. 7 = 0 TO PUNCH CONTINUOUS.
7. PRESS CONSOLE START BUTTON. 1055 WILL START PUNCHING.

3. SERVICE HINTS
1. A TIME DELAY CAN BE ENTERED BETWEEN EACH CHARACTER PUNCHED. IF /7FFF IS LOADED INTO LOCATION /000D, A DELAY OF APPROXIMATELY 1/6 SECONDS WILL OCCUR. (2 MICRO-SECOND SYSTEM) ANY VALUE BETWEEN /0000 AND /7FFF CAN BE ENTERED. THE GREATER THE VALUE, THE LONGER THE TIME DELAY.

- DSW
- 0 RDR. ANY ERROR
 - 1 RDR. REQ.
 - 2 PUNCH PARITY ERROR
 - 3 PUNCH REQ.
 - 4 RDR. BUSY
 - 5 RDR. NOT RDY.
 - 6 PUNCH BUSY
 - 7 PUNCH NOT RDY.
 - 8 RDR. PARITY ERROR
 - 9 RDR. STOR. PROT.
 - 10 C.E. RDR. BUSY
 - 11 C.E. RDR. NOT RDY.
 - 12 C.E. PUNCH BUSY
 - 13 C.E. PUNCH NOT RDY.

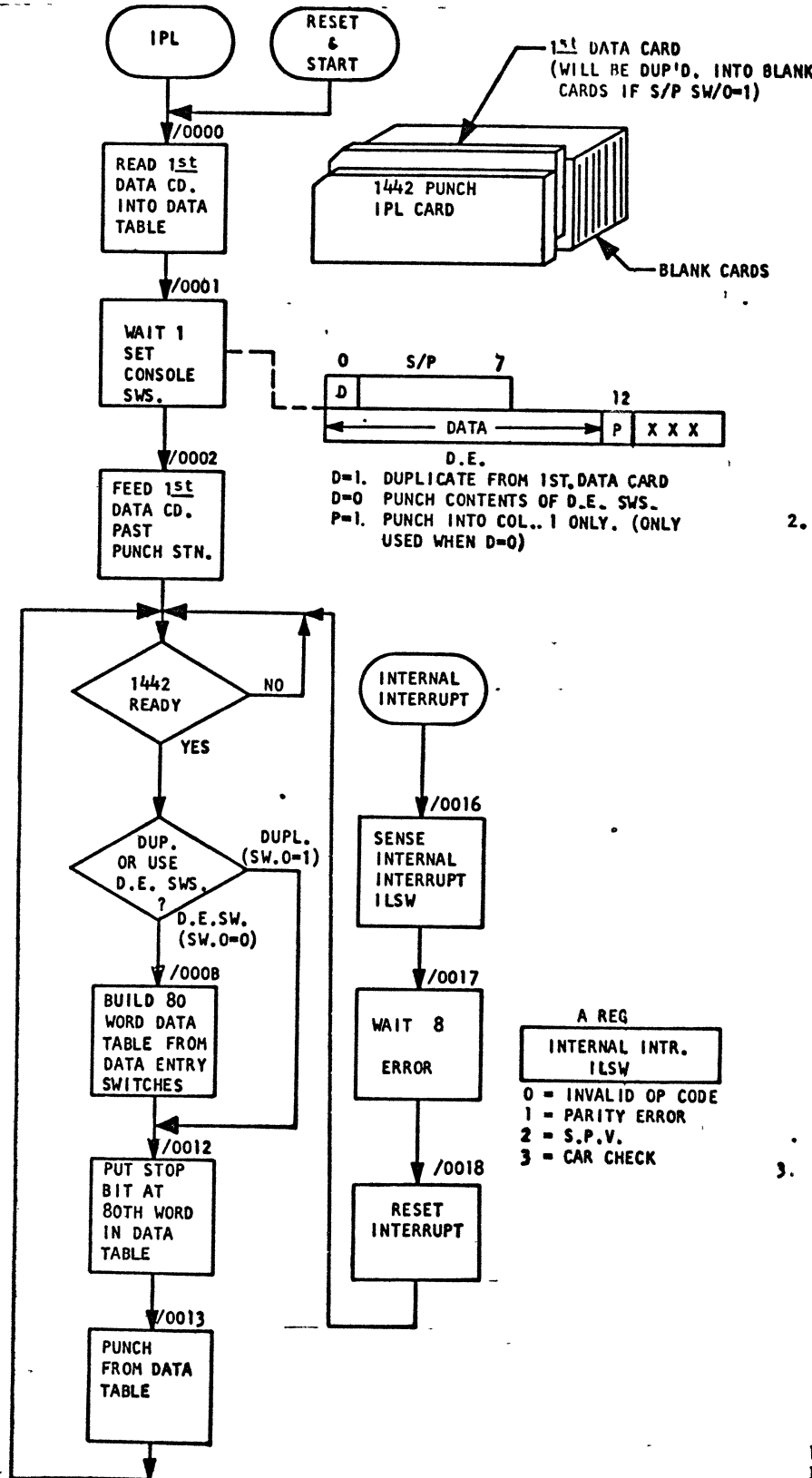
*** 1055 PUNCH SCOPE LOOP *** IV

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*
ABS
BEGIN WAIT 1 WAIT AFTER IPL.
LDX 3 /0000 PUT 0 IN XR3.
XIO SPSW SENSE PROG. SWS (SW0=1 FOR BINARY)
BSC L INCR,Z+ BRANCH IF SW. 0=1.
LDX 3 /0000 PUT 0 IN XR3.
XIO DESW READ DATA SW'S INTO LOCATION /0024.
XIO PCH WRITE (PUNCH) FROM LOCATION /0024.
XIO DSW SENSE DSW.
SLA 3 PUTS SERVICE REQ. AT BIT 0.
BSC - SKIP IF SERVICE REQ. (BIT 0=1)
LDX /0008 BRANCH TO /0008.
LDX L1 /0000 PUT /0000 IN XRI. BEGIN DELAY.
NORMAL DELAY IS NOTHING.
* MDX -1 DECR. XRI BY 1.
LDX /000E BRANCH TO /000E.
XIO SPSW SENSE PROG. SW'S.
(SW7 = 0 TO CONTINUE).
* SRA 8 SKIP IF BIT 15 = 0.
BSC E
WAIT 2 BRANCH TO /0002.
LDX /0002 INCR. XR3 BY /0100. (NEXT DATA)
INCR MDX L3 /0100
NOP STORE XR3 AT LOCATION /0024.
STX 3 OUT BRANCH TO /0007.
LDX /0007
DSW DC
DC /1F01 SENSE DSW IOCC
SPSW DC
DC /0760 SENSE PROGRAM SWS IOCC
DESW DC OUT READ DATA SW'S INTO LOCATION /0024.
PCH DC /0240 READ DATA ENTRY SWS IOCC
DC OUT WRITE (PUNCH) FROM LOCATION /0024.
DC /1900 WRITE IOCC
DC
DC
DC
DC
OUT DC STORAGE FOR PUNCH CHARACTER.
END BEGIN
    
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1. PROGRAM DESCRIPTION
THIS PROGRAM WILL PUNCH INTO BLANK CARDS ONE OF TWO WAYS.
1. DUPLICATE FROM THE FIRST DATA CARD IN THE HOPPER.
2. PUNCH THE IMAGE OF DATA ENTRY SWITCHES 0-11.

2. OPERATING PROCEDURE

- PLACE THE IPL CARD, A CARD TO BE DUPLICATED, AND SEVERAL BLANK CARDS IN THE HOPPER. (SEE SECTION 7 WHEN RUNNING THE 2ND 1442)
- SET "CHECK STOP" SW. ON.
- PRESS "PROGRAM LOAD" CONSOLE BUTTON. THE PROGRAM SHOULD LOAD AND STOP AT WAIT 1. (WAIT NUMBER CLEARED FROM B-REG BY CARD CS CYCLES).
- TO DUPLICATE THE FIRST CARD, SET SENSE/PROG. SW.0=1 AND PRESS START BUTTON. PUNCHING WILL BEGIN.
- TO PUNCH FROM THE DATA ENTRY SWITCHES, SET SENSE/PROG. SW.0=0. SET THE PUNCH IMAGE IN DATA ENTRY SWITCHES 0-11 AND PRESS START BUTTON. PUNCHING WILL BEGIN. IF D.E.SW.12=1, ONLY COL. 1 WILL BE PUNCHED. DATA ENTRY SW CHES MAY BE CHANGED WHILE RUNNING.
- PROGRAM WILL STOP AT WAIT 8 IF A CAR CHECK ERROR OCCURS.
- WHEN RUNNING THE 2ND 1442, PLACE THE DATA CARDS IN THE 2ND 1442 HOPPER AND PRESS THE START BUTTON. PLACE THE IPL CARD IN THE FIRST 1442 HOPPER. PRESS THE START BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP READY. GO TO STEP 2.

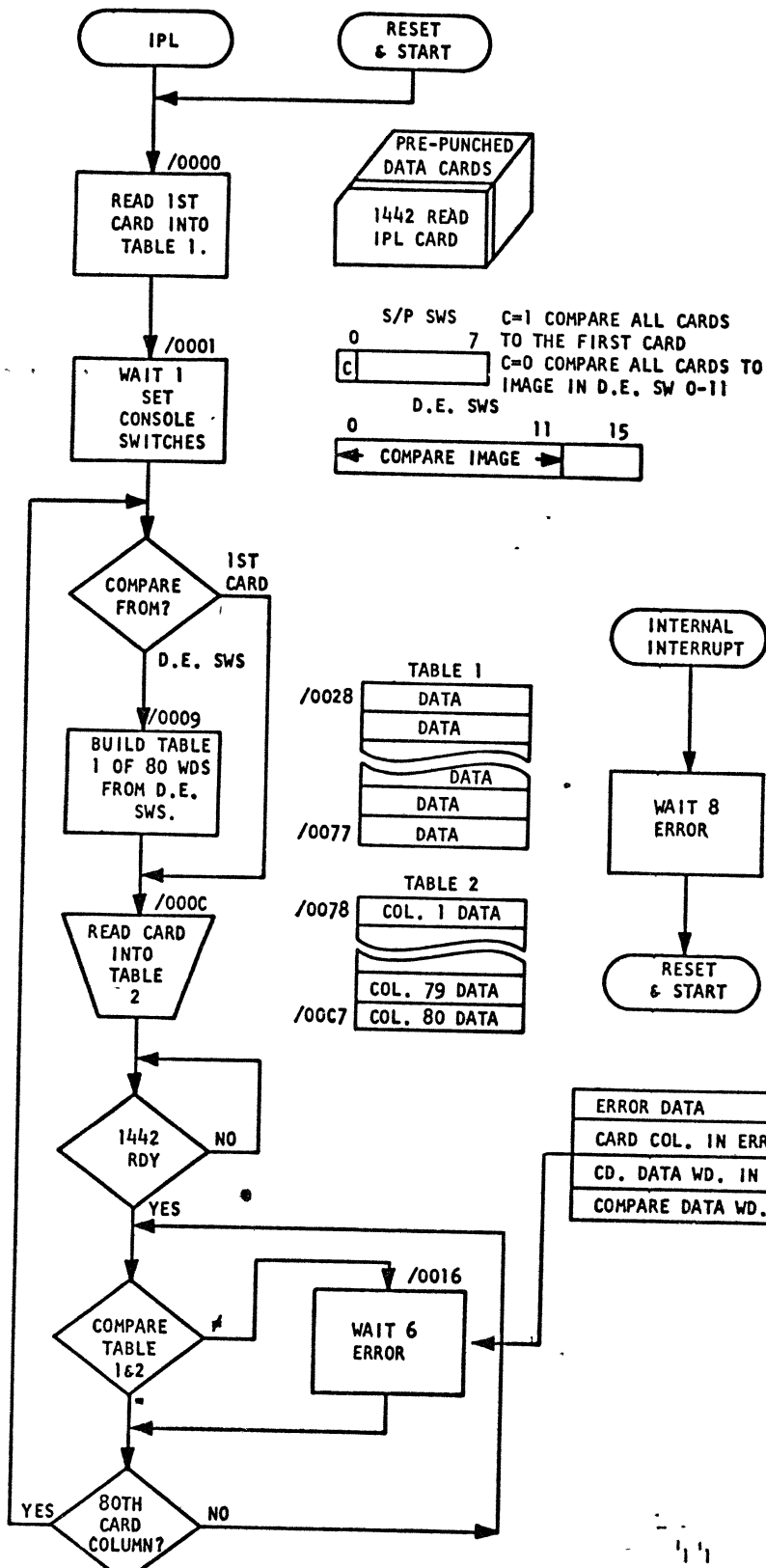
3. SERVICE HINTS

- THE NUMBER OF COLUMNS PUNCHED ON EACH CARD CAN BE CONTROLLED BY MODIFYING THE INSTRUCTIONS AT /0010 AND /0012. TO CHANGE WHERE THE TERMINATOR IS PLACED
- DSW
- ANY ERROR
- LAST CARD
- OPERATION COMPL.
- PARITY
- STOR. PROT. ERROR
- FD. CHECK AT RD. STN.
- C.E. BUSY
- C.E. NOT RDY.
- BUSY
- NOT RDY.

```

*** 1442 PUNCH SCOPE LOOP *** V, VI
*
ABS
BEGIN XIO READ INIT. READ INTO LOCATION /0028.
      WAIT 1 WAIT AFTER IPL.
      XIO FEED INIT. READ INTO LOCATION /0028.
      XIO DSW SENSE DSW. NOT READY IN BIT 15.
      BSC E SKIP IF READY. (BIT 15=0)
      LDX /0003 BRANCH TO /0003.
      XIO SPSW SENSE PROG. SW'S. (SW 0=1
*          TO DUPLICATE)
      LDX /0009 BRANCH TO /0009.
      DC /0015 INTERNAL INTERRUPT VECTOR.
      BSC L DUP,Z+ BRANCH TO /0010 IF BIT 0=1.
*          (DUPLICATE)
      LDX 1 -80 PUT -80 IN XR1. BUILD DATA TABLE.
      XIO DESW SENSE DATA ENTRY SW'S.
*          (SW'S 0 THRU 11=PUNCH DATA.)
      STO 1 /0078 STORE DATA SW'S. XR1 +120.
      MDX 1 1 INCR XR1 + 1 (SKIP AFTER 80 LOOPS)
      DUP LD /0077 LOAD LAST WORD FROM DATA TABLE.
      LDX /0000 BRANCH TO /0000.
      OR SPSW OR IN /0008. 12 BIT STOPS PUNCHING
      STO /0077 STORE LAST WORD FROM DATA TABLE.
      XIO WRITE INIT. WRITE FROM LOCATION /0028.
      LDX /0003 BRANCH TO /0003. REPEAT PROGRAM
      DC INTERNAL INTR ENTRY
      XIO ILSW SENSE INTERNAL ERROR ILSW.
      WAIT 8 INTERNAL ERROR.
      BOSC RESET INTERNAL INTERRUPT
      LDX /0003
      ILSW DC SPARE LOCATION
      DC /0300 SENSE ILSW IOCC
      SPSW DC /0008 TERMINATOR BIT
      DC /0760 SENSE S/P SWITCHES IOCC
      READ DC /0028 INIT. READ INTO LOCATION /0028.
      DC /1600 READ IOCC (NOTE 1)
      WRITE DC /0028 INIT. WRITE FROM LOCATION /0028.
      DC /1500 WRITE IOCC (NOTE 1)
      FEED DC CARD FEED IOCC (NOTE 1)
      DC /1402
      DSW DC /1701 SENSE DSW IOCC (NOTE 1)
      DC /1701
      DESW DC /0740 SENSE DATA ENTRY SWS IOCC (NOTE 1)
      DC /0740
      END BEGIN
*
*** NOTE 1 ***
*
* THIS LISTING IS FOR THE FIRST 1442. FOR THE SECOND 1442,
* THE FOLLOWING LOCATIONS CONTAIN -
*
* LOCATION CONTENTS
*
* /001F /8E00
* /0021 /8D00
* /0023 /8C02
* /0025 /8F01

```



- PROGRAM DESCRIPTION
 READS AND COMPARES PRE-PUNCHED CARDS ONE OF TWO WAYS:
 1. COMPARE ALL CARDS TO THE FIRST CARD.
 2. COMPARE ALL CARDS TO THE IMAGE IN DATA ENTRY SWITCHES 0-11.
- OPERATING PROCEDURE
 1. PLACE THE IPL CARD FOLLOWED BY THE CARDS TO BE READ AND COMPARED IN THE 1442 HOPPER. (SEE SECTION 8 WHEN RUNNING THE SECOND 1442).
 2. SET "CHECK STOP" SWITCH ON.
 3. PRESS "PROGRAM LOAD" CONSOLE BUTTON. PROGRAM SHOULD LOAD AND STOP AT WAIT 1. (WAIT NUMBER CLEARED FROM B-REG BY CARD CS CYCLES).
 4. SET SENSE/PROG. SW. 0=1 TO COMPARE THE 1ST CARD WITH ALL FOLLOWING CARDS.
 5. SET SENSE/PROG. SW. 0=0 TO COMPARE THE DATA ENTRY SWITCHES WITH ALL FOLLOWING CARDS. SET DATA IMAGE IN DATA ENTRY SWITCHES 0-11.
 6. PRESS CONSOLE "START" BUTTON. PROGRAM WILL READ A CARD, COMPARE THE DATA AND REPEAT.
 7. PROGRAM WILL STOP AT WAIT 6 IF COMPARE ERROR OCCURS. PROGRAM WILL STOP AT WAIT 8 IF A CAR CHECK ERROR OCCURS.
 8. WHEN RUNNING THE 2ND 1442, PLACE THE DATA CARDS IN THE 2ND 1442 HOPPER AND PRESS THE START BUTTON. PLACE THE IPL CARD IN THE 1ST 1442 HOPPER. PRESS THE START BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP READY. GO TO STEP 2.

NOTE:
 THE IOCC WORDS AT /001F AND /0021 CAN BE CHANGED TO /1601 OR /8E01 TO TEST THE PACK MODE CIRCUITRY.

ERROR DATA	A REG
CARD COL. IN ERROR	XR-1
CD. DATA WD. IN ERROR (TBL. 2)	(XR-1)+(/0027)
COMPARE DATA WD. (TBL. 1)	(XR-1)+(/0077)

- DSW
- ANY ERROR
 - LAST CARD
 - OP. COMPL.
 - PARITY
 - STOR. PROT. ERROR
 - FD. CHECK AT RD. STN.
 - C.E. BUSY
 - D.E. NOT RDY.
 - BUSY
 - NOT RDY.

```

*** 1442 READ SCOPE LOOP *** VII, VIII
*
0000 0 081D      BEGIN XIO 001E      INIT. READ INTO LOCATION /0028.
0001 0 3001      WAIT 1          WAIT AFTER IPL.
0002 0 0823      XIO /0026      SENSE PROG. SW'S. (SWO=1
*                                     COMPARE 1 ST CARD)
0003 00 4C28000C BSC L /000C,Z+    BRANCH TO /000C IF BIT 0=1.
0005 0 6150      LDX 1 80        PUT 80 IN XR1.
0006 0 081D      XIO /0024      SENSE DATA SW'S (SW'S
*                                     0-11=COMPARE DATA)
0007 0 6009      LDX /0009      BRANCH TO /0009.
0008 0 001A      DC /001A      INTERNAL INTERRUPT VECTOR.
0009 0 0127      STO 1 /0027      STORE DATA SW'S IN LOC /0027+XR1
000A 0 71FF      MDX 1 -1        DECR. XR1 BY 1. SKIP AFTER 80 LPS.
000B 0 6009      LDX /0009      BRANCH TO /0009.
000C 0 0813      XIO /0020      INIT. READ INTO LOCATION /0078.
000D 0 0814      XIO /0022      SENSE DSW. PUTS NOT READY AT BIT 15
000E 0 1000      NOP
000F 0 4804      BSC E          SKIP IF READY. (BIT 15 =0)
0010 0 600D      LDX /000D      BRANCH TO /000D.
0011 0 6150      LDX 1 80        PUT 80 IN XR1.
0012 00 C5000077 LD L1 /0077      LOAD DATA FROM CARD.
0014 0 B127      CMP 1 /0027      IS CARD DATA=1ST CARD, OR
*                                     DATA ENTRY SW DATA.
0015 0 1000      NOP
0016 0 3106      WAIT 6          NO, COMPARE ERROR.
0017 0 71FF      MDX 1 -1        YES, DECR. XR1 BY 1. (SKIP AFTER 80
*                                     LOOPS)
0018 0 6012      LDX /0012      BRANCH TO /0012.
0019 0 6002      LDX /0002      BRANCH TO /0002.
001A 0 0000      DC          INTERNAL INTR ENTRY
001B 0 3008      WAIT 8          INTERNAL ERROR.
001C 0 0000      DC
001D 0 0000      DC
*
*** IOCC'S ***
*
001E 0 0028      DC /0028      INIT. READ INTO LOCATION /0028.
001F 0 1600      DC /1600      (NOTE 1)
0020 0 0078      DC /0078      INIT. READ INTO LOCATION /0078.
0021 0 1600      DC /1600      (NOTE 1)
0022 0 0000      DC          SENSE DSW, AND RESET. IOCC
0023 0 1701      DC /1701      (NOTE 1)
0024 0 0000      DC          SENSE DATA SW'S IOCC
0025 0 0740      DC /0740      SENSE PROG. SW'S. IOCC
0026 0 0000      DC
0027 0 0760      DC /0760
END BEGIN
*
*** NOTE 1 ***
*
*THIS LISTING IS FOR THE FIRST 1442.
*FOR THE SECOND 1442, THE FOLLOWING
*LOCATIONS CONTAIN -
*
* LOCATION          CONTENTS
*
* /001F              /8E00
* /0021              /8E00
* /0023              /8F01
    
```

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SCOPE LOOP PROGRAMS

APPENDIX B

1. PROGRAM DESCRIPTION

WILL PERFORM A CARRIAGE CONTROL OPERATION, PRINT A LINE OF 120 CHARACTERS (ALTERNATE CHAR. 1'S AND 2'S) AND REPEAT.

2. OPERATING PROCEDURE

1. PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO READ THE CARD IN AND ONCE TO BRING UP "READY". FOR PAPER TAPE INPUT, PLACE THE DELETE HOLE SECTION OF THE PAPER TAPE OVER THE READ STATION.
2. SET "CHECK STOP" SWITCH ON.
3. PRESS "PROGRAM LOAD" CONSOLE BUTTON. PROGRAM WILL LOAD AND STOP AT WAIT 1.
4. SET THE CARRIAGE CONTROL MODIFIER IN SENSE/PROGRAM SWITCHES 0-7. (SEE TABLE 1).
5. SET DATA ENTRY SWS. 2-7=CHARACTER 1, AND SWS. 10-15=CHARACTER 2.
6. PRESS CONSOLE "START" BUTTON PROGRAM WILL PERFORM THE CARRIAGE CONTROL OPERATION, PRINT A LINE OF 120 CHARACTERS, AND REPEAT.
7. IF A CAR CHECK ERROR OCCURS, THE PROGRAM WILL STOP AT WAIT 8.

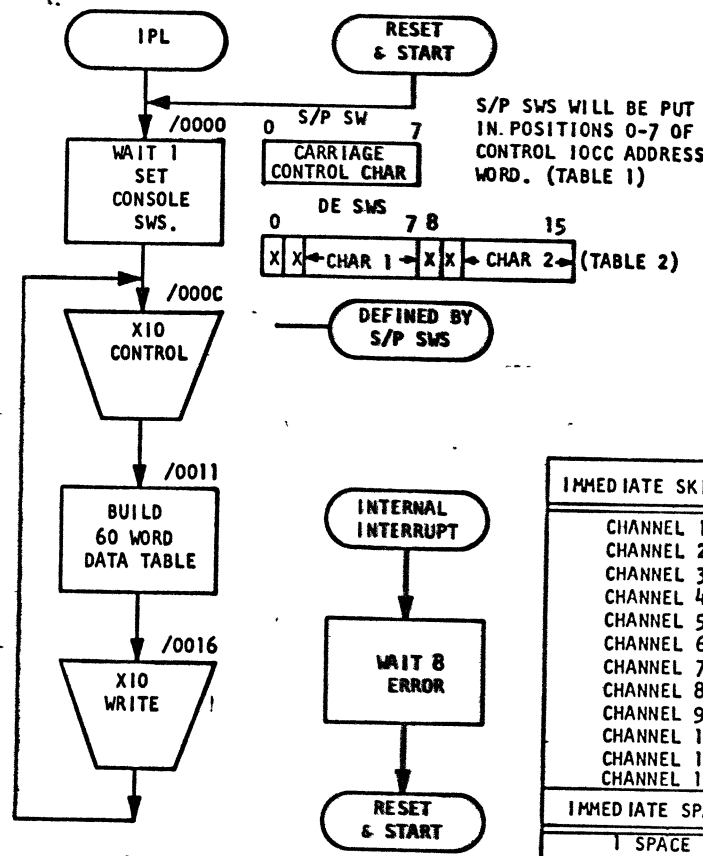
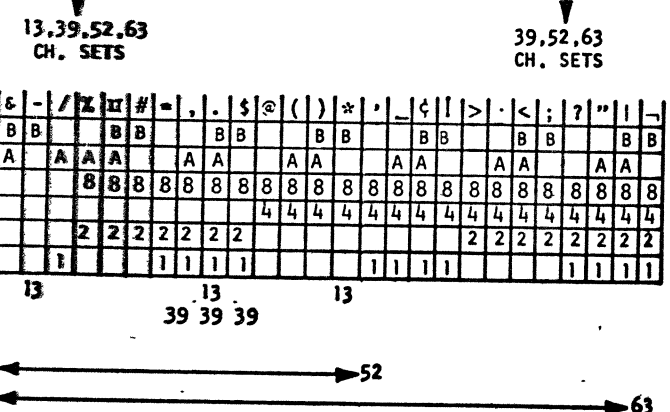


TABLE 1 CARRIAGE CONTROL CHARACTERS

IMMEDIATE SKIP TO	BIT							SKIP AFTER PR TO	BIT								
	0	1	2	3	4	5	6		7	0	1	2	3	4	5	6	7
CHANNEL 1	0	0	0	0	0	0	0	1	CHANNEL 1	0	0	1	1	0	0	0	1
CHANNEL 2	0	0	0	0	0	0	1	0	CHANNEL 2	0	0	1	1	0	0	1	0
CHANNEL 3	0	0	0	0	0	0	1	1	CHANNEL 3	0	0	1	1	0	0	1	1
CHANNEL 4	0	0	0	0	0	1	0	0	CHANNEL 4	0	0	1	1	0	1	0	0
CHANNEL 5	0	0	0	0	0	1	0	1	CHANNEL 5	0	0	1	1	0	1	0	1
CHANNEL 6	0	0	0	0	1	0	1	1	CHANNEL 6	0	0	1	1	0	1	1	1
CHANNEL 7	0	0	0	0	1	1	1	1	CHANNEL 7	0	0	1	1	0	1	1	1
CHANNEL 8	0	0	0	1	0	0	0	0	CHANNEL 8	0	0	1	1	0	0	0	0
CHANNEL 9	0	0	0	1	0	0	1	0	CHANNEL 9	0	0	1	1	0	0	1	0
CHANNEL 10	0	0	0	1	0	1	0	1	CHANNEL 10	0	0	1	1	0	1	0	1
CHANNEL 11	0	0	0	1	0	1	1	1	CHANNEL 11	0	0	1	1	0	1	1	1
CHANNEL 12	0	0	0	1	1	0	0	1	CHANNEL 12	0	0	1	1	0	0	1	1
IMMEDIATE SPACE									SPACE AFTER PRINT								
1 SPACE	0	0	1	0	0	0	0	1	1 SPACE	0	0	0	1	0	0	0	1
2 SPACES	0	0	1	0	0	0	1	0	2 SPACES	0	0	0	1	0	0	1	0
3 SPACES	0	0	1	0	0	0	1	1	3 SPACES	0	0	0	1	0	0	1	1

TABLE II ALPHABETIC CHARACTERS

BIT	BIT	1	2	3	4	5	6	7	8	9	0	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	
2	10											B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
3	11											A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
4	12								8	8	8																											
5	13				4	4	4	4									4	4	4	4																		
6	14			2	2	2	2	2									2	2	2	2																		
7	15			1	1	1	1	1									1	1	1	1																		



```

*** 1443 PRINTER SCOPE LOOP ***   IX
*
ABS
BEGIN WAIT 1          WAIT AFTER IPL.
XIO /0020           SENSE DSW PUTS NOT READY AT BIT 15.
NOP
0002 0 1000         BSC E          SKIP IF READY. (BIT 15=0)
0003 0 4804         LDX /0001     BRANCH TO /0001.
0004 0 6001         SLA 13       PUTS CARRIAGE BUSY AT BIT 0.
0005 0 100D        LDX /0009     BRANCH TO /0009.
0006 0 6009        NOP
0007 0 1000        DC /0019      INTERNAL INTERRUPT VECTOR.
0008 0 0019        BSC Z+       SKIP IF CARRIAGE NOT BUSY. (BIT 0=0)
0009 0 4828        LDX /0001     BRANCH TO /0001.
000A 0 6001        XIO /0022    READ PROG. SWS INTO LOCATION /001E.
000B 0 0816        XIO /001E    CTRL (DEFINED BY PROG SWS 0-7).
000C 0 0811        XIO /0020    SENSE AND RESET DSW.
000D 0 0812        SLA 13       PUTS CARRIAGE BUSY AT BIT 0.
000E 0 100D        BSC Z+       SKIP IF CARR NOT BUSY. (BIT 0=0)
000F 0 4828        LDX /000D    BRANCH TO /000D.
0010 0 600D        LDX 1 80     PUT 80 IN XR1.
0011 0 6150        XIO /0024    SENSE DATA SWS. (SW 0-15=CHAR)
0012 0 0811        STO 1 /0027  STORE DATA SW'S IN /0027 + XR1.
0013 0 D127        MDX 1 -1    DECR. XR1 BY 1. SKIP AFTER 80 LPS.
0014 0 71FF        LDX /0013   BRANCH TO /0013.
0015 0 6013        XIO /001C   INIT. WRITE FROM LOCATION /0027.
0016 0 0805        NOP
0017 0 1000        LDX /0001   BRANCH TO /0001.
0018 0 6001

*
*** INTERNAL ERROR RTN ***
*
DC
WAIT 8          INTERNAL INTR ENTRY
DC              INTERNAL ERROR.

*
*** IOCC'S ***
*
DC /0027       INIT. WRITE FROM LOCATION /0027.
DC /3500
DC /001E       CONTROL.
DC /3400
DC /0020       SENSE DSW, AND RESET.
DC /3701
DC /001E       READ PROG. SW'S INTO LOCATION /001E
DC /0260
DC /0024       SENSE DATA SW'S.
DC /0740
DC /0026       WORD COUNT=60. BEGIN DATA TABLE.
DC /003C
END BEGIN
0019 0 0000
001A 0 3008
001B 0 0000
001C 0 0027
001D 0 3500
001E 0 0000
001F 0 3400
0020 0 0000
0021 0 3701
0022 0 001E
0023 0 0260
0024 0 0000
0025 0 0740
0026 0 0000
0027 0 003C
    
```

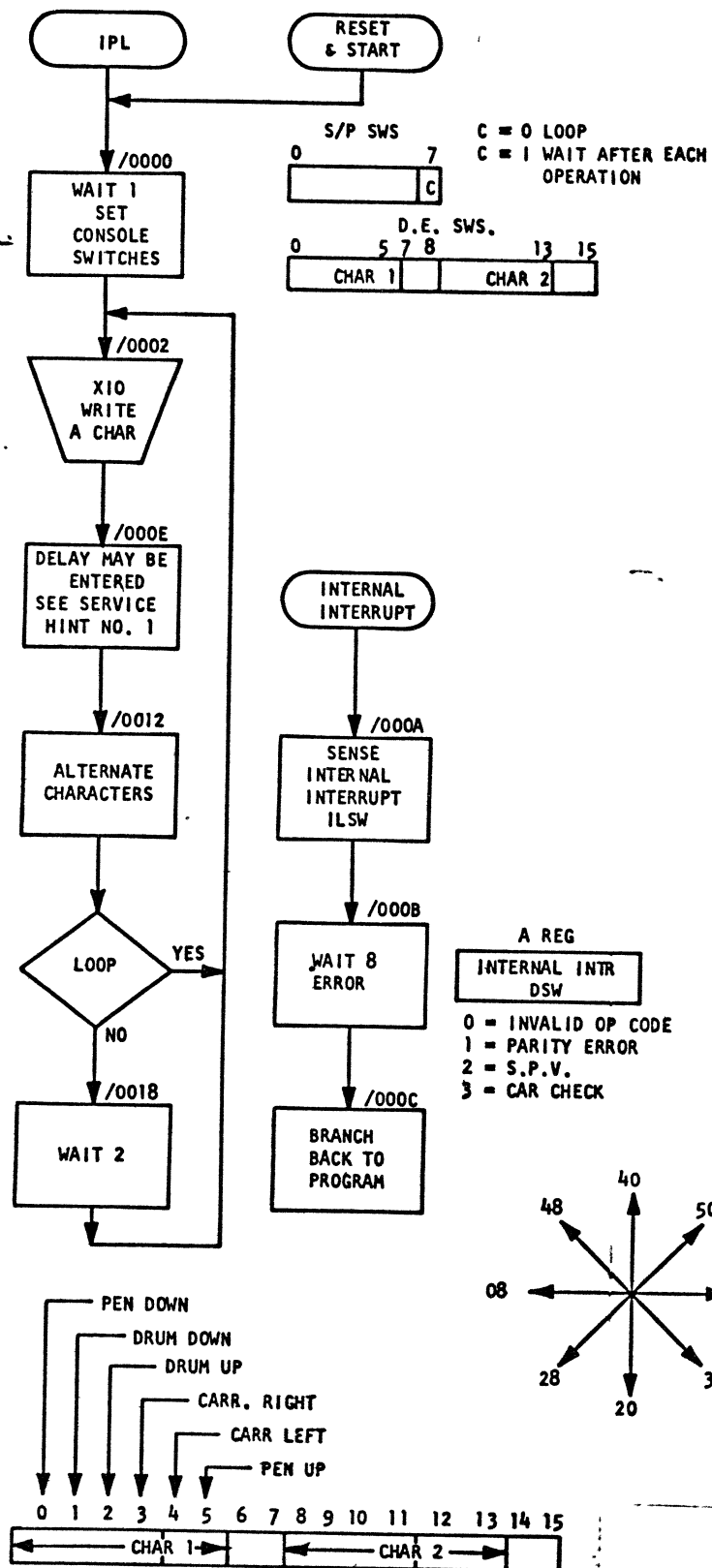
SCOPE LOOP PROGRAMS

APPENDIX B

1. PROGRAM DESCRIPTION
WILL PERFORM TWO PLOT OPERATIONS. PROGRAM HAS THE OPTION TO LOOP OR WAIT AFTER EACH OPERATION.

2. OPERATING PROCEDURE
1. PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP READY. FOR PAPER TAPE INPUT, PLACE THE DELETE HOLE SECTION OF THE PAPER TAPE OVER THE READ STATION.
 2. SET "CHECK STOP" SWITCH ON.
 3. PRESS "RESET" AND "PROGRAM LOAD" CONSOLE BUTTONS. THE PROGRAM SHOULD LOAD AND STOP AT WAIT 1.
 4. SET SENSE/PROG. SW. 7=0 TO PLOT CONTINUOUSLY, OR SW. 7=1 TO WAIT AFTER EACH PLOT COMMAND.
 5. SET CHAR. 1 IN DATA ENTRY SWITCHES 0-7 AND CHAR. 2 IN 8-15.
 6. PRESS START BUTTON. THE PROGRAM WILL PLOT CHAR. 1 THEN CHAR. 2 AND REPEAT.
 7. PROGRAM WILL STOP AT WAIT 8 IF A CAR CHECK ERROR OCCURS.

3. SERVICE HINTS
1. A TIME DELAY CAN BE ENTERED BETWEEN EACH PLOTTER OPERATION BY ALTERING LOCATION /000F. BY CHANGING FROM /FFFF TO /0000, A 1/6 SECOND DELAY WILL OCCUR (2 MICRO-SECOND SYSTEM). AS THE VALUE IN LOCATION /000F IS INCREASED, THE TIME DELAY WILL DECREASE. ENTER ANY VALUE BETWEEN /0000 AND /7FFF.



*** 1627 SCOPE LOOP *** X

```

*
*   ABS
BEGIN WAIT 1      WAIT AFTER IPL.
      XIO  DESW    READ DATA SW'S INTO LOCATION /0027.
      XIO  WRITE   WRITE CHAR. FROM LOCATION /0027.
      XIO  DSW     SENSE DSW. PUTS RESPONSE AT BIT 0.
      NOP
      BSC  -       SKIP IF RESPONSE, (BIT 0=1)
      LDX  /0003   BRANCH TO /0003.
      LDX  /000E   BRANCH TO /000E.
      DC   /0009   INTERNAL INTERRUPT VECTOR.
      DC
      XIO  ILSW    INTERNAL INTR ENTRY
      WAIT 8      SENSE ILSW.
      BOSC I /0009 INTERNAL ERROR. (TO LOOP, NOP WAIT)
      LDX  L1 /FFFF BRANCH OUT VIA LOCATION /0009.
      MDX  1      PUTS /FFFF IN XR1. BEGIN DELAY.
      LDX  /0010  INCR. XR1 BY 1.
      LDD  OUT    BRANCH TO /0010.
      RTE  8      PUT C (LOC. /0027) IN A AND Q.
      STO
      ALTERNATES CHARACTERS IN A.
      STORES ALTERNATED CHARS.
      AT LOCATION /0027.
*
*   XIO  SPSW    SENSE PROG. SW'S. (SW7=0
*               TO PLOT CONTINUOUSLY)
*               PUTS SW7 AT BIT 15.
*               SKIP IF BIT 15 = 0.
*
*   SRA  8
*   BSC  E
*   WAIT 2
*   LDX  /0002   BRANCH TO /0002.
*   DC
*   DC          SPARE LOCATION
*   DC          SPARE LOCATION
*
*** IOCC'S ***
*
ILSW DC          SENSE ILSW IOCC
DESW DC /0300   READ DATA SW'S INTO LOCATION /0027.
WRITE DC /0240  READ DATA ENTRY SW IOCC
DSW  DC /2900   WRITE CHAR. FROM LOCATION /0027.
      DC /2900   WRITE IOCC
SPSW DC /2F01   SENSE DSW IOCC
      DC /2F01
      DC /0760   SENSE S/P IOCC
OUT  DC
      DC          DATA SW STORAGE, (' CHARACTERS).
END  BEGIN

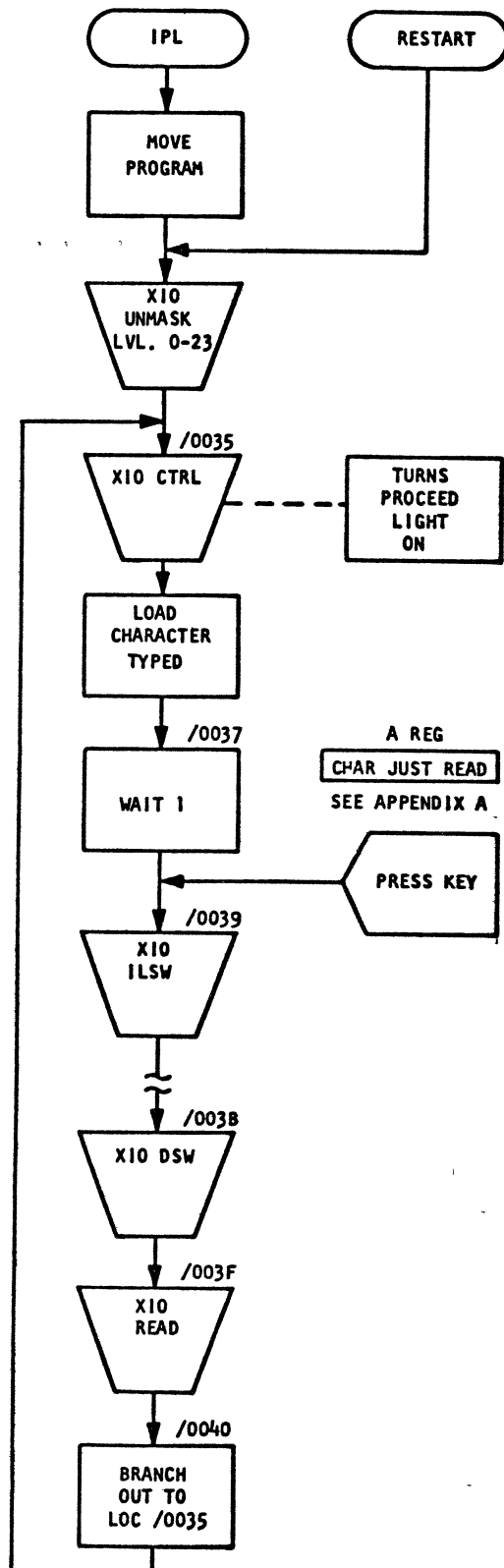
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DSW	
0	SERVICE COMPL.
1	PARITY CHECK
12	C.E. BUSY
13	C.E. NOT RDY.
14	BUSY
15	NOT RDY.

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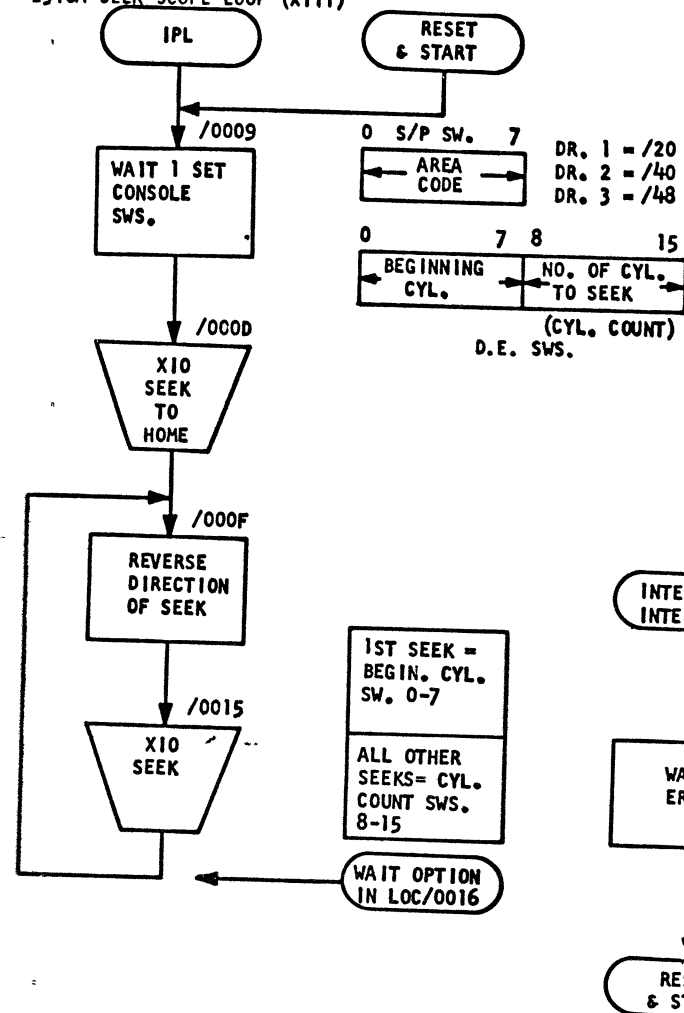


1. PROGRAM DESCRIPTION
WILL READ ANY KEYBOARD CHARACTER AND LOAD IT INTO THE A REGISTER. THE PROGRAM USES INTERRUPTS AND WILL SERVICE ANY 1816 ASSIGNED TO LEVELS 0-23.
2. OPERATING PROCEDURE
1. PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 'START' BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP 'READY.'
 2. SET 'CHECK STOP' SWITCH ON.
 3. PRESS 'PROGRAM LOAD' CONSOLE BUTTON. PROGRAM WILL LOAD AND STOP AT WAIT 1.
 4. THE 1816 'PROCEED' LIGHT SHOULD BE ON. PRESS ANY KEY ON THE KEYBOARD. THE PROGRAM WILL READ THE 1816, LOAD THE A REGISTER WITH THE CHARACTER READ, AND STOP AT WAIT 1. (SEE KEYBOARD CHARACTER TABLE IN APPENDIX A). THE ILSW WILL BE IN THE Q-REG AND THE DSW IN XR-1.
 5. REPEAT.
3. SERVICE HINTS
1. THE 'PROCEED' LIGHT MUST BE ON BEFORE A CHARACTER KEY WILL CAUSE AN INTERRUPT.
 2. THE 'PROCEED' LIGHT CAN BE TURNED ON BY PRESSING THE 'KEYBOARD REQUEST' KEY.
 3. THE 'RESET' BUTTON ON THE P.C. CONSOLE AND THE 'RESTORE' KEY ON THE 1816 WILL RESTORE ALL KEYS ON THE KEYBOARD.

BIT	DESCRIPTION
0	PTR. SERV. REQ.
1	KEYBOARD SER. REQ.
2	KEYBOARD REQ.
4	PRTR. BUSY
5	PRTR. NOT RDY.
6	KEYBOARD NOT RDY.
7	S.P.V.
8	KEYBOARD PARITY ERROR
9	PRTR. PARITY ERROR
12	C.E. PRTR. BUSY.
13	C.E. PRTR. (OR KEYBOARD) NOT RDY.

```

*** 1816 KEYBOARD SCOPE LOOP *** X1, X11
*
0280          ABS
              ORG      40
*
0028 0 611F   BEGIN LDX  1 31   NUMBER OF INST TO MOVE
0029 0 C108   CONT  LD   1 8    PICK UP INST
002A 0 D130   STO   1 48   * AND MOVE
002B 0 C004   LD     ADRS    GET INTR VECTOR
002C 0 D108   STO   1 8    * AND SET IN PLACE
002D 0 71FF   MDX   1 -1
002E 0 70FA   MDX   CONT
002F 0 6031   LDX   START
0030 0 0038   ADRS  DC    ENTRY    INTERRUPT ADDRESS
*
0031 0 C010   START LD   INST  GET BCH INST
0032 0 D0CD   STO   /0    * AND SET IN AT ZERO
0033 0 0810   XIO   UNMK1  UNMASK LEVEL 1
0034 0 0811   XIO   UNMK2  UNMASK LEVEL 2
0035 0 0816   WAIT  XIO  CNTL  TURN ON PROCEED
0036 0 C011   LD     ILSW  GET CHARACTER CODE
0037 0 3001   WAIT  1    WAIT FOR INTERRUPT
*
0038 0 0000   ENTRY  DC   /0000  INTERRUPT ENTRY
0039 0 080E   XIO   ILSW  SENSE ILSW
003A 0 18D0   RTE   16    SAVE ILSW IN 0-REG
003B 0 080E   XIO   DSW   SENSE DSW
003C 0 D001   STO   TEMP+1
003D 00 65000000 TEMP  LDX  L1  *-*   XR 1 HAS DSW
003E 0 080E   XIO   READ  READ *KEYBOARD
0040 00 4C400035 BOSC  L  WAIT  RESET INTR AND GO TO WAIT
*
0042 0 7030   INST  MDX  X  START-1  USED FOR RESET-START
0044 0 0000   BSS   E
0044 0 0000   UNMK1  DC
0045 0 0480   DC     /0480  UNMASK IOCC
0046 0 0000   UNMK2  DC
0047 0 0481   DC     /0481  UNMASK IOCC
0048 0 0000   ILSW  DC   /0000  INPUT CHARACTER
0049 0 0300   DC     /0300  SENSE ILSW IOCC
004A 0 0000   DSW   DC
004B 0 0F03   DC     /0F03  SENSE DSW IOCC
004C 0 0000   CNTL  DC
004D 0 0C02   DC     /0C02  CONTROL IOCC
004E 0 0048   READ  DC   ILSW  INPUT AREA
004F 0 0A02   DC     /0A02  READ KEYBOARD IOCC
*
0050 0 0028   END    BEGIN
*
*** NOTE 1 ***
*
*THIS LISTING IS FOR THE FIRST 1816. FOR
*THE SECOND 1816, THE FOLLOWING STORAGE LOCATIONS
*CONTAIN -
*
* LOCATION          CONTENTS
*
* /004B             /7F03
* /004D             /7C02
* /004F             /7A02
    
```



1. PROGRAM DESCRIPTION
WILL MOVE THE CARRIAGE BETWEEN ANY TWO CYLINDERS. THE PROGRAM WILL ACCESS TO THE BEGINNING CYLINDER, REVERSE DIRECTION AND ACCESS THE NUMBER OF CYLINDERS INDICATED IN THE CYLINDER COUNT. THE PROGRAM WILL LOOP, ALTERNATING IN THE FORWARD AND REVERSE DIRECTION. NO DATA WILL BE READ OR WRITTEN ON THE DISK.

- 2. OPERATING PROCEDURE**
1. PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP 'READY!' FOR PAPER TAPE INPUT, PLACE THE 'DELETE HOLE' SECTION OF THE PAPER TAPE OVER THE READ STATION.
 2. SET 'CHECK STOP' SWITCH ON.
 3. PRESS 'RESET' AND 'PROGRAM LOAD' CONSOLE BUTTONS. THE PROGRAM WILL LOAD AND STOP AT WAIT 1. (B REG. = /3001)
 4. SET THE SENSE/PROG. SWS. TO SELECT THE DRIVE TO BE RUN.
DRIVE 1 = /20
DRIVE 2 = /40
DRIVE 3 = /48
 5. SET DATA ENTRY SWITCHES 0-7 TO SPECIFY THE STARTING CYLINDER NUMBER AND SWITCHES 8-15 TO SPECIFY THE NUMBER OF CYLINDERS TO SEEK. (SEE HEX TO DECIMAL CONVERSION TABLE IN THE FLOW CHART.)
 6. PRESS CONSOLE START BUTTON. THE PROGRAM WILL SEEK FORWARD BY THE BEGINNING CYLINDER COUNT, SEEK BACK BY AMOUNT OF SEEK COUNT, SEEK FORWARD BY AMOUNT OF SEEK COUNT, SEEK BACK BY AMOUNT OF SEEK COUNT, ETC.
 7. IF A CAR CHECK ERROR OCCURS, THE PROGRAM WILL STOP AT WAIT 8.

- 3. SERVICE HINTS**
1. WHEN SCOPING THE SINGLE SHOT THAT PERMITS THE HEADS TO SETTLE, THE SEEK OPERATION SHOULD MOVE THE CARRIAGE AT LEAST FIVE CYLINDERS. THIS WILL INSURE THAT THE SINGLE SHOT WILL 'TIME OUT' AFTER EACH SEEK OPERATION.

DECIMAL TO HEX CONVERSION TABLE

CYLINDER NUMBER IN DECIMAL	DATA ENTRY SWITCH SETTING IN HEX
10	0A
20	14
30	1E
40	28
50	32
60	3C
70	46
80	50
90	5A
100	64
110	6E
120	78
130	82
140	8C
150	96
160	A0
170	AA
180	B4
190	BE
200	C8

DSW

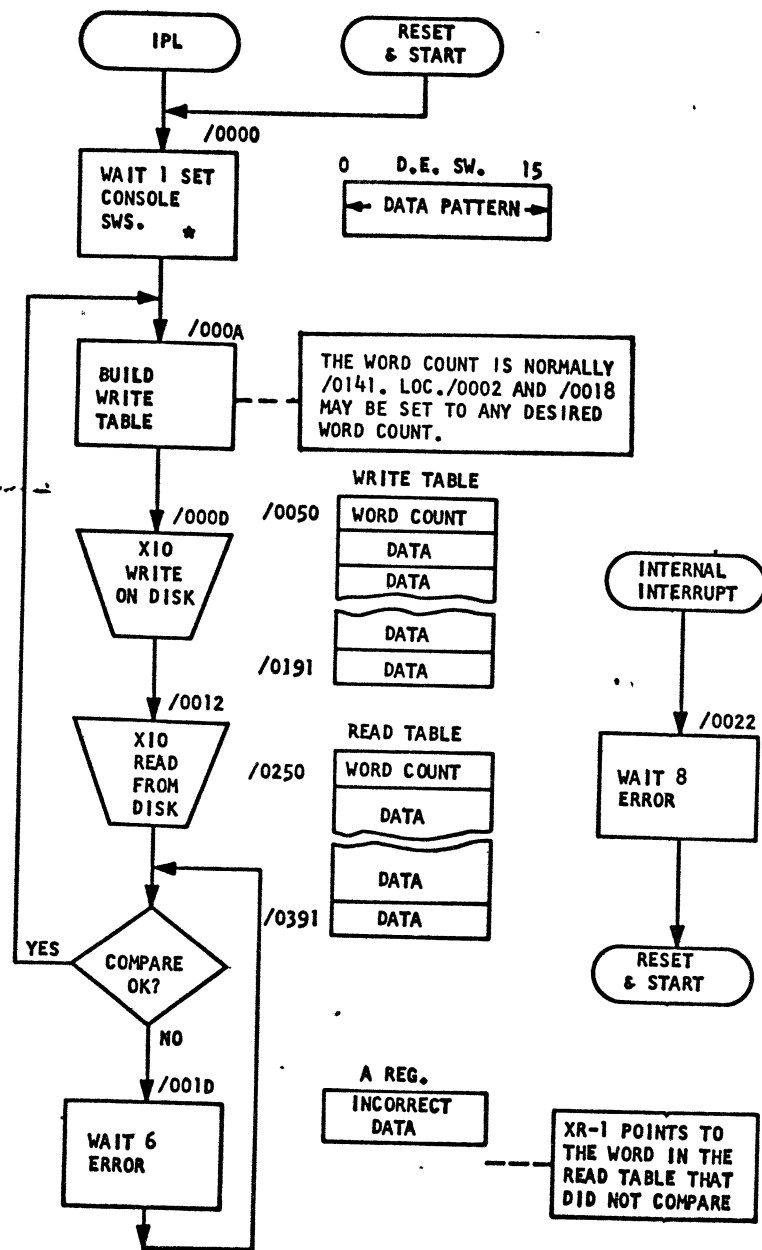
0	ANY ERROR*
1	OP. COMPL.
2	DISK NOT RDY.
3	DISK BUSY (R/W OR CARR.)
4	CARR. HOME
5	PARITY CHECK ERROR
6	STOR. PROT. ERROR
7	DATA ERROR
8	WRITE SEL. ERROR
9	DATA OVERRUN
11	C.E. NOT RDY.
12	C.E. BUSY
14-15	SECTOR COUNT.

SCOPE LOOP PROGRAMS

APPENDIX B

```

*** 1810A SEEK SCOPE LOOP *** XIII
*
0000 0 3001
0001 0 081D
*
0002 0 E01A
0003 0 E81A
0004 0 D020
0005 0 D021
0006 0 E81B
0007 0 6009
0008 0 001B
0009 0 0019
000A 0 0816
*
000B 0 1808
000C 0 D019
000D 0 0816
000E 0 C018
000F 0 F010
0010 0 D016
0011 0 0811
0012 0 1001
0013 0 4810
0014 0 6011
0015 0 0810
0016 0 1000
0017 0 0809
*
0018 0 E00B
0019 0 D00C
001A 0 600E
001B 0 0000
001C 0 3008
*
001D 0 F800
001E 0 0404
001F 0 0760
0020 0 0004
0021 0 0740
0022 0 0701
0023 0 0005
0024 0 00FF
0025 0 0004
0026 0 0000
0027 0 0000
*
0028 0 0000
0029 0 0000
0030 0 0000
*
0031 0 0000
0032 0 0000
0033 0 0000
0034 0 0000
0035 0 0000
0036 0 0000
0037 0 0000
0038 0 0000
0039 0 0000
0040 0 0000
0041 0 0000
0042 0 0000
0043 0 0000
0044 0 0000
0045 0 0000
0046 0 0000
0047 0 0000
0048 0 0000
0049 0 0000
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0095 0 0000
0096 0 0000
0097 0 0000
0098 0 0000
0099 0 0000
0100 0 0000
0101 0 0000
0102 0 0000
0103 0 0000
0104 0 0000
0105 0 0000
0106 0 0000
0107 0 0000
0108 0 0000
0109 0 0000
0110 0 0000
0111 0 0000
0112 0 0000
0113 0 0000
0114 0 0000
0115 0 0000
0116 0 0000
0117 0 0000
0118 0 0000
0119 0 0000
0120 0 0000
0121 0 0000
0122 0 0000
0123 0 0000
0124 0 0000
0125 0 0000
0126 0 0000
0127 0 0000
0128 0 0000
0129 0 0000
0130 0 0000
0131 0 0000
0132 0 0000
0133 0 0000
0134 0 0000
0135 0 0000
0136 0 0000
0137 0 0000
0138 0 0000
0139 0 0000
0140 0 0000
0141 0 0000
0142 0 0000
0143 0 0000
0144 0 0000
0145 0 0000
0146 0 0000
0147 0 0000
0148 0 0000
0149 0 0000
0150 0 0000
0151 0 0000
0152 0 0000
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0155 0 0000
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0157 0 0000
0158 0 0000
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0160 0 0000
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0171 0 0000
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0174 0 0000
0175 0 0000
0176 0 0000
0177 0 0000
0178 0 0000
0179 0 0000
0180 0 0000
0181 0 0000
0182 0 0000
0183 0 0000
0184 0 0000
0185 0 0000
0186 0 0000
0187 0 0000
0188 0 0000
0189 0 0000
0190 0 0000
0191 0 0000
0192 0 0000
0193 0 0000
0194 0 0000
0195 0 0000
0196 0 0000
0197 0 0000
0198 0 0000
0199 0 0000
0200 0 0000
*
ABS
BEGIN WAIT 1
XIO /001F
*
AND /001D
OR /001E
STO /0025
STO /0027
OR /0022
LDX /0009
DC /001B
STO /0023
XIO /0021
*
SRA 8
STO /0026
XIO /0024
LD /0027
EOR /0020
STO /0027
XIO /0023
SLA 1
BSC -
LDX /0011
XIO /0026
NOP
XIO /0021
*
AND /0024
STO /0026
LDX /000E
DC
WAIT 8
*
DC /F800
DC /0404
DC /0760
DC /0004
DC /0740
DC /0701
DC /0005
DC /00FF
DC /0004
DC
DC
DC
END BEGIN
    
```



- PROGRAM DESCRIPTION**
WRITES A FULL SECTOR (321 WORDS) FROM STORAGE LOCATIONS /0051- /0191 ON TO SECTOR ZERO OF WHEREVER THE CARRIAGE IS LOCATED. IT WILL THEN READ INTO STORAGE LOCATIONS /0251- /0391, AND COMPARE THE TWO TABLES.
- OPERATING PROCEDURE**
 - PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP "READY". FOR PAPER TAPE INPUT, PLACE THE "DELETE HOLE" PORTION OF THE PAPER TAPE OVER THE READ STATION.
 - SET "CHECK STOP" SWITCH ON.
 - PRESS "RESET" AND "PROGRAM LOAD" CONSOLE BUTTONS. THE PROGRAM WILL LOAD AND STOP AT WAIT 1.
 - SET THE DESIRED DATA PATTERN IN THE DATA ENTRY SWITCHES.

* CAUTION * DO NOT USE ON CUSTOMER PACK. INSURE THAT THE CARRIAGE IS NOT LOCATED ON ONE OF THE C.E. CYLINDERS (90₁₀ - 110₁₀)

 - PRESS THE CONSOLE "START" BUTTON. THE PROGRAM WILL RUN IN A WRITE/READ/COMPARE LOOP. IF THE PROGRAM IS READING AND WRITING, THE "C.S. SERV." CONSOLE LIGHT WILL GLOW FAINTLY.
 - IF A DATA COMPARE ERROR OCCURS, THE PROGRAM WILL STOP AT WAIT 6.
 - IF A CAR CHECK ERROR OCCURS, THE PROGRAM WILL STOP AT WAIT 8.
- SERVICE HINTS**
 - LOCATIONS /0002 AND /0018 CONTAIN THE WORD COUNT. TO MODIFY THE LENGTH OF THE DATA TABLE, CHANGE THESE LOCATIONS TO THE DESIRED NO. THEN PRESS "RESET" AND "START" BUTTONS.
 - TO CHANGE THE SECTOR NO., ALTER THE LOW ORDER HEX DIGIT IN LOCATIONS /0025 AND /0027. THE PROGRAM NORMALLY USES SECTOR ZERO. ENTER 1-7 TO SELECT ANY OTHER SECTOR.
 - FOR A CONTINUOUS WRITE OPERATION, CHANGE THE X10 AT /0012 TO /600D (LDX).
 - FOR A CONTINUOUS READ OPERATION, CHANGE THE LDX AT /0017 TO /6012 (LDX).

DSW

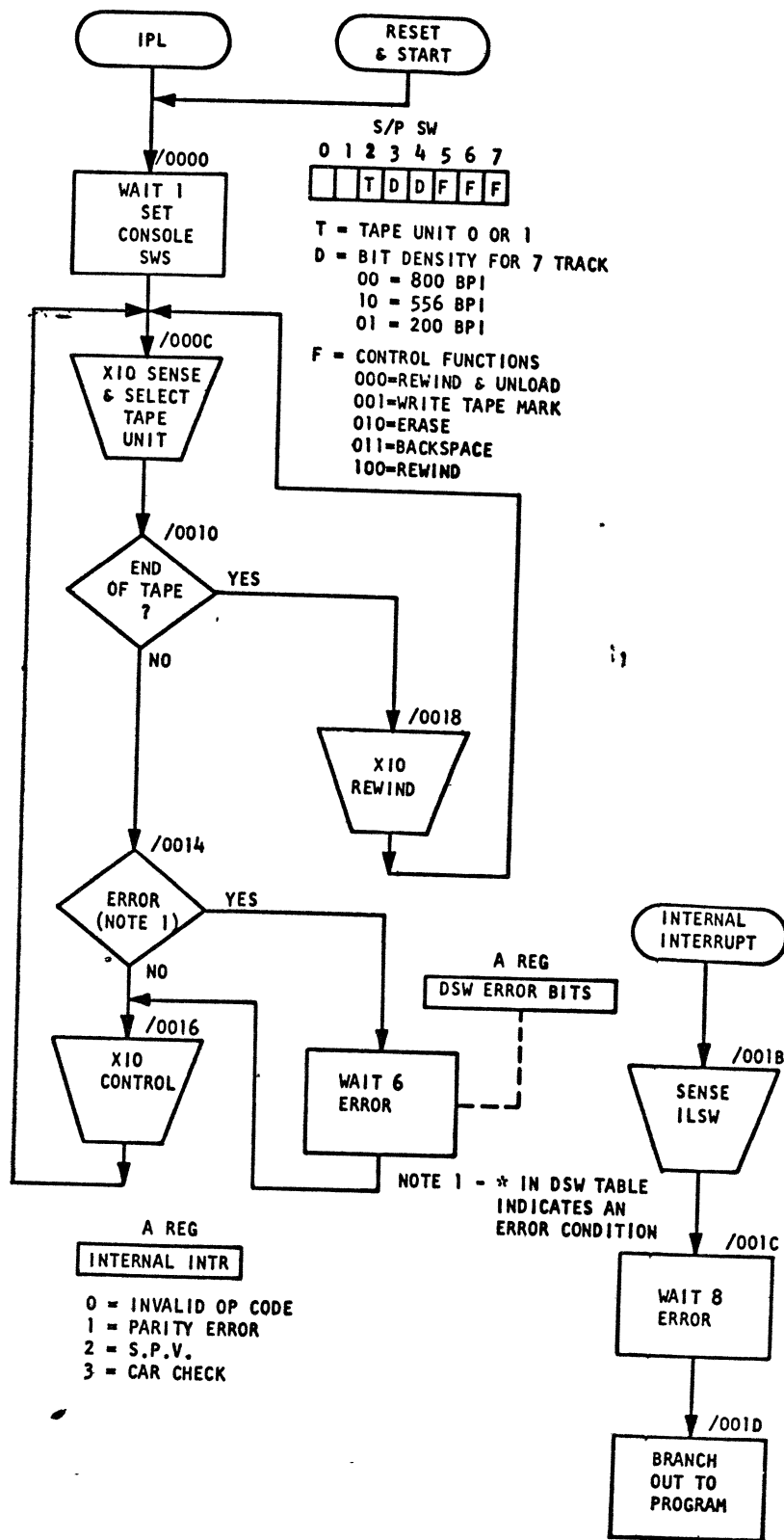
 - ANY ERROR
 - OP. COMPL.
 - DISK NOT RDY.
 - DISK BUSY (R/W OR CARR.)
 - CARR. HOME
 - PARITY CHECK ERROR
 - STOR. PROT. ERROR
 - DATA ERROR
 - WRITE SEL. ERROR
 - DATA OVERRUN
 - C.E. NOT RDY.
 - C.E. BUSY
 - 14-15 SECTOR COUNT

```

*** 1810A AND B WR/RD/CMP SCOPE LOOP *** XIV, XV, XVI
*
ABS
BEGIN WAIT 1 WAIT AFTER IPL.
LDX L1 /0141 PUT 321 IN XR1. THIS IS THE WD CT
STX L1 /0250 PUTS WORD COUNT IN READ TABLE
* LOC. /0250.
* STX 1 /0050 PUTS WORD COUNT IN WRITE TABLE
* LOC. /0050.
* X10 /0009 SENSE DATA SW'S.
* SW'S 0 THRU 15 = WRITE DATA
* LDX /000A BRANCH TO /000A.
DC /0021 INTERNAL INTERRUPT VECTOR.
DC /0740 IOCC-SENSE DATA SW'S.
* STO 1 /0050 STORE DATA SW'S IN WRITE TABLE.
* MDX 1 -1 DECR. XR1 (SKIP AFTER 321 LOOPS).
* LDX /000A BRANCH TO /000A.
* X10 /0024 INIT. WRITE FROM LOCATION /0050.
* X10 /0023 SENSE DSW.
* SLA 1 PUTS OP COMPLETE AT BIT 0.
* BSC - SKIP IF OP COMPLETE. (BIT 0=1)
* LDX /000E BRANCH TO /000E.
* X10 /0026 INIT. READ INTO LOCATION /0250.
* X10 /0023 SENSE DSW.
* SLA 1 PUTS OP COMPLETE AT BIT 0.
* BSC - SKIP IF OP COMPLETE. (BIT 0=1)
* LDX /0013 BRANCH TO /0013.
* LDX L1 /0141 PUT 321 IN XR1. THIS IS THE WD CT.
* LD L1 /0250 LOAD WORD FROM READ TABLE.
* CMP 1 /0050 IS RDTBL WORD=WRTBL WORD.
* NOP NO
* WAIT 6 NO, COMPARE ERROR.
* MDX 1 -1 YES, DECR. XR1 BY 1.
* SKIP AFTER 321 LOOPS.
* LDX /0019 BRANCH TO /0019.
* LDX /0001 BRANCH TO /0001. REPEAT PROGRAM.
*
*** INTERNAL INTERRUPT ROUTINE ***
*
DC
WAIT 8 INTERNAL INTR ENTRY
INTERNAL ERROR.
*
*** IOCC'S ***
*
DC /2701 SENSE DSW AND RESET. (NOTE 1)
DC /0050 INIT. WR FROM LOC /0050. WC=321
DC /2500 (WRTBL IS AT LOC /0050 - /0191)
* (NOTE 1)
*
DC /0250 INIT. RD FROM LOC. /0250. WC=321
DC /2600 (RDTBL IS AT LOC /0250 - /0391)
* (NOTE 1)
*
END BEGIN
*
*** NOTE 1 ***
*
*THIS LISTING IS FOR DRIVE NO. 1. FOR DRIVE NO. 2
*AND 3, THE FOLLOWING STORAGE LOCATIONS CONTAIN -
*
* LOCATION DRIVE 2 DRIVE 3
*
* /0023 /4701 /4F01
* /0025 /4500 /4D00
* /0027 /4600 /4E00

```

APPENDIX B



- 1. PROGRAM DESCRIPTION**
 WILL EXECUTE ANY ONE OF THE FIVE CONTROL FUNCTIONS.
 1. REWIND AND UNLOAD
 2. WRITE TAPE MARK
 3. ERASE
 4. BACKSPACE
 5. REWIND
- 2. OPERATING PROCEDURE**
 1. LOAD THE TAPE DRIVE AND MAKE "READY".
 2. PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP "READY". FOR PAPER TAPE INPUT, PLACE THE DELETE HOLE SECTION OF THE PAPER TAPE OVER THE READ STATION.
 3. SET "CHECK STOP" SWITCH ON.
 4. PRESS "PROGRAM LOAD" CONSOLE BUTTON. PROGRAM WILL LOAD AND STOP AT WAIT 1.
 5. SET S/P SW. 2 TO SELECT THE TAPE UNIT (0 OR 1). SET S/P SWS. 3 AND 4 TO INDICATE 7 TRACK BIT DENSITY. 00=800 BPI 10=556 BPI 01=200 BPI. SET S/P SWS. 5-7 TO SELECT THE CONTROL OPERATION. 000=REWIND AND UNLOAD. 001=WRITE TAPE MARK. 010=ERASE. 011=BACKSPACE. 100=REWIND.
 6. PRESS "START" CONSOLE BUTTON. PROGRAM WILL PERFORM THE OPERATION DEFINED IN S/P SWITCHES 5-7
 7. IF AN ERROR IS DETECTED IN THE DSW, THE PROGRAM WILL STOP AT WAIT 6
 8. IF A CAR CHECK ERROR OCCURS, PROGRAM WILL STOP AT WAIT 8.
- 3. SERVICE HINTS**
 1. A BACKSPACE AT LOAD POINT WILL GIVE A COMMAND REJECT. PLACE A NOP AT LOCATION /0015 TO LOOP.

DSW	
BIT	DESCRIPTION
0	SPARE
1	TAPE UNIT 1 SELECT
*2	COMMAND REJECT
3	END OF TABLE
*4	CHAIN STOP
*5	STO PROT. VIOLATION
*6	TAPE DATA ERROR
*7	BUS OUT/PC PARITY
*8	DATA OVERRUN
9	OPERATION COMPLETE
*10	CE DIAGNOSTIC IND.
*11	WRONG LENGTH REC.
12	AT LOAD POINT
13	TAPE IND. OR MARK
14	TAPE BUSY OR RWND.
15	TAPE BUSY OR NOT RDY.

*** 2400 CONTROL, SCOPE LOOP *** XVII

```

*
0000 0 3001
0001 0 081D
0002 0 1808
0003 0 E81C
0004 0 D022
0005 0 E01C
0006 0 E81D
0007 0 6009
0008 0 001A
0009 0 D01B
000A 0 E816
000B 0 D017
000C 0 0816
000D 0 4804
000E 0 600C
000F 0 1802
0010 0 4804
0011 0 6018
0012 0 1002
0013 0 E012

0014 0 4820
0015 0 3006
0016 0 0810
0017 0 6001
0018 0 080C
0019 0 600C
001A 0 0000
001B 0 0805
001C 0 3008
001D 00 4CC0001A
001F 0 0760
0020 0 7400
0021 0 0300
0022 0 0020
0023 0 7700
0024 0 7404
0025 0 7404
0026 0 2F80
0027 0 7400
0028 0000

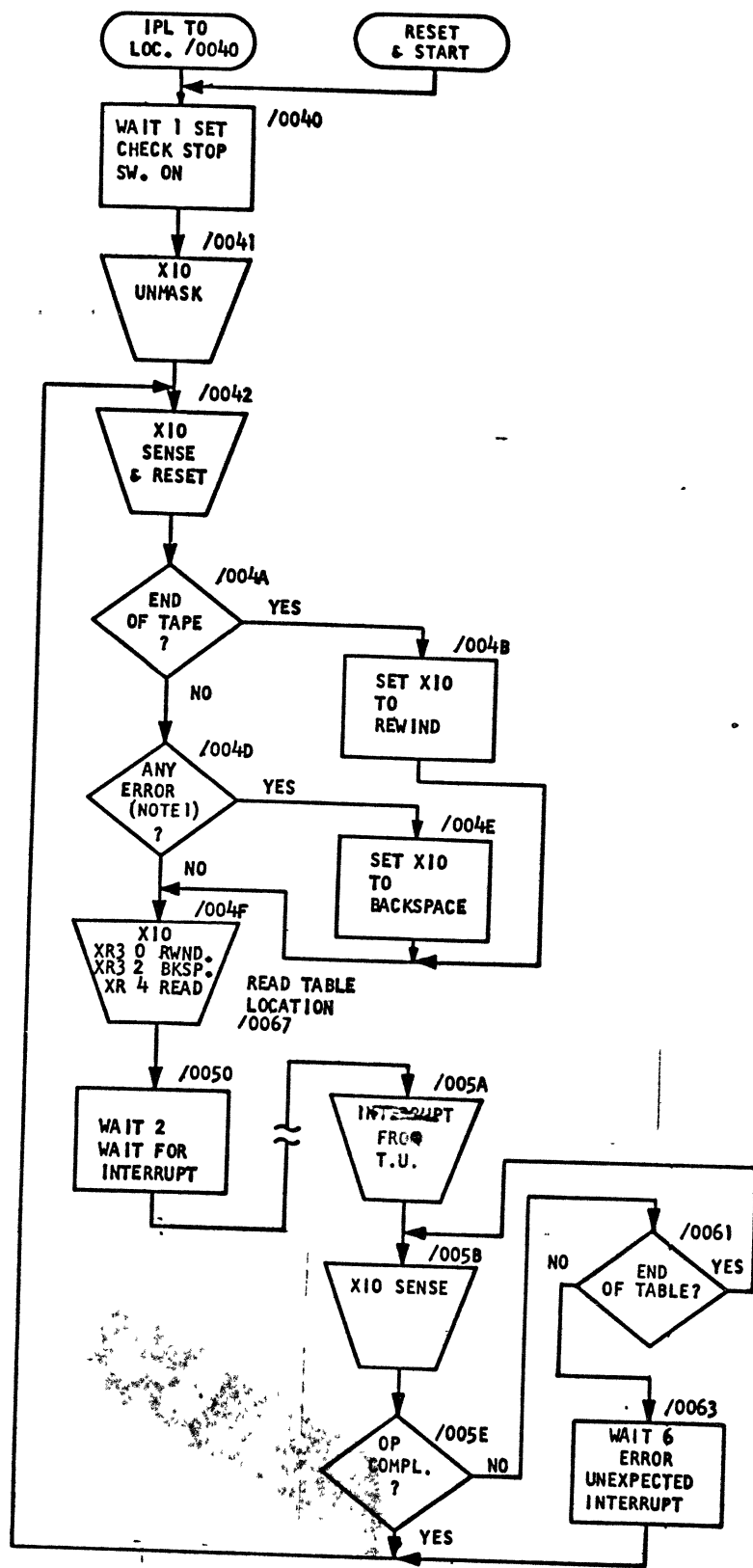
BEGIN WAIT 1
XIO SPSW-1
SRA 8
OR ILSW
STO /0027
AND DSW
OR REWD
LDX /0009
DC /001A
STO REWD+1
OR ILSW+1
STO DSW+1
XIO DSW
BSC E
LDX /000C
SRA 2
BSC E
LDX /0018
SLA 2
AND CNTL

BSC 2
WAIT 6
XIO CNTL
LDX /0001
XIO REWD
LDX /000C
DC
XIO ILSW
WAIT 8
BOSC I /001A
DC /0760
ILSW DC /7400
DC /0300
DSW DC /0020
DC /7700
REWD DC /7404
DC /7404
CNTL DC /2F80
DC /7400
END BEGIN
    
```

DATE 01 JUL 66 EC 415178 DATE 04 NOV 66 EC 415233 DATE 15 FEB 67 EC 415233B DATE 15 MAY 67 EC 411731 DATE 12 DEC 68 EC 411961 PROG ID 08C8-* PAGE 14

DATE 14 NOV 69 EC 431319 DATE 31 JUL 70 EC 431326

APPENDIX B



1. PROGRAM DESCRIPTION
WILL READ MAGNETIC TAPE, CHECK FOR ERRORS (SEE NOTE 1), REWIND WHEN END OF TAPE IS DETECTED, AND REPEAT.
THIS PROGRAM OPERATES UNDER CONTROL OF INTERRUPTS ON ANY ASSIGNED LEVEL 0-13. TO OPERATE ON LEVELS 14-23, SEE SERVICE HINTS. NOTE-PROGRAM MUST BE LOADED INTO CORE STARTING AT LOCATION /0040.

2. OPERATING PROCEDURE
1. CLEAR STORAGE TO /005A. (SETS VECTOR, ADDRESSES)
 2. LOAD /6040 INTO LOC. /0000. (BRANCH TO LOC. /0040)
 3. SET THE "CHECK STOP" SWITCH ON.
 4. PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE "START" BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP "READY". FOR PAPER TAPE INPUT, PLACE THE DELETE SECTION OF THE PAPER TAPE OVER THE READ STATION
 5. LOAD PROGRAM STARTING AT LOCATION /0040.
 - a) SET I-COUNTER TO /0040.
 - b) PRESS "PROGRAM LOAD" BUTTON ON CONSOLE. PROGRAM SHOULD LOAD AND STOP AT WAIT 1.
 6. LOAD THE TAPE DRIVE WITH THE TAPE TO BE READ AND MAKE "READY". (NORMALLY A TAPE GENERATED BY THE 2400 WRITE-READ-COMP. PROGRAM)
 7. PRESS "START" CONSOLE BUTTON. PROGRAM WILL START READING TAPE.
 8. IF AN UNEXPECTED INTERRUPT IS RECEIVED THE PROGRAM WILL STOP AT WAIT 6.

3. SERVICE HINTS
1. THIS PROGRAM SETS A WORD COUNT OF /001A CORRESPONDING TO THE RECORD LENGTH OF THE 2400 WRITE-READ-COMP SCOPE LOOP. TO CHANGE WORD COUNT, ALTER LOCATION /0067.
 2. IF THE TAPE CONTROL UNIT IS ASSIGNED TO AN INTERRUPT LEVEL 14 TO 23, ALTER LOCATION /0059 TO /0481.
 3. ANY RECORD THAT CANNOT BE READ WITHOUT ERRORS WILL CAUSE CONTINUOUS BACKSPACE RE-READS.

DSW

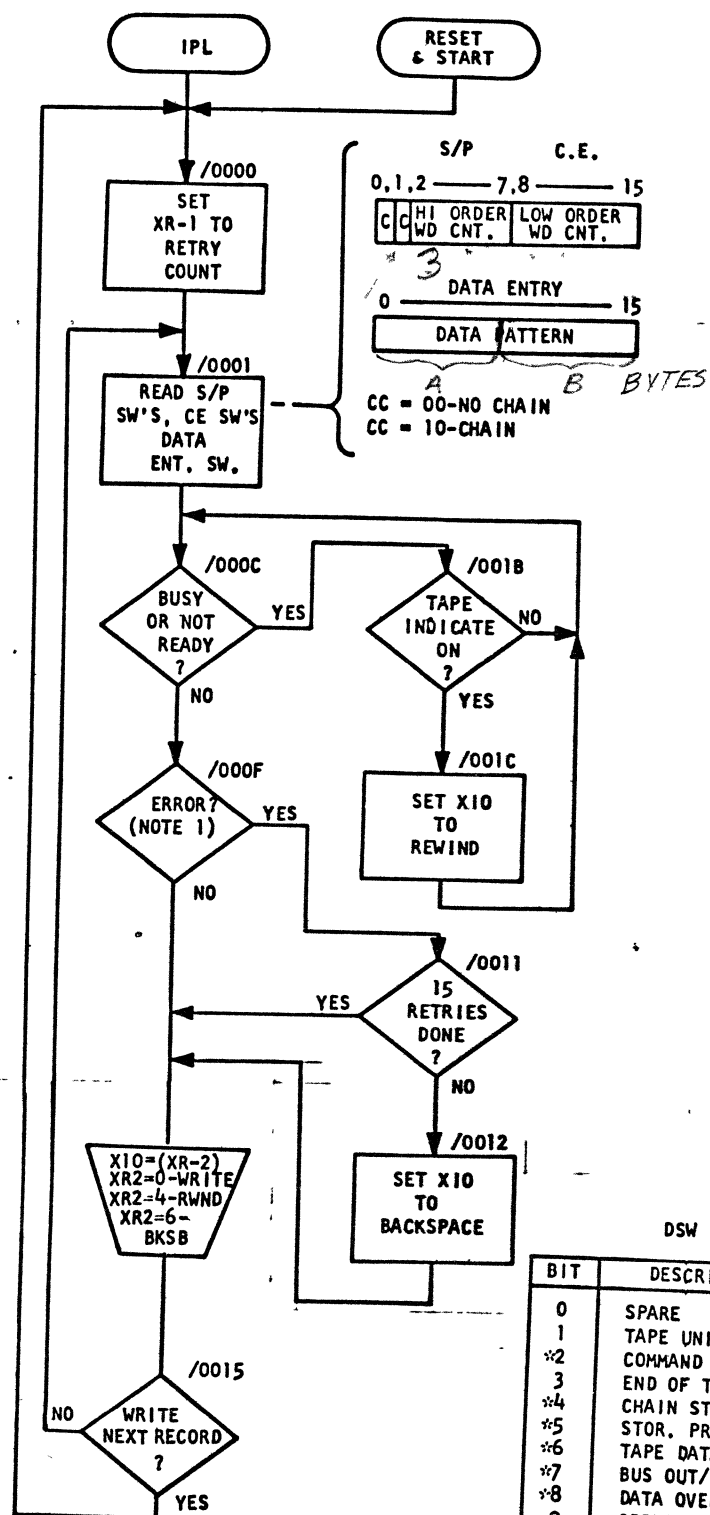
BIT	DESCRIPTION
0	SPARE
1	TAPE UNIT 1 SELECT
*2	COMMAND REJECT
3	END OF TABLE
*4	CHAIN STOP
*5	STO.PROT. VIOLATION
*6	TAPE DATA ERROR
*7	BUS OUT/PC PARITY
*8	DATA OVERRUN
9	OPERATION COMPLETE
*10	CE DIAGNOSTIC IND.
*11	WRONG LENGTH REC.
12	AT LOAD POINT
13	TAPE IND. OR MARK
14	TAPE BUSY OR RWND.
15	TAPE BUSY OR NOT RDY.

*** 2400 INTERRUPT READ, SCOPE LOOP *** XVIII, XIX

```

*
* ABS
BEGIN WAIT 1 WAIT AFTER IPL.
XIO /0058 UNMASK.
XIO /0047 SENSE DSW. PUTS BUSY AT BIT 15.
BSC E SKIP IF NOT BUSY. (BIT 15=0)
LDX /0042 BRANCH TO /0042.
XIO /0051 SENSE DSW AND RESET.
BOSC +-2 RESET INTERRUPTS AND SKIP TO /0048.
DC /7700 SENSE DSW. (NOTE 1)
LDX 3 4 PUT 4 IN XR3. (INIT. READ)
SRT 2 PUTS TAPE INDICATOR AT BIT 15.
BSC E SKIP IF NOT TAPE IND. (BIT 15=0)
LDX 3 0 PUT 0 IN XR3. (REWIND)
* ALSO, SENSE ILSW IOCC.
AND /0052 AND IN /OBEC. LEAVES ERROR
BITS IN ACCUM.
* BSKP. IF=2.
BSC 2 WAIT FOR INTERRUPT.
LDX 3 2 SENSE DSW AND RESET. (NOTE 1)
XIO 3 /0052 PUT 2 IN XR3. (BACKSPACE)
INIT. READ IF XR3=4, REWIND IF=0.
* BKSP. IF=2.
WAIT 2 WAIT FOR INTERRUPT.
DC /7701 SENSE DSW AND RESET. (NOTE 1)
DC /OBEC REWIND. ALSO, DSW ERROR CONSTANT.
DC /7404 (NOTE 1)
DC /0B0E BACKSPACE. ALSO,
* DSW CORRECTION CONSTANT.
DC /7408 (NOTE 1)
DC /0067 INIT. READ INTO LOCATION /0067.
DC /7606 (NOTE 1)
DC /0003 UNMASK.
DC /0480
DC
DC
XIO /004B INTERNAL INTR ENTRY
XIO /0047 SENSE ILSW.
SRT 6 PUTS OP COMPLETE AT BIT 15.
BSC L /0064,E IF OP COMPLETE, BRANCH TO /0064.
(BIT 15=1)
* PUTS END OF TABLE AT BIT 15.
SRT 6 IF END OF TABLE, BRANCH TO /005B.
BSC L /005B,E BIT 15=1
* ERROR. (UNEXPECTED INTERRUPT)
WAIT 6 DECR. XR3 BY 1. CHECK FOR
MDX 3 -1 LAST REWIND.
* NOT A REWIND, SO BRANCH TO /0045.
LDX /0045 IT WAS A REWIND, SO BR. TO /0042.
LDX /0042
*
*** READ TABLE ***
*
DC /001A BEGIN READ TABLE, (/0067 THRU /0081)
DC /001A 1ST READ WORD.
* ETC.
*
END BEGIN
*
*** NOTE 1 ***
*
*THIS LISTING IS FOR TAPE DRIVE ZERO. FOR
*TAPE DRIVE ONE, THE FOLLOWING LOCATIONS
*CONTAIN -
* LOCATION CONTENTS
* /0047 /7720
* /0051 /7721
* /0053 /7424
* /0055 /742B
* /0057 /7626
  
```


APPENDIX B



NOTE 1 - * IN DSW TABLE INDICATES AN ERROR CONDITION.

BIT	DESCRIPTION
0	SPARE
1	TAPE UNIT 1 SELECT
*2	COMMAND REJECT
3	END OF TABLE
*4	CHAIN STOP
*5	STOR. PROT. VIOLATION
*6	TAPE DATA ERROR
*7	BUS OUT/PC PARITY
*8	DATA OVERRUN
9	OPERATION COMPLETE
*10	CE DIAGNOSTIC IND.
*11	WRONG LENGTH REC.
12	AT LOAD POINT
13	TAPE IND. OR MARK
14	TAPE BUSY OR RWND.
15	TAPE BUSY OR NOT RDY.

1. PROGRAM DESCRIPTION

WILL WRITE RECORDS OF ANY DESIRED LENGTH OR CHAIN CONTINUOUSLY. THE DATA WRITTEN IS DETERMINED BY THE DATA ENTRY SWITCHES. UPON SENSING END OF TAPE STICKER, TAPE WILL REWIND AND THEN CONTINUE. DATA WILL BE WRITTEN IN 2 BYTE MODE ON A 9 TRACK DRIVE AND IN 3 BYTE MODE ON A 7 TRACK DRIVE. UPON DETECTING AN ERROR, UP TO 15 BACKSPACE RETRIES WILL BE DONE. IF ERROR CANNOT BE CORRECTED, TAPE ADVANCES AND WRITES NEXT RECORD.

2. OPERATING PROCEDURE

- LOAD TAPE UNIT AND MAKE READY.
- CLEAR CORE TO /002A (IF CHAINING).
- SET SWITCHES AS FOLLOWS:
 - 'CHECK STOP' ON
 - S/P SW 0,1 = 00 - NO CHAIN = 10 - CHAIN
 - S/P SWS 2 THRU 7=HIGH ORDER WORD COUNT (256-16383)
CE SWS=LOW ORDER WORD COUNT (0-255)
(NOTE - DO NOT EXCEED CORE SIZE MINUS /002C)
 - DATA ENTRY SWS=ANY DESIRED DATA PATTERN
- PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE START KEY ONCE TO RUN THE CARD IN AND ONCE TO BRING UP "READY". FOR PAPER TAPE INPUT, PLACE THE DELETE HOLE SECTION OF PAPER TAPE OVER THE READ STATION.
- PRESS PROGRAM LOAD BUTTON. PROGRAM WILL EXECUTE.

3. SERVICE HINTS

- ENTRY SWITCH INPUT CAN BE CHANGED AT ANY TIME.
- TO DISPLAY DSW ERROR BITS IN ACCUMULATOR, SET LOCATION /0011 TO /3000.
- TO ELIMINATE BACKSPACE, SET ADDRESS /000F TO /4C00.
- TO CHANGE WRITING TO READING, SET LOCATION /0021 TO /7606.
- TO TEST FOR CRC ERROR CORRECTION ON 9 TRACK DRIVE:
 - WRITE SHORT RECORDS OF ALL BITS ON A LENGTH OF TAPE WITHOUT CHAINING.
 - REWIND
 - CHANGE PROGRAM TO READ (SET LOCATION /0021 TO /7606).
 - START PROGRAM IN READ MODE.
 - DISABLE ONE READ TRACK AT A TIME BY PULLING PRE-AMP CARD IN TAPE DRIVE. PROPER CORRECTION IS INDICATED BY A SINGLE BACKSPACE ON EACH RECORD. LACK OF CORRECTION IS INDICATED BY 15 BACKSPACES ON EACH RECORD.

*** 2400 CHAIN WRITE SCOPE LOOP *** XX, XXI

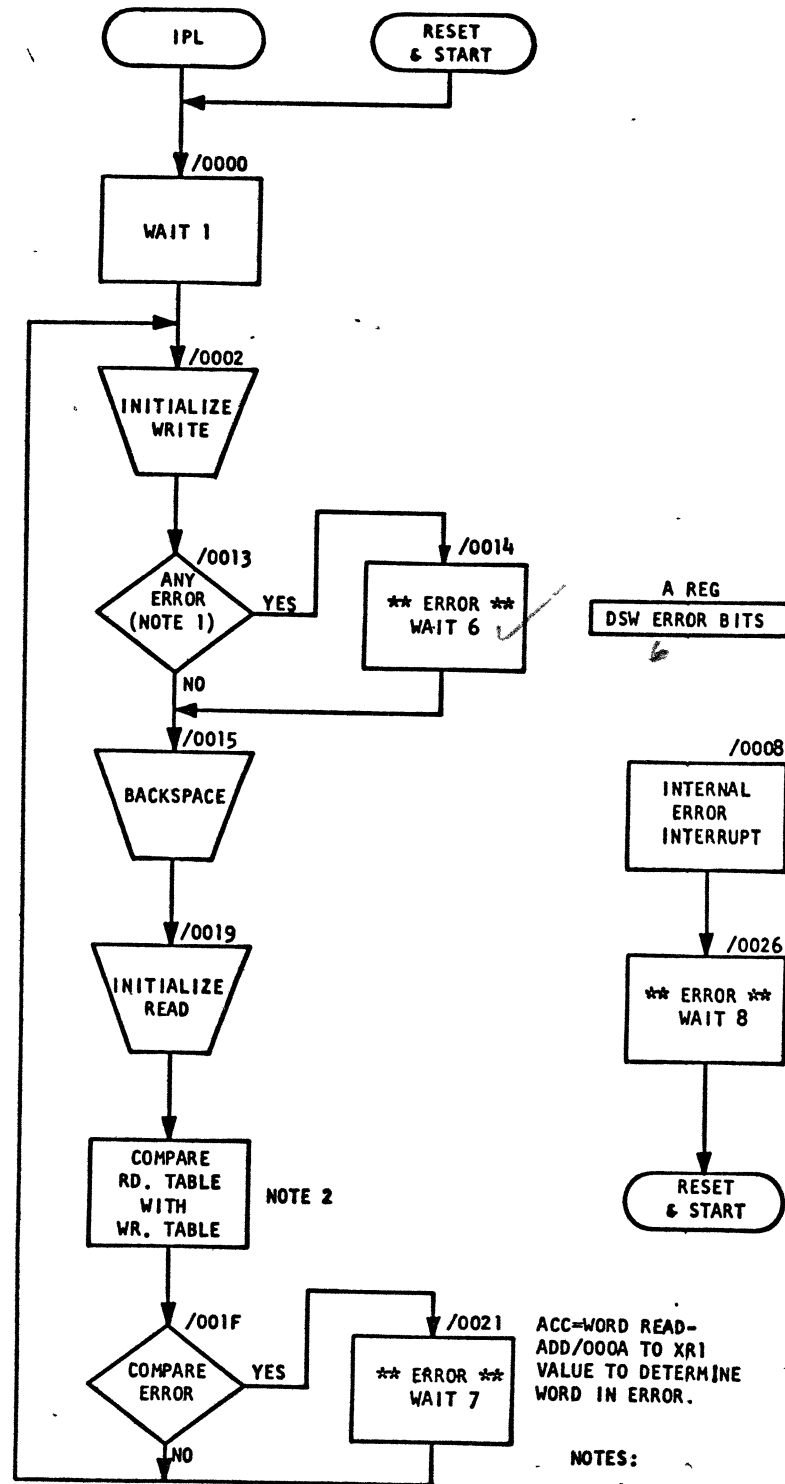
```

*
* ABS
BEGIN LDX 1 16      PUT 16 IN XR1. (MAX. BACKSPACE CT)
      XIO  SPSW     SENSE PROG. AND CE SW'S.
*                               (SC BITS + WORD COUNT)
      STO  /002B    STORE SC BITS + WD CT AT LOC /002B
      AND  /0022    AND IN /3FFF. (CLEARS SC BITS)
      STO  /0029    STORE WORD COUNT AT LOCATION /0029.
      LDX  12 /0029 PUT WORD COUNT IN XR2.
      XIO  DESW     SENSE DATA SW'S.
*                               SW'S 0 THRU 15=WRITE DATA
      STO  2 /002B  STORE DATA SW'S IN WRITE TABLE.
      MDX  2 -1    DECR. XR2 BY 1.
*                               (SKIP WHEN TABLE=WORD COUNT)
      LDX  /0008    BRANCH TO /0008.
      XIO  /0023    SENSE DSW. PUTS BUSY AT BIT 15.
      BSC  E        SKIP IF NOT BUSY (BIT 15=0)
      LDX  /001A    BRANCH TO /001A.
      AND  /0026    AND IN /2F80.
*                               LEAVES ERROR BITS IN ACCUM.
      BSC  L /0013,--+ BRANCH TO /0013 IF NO ERRORS.
      MDX  1 -1    DECR. XR1 BY 1.
*                               (SKIP IF MAX. BACKSPACE COUNT)
      LDX  2 6      PUT 6 IN XR2. SET UP BACKSPACE.
      XIO  2 /0020  WRITE/REWIND/BACKSPACE
      MDX  2 -5    DECR. XR2 BY 5. (SKIP IF LAST BKSP)
      LDX  3 3      PUT 3 IN XR3. (1 BKSP + 2 WRITES)
      MDX  3 -1    DECR. XR3 BY 1.
*                               (SKIP AFTER 1 BKSP + 2 WRITES)
      LDX  /0001    BRANCH TO /0001.
      LDX  /0000    BRANCH TO /0000. REPEAT PROGRAM
      DC   /0760    SENSE PROG. SW'S.
      SLA  12      PUTS TAPE INDICATOR AT BIT 1.
      CMP  /0024    IS TAPE INDICATOR AT BIT 1.
      LDX  2 4      YES, SET UP REWIND
      STX  1 /002B  AND STOP CHAINING.
      LDX  /000B    NO, BRANCH TO /000B.
      DC   /0740    SENSE DATA SW'S.
      DC   /002B    IOCC-INIT. WRITE FROM
      DC   /7504    LOCATION /002B. (NOTE 1)
      DC   /3FFF    CONSTANT
      DC   /7700    IOCC-SENSE DSW. (NOTE 1)
      DC   /3000    IOCC-REWIND
      DC   /7404    (NOTE 1)
      DC   /2F80    IOCC-BACKSPACE.
      DC   /740B    (NOTE 1)
      DC   /0000
      DC   /0000
      DC   /002A
      DC   /002A
      DC   /0000
      DC   /0000
      DC   /0000
      END  BEGIN
  
```

*** NOTE 1 ***

*THIS LISTING IS FOR TAPE DRIVE ZERO. FOR TAPE DRIVE ONE, THE FOLLOWING STORAGE

LOCATION	CONTENTS
/0021	/7524
/0023	/7720
/0025	/7424
/0027	/742B



ACC=WORD READ-
 ADD/000A TO XR1
 VALUE TO DETERMINE
 WORD IN ERROR.

NOTES:

- * IN DSW TABLE INDICATES AN ERROR CONDITION.
- WRITE TABLE LOCATED AT /000A.
 READ TABLE LOCATED AT /0027.

1. PROGRAM DESCRIPTION

WRITES A 26 WORD RECORD OF WHICH THE FIRST 2 WORDS ARE ALTERNATE BITS AND THE REMAINING 24 WORDS ARE RANDOM DATA (THE PROGRAM ITSELF), BACKSPACES, READS AND COMPARES, THEN REPEATS.

2. OPERATING PROCEDURE

- LOAD THE TAPE DRIVE AND MAKE "READY".
- PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP "READY." FOR PAPER TAPE INPUT, PLACE THE DELETE HOLE SECTION OF THE PAPER TAPE OVER THE READ STATION.
- SET "CHECK STOP" SWITCH ON.
- PRESS "PROGRAM LOAD" CONSOLE BUTTON. PROGRAM WILL LOAD AND STOP AT WAIT 1.
- PRESS THE CONSOLE "START" BUTTON. PROGRAM WILL WRITE, BACKSPACE, READ, COMPARE DATA, THEN REPEAT.
- IF AN ERROR IS DETECTED IN THE DSW, PROGRAM WILL STOP AT WAIT 6. INDEX REGISTER 1 INDICATES THE WORD IN ERROR.
- IF A DATA COMPARE ERROR OCCURS, PROGRAM WILL STOP AT WAIT 7.
- IF A CAR CHECK OCCURS, PROGRAM WILL STOP AT WAIT 8.

3. SERVICE HINTS

- TO PERFORM WRITE ONLY WITH ERROR CHECK: SET LOCATION /0015 TO /6002, PRESS "RESET" BUTTON, AND PRESS "START" BUTTON TWICE.
- TO PERFORM READ ONLY WITH COMPARE ERROR CHECK: SET LOCATION /0024 TO /6019, PRESS "RESET" BUTTON, SET I REGISTER TO /0019 AND PRESS "START" BUTTON.

DSW	
BIT	DESCRIPTION
0	SPARE
1	TAPE UNIT 1 SELECT
* 2	COMMAND REJECT
3	END OF TABLE
* 4	CHAIN STOP
* 5	STO PROT. VIOLATION
* 6	TAPE DATA ERROR
* 7	BUS OUT/PC PARITY
* 8	DATA OVERRUN
9	OPERATION COMPLETE
*10	CE DIAGNOSTIC IND.
*11	WRONG LENGTH REC.
12	AT LOAD POINT
13	TAPE IND. OR MARK
14	TAPE BUSY OR RWND.
15	TAPE BUSY OR NOT RDY.

APPENDIX B

```

*** 2400 WR/RD/CMP, SCOPE LOOP ***  XXII, XXIII
*
0000 0 3001      WAIT 1      WAIT AFTER IPL.
*
*** WRITE ***
ABS
BEGIN XIO /0009    SENSE DSW. SELECTS TAPE DRIVE.
      XIO /000E    INIT. WRITE FROM LOCATION /000A.
      XIO /0009    SENSE DSW. PUTS BUSY AT BIT 15.
      BSC E       SKIP IF NOT BUSY. (BIT 15=0)
      LDX /0003    BRANCH TO /0003.
      AND /0012    AND IN /2F80.
      LDX /0013    BRANCH TO /0013.
      DC /0025     INTERNAL INTERRUPT VECTOR.
*
*** IOCC'S AND CONSTANTS ***
DC /7700        SENSE DSW. (NOTE 1)
DC /001A        BEGIN WRITE TABLE
                /000A THRU /0024. WC = 26.
*
DC /55AA        1ST WRITE WORD.
DC /AA55        2ND
DC /740B        BACKSPACE. (NOTE 1)
DC /000A        INIT. WRITE FROM
DC /7504        LOCATION /000A. (NOTE 1)
DC /0027        INIT. READ INTO
DC /7606        LOCATION /0027. (NOTE 1)
DC /2F80        DSW ERROR IMAGE.
*
*** BACKSPACE ***
BSC Z          SKIP IF NO ERRORS. (ACCUM=0)
WAIT 6         ERROR DURING WRITE.
XIO /000D      BACKSPACE.
XIO /0009      SENSE DSW. PUTS BUSY AT BIT 15.
BSC E         SKIP IF NOT BUSY. (BIT 15=0)
LDX /0016     BRANCH TO /0016.
*
*** READ ***
XIO /0010      INIT. READ INTO LOCATION /0027.
XIO /0009      SENSE DSW. PUTS BUSY AT BIT 15.
BSC E         SKIP IF NOT BUSY. (BIT 15=0)
LDX /001A     BRANCH TO /001A.
LDX 1 +26     PUT +26 IN XR1.
LD 1 /0027    LOAD READ WORD.
CMP 1 /000A   IS READ WORD=WRITE WORD.
NOP          NO
WAIT 7       NO, COMPARE ERROR.
MDX 1 -1     YES, DECERMENT XR1 BY -1.
                SKIP AFTER 26 LOOPS
*
LDX /001E     BRANCH TO /001E.
LDX /0002     BRANCH TO /0002. REPEAT PROGRAM.
DC           INTERNAL INTR ENTRY
WAIT 8       INTERNAL ERROR.
DC /001A     BEGIN READ TABLE.
                /0027 THRU /0042. WC = 26.
*
END BEGIN
*
*** NOTE 1 ***
*
*THIS LISTING IS FOR TAPE DRIVE ZERO. FOR
*TAPE DRIVE ONE, THE FOLLOWING LOCATIONS
*CONTAIN -
*
* LOCATION          CONTENTS
*
* /0009             /7720
* /000D             /742B
* /000F             /7524
* /0011             /7626
    
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DATE 01 JUL 66
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 EC 431319

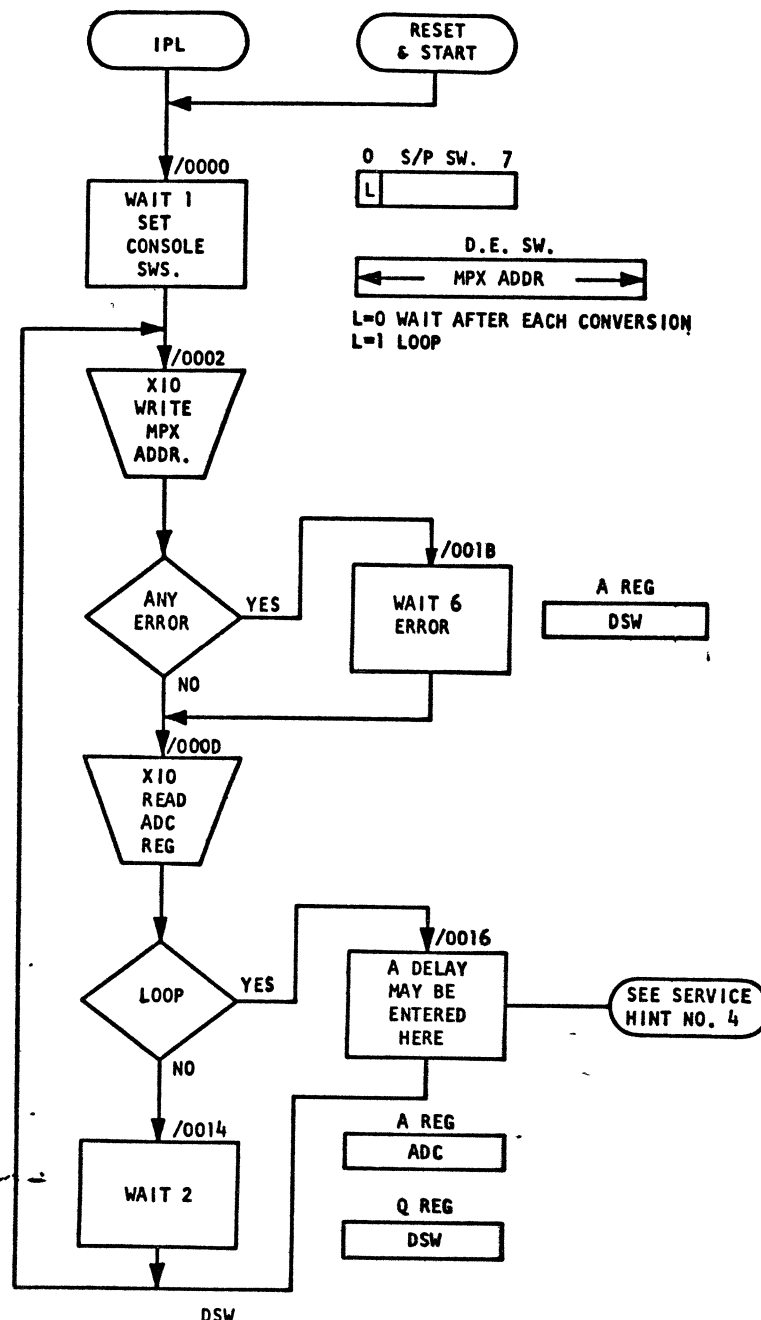
DATE 04 NOV 66
 EC 415233
 DATE 31 JUL 70
 EC 431326

DATE 15 FEB 67
 EC 415233B

DATE 15 MAY 67
 EC 411731

DATE 22 DEC 68
 EC 411961

PROG ID 08C8-
 PAGE 17



- DSW
- 0 END OF TABLE
 - 1 DPC SS CONV. COMPL.
 - 2 DPC RLY. CONV. COMPL.
 - 3 STORAGE PROT. VIOLATION
 - 4 PARITY CONTROL ERROR
 - 5 PARITY DATA ERROR
 - 6 ADC OVERLOAD
 - 7 OVERLAP CONFLICT
 - 8 DATA CHANNEL, SS-MPXR.
OR AMAR BUSY
 - 9 DPC RLY. MPXR. BUSY
 - 15 ANY ERROR

1. PROGRAM DESCRIPTION
WILL ADDRESS ONE MULTIPLEXER POINT AND EITHER LOOP OR COME TO A WAIT.
2. OPERATING PROCEDURE
 1. PLACE THE SINGLE I.P.L. CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP "READY". FOR PAPER TAPE INPUT, PLACE THE DELETE HOLE SECTION OF THE PAPER TAPE OVER THE READ STATION.
 2. SET "CHECK" STOP SWITCH ON.
 3. PRESS "RESET" AND "PROGRAM LOAD" CONSOLE BUTTONS. THE PROGRAM WILL LOAD AND STOP AT WAIT 1.
 4. SET THE DATA ENTRY SWITCHES TO THE MULTIPLEXER ADDRESS DESIRED. SET SENSE/PROGRAM SWITCH 0 = 0 TO WAIT AFTER THE POINT HAS BEEN CONVERTED. SET SWITCH 0 = 1 TO LOOP. (SEE FLOW CHART)
 5. PRESS CONSOLE "START" BUTTON.
 6. IF ANY ERROR IS DETECTED IN THE DSW, THE PROGRAM WILL STOP AT WAIT 6.
3. SERVICE HINTS
 1. TO PERFORM A "READ ONLY" LOOP.
 - a. SET LOCATION /000F TO /600D.
 - b. SET I-REG TO /000D AND PRESS START.
 2. /7FFF (ALL ONES EXCEPT THE SIGN BIT) MAY BE MANUALLY ENTERED IN THE ADC REGISTER BY REMOVING THE CONNECTOR ON PIN A-A1C11 (THIS IS THE COMPARATOR OUTPUT), AND THEN CAUSING THE ADC TO TAKE A CONVERSION CYCLE. /7FFF SHOULD BE TRANSFERRED TO THE A REGISTER IF THE DPC READ COMMAND IS WORKING CORRECTLY. /7FFF IN THE ADC REGISTER SHOULD SET THE "ADC OVERLOAD" AND "ANY ERROR" BITS IN THE DSW. SET LOCATION /0019 TO /1000 (NOP) TO BYPASS THE ERROR WAIT.
 3. TO INSPECT THE DSW IMMEDIATELY AFTER A WRITE COMMAND, SET LOCATION /04 TO 3000. THE DSW WILL BE IN THE A-REG. BIT 8 OR 9 SHOULD BE ON IN THE DSW.
 4. A DELAY CAN BE ENTERED BETWEEN EACH CONVERSION. THIS WILL PERMIT THE ADC REGISTER TO BE VIEWED IN THE I/Q MONITOR BOX. IF /7FFF IS LOADED INTO LOCATION /0017 A DELAY OF APPROXIMATELY 1/6 SEC. WILL OCCUR (2 MICRO-SECOND SYSTEM).

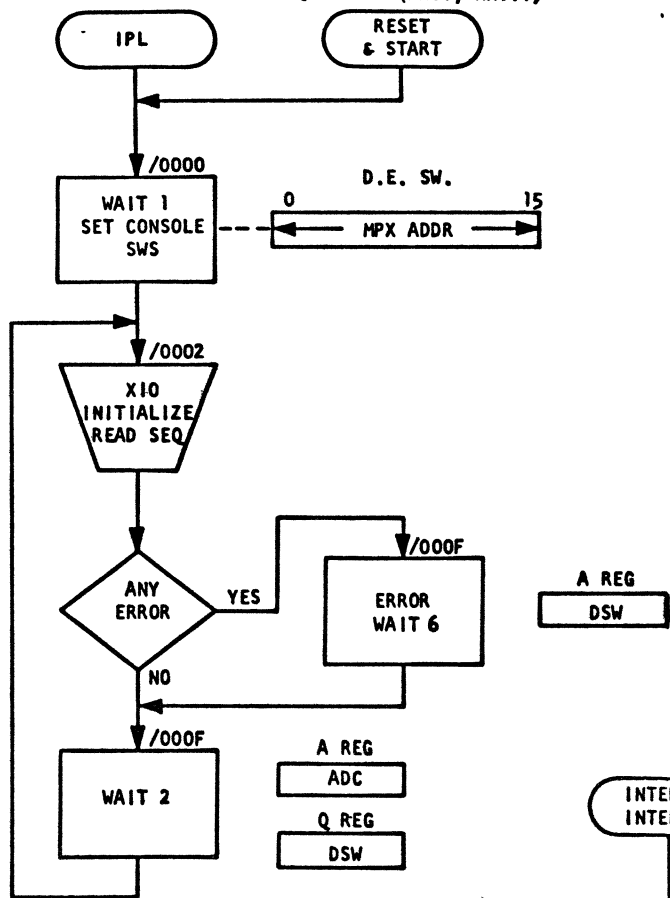
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*** AI DPC SCOPE LOOP *** XXIV, XXV
*
ABS
BEGIN WAIT 1 SET THE CONSOLE SWITCHES
XIO DESW READ THE D.E. SWS INTO LOC./0028.
XIO WRITE ADDR. THE POINT SPECIFIED IN D.E. SWS.
*
XIO DSW SENSE DSW (NO RESET)
NOP
BSC E SKIP IF NO ERROR. (BIT 15=0)
LDX ERROR BRANCH TO ERROR WAIT.
SRA 13
BSC E SKIP IF NO RELAY CONV. COMPL. (BIT 15=0)
LDX /000D BRANCH TO LOC. /000D.
SLA 14
BSC - SKIP IF S.S. CONV. COMPL. (BIT 0=1)
LDX /0003 BRANCH TO LOC. /0003.
XIO READ READ ADC READING INTO LOC. /0029.
XIO DSW1 SENSE AND RESET DSW.
SRT 16 PUT DSW IN Q REG.
XIO SPSW SENSE THE SENSE/PROG. SWS.
BSC +Z SKIP IF S/P SW. 0 IS OFF.
LDX /0016 BRANCH TO LOC. /0016.
LD /0029 LOAD ADC READING INTO A REG.
WAIT 2
LDX BEGIN BRANCH TO LOC. /0001
*
***--DELAY LOOP ***
*
LDX L1 /0000 SET XRI TO ZERO.
MDX 1 -1 DECR XRI BY 1.
LDX /0018 BRANCH TO LOC. /0018.
LDX /0001 BRANCH TO LOC. /0001 (END OF DELAY)
ERROR WAIT 6 ERROR WAIT 6.
LDX /000D BRANCH TO /000D.
SPSW DC IOCC TO SENSE THE S/P SWITCHES
DESW DC IOCC TO READ THE DATA ENTRY
DC /0240 SWITCHES INTO LOCATION /0028.
WRITE DC /0028 IOCC TO WRITE AN MPX FROM LOC/0028.
DC /5108 (NOTE 1)
DSW DC /0000 IOCC TO SENSE THE DSW (NO RESET)
DC /5700 (NOTE 1)
DSW1 DC /0000 IOCC TO SENSE AND RESET THE DSW.
DC /5701 (NOTE 1)
READ DC /0029 IOCC TO READ THE ADC REGISTER.
DC /5200 (NOTE 1)
*
DC MPX ADDR.
DC STORAGE FOR ADC READING.
END BEGIN
*
*** NOTE 1 ***
*
*THIS LISTING IS FOR THE FIRST AI ATTACHMENT. FOR THE
*AI EXPANDER ATTACHMENT, THE FOLLOWING STORAGE
*LOCATIONS CONTAIN -
*
* LOCATION CONTENTS
*
*/0021 /8108
*/0023 /8700
*/0025 /8701
*/0027 /8200
    
```

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- DSW
- 0 END OF TABLE
 - 1 DPC SS CONV. COMPL.
 - 2 DPC RLY. CONV. COMPL.
 - 3 STORAGE PROT. VIOLATION
 - 4 PARITY CONTROL ERROR
 - 5 PARITY DATA ERROR
 - 6 ADC OVERLOAD
 - 7 OVERLAP CONFLICT
 - 8 DATA CHANNEL, SS MPXR. OR AMAR BUSY
 - 9 DPC RLY. MPXR. BUSY
 - 15 ANY ERROR

DATA TABLES

/0022	/C002	WORD COUNT = 2 SCAN CTRL=CHAIN WITH NO INTR.
/0023	/13E8	CALIBRATION POINT
/0024	XXXX	ADC. READING FROM CAL. POINT
/0025	/0026	CHAIN ADDRESS
/0026	/0026	CAR CHECK WORD
/0027	/0002	WORD COUNT = 2 SCAN CTRL=NO CHAIN WITH INTR.
/0028	XXXX	ADDR. FROM D.E. SWITCHES
/0029	XXXX	ADC READING

1. PROGRAM DESCRIPTION
 PROVIDES THE ABILITY TO READ (IN CHAINED SEQUENTIAL MODE) THE CALIBRATION POINT, CHAIN TO A SECOND DATA TABLE AND READ A POINT THAT HAS BEEN SPECIFIED IN THE DATA ENTRY SWITCHES. FOR A DETAILED LAYOUT OF THE TABLES, SEE THE FLOW CHART.
2. OPERATING PROCEDURE
1. PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP "READY" FOR PAPER TAPE INPUT, PLACE THE DELETE HOLE SECTION OF THE PAPER TAPE OVER THE READ STATION.
 2. SET "CHECK STOP" SWITCH ON.
 3. PRESS "RESET" AND "PROGRAM LOAD" CONSOLE BUTTONS. THE PROGRAM WILL LOAD AND STOP AT WAIT 1 (B REG = 3001).
 4. SET THE DATA ENTRY SWITCHES TO THE MULTIPLEX ADDRESS DESIRED.
 5. PRESS CONSOLE "START" BUTTON. PROGRAM SHOULD READ AND CONVERT THE CALIBRATION POINT, THE POINT SPECIFIED IN THE DATA ENTRY SWITCHES, AND STOP AT WAIT 2 (B REG = 3002). PRESS THE "START" BUTTON TO REPEAT.
 6. IF A CAR CHECK ERROR OCCURS, THE PROGRAM WILL STOP AT WAIT 8. IF "CHECK STOP" SW IS TURNED OFF, ALL INTERNAL ERRORS WILL STOP AT WAIT 8. IF "ANY ERROR" IS DETECTED IN THE DSW, THE PROGRAM WILL STOP AT WAIT 6.
3. SERVICE HINTS
1. TO LOOP THE PROGRAM, CHANGE LOCATION /000F FROM /3002 (WAIT) TO /1000 (NOP).
 2. /7FFF (ALL ONES EXCEPT THE SIGN BIT) MAY BE MANUALLY ENTERED IN THE ADC REGISTER BY REMOVING THE CONNECTOR ON PIN A-A1C11 (THIS IS THE COMPARATOR OUTPUT), AND THEN CAUSING THE ADC TO TAKE A CONVERSION CYCLE. /7FFF IN THE ADC REGISTER SHOULD SET THE "ADC OVERLOAD" AND "ANY ERROR" BITS IN THE DSW. TO BYPASS THE ERROR WAIT, CHANGE LOCATION /0011 FROM /3006 (WAIT 6) TO /1000 (NOP).
 3. TO INSPECT THE DSW IMMEDIATELY AFTER AN INITIALIZE READ COMMAND, SET LOCATION /0004 TO /3000. THE DSW WILL BE IN THE A REGISTER. BIT 8 SHOULD BE ON IN THE DSW.

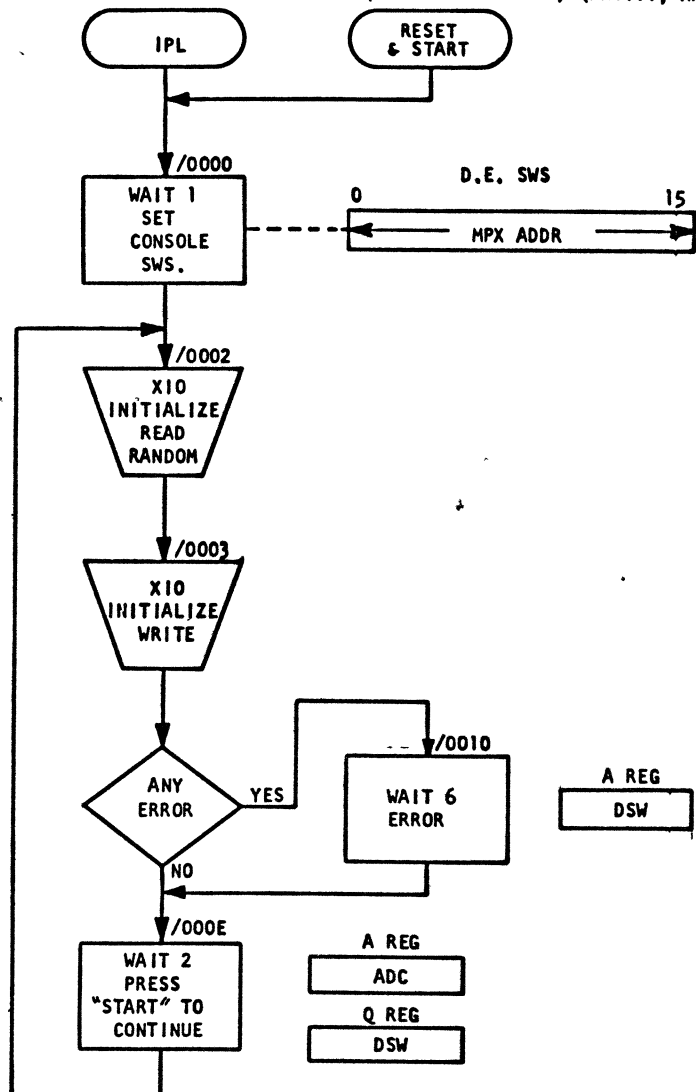
- A REG
- INTERNAL INTR ILSW
- 0 = INVALID OP. CODE
 - 1 = PARITY ERROR
 - 2 = S.P.V.
 - 3 = CAR CHECK

SCOPE LOOP PROGRAMS
 APPENDIX B

```

*** AI DC SEQUENTIAL SCOPE LOOP *** XXVI, XXVII
*
ABS
BEGIN WAIT 1 SET CONSOLE SWITCHES
XIO DESW READ D.E. SWS. INTO LOC./0028
XIO READ I READ SEQUENTIAL MODE
XIO DSW SENSE DSW (NO RESET)
NOP
BSC E SKIP IF NO ERROR. (BIT 15=0)
LDX ERROR BRANCH TO ERROR WAIT.
LDX /0009 BRANCH AROUND INTERNAL INTR. ADDR.
DC /0013 XFER VECTOR ADDR.
BSC - SKIP IF EOT BIT IS ON (BIT 0 = 1)
LDX /0003 BRANCH TO /0003.
XIO DSW1 SENSE AND RESET DSW.
SRT 16 PUT DSW INTO 0 REG.
LD /0029 LOAD ADC READING INTO A REG
WAIT 2
LDX /0001 BRANCH TO LOC. /0001.
ERROR WAIT 6 ERROR WAIT.
LDX /000B BRANCH TO LOC. /000B.
*
*** INTERNAL INTERRUPT ROUTINE ***
*
DC INTERNAL INTR ENTRY
XIO ILSW SENSE ERROR ILSW
WAIT 8 INTERNAL ERROR WAIT
BOSC I /0013 BRANCH OUT TO PROGRAM
*
*** IOCC'S ***
*
DESW DC /0028 IOCC-READ THE D.E. SWS. INTO
DC /0240 LOC. /0028.
READ DC /0022 IOCC-READ.
DC /5608 (NOTE 1)
DSW DC IOCC-SENSE DSW (NO RESET)
DC /5700 (NOTE 1)
DSW1 DC IOCC-SENSE AND RESET DSW
DC /5701 (NOTE 1)
ILSW DC IOCC-SENSE INTERNAL INTR. ILSW
DC /0300 AND RESET INTR. REQUEST.
*
*** DATA TABLES ***
EN
DC /C002 WD CT=2 CHAIN, NO INTR.
DC /13E8 CALIBRATION POINT
DC /0000 ADC READING FROM CALIBRATION POINT
DC /0026 CHAIN ADDRESS
DC /0026 CAR CHECK WORD
DC /0002 WD CT=2 NO CHAIN WITH INTR.
*
DC ADDR. FROM DATA ENTRY SWS.
DC STORAGE FOR ADC READING
END BEGIN
*
*** NOTE 1 ***
*
*THIS LISTING IS FOR THE FIRST AI ATTACHMENT. FOR THE
*AI EXPANDER ATTACHMENT, THE FOLLOWING STORAGE LOCATIONS
*CONTAIN -
*
* LOCATION CONTENTS
*

```



TABLES

MPX ADDR (1 WRITE)

/001C	/13E8	CALIBRATION POINT
/001D	/13E8	CALIBRATION POINT
/001E	/001F	CHAIN ADDRESS
/001F	/001F	CAR CHECK WORD
/0020	XXXX	ADDR. FROM DATA ENTRY SWITCHES

DATA (1 READ)

/0021	/C002	WD.CT = 2 SCAN CTRL=CHAIN WITH NO INTR.
/0022	XXXX	ADC READING FROM CAL. POINT
/0023	XXXX	ADC READING FROM CAL. POINT
/0024	/0025	CHAIN ADDRESS
/0025	/0025	CAR CHECK WORD
/0026	/0001	WD.CT = 1 SCAN CTRL=NO CHAIN WITH INTR.
/0027	XXXX	ADC READING (MPX ADDR. IN LOC. /0020)

1. PROGRAM DESCRIPTION

1. READS THE CALIBRATION POINT TWICE, CHAINS TO A SECOND TABLE AND READS THE POINT SPECIFIED IN THE DATA ENTRY SWITCHES. DO NOT USE THIS PROGRAM IF THE "MULTIPLEXER OVERLAP" FEATURE IS INSTALLED.

2. OPERATING PROCEDURE

- PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP "READY". FOR PAPER TAPE INPUT, PLACE THE DELETE HOLE SECTION OF THE PAPER TAPE OVER THE READ STATION.
- SET "CHECK STOP" AND "DISABLE INTERRUPT" SWITCHES ON. TURNING "DISABLE INTERRUPT" SWITCH ON CAUSES ALL CAR CHECK ERRORS TO BE IGNORED.
- PRESS "RESET" AND "PROGRAM LOAD" CONSOLE BUTTONS. THE PROGRAM WILL LOAD AND STOP AT WAIT 1 (B REG = 3001).
- SET THE DATA ENTRY SWITCHES TO THE MULTIPLEX ADDRESS DESIRED.
- PRESS CONSOLE "START" BUTTON. PROGRAM WILL READ AND CONVERT THE CAL. POINT TWICE, THE POINT SPECIFIED IN THE DATA ENTRY SWITCHES, AND STOP AT WAIT 2 (B REG = 3002). THE ADC READING IS IN THE A REGISTER AND THE DSW IS IN THE Q REGISTER.

3. SERVICE HINTS

- TO PUT THE PROGRAM IN A CONTINUOUS LOOP, CHANGE THE WAIT (3002) AT /000E TO A NOP (1000)
- /7FFF (ALL ONES EXCEPT THE SIGN BIT) MAY BE MANUALLY ENTERED IN THE ADC REGISTER BY REMOVING THE CONNECTOR ON PIN A-AIC11 (THIS IS THE COMPARATOR OUTPUT), AND THEN CAUSING THE ADC TO TAKE A CONVERSION CYCLE. /7FFF IN THE ADC REGISTER SHOULD SET THE "ADC OVERLOAD" AND "ANY ERROR" BITS IN THE DSW. SET LOCATION /0010 TO /1000 (NOP) TO BYPASS THE ERROR WAIT.
- TO INSPECT THE DSW IMMEDIATELY AFTER THE INITIALIZE WRITE COMMAND, SET LOCATION /0005 TO /3000. THE DSW WILL BE IN THE A REGISTER. BIT 8 SHOULD BE ON IN THE DSW.

DSW

- | | | | |
|---|-----------------------|----|---------------------------------|
| 0 | END OF TABLE | 6 | ADC OVERLOAD |
| 1 | DPC SS CONV. COMPL | 7 | OVERLAP CONFLICT |
| 2 | DPC RLY. CONV. COMPL. | 8 | DATA CH., SS MPXR. OR AMAR BUSY |
| 3 | STOR. PROT. VIOL. | 9 | DPC RLY. MPXR. BUSY |
| 4 | PARITY CTRL. ERROR | 15 | ANY ERROR |
| 5 | PARITY DATA ERROR | | |

APPENDIX B

*** AI DC RANDOM SCOPE LOOP *** XXVIII, XXIX
 *** (W/O MPXR. OVERLAP) ***
 *

```

0000 0 3001  BEGIN WAIT 1      SET CONSOLE SWS.
0001 0 0814  XIO  DESW      READ D.E. SWS. INTO LOC. /0020.
0002 0 0815  XIO  READ      INITIALIZE READ RANDOM
0003 0 0816  XIO  WRITE     INITIALIZE WRITE
0004 0 080D  XIO  DSW       SENSE DSW (NO RESET)
0005 0 1000  NOP
0006 0 4804  BSC  E         SKIP IF NO ERROR (BIT 15=0)
0007 0 6010  LDX  ERROR    BRANCH TO ERROR WAIT
0008 0 4810  BSC  -         SKIP IF EOT BIT IS ON (BIT0=1)
0009 0 6004  LDX  /0004    BRANCH TO LOC. /0004.
000A 0 1000  NOP
000B 0 0808  XIO  DSW1     SENSE AND RESET DSW
000C 0 1890  SRT  16      PUT DSW IN Q REG.
000D 0 C019  LD   ADC       PUT ADC READING IN A REG.
000E 0 3002  WAIT 2
000F 0 6001  LDX  /0001    BRANCH TO LOC. /0001
0010 0 3006  ERROR WAIT 6  ERROR WAIT
0011 0 600A  LDX  /000A    BRANCH TO LOC. /000A
  
```

*** IOCC'S ***

```

0012 0 0000  DSW  DC       /0000    IOCC SENSE DSW WITH NO RESET
0013 0 5700  DSW  DC       /5700    (NOTE 1)
0014 0 0000  DSW1 DC       /0000    IOCC SENSE AND RESET THE DSW
0015 0 5701  DC       /5701    (NOTE 1)
0016 0 0020  DESW DC       /0020    IOCC READ THE DATA
0017 0 0240  DC       /0240    ENTRY SWITCHES
0018 0 0021  READ  DC       /0021    IOCC INITIALIZE READ RANDOM
0019 0 5628  DC       /5628    (NOTE 1)
001A 0 001C  WRITE DC       /001C    IOCC-INITIALIZE WRITE
001B 0 5500  DC       /5500    (NOTE 1)
  
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*** TABLES ***

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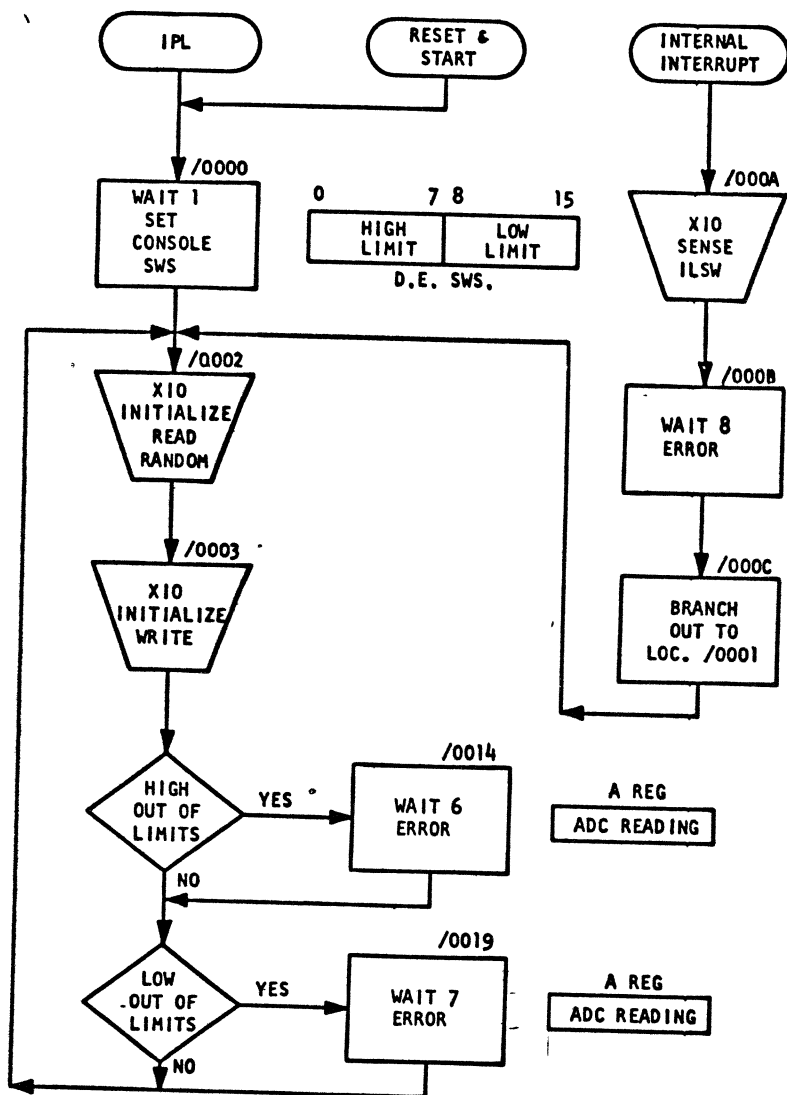
001C 0 13E8  DC       /13E8    CALIBRATION MPX ADDR.
001D 0 13E8  DC       /13E8    CALIBRATION MPX ADDR.
001E 0 001F  DC       /001F    CHAIN ADDRESS
001F 0 001F  DC       /001F    CAR CHECK WORD
0020 0 0000  DC
0021 0 C002  DC       /C002    ADDR. FROM DATA ENTRY SWITCHES
0022 0 0000  DC
0023 0 0000  DC
0024 0 0025  DC       /0025    WD.CT.=2 CHAIN, NO INTR.
0025 0 0025  DC       /0025    ADC READING FROM CALIBRATION POINT
0026 0 0001  DC       /0001    CHAIN ADDRESS
0027 0 0000  ADC  DC       /0001    CAR CHECK WORD
                                WD.CT.=1 NO CHAIN WITH INTR.
                                ADC READING
  
```

*** NOTE 1 ***

* THIS LISTING IS FOR THE FIRST AI ATTACHMENT. FOR THE
 * AI EXPANDER ATTACHMENT, THE FOLLOWING STORAGE LOCATIONS
 * CONTAIN -

LOCATION	CONTENTS
/0013	/8700
/0015	/8701
/0019	/8628
/001B	/8500

APPENDIX B



TABLES

DATA (1 READ)	
/0027	/0001
/0028	XXXX
MPX ADDR. (1 WRITE)	
/0024	/73E8
/0025	XXXX

A.I. BASIC DSW

0 END OF TABLE	6 ADC OVERLOAD
1 DPC SS CONV. COMPL.	7 OVERLAP CONFLICT
2 DPC RLY. CONV. COMPL.	8 DATA CH., SS MPXR. OR AMAR BUSY
3 STOR. PROT. VIOL.	9 DPC RLY. MPXR. BUSY
4 PARITY CTRL. ERROR	15 ANY ERROR
5 PARITY DATA ERROR	

- PROGRAM DESCRIPTION**
READS THE CALIBRATION POINT (/13E8) AND PERFORMS A LIMIT CHECK. THE LIMIT WORD IS SPECIFIED IN THE D.E. SWITCHES.
- OPERATING PROCEDURE**
 - PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP "READY". FOR PAPER TAPE INPUT, PLACE THE DELETE HOLE SECTION OF THE PAPER TAPE OVER THE READ STATION.
 - SET "CHECK STOP" SWITCH ON.
 - PRESS "RESET" AND "PROGRAM LOAD" CONSOLE BUTTONS. THE PROGRAM WILL LOAD AND STOP AT WAIT 1 (B REG = 3001).
 - SET THE D.E. SWITCHES TO THE DESIRED LIMIT WORD. SWS, 0-7 = HIGH LIMIT. SWS, 8-15 = LOW LIMIT.
 - PRESS CONSOLE "START" BUTTON. THE PROGRAM WILL READ THE CALIBRATION POINT AND COMPARE IT TO THE DATA ENTRY SWITCHES. IF AN "OUT OF LIMIT" CONDITION IS DETECTED THE PROGRAM WILL STOP AT WAIT 6 OR 7.
 - IF A CAR CHECK ERROR IS DETECTED, THE PROGRAM WILL STOP AT WAIT 8. THE ERROR ILSW WILL BE IN THE A REGISTER.
- SERVICE HINTS**
 - TO INSPECT THE COMPARATOR DSW IN THE A REGISTER, ENTER A WAIT (/3000) IN LOC. /0011.
 - IF A MULTIPLEXER ADDRESS OTHER THAN THE CALIBRATION POINT IS DESIRED, INSERT THE NEW ADDRESS IN LOCATION /0024. ENTER BIT 0 = 0, BITS 1 AND 2 = 1 AND BITS 3-15 = DESIRED ADDRESS. IF A RELAY ADDRESS IS CHOSEN AND THE OVERLAP FEATURE IS INSTALLED, REMOVE THE SLT CARD AT A-B1L7 POSITION BEFORE RUNNING PROGRAM.

COMPARATOR DSW	
0	HIGH OUT OF LIMITS
1	LOW OUT OF LIMITS
2	OVERLOAD
3-15	MPX ADDR.

*** AI COMPARATOR SCOPE LOOP *** XXX, XXXI

```

*
ABS
BEGIN WAIT 1 SET CONSOLE SWS.
XIO /001C RD DATA ENTRY SWITCHES
XIO /001E INIT. READ RANDOM
XIO /0020 INIT. WRITE
XIO /001B SENSE AND RESET DSW
SRA 7
LDX /000E BRANCH AROUND ERROR ROUTINE
DC /0301 IOCC SENSE INTERNAL ERROR ILSW.
DC /0009
    
```

*** INTERNAL ERROR INTR. ROUTINE ***

```

*
DC INTERNAL INTR ENTRY
XIO /0007 SENSE INTERNAL ERROR ILSW.
WAIT 8 INTERNAL ERROR
BOSC L BEGIN+1 RESET INTERRUPT + BRANCH
*
BSC E BUSY
LDX /0004 BRANCH TO LOC. /0004.
XIO /0022 SENSE COMPARATOR DSW.
BSC - HIGH OUT OF LIMIT
LDX /0015 NO
LD /0028 LOAD ACC WITH ADC READING
WAIT 6 HIGH OUT OF LIMIT
SLA 1
BSC - LOW OUT OF LIMIT
LDX /0001 BRANCH TO LOC. /0001
LD /0028 LOAD ACC WITH ADC READING
WAIT 7 LOW OUT OF LIMIT.
LDX /0001 BRANCH TO LOC. /0001
    
```

*** IOCC'S ***

```

*
DC /5701 IOCC SENSE AND RESET DSW (NOTE 1)
DC /0025 IOCC READ D.E. INTO LOC. /0025
DC /0240
DC /0027 IOCC INITIALIZE READ (NOTE 1)
DC /5620
DC /0024 IOCC INITIALIZE WRITE (NOTE 1)
DC /5500 IOCC SENSE THE COMPARATOR (NOTE 1)
DC /5781
DC /73E8 MPX ADDR. BIT 2=LIMIT WD. FOLLOWS
DC LIMIT WORD - READ FROM SWITCHES
DC SPARE LOCATION
DC /0001 RD TABLE
END BEGIN
    
```

*** NOTE 1 ***

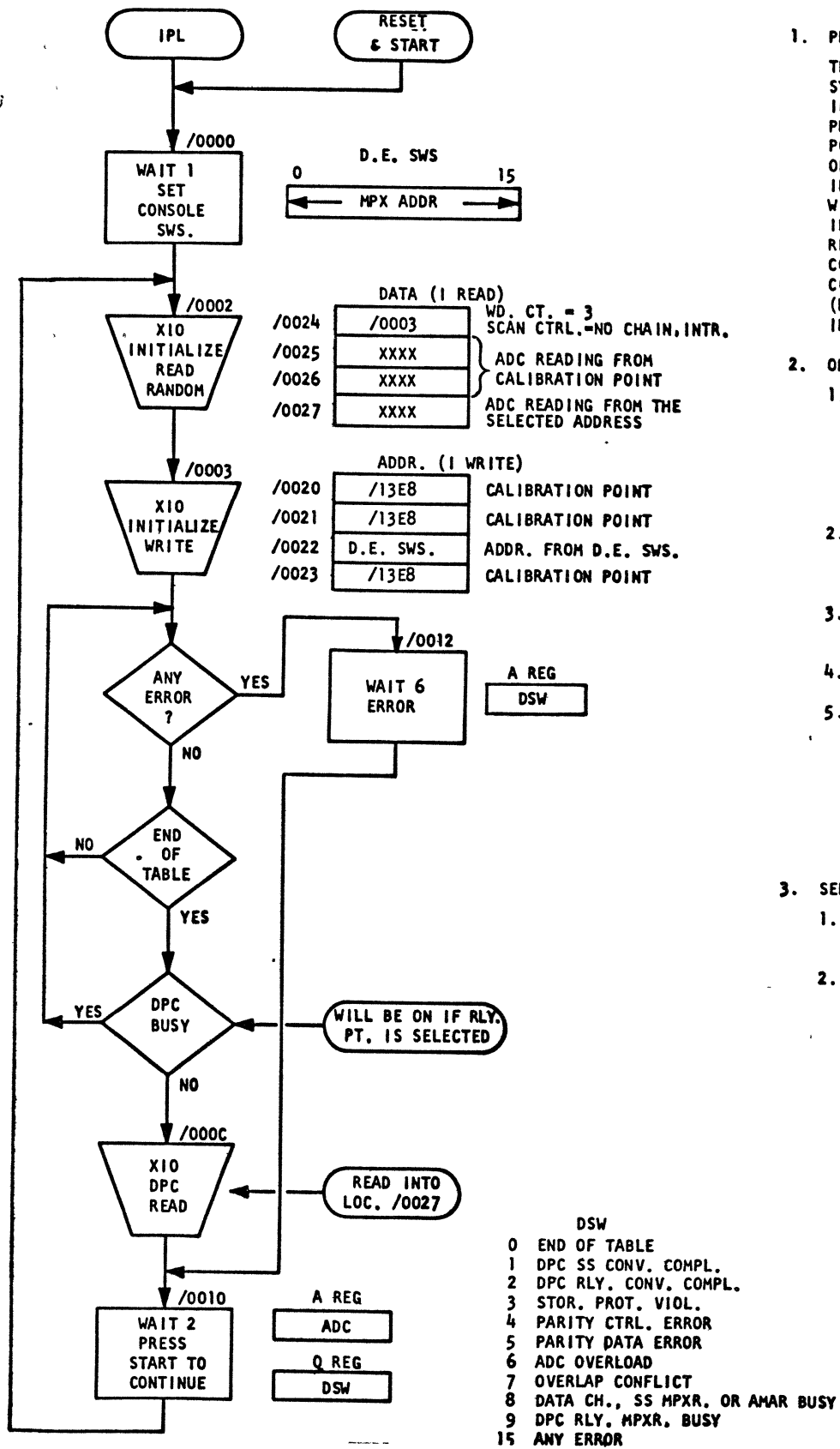
*THIS LISTING IS FOR THE FIRST AI ATTACHMENT. FOR THE *AI EXPANDER ATTACHMENT, THE FOLLOWING STORAGE LOCATIONS *CONTAIN -

LOCATION	CONTENTS
/001B	/8701
/001F	/8620
/0021	/8500
/0023	/8781

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EC NO. 415178 415233 415233B 411731 411961 431319 431326 PAGE 21A



1. PROGRAM DESCRIPTION

THIS PROGRAM SHOULD BE USED ONLY FOR SYSTEMS WITH "MPXR, OVERLAP" FEATURE. IF A SOLID STATE POINT IS SELECTED, PROGRAM WILL READ THE CALIBRATION POINT TWICE AND THE SELECTED POINT ONCE. IF A RELAY POINT IS SELECTED, PROGRAM WILL READ THE CALIBRATION POINT TWICE, INITIATE A RELAY MULTIPLEXER OPERATION, READ THE CALIBRATION POINT ONCE AGAIN, COMPLETE THE RELAY MULTIPLEXER AND CONVERSION OPERATIONS, THEN READ (DPC MODE) THE CONVERTED RELAY VALUE INTO LOCATION /0027.

2. OPERATING PROCEDURE

- PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP "READY" FOR PAPER TAPE INPUT, PLACE THE DELETE HOLE SECTION OF THE PAPER TAPE OVER THE READ STATION.
- SET "CHECK STOP" AND "DISABLE INTERRUPT" SWITCHES ON, TURNING "DISABLE INTERRUPT" SWITCH ON CAUSES ALL CAR CHECK ERRORS TO BE IGNORED.
- PRESS "RESET" AND "PROGRAM LOAD" CONSOLE BUTTONS. THE PROGRAM WILL LOAD AND STOP AT WAIT 1.
- SET THE DATA ENTRY SWITCHES TO THE MULTIPLEXER ADDRESS DESIRED.
- PRESS THE CONSOLE "START" BUTTON. PROGRAM WILL START READING AND CONVERTING THE CALIBRATION POINT AND THE SELECTED POINT. WHEN THE PROGRAM STOPS AT WAIT 2, THE ADC READING FOR THE SELECTED POINT IS IN THE A REG. AND THE DSW IS IN THE Q REG.

3. SERVICE HINTS

- TO PUT THE PROGRAM IN A CONTINUOUS LOOP, CHANGE THE WAIT (3002) AT LOCATION /0010 TO A NOP (1000).
- WHEN A SYSTEM HAS "MPXR, OVERLAP" INSTALLED, RELAY VALUES ARE TRANSFERRED INTO STORAGE IN DPC MODE, AND THE WORD COUNT IS NOT DECREMENTED. IN THIS PROGRAM, IF A SOLID STATE POINT IS SPECIFIED IN THE D.E. SWS, MPXR, ADDRESSES STORED IN LOC. /0020-0022 WILL BE READ. IF A RELAY POINT IS SPECIFIED, MPXR, ADDRESSES STORED IN LOC. /0020-0023 WILL BE READ, BUT THE TRANSFER TO STORAGE OF THE RELAY VALUE WILL BE ACCOMPLISHED BY THE DPC READ COMMAND. (LOC. /000C)

DSW

0	END OF TABLE
1	DPC SS CONV. COMPL.
2	DPC RLY. CONV. COMPL.
3	STOR. PROT. VIOL.
4	PARITY CTRL. ERROR
5	PARITY DATA ERROR
6	ADC OVERLOAD
7	OVERLAP CONFLICT
8	DATA CH., SS MPXR. OR AMAR BUSY
9	DPC RLY. MPXR, BUSY
15	ANY ERROR

A REG
ADC

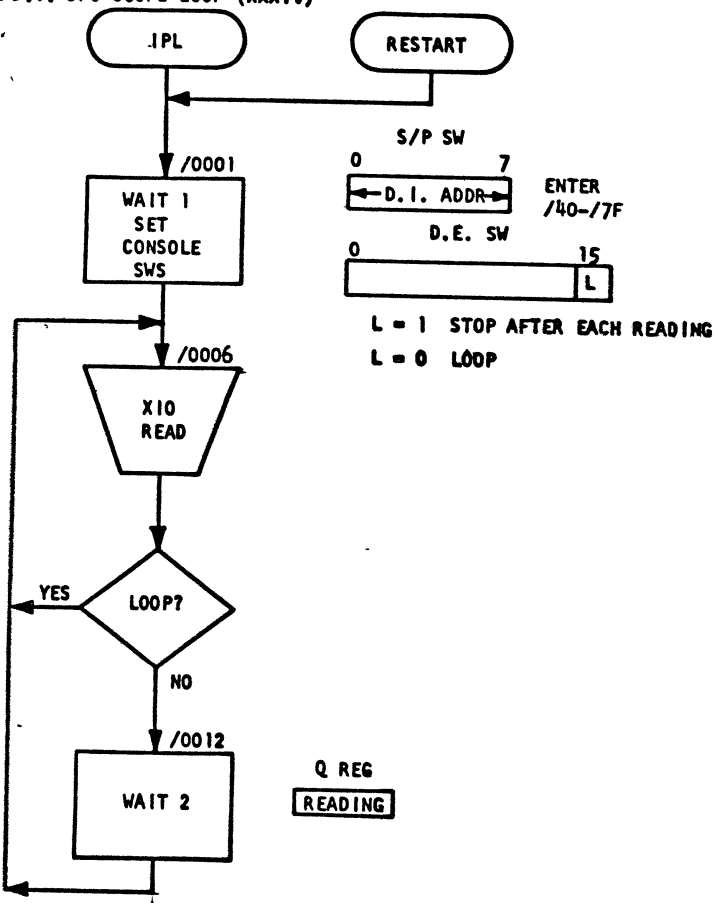
Q REG
DSW

APPENDIX B

```

*** AI DC RANDOM OVERLAP SCOPE LOOP *** XXXII, XXXIII
*
ABS
BEGIN WAIT 1 SET CONSOLE SWITCHES
XIO DESW READ D.E. SWS INTO LOC. /0022.
XIO IREAD INITIALIZE READ RANDOM
XIO WRITE INITIALIZE WRITE
XIO DSW SENSE DSW (NO RESET)
BSC E SKIP IF NO ERROR (BIT 15=0)
LDX ERROR BRANCH TO ERROR WAIT
BSC - SKIP IF EOT BIT IS ON. (BIT 0=1)
LDX /0004 BRANCH TO LOCATION /0004.
SLA 9
BSC +Z SKIP IF DPC BUSY BIT IS OFF.
(BIT 0=0)
LDX /0004 BRANCH TO LOCATION /0004.
XIO READ READ THE ADC REGISTER INTO
LOC. /0027.
XIO DSW1 SENSE AND RESET THE DSW.
SRT 16 PUT DSW IN Q REGISTER
LD ADC PUT ADC READING IN A REG.
WAIT 2
LDX /0001 BRANCH TO LOCATION /0001.
ERROR WAIT 6 ERROR WAIT
LDX /000D BRANCH TO LOC. /000D
*
*** IOCC'S ***
*
DSW DC IOCC SENSE DSW WITH NO RESET
DC /5700 (NOTE 1)
DSW1 DC IOCC SENSE AND RESET THE DSW
DC /5701 (NOTE 1)
READ DC /0027 IOCC READ THE ADC REGISTER
DC /5200 (NOTE 1)
WRITE DC /0020 IOCC INITIALIZE WRITE
DC /5500 (NOTE 1)
IREAD DC /0024 IOCC INITIALIZE READ RANDOM
DC /5628 (NOTE 1)
DESW DC /0022 IOCC READ THE DATA
DC /0240 ENTRY SWITCHES
*
*** TABLES ***
*
DC /13E8 CALIBRATION MPX ADDR
DC /13E8 CALIBRATION MPX ADDR
DC /13E8 ADDR. FROM DATA ENTRY SWITCHES.
DC /0003 CALIBRATION MPX ADDR
DC /0003 WD. CT.=3 NO CHAIN WITH INTR.
DC ADC READING FROM CALIBRATION POINT
DC ADC READING FROM CALIBRATION POINT
ADC DC ADC READING
END BEGIN
*
*** NOTE 1***
*
*THIS LISTING IS FOR THE FIRST AI ATTACHMENT. FOR THE
*AI EXPANDER ATTACHMENT, THE FOLLOWING STORAGE LOCATION
*CONTAIN -
*
* LOCATION CONTENTS
*
* /0015 /8700
* /0017 /8701
* /0019 /8200
* /001B /8500
* /001D /8628

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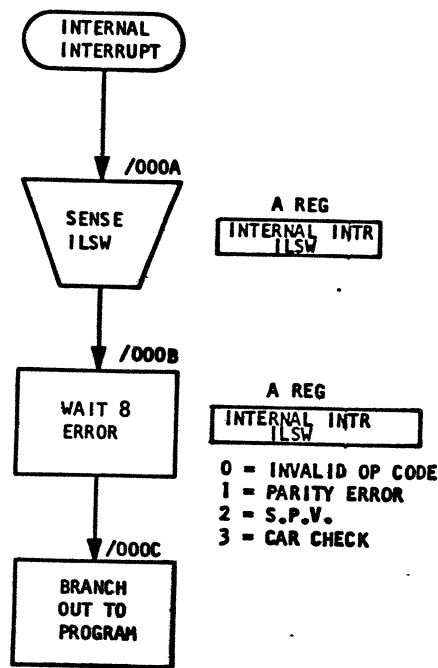


1. PROGRAM DESCRIPTION
WILL READ THE SELECTED D.I. GROUP, AND DISPLAY RESULTS IN THE Q REGISTER.

2. OPERATING PROCEDURE
1. PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP "READY". FOR PAPER TAPE INPUT, PLACE THE DELETE HOLE SECTION OF THE PAPER TAPE OVER THE READ STATION.
 2. SET "CHECK STOP" SWITCH ON.
 3. PRESS "RESET" AND "PROGRAM LOAD" CONSOLE BUTTONS. PROGRAM WILL LOAD AND STOP AT WAIT 1.
 4. SET THE D.I. ADDRESS IN THE SENSE/PROG. SWITCHES (/40 - /7F).
 5. SET DATA ENTRY SWITCH 15 = 1 TO STOP AFTER EACH READ OPERATION WITH THE READING IN THE Q REGISTER. SET SW. 15 = 0 TO LOOP.
 6. PRESS CONSOLE "START" BUTTON.
 7. IF A CAR CHECK ERROR OCCURS, THE PROGRAM WILL STOP AT WAIT 8.

DSW
0 PARITY
1 STOR. PROT. VIOL.
2 D.I. SCAN COMPL.
3 D.I. BUSY

Q REG
READING



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*** DI - DPC SCOPE LOOP *** XXXIV

```

0000 0 1000      ABS
0001 0 3001      BEGIN NOP
0002 0 0813      WAIT 1
0003 0 1808      XIO /0016
0004 0 E817      SRA 8
0005 0 D015      OR /001C
0006 0 0015      STO /001B
0007 0 600E      XIO /001A
0008 0 0009      LDX /000E
0009 0 0000      DC /0009
000A 0 0809      DC
000B 0 3008      XIO /0014
000C 00 4CC00009 WAIT 8
000E 0 C00E      BOSC I /0009
000F 0 1890      LD /001D
0010 0 0807      SRT 16
0011 0 4804      XIO /0018
0012 0 3002      BSC E
0013 0 6002      WAIT 2
0014 0 0000      LDX /0002
0015 0 0300      DC
0016 0 0000      DC /0300
0017 0 0760      DC
0018 0 0000      DC /0760
0019 0 0740      DC
001A 0 001D      DC /001D
001B 0 5A00      DC /5A00
001C 0 5A00      DC /5A00
001D 0 0000      DC
001E 0000      * END BEGIN
    
```

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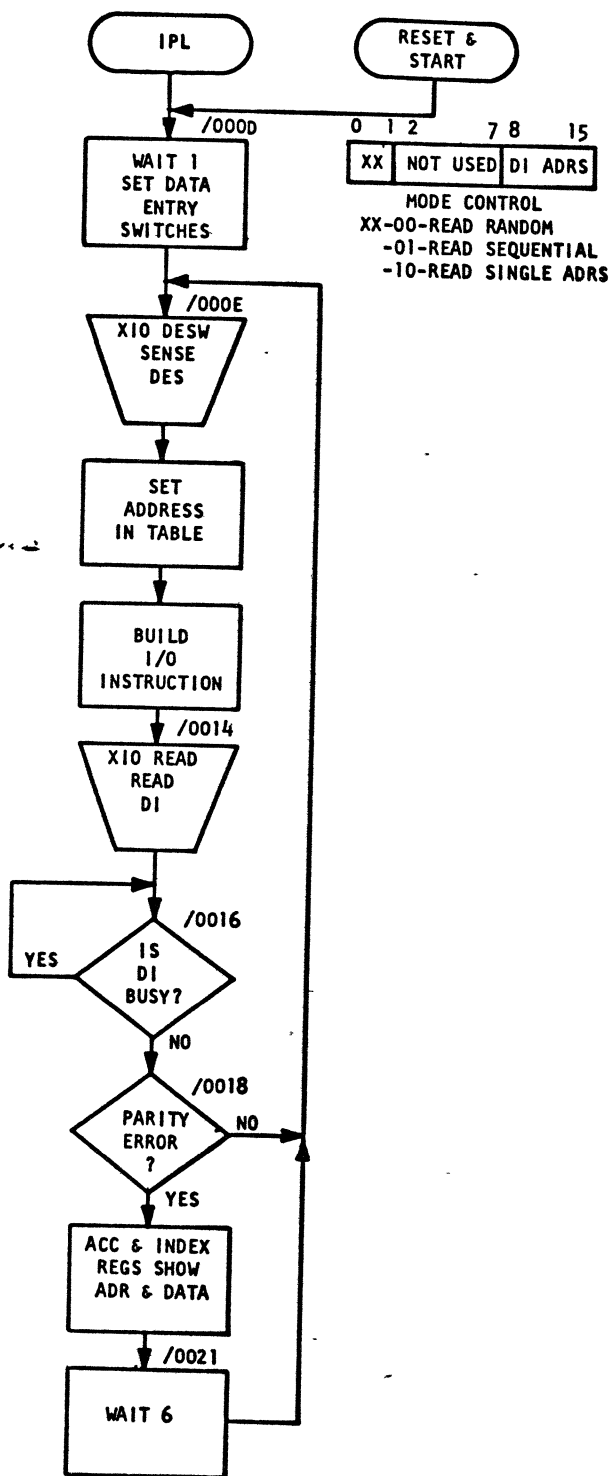
DI DC SCOPE LOOP

1. PROGRAM DESCRIPTION

PROGRAM SENSES THE DATA ENTRY SWITCHES TO FIND THE ADDRESS AND THE MODE IN WHICH DI IS TO WORK. AFTER STORING THE ADDRESS IN THE TABLE, IT WILL BUILD THE I/O INSTRUCTION. EXECUTE AN I/O READ, THE PROGRAM WILL THEN CHECK TO DETERMINE IF THERE IS ANY ERRORS. IF THERE ARE ERRORS, IT WILL LOAD THE REG ADDRESS IN THE ACCUMULATOR, DATA IN INDEX REGISTER 1, DATA OR ADDRESS IN INDEX REGISTER 2 DEPENDING UPON THE MODE, AND DATA IN INDEX REGISTER 3 COME TO WAIT 6.

2. OPERATING PROCEDURES

1. PLACE SINGLE IPL CARD IN 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO READ THE CARD IN, AND ONCE TO BRING UP LOAD READY. FOR PAPER TAPE INPUT, PLACE THE DELETE HOLE SECTION OF THE PAPER TAPE OVER THE READ STATION.
2. SET 'CHECK' SWITCH ON.
3. PRESS 'RESET' AND 'PROGRAM LOAD' CONSOLE BUTTONS. THE PROGRAM WILL LOAD AND STOP AT WAIT 1.
4. SET THE DATA ENTRY SWITCHES TO FOLLOWING, MODE OF OPERATION IN BIT SWITCHES 0 AND 1 AND THE ADDRESS REGISTER IN BIT SWITCHES 8 TO 15 OF THE DATA ENTRY SWITCHES.
5. PRESS START. PROGRAM WILL RUN.
6. WAIT 6 WILL INDICATE A PARITY ERROR. THE ADDRESS OF THE REGISTER WILL BE IN THE ACCUMULATOR. INDEX REGISTER 1 WILL HAVE DATA. INDEX REGISTER 2 WILL HAVE DATA OR AN ADDRESS IF IN RANDOM MODE. INDEX REGISTER 3 WILL HAVE DATA.



0280		
0000	0	600D
0001	0	0740
0002	0	0023
0003	0	5E00
0004	0	5E00
0005	0	5F01
0006	0	0000
0007	0	0300
0008	0	0009
0009	0	0000
000A	0	08FB
000B	0	3008
000C	0	4878
000D	0	3001
000E	0	08F1
000F	0	D014
0010	0	D015
0011	0	1809
0012	0	E8F1
0013	0	D0EF
0014	0	08ED
0015	0	08EE
0016	0	4804
0017	0	6015
0018	0	4810
0019	0	600E
001A	0	C009
001B	00	65800025
001D	00	66800026
001F	00	67800027
0021	0	3006
0022	0	600E
0023	0	0004
0024	0	0000
0025	0	0000
0026	0	0000
0027	0	0000
0028		0000

*** DI - DC SCOPE LOOP *** XXXV

*	ABS		
*	ORG	0	
*	DESW	LDX	BEGIN
	DC	/0740	SENSE DATA ENTRY SWITCHES
READ	DC	RAREA	READ AREA
	DC	/5E00	READ IOCC
DSW	DC	/5E00	CONSTANT
	DC	/5F01	SENSE DSW IOCC
ILSW	DC		
	DC	/0300	SENSE ILSW IOCC
	DC	INTER	INTERNAL INTR ADRS VECTOR
*	INTER	DC	0
	XIO	ILSW	INTERNAL INTR ENTRY
WAIT8	WAIT	8	SENSE ILSW
	BOSC	+-Z	ILSW IN ACC
			SKIP AND RESET INTR
*	BEGIN	WAIT	1
	XIO	DESW	SET DATA ENTRY SWITCHES
	STO	ADR	SENSE DATA ENTRY SWITCHES
	STO	ADR+2	SET ADR IN TABLE
			USED ONLY IN RANDOM MODE
*	SRA	9	POSITION MODE BITS
	OR	DSW	ADD AREA AND FUNC
	STO	READ	BUILD IOCC
*	XIO	READ	READ DIGITAL
CK	XIO	DSW	SENSE DSW
	BSC	E	IS DEVICE BUSY
	LDX	CK	* YES
	BSC	-	* NO, PARITY ERRORS
	LDX	BEGIN+1	* NO
	LD	ADR	* YES, GET ADRS
	LDX	I1 ADR+1	GET 1 ST DATA
	LDX	I2 ADR+2	GET 2 ND DATA OR RAND ADRS
	LDX	I3 ADR+3	GET 3 RD ADRS
WAIT6	WAIT	6	PARITY ERROR FOUND
	LDX	BEGIN+1	
*	RAREA	DC	/0004
	ADR	DC	WORD COUNT
	DC		ADDRESS
	DC		DATA
	DC		DATA OR ADR IF RAND MODE
	DC		DATA
*	END	DESW	

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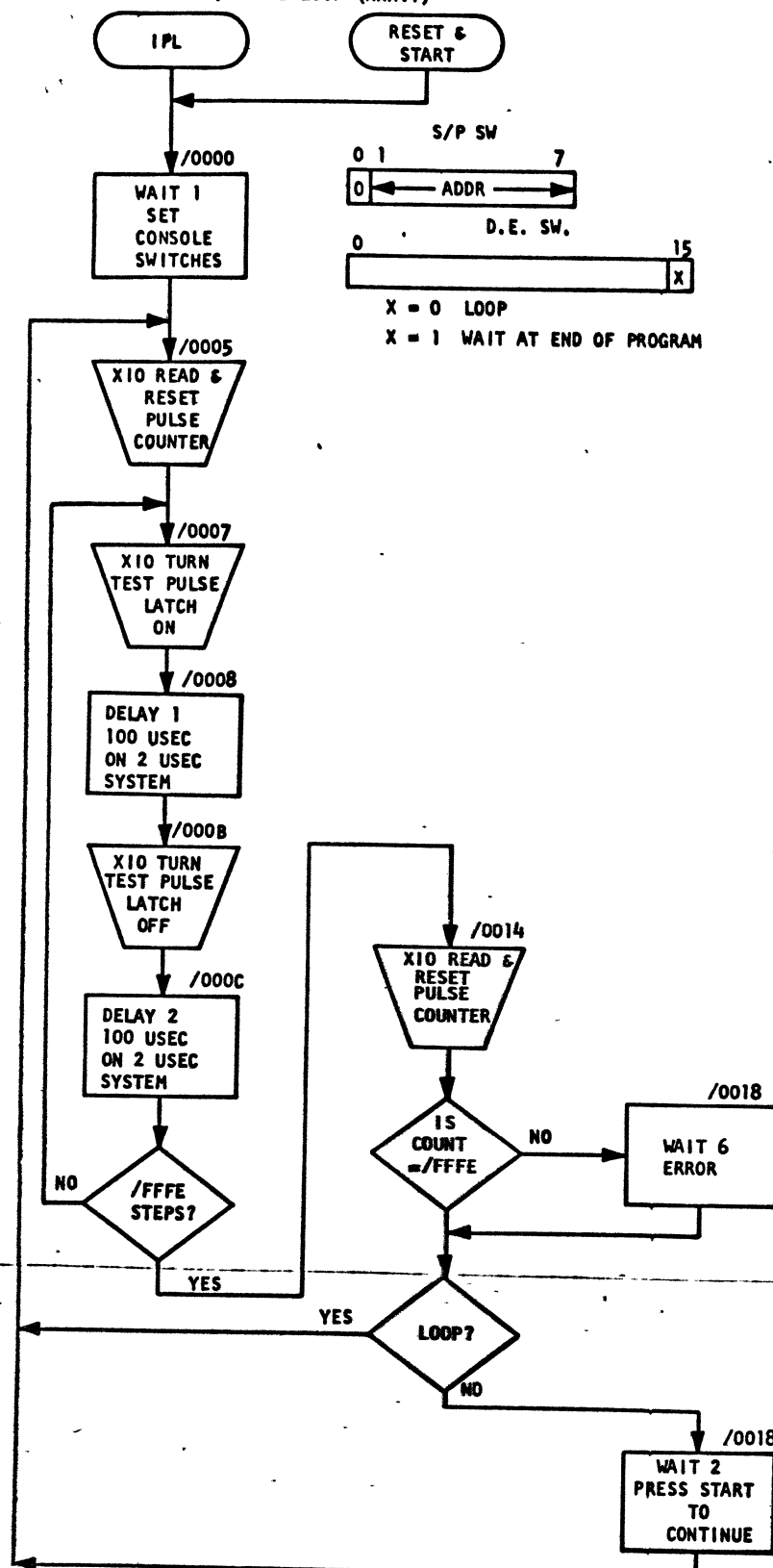
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APPENDIX B



1. PROGRAM DESCRIPTION
WILL STEP THE SELECTED 16 BIT PULSE COUNTER 2¹⁶ - 2 TIMES AND CHECK THAT THE COUNTER IS AT /FFFE.

2. OPERATING PROCEDURE
1. PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP "READY". FOR PAPER TAPE INPUT, PLACE THE DELETE HOLE SECTION OF THE PAPER TAPE OVER THE READ STATION.
 2. SET "CHECK STOP" SWITCH ON.
 3. PRESS "RESET" AND "PROGRAM LOAD" CONSOLE BUTTONS. THE PROGRAM WILL LOAD AND STOP AT WAIT 1. (B REG = 3001).
 4. SET THE ADDRESS OF THE PULSE COUNTER IN SENSE/PROG. SW'S. 1-7 (/7F - /40).
 5. SET DATA ENTRY SW. 15 = 0 TO LOOP OR = 1 TO WAIT AT THE END OF THE PROGRAM.
 6. CONNECT THE TEST PULSE WIRES TO TERMINAL OF THE COUNTER BEING TESTED. (TB19-12,13)
 7. PRESS CONSOLE "START" BUTTON. THE PROGRAM WILL STEP THE COUNTER (2¹⁶) - 2 TIMES. IF THE COUNTER CONTAINS /FFFE, IT WILL GO TO WAIT 2 OR LOOP, AS DEFINED BY D.E. SW. 15. IF THE COUNTER HAS AN INCORRECT AMOUNT, IT WILL GO TO WAIT 6.
 8. THE RUNNING TIME ON A 2 MICRO-SEC. SYSTEM IS 15 SECONDS.

3. SERVICE HINTS
1. LOCATION /0022 CONTAINS THE NUMBER OF TIMES THE COUNTER WILL STEP. ANY VALUE MAY BE LOADED INTO THIS LOCATION.
 2. THE OUTPUT OF THE "TEST PULSE LATCH" COMES OUT TO TB-19 TERMINALS 12 AND 13.

DSW
0 PARITY
1 STOR. PROT. VIOL.
2 D.I. SCAN. COMPL.
15 D.I. BUSY

*** PULSE COUNTER, 16 BIT SCOPE LOOP *** XXXVI

```

*
* ABS
* BEGIN WAIT 1 WAIT AFTER IPL.
* XIO SPSW 1 SENSE PROG. SW'S.
* SRA 8 MODIFIER FOR READ PULSE COUNT IOCC.
* OR DESW 8 OR IN /5A00. (PC AREA AND READ
* FUNCTION)
*
* STO READ+1 STORE READ PULSE COUNT IOCC AT
* LOCATION /0027.
* XIO READ READ PULSE COUNT INTO LOCATION
* /0028. (RESET)
* LD OFF PUT /FFFE IN ACCUM. BEGIN /FFFE
* TEST PULSES.
*
* XIO ON TEST PULSE ON.
* LDX 1 -16 PUT /FFFO IN XR1. BEGIN DELAY 1.
* MDX 1 +1 INCR XR1 BY 1.
* LDX /0009 BRANCH TO /0009.
* XIO OFF TEST PULSE OFF.
* LDX 1 -16 PUT /FFFO IN XR1. BEGIN DELAY 2.
* MDX 1 +1 INCR XR1 BY 1.
* LDX /000D BRANCH TO /000D.
*
* NOP
* S ON SUBT. 1 FROM ACCUM
* BSC L /0014,+- BRANCH TO /0014 IF ZERO.
* LDX /0007 BRANCH TO /0007.
* XIO READ READ PULSE COUNTER INTO
* LOCATION /0028.
* LD /0028 PUT PULSE COUNT READING INTO ACCUM.
* CMP OFF IS ACTUAL COUNT EQUAL TO
* DESIRED COUNT.
*
* NOP NO
* WAIT 6 ERROR WAIT.
* XIO DESW 6 SENSE DATA SW'S.
* BSC E SKIP IF LOOPING PROGRAM.
* (DATA SW15=0)
*
* WAIT 2 TEST COMPLETED OK.
* LDX /0001 BRANCH TO /0001. REPEAT PROGRAM.
* DC SPARE LOC.
*
* *** IOCC'S ***
*
* SPSW DC SPARE LOC.
* ON DC /0760 IOCC-SENSE PROG. SW'S.
* DC /0001 CONSTANT
* DC /6401 IOCC-TEST PULSE ON.
* OFF DC /FFFE NO. OF COUNTS.
* DC /6400 IOCC-TEST PULSE OFF.
* DESW DC /5A00 CONSTANT
* DC /0740 IOCC-SENSE DATA SW'S.
* READ DC /0028 IOCC-READ PULSE COUNT INTO
* DC /5A00 LOCATION /0028.
*
* DC PULSE COUNT READING STORAGE.
* END BEGIN
    
```

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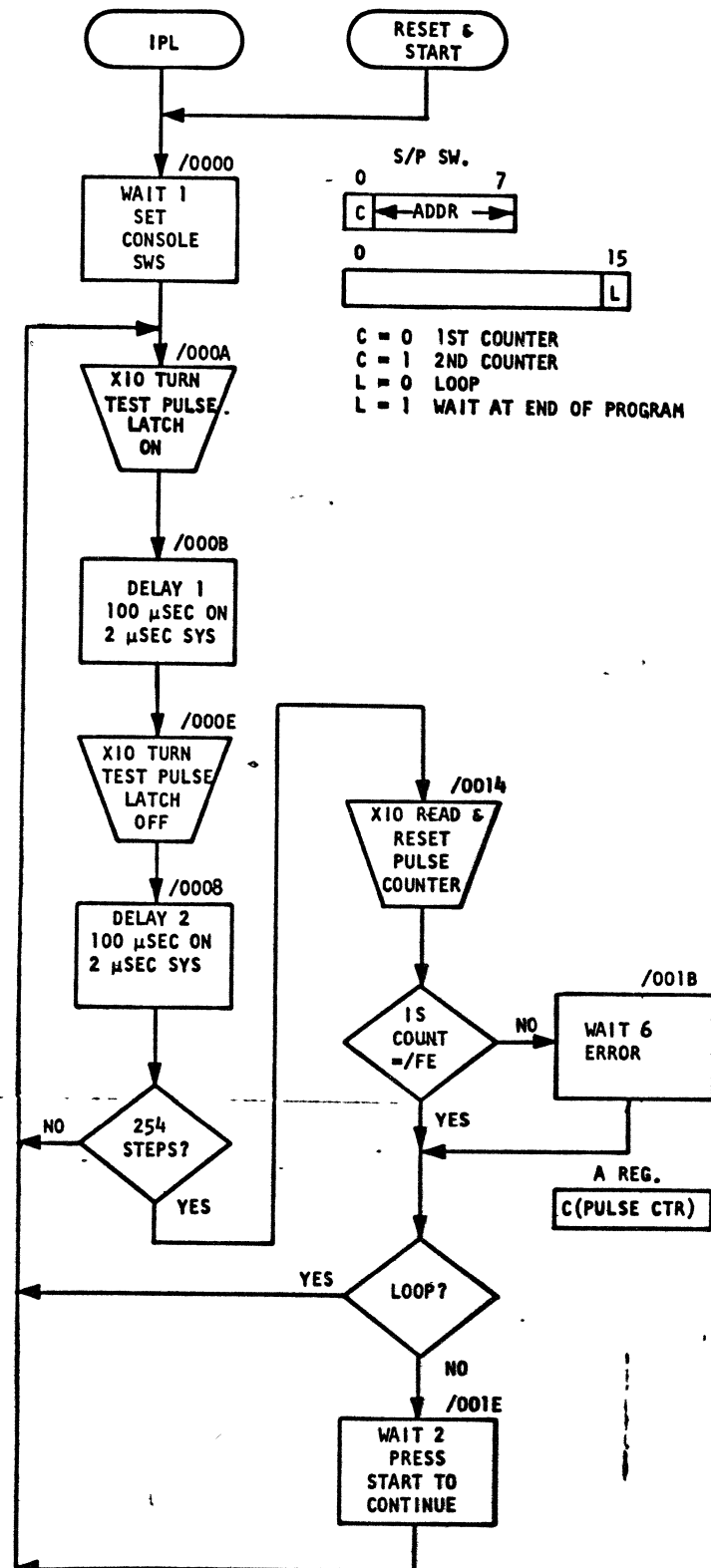
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APPENDIX B



- PROGRAM DESCRIPTION**
WILL STEP THE SELECTED 8 BIT PULSE COUNTER 254 TIMES AND CHECK THAT THE COUNTER IS AT /FE.
- OPERATING PROCEDURE**
 - PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP "READY". FOR PAPER TAPE INPUT, PLACE THE DELETE HOLE SECTION OF THE PAPER TAPE OVER THE READ STATION.
 - SET "CHECK STOP" SWITCH ON.
 - PRESS "RESET" AND "PROGRAM LOAD" CONSOLE BUTTONS. THE PROGRAM WILL LOAD AND STOP AT WAIT 1. (B REG = 3001)
 - SET THE ADDRESS OF THE PULSE COUNTER IN SENSE/PROG. SWS. 1-7 (/7F-/40). SET SW. 0 = 0 FOR THE 1ST COUNTER AND = 1 FOR THE 2ND.
 - SET DATA ENTRY SW. 15 = 0 TO LOOP OR = 1 TO WAIT AT THE END OF THE PROGRAM.
 - CONNECT THE TEST PULSE WIRES TO TERMINAL OF THE COUNTER BEING TESTED. (TB19-12,13)
 - PRESS CONSOLE "START" BUTTON. THE PROGRAM WILL STEP THE COUNTER 254 TIMES. IF THE COUNTER CONTAINS /FE, IT WILL GO TO WAIT 2 OR LOOP, AS DEFINED BY D.E. SW. 15. IF THE COUNTER HAS AN INCORRECT AMOUNT, IT WILL GO TO WAIT 6.
 - THE RUNNING TIME ON A 2 MICRO-SEC. SYSTEM IS LESS THAN 1 SECOND.

- SERVICE HINTS**
 - LOCATION /0009 CONTAINS THE NUMBER OF TIMES THAT THE COUNTER WILL STEP. ANY VALUE BETWEEN 1 AND 255 MAY BE LOADED INTO THIS LOCATION.
 - THE OUTPUT OF THE "TEST PULSE LATCH" COMES OUT TO TB-19 TERMINALS 12 AND 13.

DSW
0 PARITY
1 STOR. PROT. VIOL.
2 D.I. SCAN COMPL.
15 D.I. BUSY

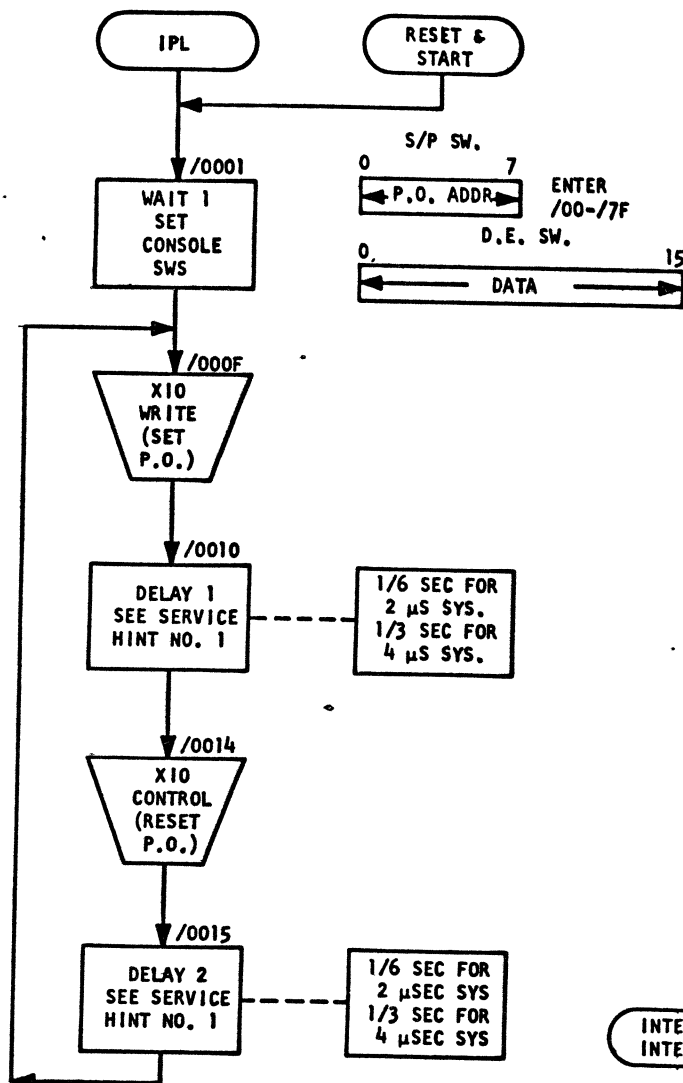
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*** PULSE COUNTER, 8 BIT, SCOPE LOOP *** XXXVII
*
ABS
BEGIN WAIT 1 WAIT AFTER IPL.
XIO /0021 SENSE PROG. SW'S.
BSC Z+ SKIP IF 1ST COUNTER. (PROG. SW0=0)
LDS 0 SET OFLO. (2ND COUNTER)
SLA 1
SRA 9 MODIFIER FOR READ PULSE COUNT IOCC.
OR /0024 OR IN /5A00. (PC AREA AND
READ FUNCTION)
*
STD /0027 STORE READ PULSE COUNT IOCC
AT LOCATION /0027.
*
LDX L3 /00FE PUT /00FE IN XR3. BEGIN 254
TEST PULSES.
XIO /0025 TEST PULSE ON.
LDX 1 -16 PUT /FFFO IN XR1. BEGIN DELAY 1.
MDX 1 +1 INCR XR1 BY 1.
LDX /000C BRANCH TO /000C.
XIO /001F TEST PULSE OFF.
LDX 1 -16 PUT /FFFO IN XR1. BEGIN DELAY 2.
MDX 1 +1 INCR XR1 BY 1.
LDX /0010 BRANCH TO /0010.
MDX 3 -1 DECR XR3 BY 1. (SKIP AFTER
254 TIMES)
*
LDX /000A BRANCH TO /000A.
XIO /0026 READ PULSE COUNT INTO
LOCATION /0028.
LD /0028 PUT PULSE COUNT READING INTO ACCUM.
BSC 0 SKIP IF 1ST COUNTER.
SRA 8
AND /0022 AND IN /00FF.
CMP /0009 ARE THE COUNTS EQUAL.
NOP
WAIT 6 ERROR WAIT.
XIO /0023 SENSE DATA SW'S.
BSC E SKIP IF LOOPING PROGRAM.
* (DATA SW15=0)
WAIT 2 TEST COMPLETED OK.
LDX L /0001 BRANCH TO /0001. REPEAT PROGRAM.
*
*** IOCC'S ***
*
DC /0760 IOCC-SENSE PROG. SW'S.
DC /00FF CONSTANT
DC /0740 IOCC-SENSE DATA SW'S.
DC /5A00 CONSTANT
DC /6401 IOCC-TEST PULSE ON.
DC /0028 IOCC-READ PULSE COUNT INTO
DC /5A00 LOCATION /0028.
DC BEGIN PULSE COUNT READING STORAGE.
END
    
```

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1. PROGRAM DESCRIPTION

WILL WRITE A PULSE OUTPUT DATA WORD, DELAY, RESET THE PULSE OUTPUT DATA WORD, DELAY, AND REPEAT.

2. OPERATING PROCEDURE

1. PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP "READY". FOR PAPER TAPE INPUT, PLACE THE DELETE HOLE SECTION OF THE PAPER TAPE OVER THE READ STATION.
2. SET "CHECK STOP" SW. ON.
3. PRESS "RESET" AND "PROGRAM LOAD" CONSOLE BUTTONS. THE PROGRAM WILL LOAD AND STOP AT WAIT 1.
4. SET THE PULSE OUTPUT ADDRESS IN THE SENSE/PROGRAM SWITCHES. (/00-7F)
5. SET THE DATA TO BE WRITTEN IN DATA ENTRY SWITCHES 0-15.
6. PRESS CONSOLE "START" BUTTON. THE PROGRAM WILL WRITE THE P.O. DATA WORD, DELAY, RESET THE P.O. DATA WORD, DELAY, AND REPEAT.
7. IF A CAR CHECK ERROR OCCURS, THE PROGRAM WILL STOP AT WAIT 8.

3. SERVICE HINTS

1. IT IS POSSIBLE TO CHANGE THE TIME DELAYS. NORMALLY /7FFF IS LOADED INTO INDEX REGISTER NO. 1. IF A SMALLER VALUE IS ENTERED, THE TIME DELAY WILL BE LESS. LOCATION /0011 CONTROLS DELAY 1 AND LOCATION /0016 CONTROLS DELAY 2.

*** DAO - DPC PULSE OUT SCOPE LOOP *** XXXVIII

```

*
ABS
BEGIN NOP
WAIT 1 WAIT AFTER IPL.
XIO /001A SENSE PROG. SW'S. (PO ADDR)
SRA 8
OR /0024 OR IN /6100.
STO /0021 STORE IOCC TO WRITE PO.
NOP
LDX /000E BRANCH TO /000E.
DC /0009 INTERNAL INTERRUPT VECTOR.
DC INTERNAL INTR ENTRY
XIO /001E SENSE ILSW.
WAIT 8 INTERNAL ERROR. (TO LOOP, NOP WAIT)
BOSC I /0009 BRANCH OUT VIA LOCATION /0009.
XIO /001C READ DATA SW'S INTO LOC. /0025.
XIO /0020 WRITE PO FROM LOCATION /0025.
LDX L1 /7FFF PUT /7FFF IN XR1. BEGIN DELAY 1.
MDX 1 -1 DECR. XR1 BY 1.
LDX /0012 BRANCH TO /0012.
XIO /0022 CONTROL, RESET PO.
LDX L1 /7FFF PUT /7FFF IN XR1. BEGIN DELAY 2.
MDX 1 -1 DECR. XR1 BY 1.
LDX /0017 BRANCH TO /0017.
LDX /0002 BRANCH TO /0002.
DC SENSE PROG. SW'S.
DC /0760 READ DATA SW'S INTO LOCATION /0025.
DC /0025
DC /0240 SENSE ILSW.
DC
DC /0300 WRITE PO FROM LOCATION /0025.
DC /0025 CONTROL, RESET PO.
DC /6100
DC
DC /6480 CONSTANT, PO AREA AND WRITE FCN.
DC /6100 STORAGE FOR PO DATA WORD.
DC
END BEGIN
    
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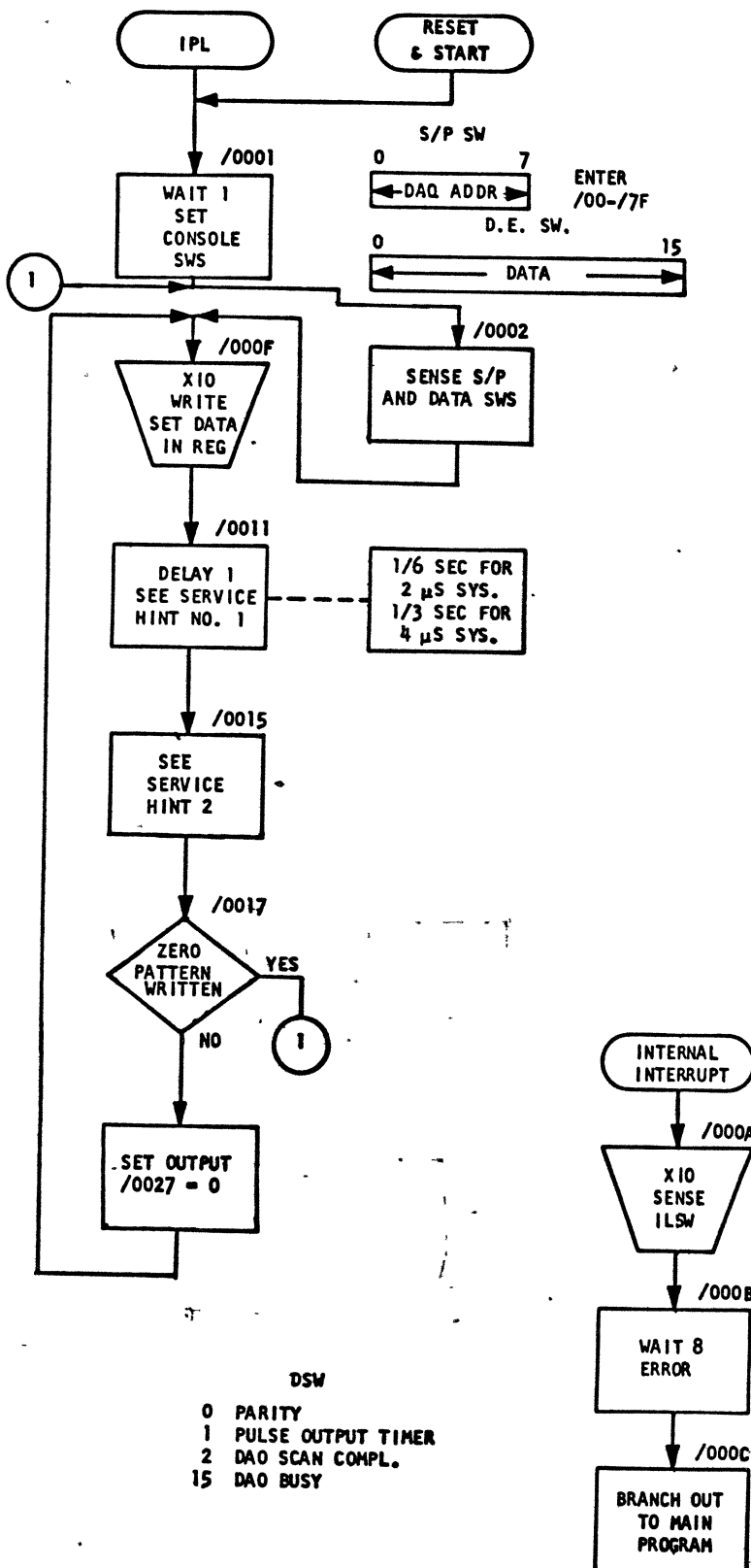
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411961

14NOV69
431319

31JUL70
431326

PROG ID
PAGE

08C8-
27A



- PROGRAM DESCRIPTION**
WILL LOAD AND RESET ONE DIGITAL OR ANALOG OUTPUT REGISTER. CAN ONLY BE USED IN D.P.C. MODE.
- OPERATING PROCEDURE**
 - PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP "READY". FOR PAPER TAPE INPUT, PLACE THE DELETE HOLE SECTION OF THE PAPER TAPE OVER THE READ STATION.
 - SET "CHECK STOP" SW. ON.
 - PRESS CONSOLE "RESET" AND "PROGRAM LOAD" BUTTONS. PROGRAM WILL LOAD AND STOP AT WAIT 1.
 - SET THE DAO. ADDRESS IN THE SENSE/PROG SWITCHES. (/00-7F) SEE SERVICE HINT 2.
 - SET THE DAO DATA WORD IN THE DATA ENTRY SWITCHES.
 - PRESS THE CONSOLE "START" BUTTON. PROGRAM WILL WRITE THE DAO WORD, DELAY, RESET THE DAO. WORD, AND REPEAT.
 - IF A CAR CHECK ERROR OCCURS, THE PROGRAM WILL STOP AT WAIT 8.
- SERVICE HINTS**
 - IT IS POSSIBLE TO CHANGE THE TIME DELAYS. NORMALLY /7FFF IS LOADED INTO INDEX REGISTER NO. 1. IF A SMALLER VALUE IS ENTERED, THE TIME DELAY WILL BE LESS. LOCATION /0012 CONTROLS DELAY.
 - IF BUFFERED DAC OPERATION IS DESIRED, CHANGE CONTENTS OF LOCATION /0015 TO /080E.
****WARNING****
THE CONTROL COMMAND CAUSES ALL AO BUFFERS TO BE TRANSFERRED TO THEIR CORRESPONDING AO REGISTERS. IF REGISTER DATA IS NOT THE SAME AS BUFFER DATA, THEN THE REGISTER WILL BE CHANGED TO REFLECT THE BUFFER DATA. OBTAIN CUSTOMER PERMISSION BEFORE ATTEMPTION BUFFER TRANSFERS.
 - ENTER A WAIT COMMAND (/3000) AT LOCATION /0010 IF IT IS DESIRED TO HALT THE PROGRAM AFTER EACH PASS SO THAT STATIC MEASUREMENTS OF OUTPUT DATA CAN BE OBSERVED.

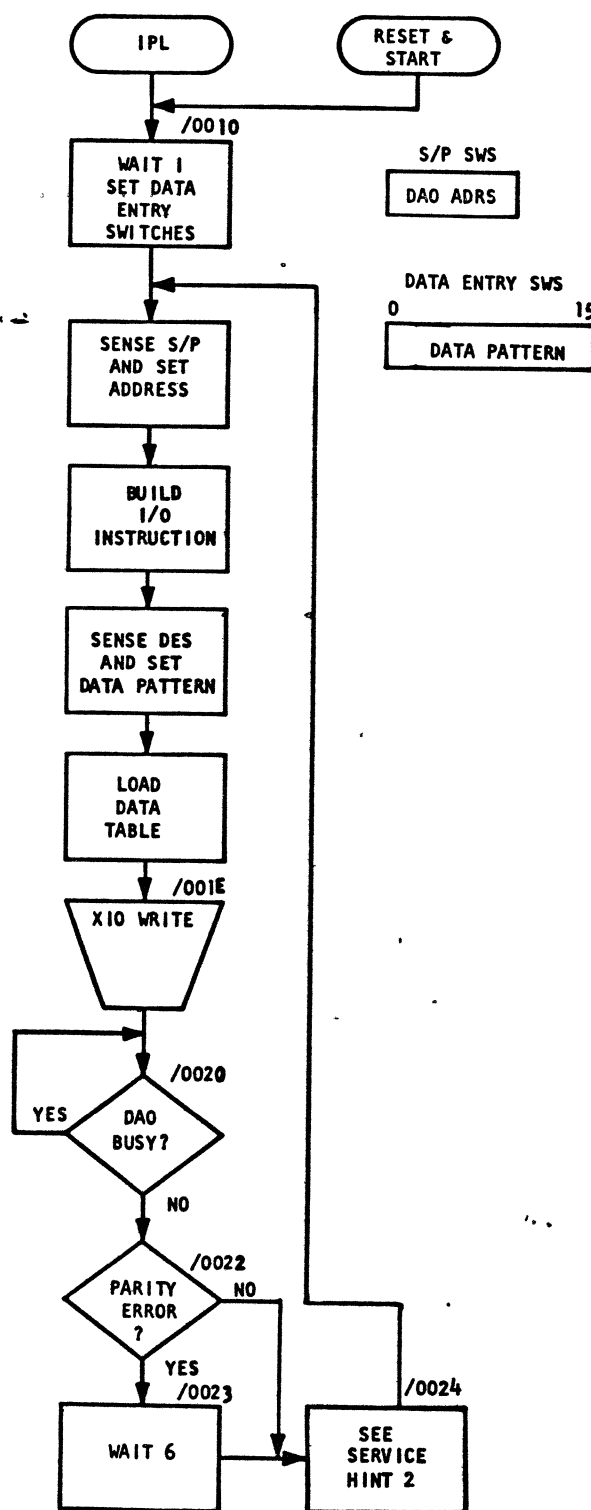
APPENDIX B

```

*** DAD - DPC SCOPE LOOP *** XXXIX
*
ABS
BEGIN NOP
WAIT 1 WAIT AFTER IPL.
XIO /001C SENSE PROG. SW'S. (DAO ADDRESS)
SRA 8
OR /0026 OR IN /6100.
STO /0023 STORE IOCC TO WRITE DAO.
NOP
LDX /000E BRANCH TO /000E.
DC /0009 INTERNAL INTERRUPT VECTOR.
*
*** INTERNAL ERROR INTR. RTN ***
*
DC INTERNAL INTR ENTRY
XIO /0020 SENSE ILSW.
WAIT 8 INTERNAL ERROR. (TO LOOP, NOP WAIT)
BOSC I /0009 BRANCH OUT VIA LOCATION /0009.
*
XIO /001E READ DATA SW'S INTO LOCATION /0027.
XIO /0022 WRITE DAO FROM LOCATION /0027.
NOP ENTER A HALT HERE, IF DESIRED.
LDX L1 /7FFF PUT /7FFF IN XR1. BEGIN DELAY 1.
MDX 1 -1 DECR. XR1 BY 1.
LDX /0013 BRANCH TO /0013.
NOP SEE SERVICE HINT 2.
LD /0027 LOAD DO DATA WORD FROM /0027.
BSC +- SKIP IF NOT ZERO.
LDX /0002 BRANCH TO /0002.
SLA 16 SHIFT LEFT TO SET A-REG TO ZERO.
STO /0027 STORE /0000 AT DO DATA WORD. /0027.
LDX /000F BRANCH TO /000F TO WRITE ZERO.
*
*** IOCC'S ***
*
DC /0000 STORAGE FOR DAO DATA WORD
DC /0760 SENSE S/P SWS IOCC
DC /0027 READ DATA SW'S INTO LOCATION /0027.
DC /0240 READ IOCC
DC
DC /0300 SENSE ILSW IOCC
DC /0027 WRITE DAO FROM LOCATION /0027.
DC /6100 WRITE IOCC
DC /001C TRANSFER BUFF TO AO REG.
DC /6440 CONTROL IOCC.
DC /6100 CONSTANT, DAO AREA AND WRITE FCN.
DC STORAGE FOR DAO DATA WORD.
END BEGIN
    
```

DATE 01 JUL 66 EC 415178
DATE 14 NOV 69 EC 431319
DATE 04 NOV 66 EC 415233
DATE 31 JUL 70 EC 431326
DATE 15 FEB 67 EC 415233B
DATE 15 MAY 67 EC 411731
DATE 02 DEC 68 EC 411961
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DATE 01JUL66 04NOV66 15FEB67 15MAY67 02DEC68 14NOV69 31JUL70
EC NO, 415178 415233 415233B 411731 411961 431319 431326
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28A



DAO DC SCOPE LOOP

1. PROGRAM DESCRIPTION

PROGRAM SENSES THE DATA ENTRY SWITCHES TO FIND THE DATA PATTERN TO BE USED. THE SENSE/PROGRAM SWITCHES INDICATE THE REGISTER. AFTER THE TABLE HAS BEEN LOADED, THE I/O INSTRUCTION IS BUILT, A WRITE COMMAND IS GIVEN. A WAIT 6 INDICATES A PARITY ERROR.

2. OPERATING PROCEDURES

1. PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO READ THE CARD IN, AND ONCE TO BRING UP READY. FOR PAPER TAPE INPUT, PLACE THE DELETE WHOLE SECTION OF THE PAPER TAPE OVER THE READ STATION.
2. SET 'CHECK STOP' SWITCH ON.
3. PRESS 'RESET' AND 'PROGRAM LOAD' CONSOLE BUTTONS. PROGRAM WILL LOAD AND STOP AT WAIT 1. SEE SERVICE HINTS 1 AND 2.
4. SET THE DATA ENTRY SWITCHES WITH THE DATA PATTERN. SET THE SENSE PROGRAM SWITCHES WITH THE REGISTER.
5. PRESS START AND PROGRAM WILL RUN.
6. WAIT 6 WILL INDICATE A PARITY ERROR.

3. SERVICE HINTS

1. TO RUN SINGLE ADDRESS MODE, SET THE CONTENTS OF LOCATION 0002 TO HEX 0040.
2. IF BUFFERED DAC OPERATION IS DESIRED, CHANGE THE CONTENTS OF LOCATION HEX 0024 TO HEX 08E5

WARNING

THE CONTROL COMMAND CAUSES ALL AO BUFFERS TO BE TRANSFERRED TO THEIR CORRESPONDING AO REGISTERS. IF REGISTER DATA IS NOT THE SAME AS BUFFER DATA, THEN THE REGISTER WILL BE CHANGED TO REFLECT THE BUFFER DATA. OBTAIN CUSTOMER PERMISSION BEFORE ATTEMPTING BUFFER TRANSFERS.

DATE 04 NOV 66
EC 415233

DATE 15 FEB 67
EC 415233B

DATE 15 MAY 67
EC 411731

DATE 02 DEC 68
EC 411961

PROG ID 08C8-
PAGE 29

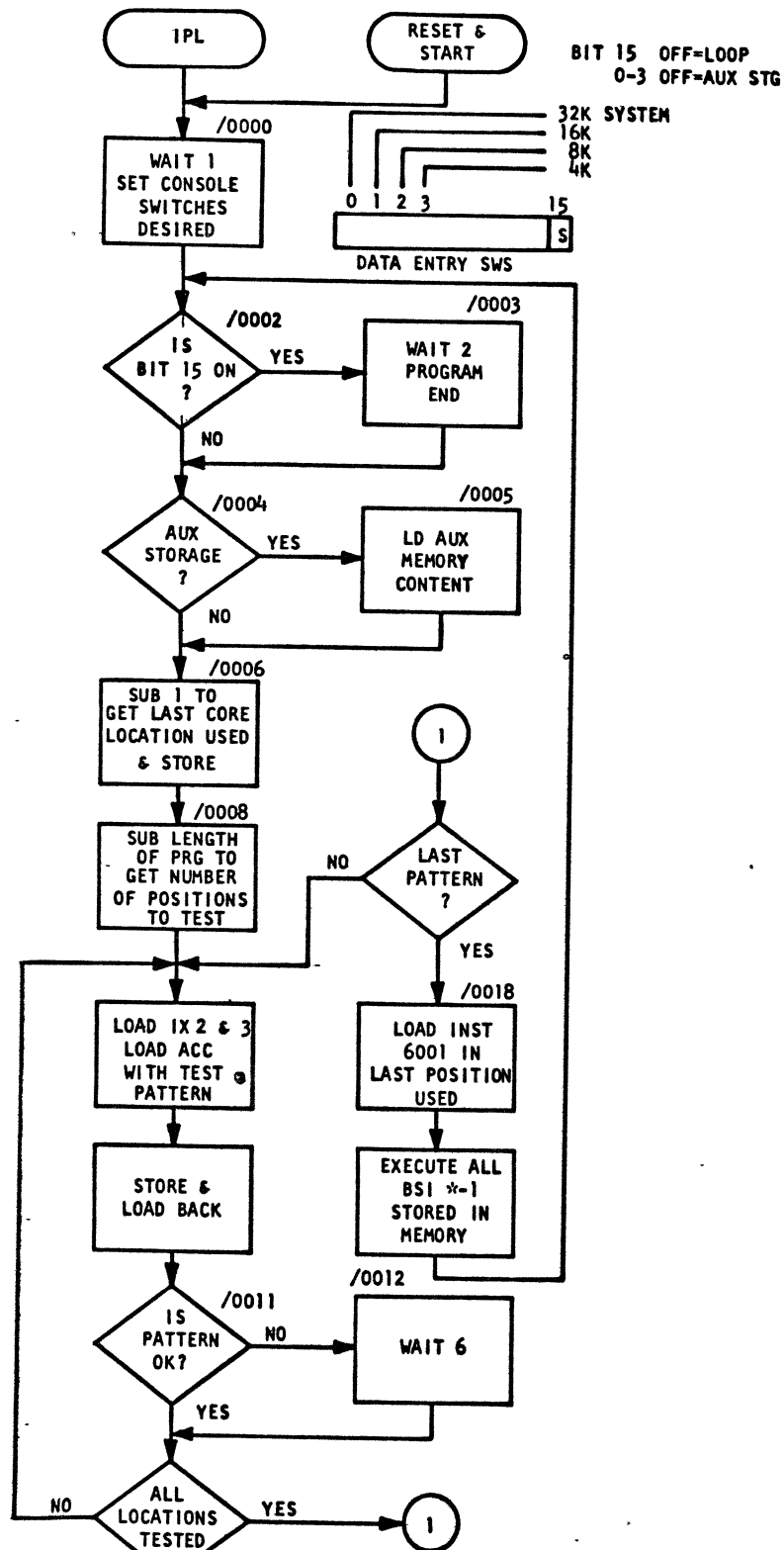
DATE 14 NOV 69
EC 431319

DATE 31 JUL 70
EC 431326

*** DAO - DC SCOPE LOOP *** XL

0280	ABS	ORG	0	
0000 0 6010	DES	LDX	BEGIN	
0001 0 0740	DC	/0740		SENSE DATA ENTRY SWS IOCC
0002 0 0000	SPSW	DC	0	IF ZERO USE RANDOM MODE
0003 0 0760	DC	/0760		SENSE S/P SWITCHES IOCC
0004 0 0026	WRITE	DC	WAREA	OUTPUT AREA
0005 0 6500	DC	/6500		WRITE IOCC
0006 0 6500	DSW	DC	/6500	CONSTANT
0007 0 6701	DC	/6701		SENSE DSW IOCC
0008 0 000C	ILSW	DC	ERROR	INTERNAL INTERRUPT VECTOR
0009 0 0300	DC	/0300		SENSE ILSW IOCC
000A 0 0000	CTRL	DC	0	CONTROL IOCC
000B 0 6440	DC	/6440		BUFFER XFERS
000C 0 0000	ERROR	DC	0	INTERNAL INTR ENTRY
000D 0 08FA	XIO	ILSW		SENSE ILSW
000E 0 3008	WAIT	8		
000F 0 4878	BOSC	+Z		RESET ERROR AND SKIP
0010 0 3001	BEGIN	WAIT	1	SET CONSOLE SWITCHES
0011 0 08F0	XIO	SPSW		SENSE DAO ADDR
0012 0 1808	SRA	8		
0013 0 D013	STO	ADRS		SET DAO ADRS IN WRITE AREA
0014 0 D014	STO	ADRS+2		USED ONLY IN RANDOM MODE
0015 0 COEC	LD	SPSW		FETCH MODE
0016 0 E8E6	OR	DSW		OR IN AREA AND FUNCTION
0017 0 DOED	STO	WRITE+1		BUILD WRITE IOCC
0018 0 08E7	XIO	DES		SENSE DATA
0019 0 D00E	STO	DATA		PLACE DATA IN WRITE AREA
001A 00 74000002	MDX	L SPSW,0		SKIP IF RANDOM MODE
001C 0 D00C	STO	DATA+1		
001D 0 D00C	STO	DATA+2		
001E 0 08E5	XIO	WRITE		GIVE WRITE COMMAND
001F 0 08E6	CK	XIO	DSW	SENSE DSW
0020 0 4804	BSC	E		IS DAO BUSY
0021 0 601F	LDX	CK		* YES
0022 0 4828	BSC	+Z		* NO, IS THERE AN ERROR
0023 0 3006	WAIT	6		* YES, DSW IN ACC
0024 0 1000	NOP			SEE SERVICE HINT 2
0025 0 6011	LDX	BEGIN+1		* NO
0026 0 4004	WAREA	DC	/4004	WORD COUNT
0027 0 0000	ADRS	DC		DAO ADDRESS
0028 0 0000	DATA	DC		DATA
0029 0 0000	DC			DAO ADDRESS IF RANDOM MODE
002A 0 0000	DC			DATA
002C 0010	END	BEGIN		

8B001190



1. PROGRAM DESCRIPTION

THE PROGRAM WILL SET THE CORE SIZE AND DETERMINE THE NUMBER OF CORE LOCATIONS TO BE TESTED. EACH WORD OF THE PROGRAM IS USED AS A PATTERN TO BE WRITTEN, READ AND CHECKED IN THE NUMBER OF POSITION DETERMINED BY THE PROGRAM. THE LAST PATTERN USED IS /40FF WHICH IS A BSI *-1. WHEN THIS IS STORED THROUGHOUT MEMORY, THESE INSTRUCTIONS ARE EXECUTED. EACH LOCATION WILL HAVE THE NEXT HIGHER ADDRESS STORED IN IT AND THE PROGRAM WILL LOOP UNTIL BIT 15 IS SET ON. AFTER USING AUX STORAGE LOAD THE AUX LOADER.

2. OPERATING PROCEDURE

1. PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO READ THE CARD IN AND ONCE TO BRING UP 'READY'. FOR PAPER TAPE INPUT, PLACE THE DELETE HOLE SECTION OF THE PAPER TAPE OVER THE READ STATION.
2. SET 'CHECK STOP' SWITCH ON. TO LOAD IN AUX SET 'FORCE AUX' SWITCH ON.
3. PRESS 'RESET' AND 'PROGRAM LOAD' CONSOLE BUTTONS. THE PROGRAM WILL LOAD AND STOP AT WAIT 1.
4. SET CORE SIZE IN THE DATA ENTRY SWITCHES:
NO BITS - 256 - USE IN AUX OR MAIN LINE
BIT 0 - 32K - MAIN LINE
1 } - 24K - MAIN LINE
2 }
3 - 4K - MAIN LINE
5. PRESS CONSOLE START. PROGRAM WILL CONTINUE TO RUN UNTIL BIT 15 IS SET ON.
6. PROGRAM WILL STOP AT WAIT 6 IF A COMPARE ERROR OCCURS.

3. SERVICE HINTS

1. IF A PARITY ERROR OCCURS, SET THE DISPLAY ADDRESS REGISTER TO SAR TO DETERMINE THE FAILING ADDRESS.
2. IF AN ADDRESS IS SELECTED THAT IS TOO LARGE, IT WILL CAUSE THE PROGRAM TO BE OVERLAID AND THE PROGRAM WILL STOP.
3. THE SMALLEST ADDRESS THAT MAY BE USED IS /0026.
4. IF WAIT 6 IS ENCOUNTERED, THE B-REGISTER WILL CONTAIN THE ERROR PATTERN THAT WAS READ FROM MEMORY. THE SAR WILL SHOW THE ADDRESS OF THE CORRECT PATTERN. DISPLAY INDEX REGISTER 3 AND ADD THE ADDRESS OF LAST WORD USED IN THE PROGRAM LISTING TO FIND THE FAILING ADDRESS.

*** STORAGE CHECK SCOOP LOOP *** XLI

```

028C
0000 0 3001
0001 0 081A
0002 0 4804
0003 0 3002
0004 0 E01C
0005 0 4818
0006 0 C017
0007 0 9018
0008 0 D016
0009 0 901A
000A 0 D002

000B 0 62DB
000C 00 67000000
000E 0 C226
000F 0 D325
0010 0 C325
0011 0 F226
0012 0 4820
0013 0 3006
0014 0 73FF
0015 0 600E

0016 0 7201
0017 0 600C

0018 0 C003
0019 00 D480001F
001B 0 6026

001C 0 6001
001D 0 0740
001E 0 0100
001F 0 0000
0020 0 0001
0021 0 FFC0
0022 0 5555
0023 0 AAAA
0024 0 0025
0025 0 40FF

0026 0000

ABS
ORG 0
START WAIT 1 SET REQUIRED SWITCHES
CHECK XIO DESW SENSE DATA ENTRY SWITCHES
BSC E IS BIT 15 ON
WAIT 2 * YES, PROG HALT
AND KFFCO * NO
BSC +- IS PROG FOR AUX
LD AUX * YES
S ONE * NO, COMPUTE SIZE
STO ADR LAST ADDRESS USED
S CTR
STO CRTL+1 NUMBER OF LOCATIONS TO CK

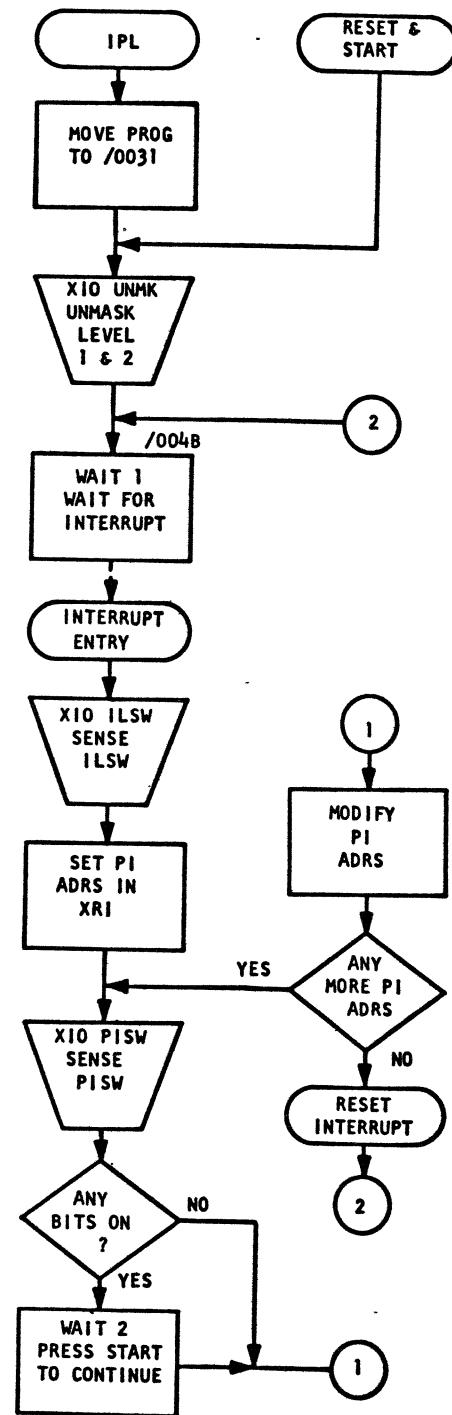
*
LDX 2 -K40FF NUMBER OF PATTERNS TO USE
CNTL L3 NUMBER OF LOCATIONS TO CK
LD 2 K40FF+1 GET PATTERN
STO 3 K40FF STORE PATTERN
LD 3 K40FF READ PATTERN BACK
EOR 2 K40FF+1 CK AGAINST PATTERN
BSC Z IS PATTERN CORRECT
WAIT 6 * NO
MDX 3 -1 * YES, CHANGE LOCATIONS
LDX CNTL+2

*
MDX 2 1 CHANGE PATTERN
LDX CNTL

*
LD DESW GET INSTRUCTION AND
STO 1 ADR * STORE IN LAST ADDRESS
LDX K40FF+1 * EXECUTE ALL 'BSI *-1'

*
DESW LDX CHECK
DC /0740 SENSE DATA ENTRY SWITCHES
AUX DC /100 AUX STORAGE ADDRESS
ADR DC /0000 LAST ADDRESS OF MEMORY
ONE DC 1 CONSTANT
KFFCO DC /FFC0 CONSTANT
DC /5555 CONSTANT
DC /AAAA CONSTANT
CTR DC K40FF LAST ADDRESS OF PROGRAM
K40FF DC /40FF CONSTANT- BSI *-1

*
END START END CARD NOT USED ON IPL
    
```



(PROCESS INTERRUPT)

1. PROGRAM DESCRIPTION

THE PROGRAM WILL RELOCATE ITSELF, SET THE INTERRUPT VECTORS, UNMASK BOTH LEVELS, AND GOES TO WAIT 1 (B-REG=3001). MANUALLY CAUSE AN INTERRUPT. THE PROGRAM WILL SEARCH PI ADDRESSES TO FIND SOME BIT ON. IT WILL STOP AT WAIT 2 (B-REG=3002). PRESS START AND THE PROGRAM SHOULD GO TO WAIT 1. IF IT GOES TO WAIT 2 ANOTHER BIT WAS FOUND ON.

2. OPERATION PROCEDURE

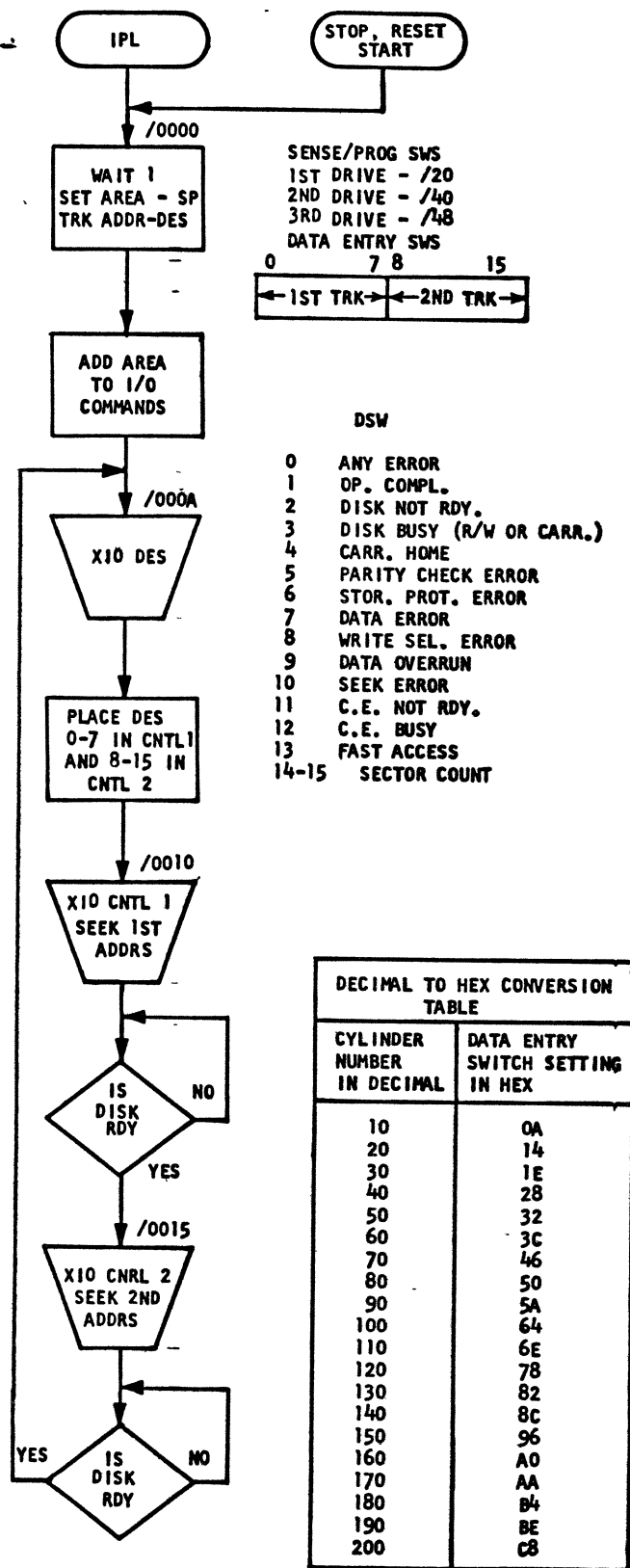
1. PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO READ THE CARD IN AND ONCE TO BRING UP 'READY'. FOR PAPER TAPE INPUT, PLACE DELETE HOLES SECTION OF THE PAPER TAPE OVER THE READ STATION.
2. SET 'CHECK STOP' SWITCH ON.
3. PRESS 'RESET' AND PROGRAM LOAD CONSOLE BUTTONS. THE PROGRAM WILL LOAD AND STOP AT WAIT 1.
4. MANUALLY CAUSE PROCESS INTERRUPT.
5. PROGRAM SHOULD STOP AT WAIT 2 WITH THE PISW IN THE ACCUMULATOR, THE PI ADDRESS IN XRI, AND THE ILSW IN THE Q-REG.
6. AFTER CHECKING FOR CORRECT OPERATION, PRESS CONSOLE START.
7. PROGRAM SHOULD GO TO WAIT 1, READY FOR ANOTHER PROCESS INTERRUPT. IF THE PROGRAM STOPS AT WAIT 2 AGAIN, TWO BITS WERE SET ON.

SCOPE LOOP PROGRAMS

APPENDIX B

*** PI SCOOP LOOP *** XLII

0280				ABS			
				ORG	40		
0028	0	611F		BEGIN	LDX	1 31	NUMBER OF INST TO MOVE
0029	0	C108		CONT	LD	1 8	PICK UP INST
002A	0	D130			STO	1 48	* AND MOVE
002B	0	C004			LD	ADRS	GET INTR VECTOR
002C	0	D108			STO	1 8	* AND SET IN PLACE
002D	0	71FF			MDX	1 -1	
002E	0	70FA			MDX	CONT	
002F	0	6031			LDX	START	
0030	0	0036		ADRS	DC	ENTRY	INTERRUPT ADDRESS
0031	0	C015		*			
0032	0	D0CD		START	LD	LOOP	GET BCH INST
0033	0	0814			STO	/0	* AND SET IN AT ZERO
0034	0	0815			XIO	UNMK1	UNMASK LEVEL 1
0035	0	3001			XIO	UNMK2	UNMASK LEVEL 2
				WAIT	WAIT	1	WAIT FOR INTERRUPT
				*			
0036	0	0000		ENTRY	DC	/0000	INTERRUPT ENTRY
0037	0	0814			XIO	ILSW	SENSE ILSW
0038	0	18D0			RTE	16	SAVE ILSW IN Q-REG
0039	0	6102			LDX	1 2	STARTING PI ADRS
003A	0	621A			LDX	2 26	NUMBER OF PI ADDRESSES
003B	0	C010			LD	ILSW	
003C	0	D012			STO	PISW+1	SET UP IOCC
				*			
003D	0	0810		BACK	XIO	PISW	SENSE PISW WORD
003E	0	4820			BSC	Z	ANY BITS ON
003F	0	3002			WAIT	2	* YES
0040	00	7401004F			MDX	L PISW+1,1	* NO, INCR PI ADRS
0041	0	7101			MDX	1 1	UPDATE PI ADRS
0042	0	72FF			MDX	2 -1	
0043	0	70F8			MDX	BACK	
0044	0	4C400035			BOSC	L WAIT	RESET INTR AND GO TO WAIT
0045	00	7030		LOOP	MDX	X START-1	USED FOR RESET-START
0046	0	0000			BSS	E	
0047	0	0000			DC		
0048	0	0000		UNMK1	DC	/0480	UNMASK IOCC
0049	0	0480			DC	/0481	UNMASK IOCC
004A	0	0000		UNMK2	DC	/5F02	STARTING PI IOCC
004B	0	0481			DC	/0300	SENSE ILSW IOCC
004C	0	5F02		ILSW	DC	/5F02	PISW IOCC
004D	0	0300			DC	/5F02	
004E	0	0000		PISW	DC		
004F	0	5F02			DC		
				*			
0050	0028			END		BEGIN	



1. PROGRAM DESCRIPTION

THE HEAD WILL MOVE BETWEEN ANY TWO CYLINDERS SET IN THE DATA ENTRY SWITCHES AND WILL CONTINUE THIS UNTIL NEW TRACK ADDRESSES ARE SET IN EITHER LOCATION 0 THROUGH 7 OR 8 THROUGH 15. NO DATA WILL BE READ OR WRITTEN ON THE DISK.

2. OPERATING PROCEDURES

- PLACE A SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO RUN THE CARD IN, AND ONCE TO BRING UP "READY". FOR PAPER TAPE INPUT, PLACE THE DELETE HOLES SECTION OF THE PAPER TAPE OVER THE READ STATION.
- SET CHECK STOP SWITCH ON.
- PRESS RESET AND PROGRAM LOAD CONSOLE BUTTONS. PROGRAM WILL LOAD AND STOP AT WAIT 1 (B REGISTER/3001).
- SET THE SENSE PROGRAM SWITCHES TO DETERMINE THE DRIVE TO BE RUN.
DRIVE 1 - /20
DRIVE 2 - /40
DRIVE 3 - /48
- SET THE DATA ENTRY SWITCHES 0-7 TO SPECIFY THE STARTING CYLINDER NUMBER AND SWITCHES 8-15 TO SPECIFY THE ALTERNATE CYLINDER NUMBER.
- PRESS CONSOLE START BUTTON. PROGRAM WILL SEEK FORWARD BEGINNING CYLINDER AND SEEK TO THE ALTERNATE CYLINDER AND CONTINUE THIS UNTIL A NEW SWITCH SETTING HAS BEEN PLACED IN THE DATA ENTRY SWITCHES.

3. SERVICE HINTS

SETTING THE SAME ADDRESS IN BIT SWITCHES 0-7 AND 8-15, THE HEAD SHOULD NOT MOVE.

*** 1810B SEEK SCOPE LOOP *** XLIII

```

0280
0000 0 3001
0001 0 081A
0002 0 E019
0003 0 D017
0004 0 E819
0005 0 D01B
0006 0 D01C

0007 0 C01C
0008 0 E812
0009 0 D01B

000A 0 0813
000B 0 18C8
000C 0 D013
000D 0 1010
000E 0 1088
000F 0 D012

0010 0 080F
0011 0 0812
0012 0 1002
0013 0 4828
0014 0 6011

0015 0 080C
0016 0 080D
0017 0 1002
0018 0 4828
0019 0 6016
001A 0 600A

001B 0 0000
001C 0 0000
001D 0 6800
001E 0 0760
001F 0 0740
0020 0 0000
0021 0 2400
0022 0 0000
0023 0 2400
0024 0 0701
0025 0 2701

0026 0000

ABS ORG 0
*
BEGIN WAIT 1 SET CONSOLE SWITCHES
XIO SPSW SENSE S/P SWS
AND SPSW SAVE BITS 1,2 DR 4
STO AREA
OR DESW OR IN CONTROL CONSTANT
STO CNTL1+1 BUILD I/O
STO CNTL2+1 BUILD I/O

*
LD DSW
OR AREA
STO DSW+1 BUILD SENSE DSW

*
HERE XIO DESW SENSE DATA ENTRY SWS
RTE 8 SAVE BITS 8-15
STO CNTL1 SET 1ST ADDRESS
SLA 16 CLEAR ACC
SLT 8 GET BITS 8-15
STO CNTL2 SET 2ND ADDRESS

*
CK1 XIO CNTL1 SEEK TO 1ST ADDRESS
XIO DSW SENSE DSW
SLA 2
BSC +Z IS DISC READY
LDX CK1 * NO

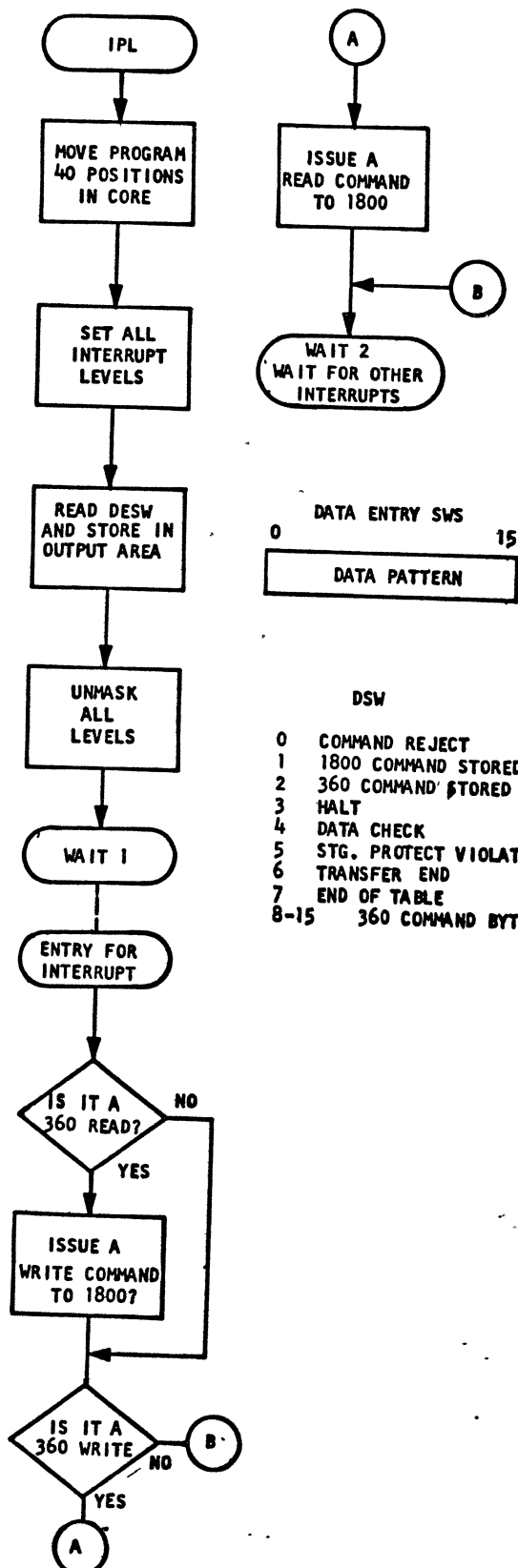
*
CK2 XIO CNTL2 * YES, SEEK 2ND ADDR
XIO DSW SENSE DSW
SLA 2
BSC +Z IS DISC READY
LDX CK2 * NO
LDX HERE * YES

*
AREA DC *-* AREA STORAGE
BSS E
SPSW DC /6800 CONSTANT
DC /0760 SENSE S/P SWS IOCC
DESW DC /0400 CONSTANT FOR CONTROL
DC /0740 SENSE DATA ENTRY SWS IOCC
CNTL1 DC *-* 1ST ADDRESS
DC /2400 CONTROL IOCC
CNTL2 DC *-* 2ND ADDRESS
DC /2400 CONTROL IOCC
DSW DC /0701 * CONSTANT FOR DSW
DC /2701 SENSE DSW IOCC

*
END BEGIN
    
```

SCOPE LOOP PROGRAMS

APPENDIX B



1. PROGRAM DESCRIPTION

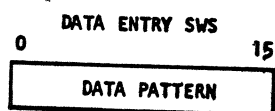
OPERATES SIMULTANEOUSLY WITH THE S/360 CH-CH SCOPE LOOP. OPERATES IN INTERRUPT MODE. RESPONDS TO S/360 WRITE COMMANDS WITH COMPLEMENTARY INITIALIZE READS AND TO S/360 READ BACK COMMANDS WITH COMPLEMENTARY INITIALIZE WRITES.

2. OPERATING PROCEDURE

1. SET DESIRED DATA PATTERN IN DATA ENTRY SWITCHES.
2. PLACE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS 1442 START BUTTON TO FEED THE CARD AND ONCE TO BRING UP READY.
3. SET 'CHECK STOP SWITCH' TO ON.
4. PRESS PROGRAM LOAD BUTTON ON 1800 CONSOLE. PROGRAM WILL LOAD AND STOP AT WAIT 1.
5. LOAD THE S/360 SIDE OF THE CHANNEL AND START IT OPERATING. THE FIRST 360 INTERRUPT WILL START THE 1800 PROGRAM.
6. AFTER THE INITIAL INTERRUPT, THE 1800 WILL BE AT WAIT 2 PENDING ALL SUCCEEDING INTERRUPTS.

3. SERVICE HINTS.

1. IF THE 1800 REMAINS AT WAIT 1, IT FAILED TO RECEIVE THE FIRST 360 INTERRUPT.
2. TO DETERMINE THE LEVEL OF THE INTERRUPT BEING SERVICED, SET THE "DISABLE INTERRUPT" SWITCH ON. THE LEVEL INDICATOR FOR THE LEVEL BEING SERVICED WILL LIGHT.
3. TO CAUSE THE 1800 TO TERMINATE DATA TRANSFERS, CHANGE THE WORD COUNT AT LOCATION 004F HEX TO 0001 THROUGH 0004.

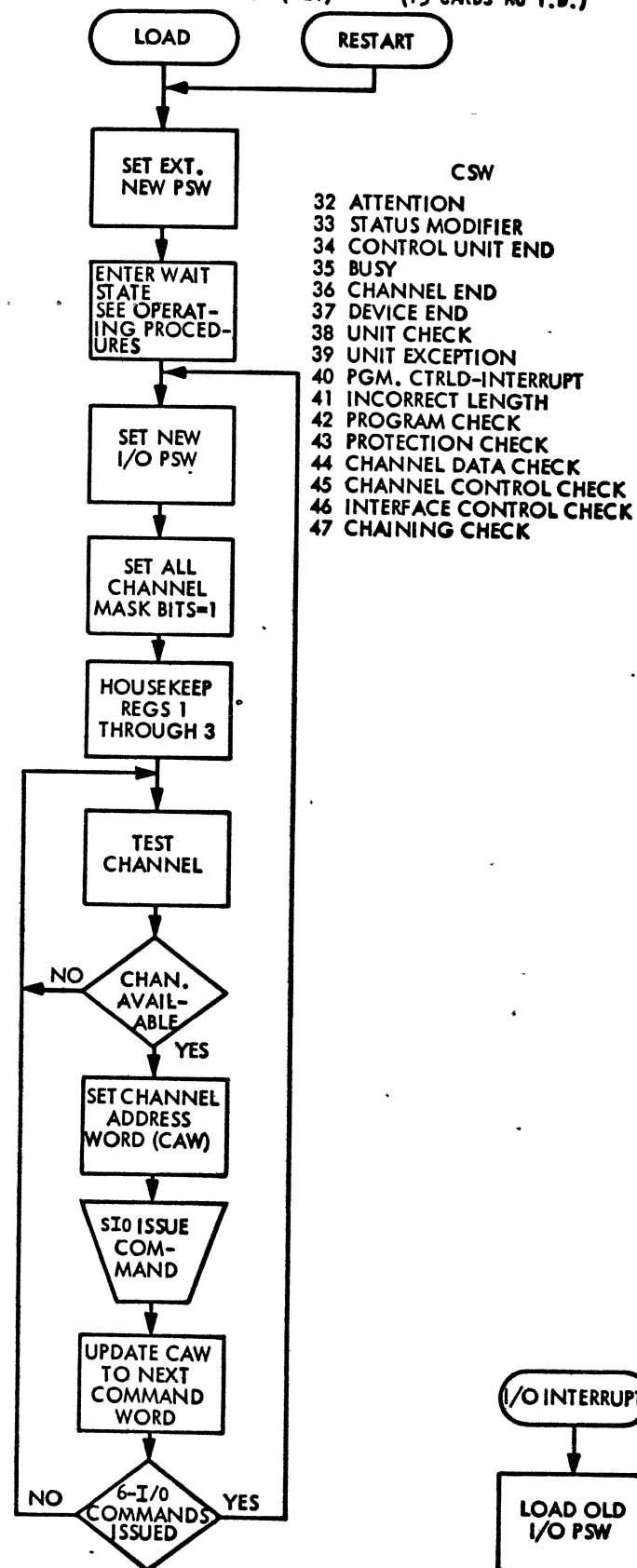


DSW

0	COMMAND REJECT
1	1800 COMMAND STORED
2	360 COMMAND STORED
3	HALT
4	DATA CHECK
5	STG. PROTECT VIOLATE
6	TRANSFER END
7	END OF TABLE
8-15	360 COMMAND BYTE

```

*** 1800 CH-CH SCOPE LOOP *** XLIV
*
02BC          ABS
0028 0 6121   ORG          40
0029 0 C106   LDX          1 33
002A 0 D12E   MOVE        LD          1 6       PICK UP PROGRAM
002B 0 C004   STO          1 46       * AND RELOCATE
002C 0 D107   LD           LD          1 7       GET INTERRUPT ADDRESS
002D 0 71FF   STO          1 7       * AND LOAD VECTORS
002E 0 70FA   MDX          1 -1
002F 0 603C   MDX          MOVE
0030 0 0046   BCH          LDX          CONT      BCH TO RELOCATED PROGRAM
0031 0 0740   DESW        DC          ENTRY     INTR ENTRY ADDRESS
0032 0 2002   DC          DC          /0740    SENSE DATA ENTRY SWS
0033 0 6F01   DSW        DC          /2002    CONSTANT
                                DC          /6F01    SENSE DSW
*
0034 0 004F   READ        DC          AREA     READ AREA
0035 0 6E00   DC          DC          /6E00   READ IOCC
0036 0 004F   WRITE       DC          AREA     WRITE AREA
0037 0 6D00   DC          DC          /6D00   WRITE IOCC
0038 0 0003   UNMK1      DC          /0003    CONSTANT
0039 0 0480   DC          DC          /0480    UNMASK LEVEL 1
003A 0 0000   UNMK2      DC          /0000    CONSTANT
003B 0 0481   DC          DC          /0481    UNMASK LEVEL 2
*
003C 0 08F3   CONT        XIO         DESW     SENSE DATA SWS
003D 0 61F1   LDX          1 -15
003E 0 D15F   GO          STO          1 AREA+16 STORE DATA PATTERN
003F 0 7101   MDX          1 1
0040 0 70FD   MDX          GO
*
0041 0 C0ED   LD           LD          BCH
0042 0 D0BD   STO          0           USED IN RESTART
0043 0 08F4   XIO         UNMK1      UNMASK LEVEL 1
0044 0 08F5   XIO         UNMK2      UNMASK LEVEL 2
0045 0 3001   WAIT        1           READY FOR INTERRUPT
*
0046 0 0000   ENTRY       DC          *-*     INTR ENTRY
0047 0 08EA   XIO         DSW        SENSE DSW
0048 0 F0E9   EOR         DSW        CHECK INTERRUPT
0049 0 4858   BOSC        +-         IS THIS COMD A READ
004A 0 08EB   XIO         WRITE     YES, ISSUE A WRITE
004B 0 F0EC   EOR         UNMK1     NO
004C 0 4858   BOSC        +-         IS IT A WRITE
004D 0 08E6   XIO         READ     YES, ISSUE A READ
004E 0 3002   WAIT        2         WAIT FOR ANOTHER INTERRUPT
*
004F 0 0008   AREA       DC          /0008   WORD COUNT MAY BE CHANGED
0050 0 0000   END
  
```

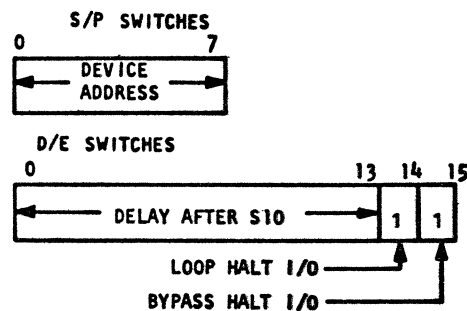
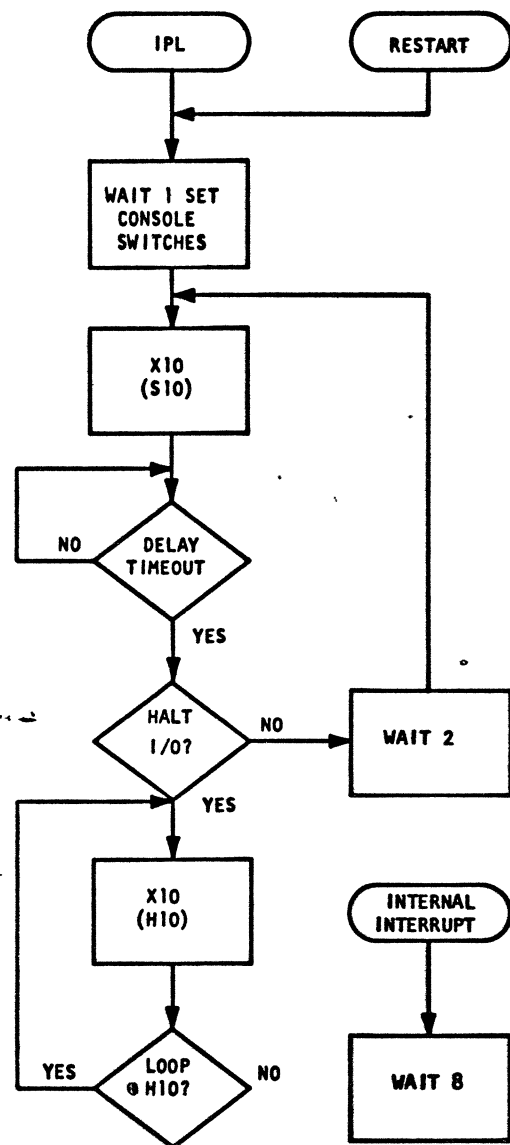
1. PROGRAM DESCRIPTION
OPERATES SIMULTANEOUSLY WITH THE 1800 CH-CH SCOPE LOOP. ACTS AS MASTER SYSTEM ISSUING READ BACK, WRITE, SENSE, CONTROL AND NO-OP COMMANDS TO THE CHANNEL ADAPTER.*
2. OPERATING PROCEDURE
 1. LOAD THE 1800 IPL SCOPE LOOP. PROGRAM WILL STOP AT WAIT 1.
 2. READY THE 5/360 READER WITH LOADER AND 360 CH-CH SCOPE LOOP.
 3. DEPRESS THE LOAD BUTTON. PROGRAM WILL ENTER WAIT STATE, ADDRESS LIGHTS=FFFF.
 4. SET LOCATION 0482 TO CHANNEL ADDRESS AND 0483 TO DEVICE ADDRESS.
 5. DEPRESS INTERRUPT KEY.
 6. PROGRAM WILL ISSUE THE I/O COMMAND SERIES OF READ BACK, WRITE, SENSE, SENSE, CONTROL AND NO-OP TO THE 1800-360 CHANNEL ADAPTER.
 7. IF 360 FAILS TO INTERRUPT THE 1800, THE 1800 WILL BE AT WAITS 1 OR 2. SEE 1800 CH-CH SCOPE LOOP DESCRIPTION.
 8. TO RESTART:
PUSH SYSTEM RESET.
PUSH START ONCE.
SET ADDRESS SWITCHES TO /0400
PUSH "SET IC" BUTTON.
PUSH START. RETURN TO OP. PROCEDURE, STEP 4.
3. SERVICE HINTS
 1. TO CHANGE PROGRAM BETWEEN MULTIPLEX CHANNEL OPERATION AND SELECTOR CHANNEL OPERATIONS, CHANGE THE WORD IN LOCATION 000482 HEX TO:
00 FOR MULTIPLEX CHANNEL
01 FOR SELECTOR CHANNEL 1
02 FOR SELECTOR CHANNEL 2

LOCATION 0483 IS THE CHANNEL ADAPTER ADDRESS ON THE 360 I/O CHANNEL-00 HEX THROUGH FF HEX
 2. TO CHANGE THE SEQUENCE IN WHICH THE I/O COMMANDS ARE ISSUED, REARRANGE THE CCWS IN LOCATIONS 000440 THROUGH 00046F
 3. TO CHANGE THE NUMBER OF I/O COMMANDS ISSUED IN EACH SEQUENCE, MODIFY THE CONTENTS OF LOCATION 00047B HEX TO THE NUMBER OF COMMANDS - 01 THROUGH 06.
 4. TO LOOP I/O COMMANDS, MODIFY THE CONTENTS OF LOCATIONS 00047E AND 00047F TO THE ADDRESS OF THE FIRST CCW - 000440 TO 000468.

* PROGRAM TIMING CONSIDERATIONS PROHIBIT THE USE OF THIS SCOPE LOOP ON MOD 65 AND UP. INDIVIDUAL COMMANDS, READ OR WRITE, OPERATE PROPERLY HOWEVER WHEN THE PROGRAM IS MODIFIED PER SERVICE HINTS NUMBER 3 ABOVE.

```

*** CHAN ADAPTER SCOPE LOOP ***
*
ICTL 25,79
  START 0
* 360 CHANNEL ADAPTER FOR 1800 SYSTEM
* REG1      C(1)=NUMBER OF CCW
* REG2      C(2)=LOCATION OF FIRST CCW
* REG3      C(3)=DEVICE ADDRESS
*
* OPERATOR MAY CHANGE LOCATIONS MARKED **
*
      USING *,0
000000      ORG  **+104
000068      DC   4X'00'
000068      DC   A(BEGIN)
000400      ORG  **+1024-112
000400      MVC  88(8),IONEW  SET EXT PSW
000406      LPSW WAIT          WAIT-UNIT ADRS
00040A      MVC  120(8),NIOPSW SET NEW IOPSW
000410      SSM  SYMSK         SET SYSTEM MASK
000414      LM   1,3,NUM
000418      TIO  0(3)         TEST I/O CHAN ADAPT
000420      BC   7,LOOP       LOOP IF NONZERO STAT
000424      ST   2,72         STORE CHAN ADD WORD
000428      SIO  0(3)         START I/O CHAN ADAPT
00042C      LA   2,8,(2)     ADD 8 TO REG2
000430      BCT  1,LOOP       BRANCH AND COUNT
000434      BC   15,MASTER   BRANCH TO MASTER
000438      IOINT LPSW 56      LOAD OLD IOPS
000440      SYMSK DC X'FE'     SYSTEM MASK
000448      FIRST CCW X'02',TABLE1,X'20',8 READ **
000450      CCW  X'01',TABLE1,X'20',8 WRITE **
000458      CCW  X'04',TABLE1,X'20',1 SNS 1 BYTE**
000460      CCW  X'04',TABLE1,X'20',2 SNS 2 BYTE**
000468      CCW  X'07',TABLE1,X'20',1 CONTROL **
000470      CCW  X'03',TABLE1,X'20',1 NO-OP **
000478      NIOPSW DC XL5'00'  FIRST PART OF PSW
00047C      DC   AL3(IOINT)   SECOND PART OF PSW
000480      NUM   DC   A(6)    NUMBER OF CCW **
000488      DC   A(FIRST)    ADDRESS OF FIRST **
000490      DC   X'00000000'  DEVICE ADDRESS **
*
000000XX IS ADDRESS OF MPX CHANNEL
000001XX IS ADDRESS OF SEL CHANNEL 1
000002XX IS ADDRESS OF SEL CHANNEL 2
DS DD
000488      WAIT DC X'010200000000FFFF' WAIT PSW
000490      IONEW DC XL5'00'      EXT I/O PSW
000495      DS   AL3(MASTER)
000498      TABLE1 DS 8C        LENGTH MAY EXTEND TO END
000400      END   BEGIN
    
```

DATE 14NOV69 DATE 31 JUL 70
EC NO. 431319 EC 431326

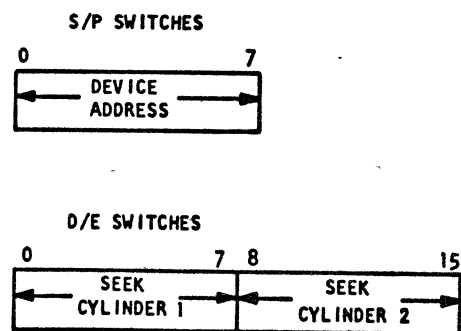
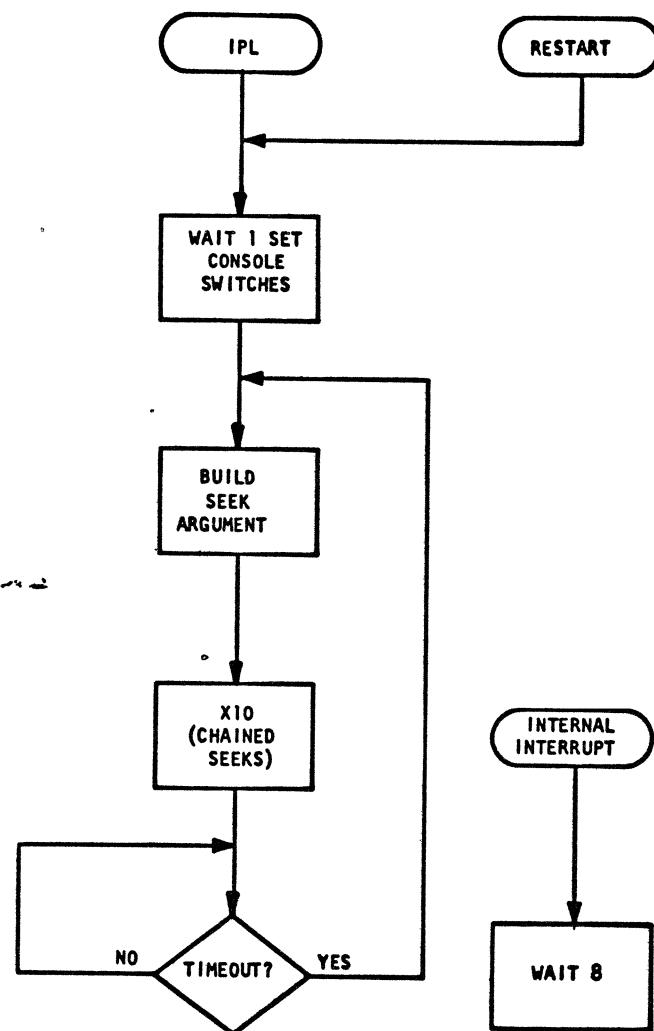
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SCOPE LOOP PROGRAMS

APPENDIX B

*** 2311 SCOPE LOOP *** XLVI

0000 0 3001	WAIT	1	WAIT ONE
0001 0 0818	XIO	/001A	SENSE S/P SWS
0002 0 1808	SRA	8	POSITION UNIT ADDR
0003 0 0016	STO	/001A	SAVE
0004 0 C018	LD	/001D	GET SIO IOCC
0005 0 1808	SRA	8	
0006 0 1008	SLA	8	
0007 0 6009	LDX	/0009	SKIP TO LOC 0009
0008 0 0027	DC	/0027	INTERNAL INT VECTOR
0009 0 E810	OR	/001A	BUILD SIO IOCC
000A 0 D012	STO	/001D	*
000B 0 080C	XIO	/0018	SENSE D/E SWS
000C 0 18C8	RTE	8	SAVE CYLINDER 1
000D 0 D01C	STO	/002A	PUT IN SEEK ARGUMENT
000E 0 1010	SLA	16	CLEAR A
000F 0 1088	SLT	8	GET CYLINDER 2
0010 0 D01C	STO	/002D	PUT IN SEEK ARGUMENT
0011 0 080A	XIO	/001C	START I/O
0012 0 0807	XIO	/001A	SENSE S/P SWS
0013 0 1000	NOP		
0014 0 D005	STO	/001A	SAVE
0015 0 74FF 001A	MDX L	/001A,-1	DECREMENT COUNT
0017 0 6015	LDX	/0015	LOOP TIMEOUT
0018 0 600B	LDX	/000B	LOOP
0019 0 0740	DC	/0740	SENSE D/E SWS
001A 0 0000	DC	--*	SAVE S/P SWS AREA
001B 0 0760	DC	/0760	SAVE S/P SWS
001C 0 001E	DC	/001E	CCW ADDR
001D 0 9500	DC	/9500	START I/O IOCC
001E 0 0001	DC	/0001	NOP BYTE COUNT
001F 0 6003	DC	/6003	CMND CODE
0020 0 0000	DC	--*	ADDR
0021 0 0006	DC	/0006	SEEK BYTE COUNT
0022 0 400B	DC	/400B	CMND CODE
0023 0 0029	DC	/0029	CCW ADDR
0024 0 0006	DC	/0006	SEEK BYTE COUNT
0025 0 000B	DC	/000B	CMND CODE
0026 0 002C	DC	/002C	CCW ADDR
	WAIT	8	WAIT 8 (INTERNAL INTERRUPT)



DATE 14NOV69 DATE 31 JUL 70
EC NO. 431319 EC 431326

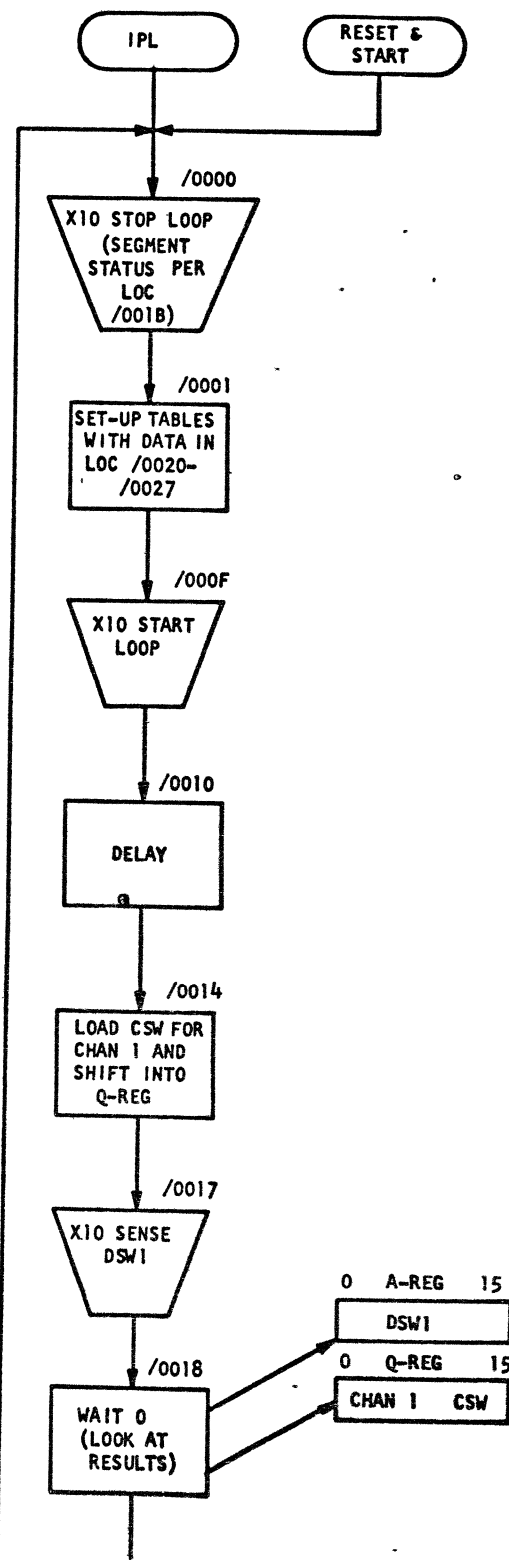
PROG ID 08C8-
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1. PROGRAM DESCRIPTION
WILL EXECUTE CONTINUOUS SEEKS BETWEEN TWO SELECTED CYLINDERS
2. OPERATING PROCEDURE
 - A. CLEAR CORE TO ALL ZEROES (LOCATIONS 0029 - 002E MUST = 0000).
 - B. PLACE THE SINGLE CARD IN THE 1442 HOPPER AND BRING UP READY.
 - C. SET "CHECK STOP" SW ON.
 - D. PRESS "RESET" AND "PROG LOAD" CONSOLE BUTTONS. THE PROGRAM SHOULD LOAD AND STOP AT WAIT 1.
 - E. SELECT THE DEVICE ADDRESS IN SENSE/PROG SWITCHES 0-7. (00-FF).
 - F. SELECT THE SEEK CYLINDERS IN DATA ENTRY SWITCHES 0-7 AND 8-15. (00-CA)
 - G. PRESS "START" BUTTON.
 - H. DELAY BETWEEN SEEKS IS VARIABLE AND IS SET UP IN SNS/PROG SWS 0-7 (00-FF) WHILE PROGRAM IS RUNNING.
3. SERVICE HINTS
 - A. SEEK 1 (D/E SWS 0-7) IS PRECEDED BY A NO-OP FOR SYNCHING.
 - B. SEEK 2 MAY BE CHANGED TO A RECALIBRATE BY CHANGING LOC 0025 FROM 000B TO 0013.

```

*** SELECTOR CHANNEL SCOPE LOOP *** XLVII
*
000 0 3001          WAIT 1          WAIT ONE
*
0001 0 081E        XIO /0020        READ S/P SWS
0002 0 1808        SRA 8
0003 0 D017        STO /001B
0004 0 C018        LD /001D        GET HALT I/O IOCC
0005 0 1808        SRA 8          BUMP OUT DEVICE ADDR
0006 0 1008        SLA 8          *
0007 0 E813        OR /001B        OR IN DVC ADDR
0008 0 D014        STO /001D        BUILD HIO IOCC
0009 0 8012        A /001C        MAKE FUNCTION = 5 (SIO)
000A 0 D018        STO /0023        BUILD SIO IOCC
*
000B 0 0812        XIO /001E        READ D/E SWS
*
000C 0 6580 001B   LDX I1 /001B       SET UP COUNT
000E 0 0813        XIO /0022        DO START I/O
000F 0 71FF        MDX 1 -1        DECREMENT COUNT
0010 0 600F        LDX /000F        LOOP (WAIT FOR TIMEOUT)
*
0011 0 C009        LD /001B        GET D/E SWS
0012 0 4C04 0019   BOD /0019        GO TO WAIT IF BIT 15 SET
*
0014 0 0807        XIO /001C        ELSE DO HALT I/O
0015 0 C005        LD /001B        GET D/E SWS
0016 0 1801        SRA 1          TEST BIT 14
0017 0 4C04 0014   BOD /0014        LOOP HIO IF BIT 14 SET
*
0019 0 3002        WAIT 2          END (NO/OP FOR SCOPE LOOP)
001A 0 600B        LDX /000B        GO TO SIO (LOOP)
*
VAC DC *-*        SAVE SWS
VAC DC /0100       CONSTANT
VAC DC /9400       HIO IOCC
HIC DC /001B       SAVE AREA ADDR
DC /0240          READ D/E SWS
DC *-*
DC /0760          SENSE S/P SWS
DC /0024          CCW ADDR
DC /9500          SIO IOCC
DC /0004          CCW-BYTE COUNT
DC /2000          -SLI BIT AND TIO CC
DC /0029          -ADDRS
*
WAIT /3008        INTERNAL INTERRUPT WAIT
  
```

2790 SCOPE LOOP (XLVIII)



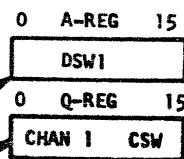
1. PROGRAM DESCRIPTION
THIS PROGRAM STOPS AND START THE LOOP WITH PRESET DATA IN THE LCCB TABLES.
2. OPERATING PROCEDURE
 1. PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP READY. FOR PAPER TAPE INPUT, PLACE THE DELETE HOLE SECTION OF THE PAPER TAPE OVER THE READ STATION.
 2. SET CHECK STOP SWITCH ON.
 3. PRESS RESET AND PROGRAM LOAD CONSOLE BUTTONS. THE PROGRAM WILL LOAD, CYCLE THROUGH THE PROGRAM ONCE AND STOP AT WAIT 0. DSW1 WILL BE DISPLAYED IN THE A-REG AND THE CSW FOR CHANNEL 1 WILL BE DISPLAYED IN THE Q-REG. OTHER LCIB AND LCCB INFORMATION CAN BE OBSERVED FROM THE TABLE STARTING AT LOCATION /0900.
 4. TABLE DATA AND SIMULATED A.S. RESPONSES ARE CUSTOMIZED BY MODIFICATIONS TO THE PROGRAM CORE LOCATIONS AS FOLLOWS:
 - A. SEGMENT CONFIGURATION --- (LOC /001B)
/3C0F -- ALL BYPASSED
/3C00 -- ALL ACTIVE
/3C07 -- SEG 1 ONLY ACTIVE, ETC
 - B. SIMULATED A.S. RESPONSES (ALL SEG MUST BE BYPASSED).
-----(LOC /001D)
/3C8X -- X EQUALS A.S. RESPONSE FIELD.
 - C. LCCB TABLE DATA
A.S. AND DEVICE ADDR ----- LOC /0020
CONTROL WORD----- /0021
BYTE CNT ----- /0022
DATA BUFFER ADDRESS ----- /0023
CHANNEL SENSE WORD ----- /0024
ADDR ERROR FRAME ----- /0025
CONTROL ERROR FRAME ----- /0026
CHANNEL TIMER COUNT WORD ----- /0027
 5. CHANGE THE WAIT INSTRUCTION AT LOC /001A TO A NOP (/1000) TO LOOP PROGRAM FOR SCOPING.

NOTE: FOR THE SECOND ADAPTER, THE FOLLOWING IOCC WORDS MUST BE MODIFIED TO REFLECT THE NEW AREA CODE:

LOC /001B -- /9C0X (SEG CONF -- SEE 4.A)
/001D -- /9C8X (A.S RESPONSE -- SEE 4.B)
/001F -- /9F01

CAUTION-

THE LOOP ADAPTER WILL AUTOMATICALLY UPDATE COMMANDS IF THE PROPER RESPONSE WAS PLACED AT LOCATION /001D (WITHOUT THE U.I. BIT SET IN THE CONTROL WORD OF IN THE LCCB'S). THIS CAN CAUSE PSEUDO LOOP ERRORS SINCE THE SIMULATED A.S. RESPONSE SHOWN IN LOCATION /001D WILL NOT BE UPDATED FOR THE NEW COMMAND.

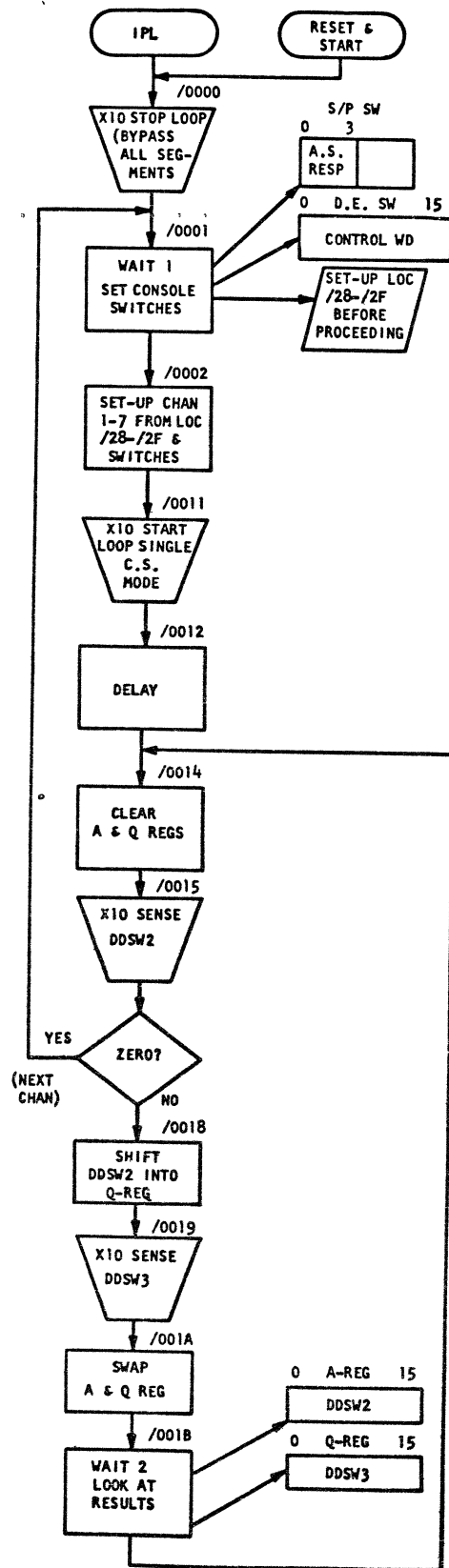


SCOPE LOOP PROGRAMS

APPENDIX B

```

0000 0 0819      *** 2790 SCOPE LOOP *** XLVIII
BEGIN X10      STOP      * STOP LOOP
*
0001 0 10A0      *
0002 00 DC000900 *      SLT      32      *
*      STD      L TABLE *
*
0004 00 6500FF30 *      LDX      L1 -/D0 *
0006 0 63F8      A1     LDX      3 -8      * SET-UP TABLES
0007 0 CB28      A2     LDD      3 ADDR+8 *
0008 00 DD0009E0 *      STD      L1 TABLE+/EO *
000A 0 7102      *      MDX      1 2      *
000B 0 7302      *      MDX      3 2      *
000C 0 70FA      *      MDX      A2      *
000D 0 7108      *      MDX      1 8      *
000E 0 70F7      *      MDX      A1      *
*
000F 0 080C      *      X10      START      * START THE LOOP
*
0010 0 7101      A3     MDX      1 1      * DELAY
0011 0 6010      *      LDX      A3      *
0012 0 1000      *      NOP      *
0013 0 1000      *      NOP      *
*
0014 00 C4000914 *      LD      L TABLE+/14 * AT WAIT,
0016 0 18D0      *      RTE      16      * DSW1 IN A-REG.
0017 0 0806      *      X10      DSW      * CHAN 1 CSW IN Q-REG.
0018 0 3000      *      WAIT     *
0019 0 6000      *      LDX      BEGIN *
*
*** IOCC'S ***
001A 0 0000      STOP   DC      0      * STOP LOOP IOCC
001B 0 3C0F      *      DC      /3C0F *
*
001C 0 0900      START  DC      TABLE * START LOOP IOCC
001D 0 3C80      *      DC      /3C80 *
*
001E 0 0000      DSW    DC      0      * SENSE LOOP DSW IOCC
001F 0 3F01      *      DC      /3F01 *
*
*      DATA FOR TABLE SET-UP
*
0020 0 1100      ADDR   DC      /1100 * AS -- DEVICE ADDR
0021 0 0200      *      DC      /0200 * CONTROL -- DATA WORD
0022 0 0003      BYTE   DC      /0003 * SPARE -- BYTE COUNT
0023 0 0040      *      DC      /0040 * DATA BUFFER ADDRESS
0024 0 0000      CSW    DC      /0000 * CHANNEL SENSE WORD
0025 0 0000      *      DC      /0000 * ADDRESS ERROR FRAME
0026 0 0000      *      DC      /0000 * CONTROL ERROR FRAME
0027 0 0000      *      DC      /0000 * CHANNEL TIMER COUNT WORD
*
*      *****
*
0900
0028 0000      TABLE EQU END /0900 * ADDRESS OF TABLES
*      BEGIN
    
```



1. PROGRAM DESCRIPTION

SINGLE STEPS THROUGH LOOP ADAPTER CYCLE STEAL SEQUENCES SET-UP BY C.E. IN LOC /0028 THRU /002F AND S/P AND DE SWITCH SETTINGS.

2. OPERATING PROCEDURE

1. PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP READY. FOR PAPER TAPE INPUT, PLACE THE DELETE HOLE SECTION OF THE PAPER TAPE OVER THE READ STATION.
2. SET CHECK STOP SWITCH ON.
3. PRESS RESET AND PROGRAM LOAD CONSOLE BUTTONS. THE PROGRAM WILL LOAD AND STOP AT WAIT 1.
4. LOAD I-REG TO /0028 AND LOAD VIA THE D.E. SWITCHES, THE CHANNEL INFORMATION IN LOCATIONS /0028 THRU /002F. (THIS INFORMATION ONLY NEEDS TO BE ENTERED ONCE UNLESS DIFFERENT DATA IS DESIRED). NOTE -- THE INFORMATION STORES IN LOC /0029 (CONTROL WORD) WILL BE DYNAMICALLY CHANGED WITH THE D.E. SWITCH DATA AND THE A S. RESPONSE WILL BE DYNAMICALLY CHANGED WITH THE DATA IN THE S/P SWITCHES PRIOR TO EACH CHANNEL SET-UP.
5. PLACE MODE SWITCH BACK IN RUN MODE AND PRESS RESET AND START. AT WAIT 1, PLACE A S. RESPONSE IN S/P SWITCHES AND THE CONTROL WORD IN D.E. SWITCHES AS SHOWN IN PROGRAM FLOW CHART. PRESS START.
6. PROGRAM WILL START LOOP ADAPTER (SINGLE CHANNEL MODE) AND TAKE FIRST CYCLE STEAL CYCLE. DDSW2 AND DDSW3 WILL BE DISPLAYED IN A AND Q REG RESPECTIVELY.
7. EACH TIME THE START BUTTON IS PRESSED, ANOTHER CYCLE STEAL CYCLE WILL BE TAKEN. WHEN ALL CYCLE STEALS FOR THE CHANNEL TIME ARE TAKEN, THE PROGRAM WILL RETURN TO WAIT 1.
8. WHEN THE START BUTTON IS PRESSED, THE DATA FROM THE CONSOLE SWITCHES AND LOCATIONS /0028 THRU /002F ARE LOADED IN CHANNEL 1-7 AND THE NEXT SEQUENTIAL CHANNEL IS SENT AND ANALYZED.
9. TO AGAIN START AT CHANNEL 1, PRESS RESET AND START AND PROCEED AS IN STEP 5 ABOVE.

3. HELPFUL HINTS

1. AT ANY POINT IN THE SEQUENCE, THE DATA IN THE LC1B AND LCCB TABLES CAN BE OBSERVED BY LOADING THE I-REG TO THE TABLE AREA STARTING AT LOC /0900. IF THE RESET OR IMMEDIATE STOP BUTTON HAS NOT BEEN PRESSED, IT IS POSSIBLE TO AGAIN CONTINUE WITH THE PROGRAM BY LOADING THE I-REG TO THE NEXT INSTRUCTION TO BE EXECUTED.
2. THE C.E. INDICATOR CARDS CAN BE USED IN CONJUNCTION WITH THIS PROGRAM TO GATHER MORE INFORMATION ABOUT THE FAILURE.
3. REFER TO F.E. MANUALS FOR VALID COMMANDS AND RESPONSES. (FEMDM'S CONTAIN CYCLE STEAL SEQUENCE CHARTS).
4. ONLY THE FIRST 7 CHANNELS ARE SET-UP. WHEN CHANNEL 8 IS REACHED, PRESS RESET AND START BUTTONS TO BEGIN AGAIN AT CHANNEL ONE.

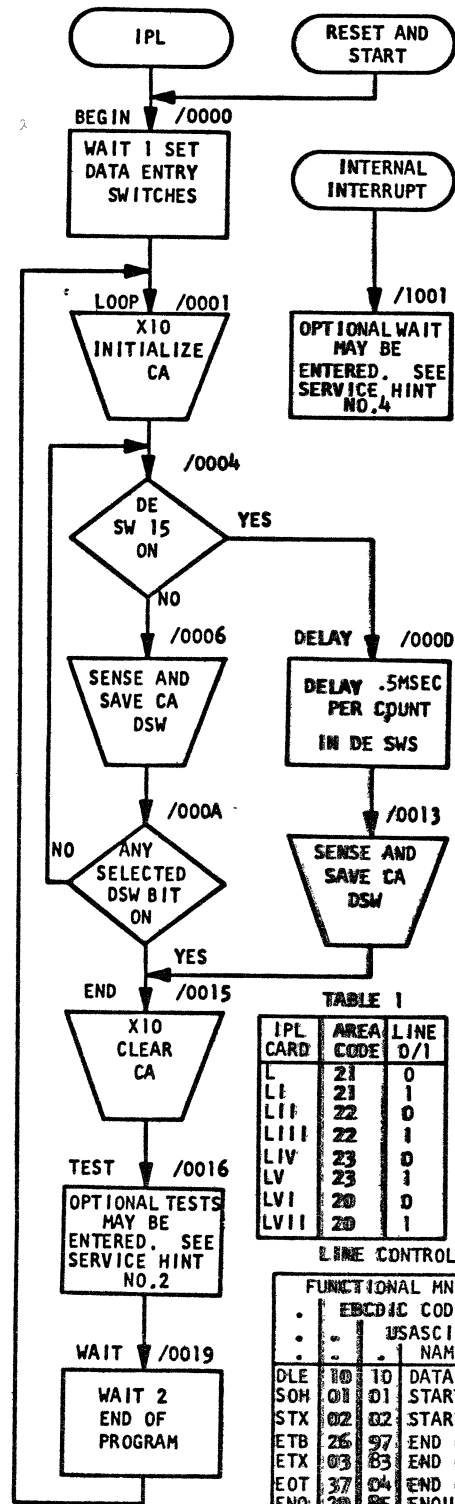
NOTE: FOR THE SECOND ADAPTER, THE FOLLOWING MODIFICATIONS MUST BE MADE TO THE IOCC WORDS TO REFLECT NEW AREA CODE:

- LOC /001D -- /9F02
- /001E -- /9CC0
- /001F -- /9F04
- /0021 -- /9C0F

```

*** 2790 SINGLE-STEP SCOPE LOOP *** XLIX
*
* SWITCH SETTINGS
* *****
* S/P * RESP *
* *****
* D.E. * CONTROL WORD
* *****
*
* BEGIN XIO STOP * STOP LOOP
* A1 WAIT 1 * SET-UP SWITCHES
*
* XIO SNS *
* SRA 12 * SET-UP RESPONSES &
* OR DSW3 * CONTROL WORD
* STO START+1 *
* XIO DESW *
*
* LDX 1 -/70 *
* LDX 3 -8 * SET-UP CHANNELS 1-7
* LDD 3 AS+8 *
* STD L1 TABLE+/80 *
* MDX 1 2 *
* MDX 3 2 *
* MDX A3 *
* MDX 1 8 *
* MDX A2 *
*
* XIO START * START LOOP
*
* A4 MDX 1 1 * DELAY
* MDX A4 *
*
* A5 SLT 32 *
* XIO DSW2 * DSW SENSES
* BSC + *
* MDX A1 *
* SRT 16 *
* XIO DSW3 *
* RTE 16 *
* WAIT 2 *
*
*** IOCC'S ***
DSW2 MDX A5 * SENSE DSW2 IOCC
DC /3F02 *
DSW3 DC /3CC0 * SENSE DSW3 IOCC
DC /3F04 *
STOP DC 0 * STOP LOOP IOCC
DC /3C0F *
START DC TABLE * START LOOP IOCC
DC *- *
SNS DC 0 * SENSE S/P SWS IOCC
DC /0760 *
DESW DC CNTRL * READ DE SWS IOCC
DC /0240 *
*
* MANUALLY SET UP FOLLOWING DATA EXCEPT CNTRL WD.
* *****
* AS DC /**** * AS ADDR * DEV ADDR *
* CNTRL DC *- * CNTRL * DATA *
* DC /**** * * BYTE COUNT *
* DC /**** * DATA BUFFER ADDRESS *
* DC /**** * CHANNEL SENSE WORD *
* DC /**** * ADDRESS ERROR FRAME *
* DC /**** * CONTROL ERROR FRAME *
* DC /**** * CHANNEL TIMER COUNT WORD*
* *****
* ADDRESS OF TABLES
*
* TABLE EQU /0900
* END BEGIN
    
```

DATE	01JUL66	04NOV66	15FEB67	15MAY67	02DEC68	14NOV69	31JUL70	PRDG ID	08C8-*
EC NO.	415178	415233	415233B	411731	411961	431319	431326	PAGE	38A



1. PROGRAM DESCRIPTION

INITIALIZES THE CA TO A 3 BYTE TRANSMIT TABLE (XIMITS AN EBCDIC ENQ) WHICH IS CHAINED TO A 10 BYTE RECEIVE TABLE. THE CA IS CLEARED EITHER AT THE END OF AN OPERATOR SPECIFIED TIME DELAY OR WHEN AN OPERATOR SELECTED DSW BIT COMES ON.

2. OPERATING PROCEDURE

1. SELECT THE SINGLE IPL CARD OR THE PAPER TAPE FOR THE CA LINE TO BE EXERCISED (SEE TABLE 1).
2. PLACE THE CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO RUN THE CARD IN AND ONCE TO BRING UP READY. FOR PAPER TAPE IPL PLACE THE DELETE HOLE SECTION OF THE PAPER TAPE IN THE READ STATION.
3. SET 'CHECK STOP' SWITCH ON AND PRESS 'RESET' AND 'PROGRAM LOAD' ON THE 1800 CONSOLE. THE PROGRAM SHOULD LOAD AND STOP AT WAIT 1 (B REG =/3001).
4. SET CONTROL OPTIONS IN DE SWS AS FOLLOWS...

SW15 ON = TIME DELAY CONTROL. THE CA IS CLEARED AFTER SPECIFIED TIME DELAY. ENTER A DELAY COUNT IN DE SWS. THE COUNT MUST BE POSITIVE (SW 0 OFF) AND ODD (SW 15 ON). THE TOTAL DELAY WILL BE APPROXIMATELY .5 MSEC PER COUNT ON A 2 μSEC SYSTEM. TABLE 2 LISTS SOME SAMPLE DELAYS FOR A 2 μSEC SYSTEM.

SW 15 OFF = DSW CONTROL. THE CA IS CLEARED WHEN ANY ONE OF THE DSW BITS SPECIFIED IN THE DE SWS COMES ON (SEE TABLE 3). FOR EXAMPLE, IF DE SWS 2 AND 4 ARE ON THE CA IS CLEARED WHEN EITHER DSW BIT 2 OR 4 COMES ON.

5. PRESS CONSOLE 'START' BUTTON. THE CA WILL BE INITIALIZED UNTIL THE TIME DELAY ENDS OR UNTIL A SPECIFIED DSW BIT COMES ON. THE CA WILL THEN BE CLEARED AND THE PROGRAM WILL HALT AT WAIT 2. PRESS 'START' TO REPEAT OPERATION.

3. SERVICE HINTS

1. THE CA XMIT/RCV TABLES (ADDR /0022) MAY BE MODIFIED TO PROVIDE ANY DESIRED XMIT AND/OR RECEIVE OPERATION.
2. THE THREE INSTRUCTIONS LOCATED AT 'TEST' (ADDR/0016) MAY BE MODIFIED TO BYPASS WAIT 2 FOR SCOPING OR TO PROVIDE A CONDITIONAL HALT AT WAIT 2.
3. THE EBCDIC ENQ CONTAINED IN THE XMIT TABLE IS PUNCHED IN CARD COLUMN 72 ROWS 12-5. IF DESIRED, A NEW CARD MAY BE PUNCHED USING SOME OTHER CHARACTER (SEE TBL 4).
4. THE NOP AT ADDR /0008 SERVES AS THE BRANCH ADDRESS FOR AN INTERNAL INTERRUPT. IF DESIRED, A WAIT MAY BE ENTERED AT ADDR /1001 TO HALT ON AN ERROR INTERRUPT.

TABLE 1

IPL CARD	AREA CODE	LINE D/I
L	21	0
L1	21	1
L1F	22	0
L111	22	1
L1V	23	0
LV	23	1
LV1	20	0
LV11	20	1

TABLE 4

LINE CONTROL CHARACTERS

FUNCTIONAL MNEMONIC	EBCDIC CODE IN HEX	USASCII CODE IN HEX	NAME OF CHAR
DLE	10	10	DATA LINK ESCAPE
SOM	01	01	START OF HEADING
STX	02	02	START OF TEXT
ETB	26	97	END OF BLOCK
ETX	03	03	END OF TEXT
EOT	37	04	END OF XMISSION
ENQ	20	85	ENQUIRY
NAK	30	15	NEGATIVE ACK
ITB	1F	1F	END INTER. BLOCK
SYN	32	16	SYNCHRONOUS IDLE

TABLE 2

DE SWS	APPROX TIME DELAY	DE SWS/OPERATING DSW
/0001	.5 MSEC	0
/000F	7.5 MSEC	1
/0065	50.5 MSEC	2
/00C9	100.5 MSEC	3
/03E9	500.5 MSEC	4
/07D3	1.0 SEC	5
/0FA5	2.0 SEC	6
/1777	3.0 SEC	7
/7531	15.0 SEC	8
/7FFF	16.4 SEC	9

*** CA SCOPE LOOPS *** L-LVII

```

*
* ABS
*
000 0 3001 * BEGIN WAIT 1 WAIT AFTER IPL OR RESTART
0001 0 081A * LOOP XIO /001C INITIALIZE CA
*
0002 0 081D * XIO /0020 SENSE DATA ENTRY SWITCHES
0003 0 001C * STO /0020 SAVE DATA ENTRY SWITCHES
0004 0 4C04 000D * BSC L /000D,E BRANCH IF DE SW 15 ON.
*
0006 0 0817 * XIO /001E SENSE AND
0007 0 0016 * STO /001E SAVE CA DSW
*
0008 0 1000 * NOP 0 INTERNAL INTRRUPT VECTOR
*
0009 0 E016 * AND /0020 CHK DSW BIT(S) PER DE SWS
000A 0 4C20 0015 * BSC L /0015,Z BR IF ANY SPECIFIED BIT ON
*
000C 0 6002 * LDX /0002 BR TO CHK SWS & DSW AGAIN
*
000D 0 6148 * DELAY LDX 1 /0048 DELAY
000E 0 71FF * MDX 1 -1 500
000F 0 600E * LDX /000E USEC
0010 0 74FF 0020 * MDX L /0020,-1 DECREMENT DELAY COUNT BY 1
0012 0 600D * LDX /000D BR IF NOT YET END OF DELAY
*
0013 0 080A * XIO /001E SENSE AND
0014 0 0009 * STO /001E SAVE CA DSW
*
0015 0 0804 * END XIO /001A CLEAR CA
*
0016 0 C007 * TEST LD /001E FETCH LAST CA DSW SENSED
0017 0 1000 * SLA 0 *** REFER TO SERVICE HINTS
0018 0 4800 * BSC 0 *** SECTION OF WRITEUP
*
0019 0 3002 * WAIT2 WAIT 2 END OF PROGRAM WAIT
001A 0 6001 * LDX /0001 BR TO INITIALIZE CA AGAIN
*
*** IOCC'S ***
*
001B 0 AF09 * CLEAR DC /AF0, CLEAR CA IOCC
001C 0 0022 * INITL DC /0022 ADDR OF XMIT/RCV TABLES
001D 0 AD00 * DC /AD00 INITIALIZE CA IOCC
001E 0 0000 * SENSE DC *- CA DSW STORAGE
001F 0 AF00 * DC /AF00 SENSE CA DSW IOCC
0020 0 0000 * DESWS DC *- DE SWITCH STORAGE
0021 0 0740 * DC /0740 SENSE DE SWS IOCC
*
*** TRANSMIT AND RECEIVE TABLES ***
*
0022 0 A003 * TABLE DC /A003 XMIT TABLE BYTE COUNT WORD
0023 0 002D * DC /002D EBCDIC ENQ CHARACTER
0024 0 FFFF * DC /, FFF PAD CHARACTER
0025 0 0025 * CHAIN DC CHAIN CHAIN AND CAR CHK ADDR
0026 0 000A * DC /000A RCV TABLE BYTE COUNT WORD
*
*
* END BEGIN
    
```

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6.1	HEX LOADER	1 CARD
6.2	HEX DUMP	2 CARD
6.3	PUNCH IPL CARD	1 CARD
6.4	TRACE-ADRS STOP	1 CARD/PAPER TAPE
6.5	80/80 REPRODUCE	1 CARD
6.6	80/80 AUX LIST	7 CARDS
6.7	PUNCH IPL P.T.	PAPER TAPE
6.8	1053 DUMP	1 CARD/PAPER TAPE
6.9	10/20 MIL SEEK	3 CARD/PAPER TAPE

1. PURPOSE

TO PROVIDE THE CE WITH UTILITY PROGRAMS IN ORDER THAT HE MIGHT HAVE ACCESS TO VARIOUS CARD AND PAPER TAPE UTILITY FUNCTIONS.

2. PREREQUISITES

THE SYSTEM MUST HAVE A 1442 OR PAPER TAPE READER.

3. USE PROCEDURES

3.1 PROGRAM LOADING

ALL PROGRAMS WILL LOAD IN IPL MODE EXCEPT 80/80 AUX LIST WHICH IS IN THE NORMAL AUX MANNER. PUNCH IPL CARD OR PAPER TAPE, HEX DUMP AND TRACE PROGRAMS MAY BE RELOCATED AT ANY EVEN ADDRESS BY SETTING THE I-COUNTER TO THE DESIRED ADDRESS. TURN THE MODE SWITCH TO SI W/CS AND PRESS PROGRAM LOAD. AFTER LOADED SET I-COUNTER TO FIRST ADDRESS AND PRESS START WITH SWITCH TO RUN.

3.2 PROGRAM OPERATIONS - SEE INDIVIDUAL PROGRAM

3.3 TERMINATION

THIS WILL VARY WITH EACH UTILITY PROGRAM DEPENDING ON THE FUNCTION. IN MOST CASES IT WILL DEPEND UPON THE COMPLETION OF THE JOB.

3.4 PROGRAM HALTS- WAITS MAY BE IDENTIFIED FROM THE CONTENTS OF THE B REG

3001 SET THE DESIRED SWITCHES. PRESS START BUTTON TO CONTINUE.
3002 END OF THE PROGRAM HAS BEEN REACHED.
3003 USED IN TRACE PROGRAM TO INDICATE TO AND FROM ADDRESS.

4. PRINTOUTS - NONE

5. COMMENTS - EACH PROGRAM HAS ITS OWN COMMENTS

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6. APPENDIX

6.1 HEX LOADER - 1 CARD

1. PROGRAM DESCRIPTION

THE HEX LOADER IS A SINGLE CARD TO LOAD CARDS PUNCHED IN THE STANDARD HEX FORMAT. THE END CARD WILL HAVE ONLY THE PROGRAM STARTING ADDRESS, IN COLUMNS 1 THRU 5. ADDRESSES MUST BE ABOVE //0074.

COL	FIELD DESCRIPTION
1	PLUS (12 PUNCH)
2-5	ADDRESS OF FIRST VALUE
6	BLANK
7-10	FIRST VALUE
11	BLANK

ADDITIONAL VALUES AND A BLANK COLUMN MAY BE CONTINUED.

2. OPERATING PROCEDURES

1. PLACE HEX LOADER, THE HEX CARDS TO BE LOADED, END CARD, A AND TWO BLANKS IN THE 1442 HOPPER. PRESS START.
2. SET 'CHECK STOP' SWITCH ON.
3. PRESS 'RESET' AND 'PROGRAM LOAD' CONSOLE BUTTONS. THE PROGRAM WILL LOAD AND BRANCH TO THE ADDRESS IN THE END CA

*** HEX LOADER ***

028C		ABS		
0000 0	611A	ORG	0	
0001 0	6918	BEGIN LDX	1 ADR+1	
0002 0	081F	STX	1 ADR+1	
0003 0	081C	XIO	READ	READ A CARD
0004 0	4804	CK XIO	DSW	SENSE DSW
0005 0	6003	BSC	E	IS 1442 READY
0006 0	6180	LDX	CK	* NO
0007 0	6207	LDX	1 -80	* YES
0008 0	6310	THERE LDX	2 7	
0009 0	C178	HERE LDX	3 16	
000A 0	4828	LD	1 AREA+84	LOAD WORD TO COVERT
000B 0	6307	BSC	+Z	IS THE WORD ALPHA
000C 0	1002	LDX	3 7	* YES
000D 0	1340	SLA	2	* NO
000E 0	4818	SLCA	3 0	DETERMINE THE DIGIT
000F 0	700D	BSC	+ -	WAS IT BLANK
0010 0	6813	MDX	BLANK	* YES
0011 0	9012	STX	3 AREA	* NO
0012 0	1884	S	AREA	GET CONVERTED DIGIT
0013 0	71FF	SRT	4	SAVE DIGIT IN THE Q REG
0014 0	72FE	MDX	1 -1	
0015 0	70F2	MDX	2 -2	
0016 00	7401001A	MDX	HERE	
0018 0	1090	MDX	L ADR+1,1	CHANGE STG LOCATION
0019 00	D600001A	SLT	16	MOVE CONVERTED WORD TO ACC
001B 0	7109	ADR STD	L2 ADR+1	
001C 0	70EA	MDX	1 9	
001D 0	C00C	MDX	THERE	
001E 00	4C98001A	BLANK LD	AREA+6	CHECK FOR END CARD
0020 0	70DF	BSC	I ADR+1,+ -	BCH IF END CARD FOUND
0021 0	1701	DSW MDX	BEGIN	
0022 0	0024	DC	/1701	SENSE DSW IOCC
0023 0	1600	READ DC	AREA	
0024 0	0000	DC	/1600	READ IOCC
0026	0000	AREA DC		READ AREA
		END	BEGIN	END CARD NOT USED IN IPL

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6-2 HEX DUMP - 2 CARDS

1. PROGRAM DESCRIPTION

THE HEX DUMP WILL CREATE STARNDARD HEX FORMAT CARDS STARTING WITH THE ADDRESS SET IN THE DATA ENTRY SWITCHES. CONTINUE UNTIL 1442 GOES NOT READY OR SYSTEM STOP IS PRESSED.

2. OPERATING PROCEDURES

1. PLACE THE HEX DUMP PROGRAM IN THE 1442 HOPPER WITH BLANK CARDS. PRESS START.
2. SET 'CHECK STOP' SWITCH ON. TO LOAD RELOCATABLE SEE 3.1.
3. PRESS RESET AND PROGRAM LOAD CONSOLE BUTTONS. PROGRAM WILL LOAD. GO TO WAIT 1.
4. SET THE DESIRED STARTING ADDRESS. THE DATA ENTRY SWITCHES PRESS START.

*** HEX DUMP ***

028C		ABS			
0000 0	700D	FEED	MDX	/0000	GO
0001 0	1402		DC	/1402	FEED IOCC
0002 0	0028	READ	DC	40	
0003 0	1601		DC	/1601	READ IOCC
0004 0	004F	PUNCH	DC	79	PUNCH ADDRESS
0005 0	1500		DC	/1500	PUNCH IOCC
0006 0	8000	DSW	DC	/8000	CONSTANT
0007 0	1701		DC	/1701	SENSE DSW IOCC
0008 0	0008	DESW	DC	/0008	PUNCH TERMINATOR
0009 0	0740		DC	/0740	SENSE DATA ENTRY SWS IOCC
000A 0	2000	SPSW	DC	/2000	CONSTANT
000B 0	0760		DC	/0760	SENSE S/P SWS IOCC
000C 0	0009	STACK	DC	/0009	CONSTANT
000D 0	1480		DC	/1480	STACK IOCC
*					
000E 0	6801	GO	STX	IX1+1	STORE I COUNTER
000F 00	65000000	IX1	L1	---	PICK UP I CTR
0011 0	7119		MDX	1 25	ADJUST FOR NEXT READ AREA
0012 0	69EF		STX	1 READ	BUILD READ IOCC
0013 0	08EE		XIO	READ	READ A CARD
0014 0	08F1	CK	XIO	DSW	SENSE DSW
0015 0	4804		BSC	E	IS 1442 READY
0016 0	70FD		MDX	CK	* NO
0017 0	08E8		XIO	FEED	* YES, CLEAR PUNCH AREA
0018 0	7127		MDX	1 39	
0019 0	69EA		STX	1 PUNCH	BUILD PUNCH IOCC
*					
001A 0	3001		WAIT	1	SET STARTING ADDRESS
001B 0	08EC		XIO	DESW	SENSE STARTING ADRS
001C 0	0001		STO	IX3+1	
001D 00	67000000	IX3	L3	---	STARTING ADDRESS
001F 0	6210	NEW	L3	16	NUMBER OF ENTRIES PER CARD
0020 0	6A14	CONV	STX	2 IX2+1	
0021 0	6204		L3	4	
0022 0	1800		RTE	16	SAVE WORD TO BE CONVERTED
0023 0	1084	MOVE	SLT	4	GET 4 POSITIONS TO CONVERT
0024 0	7101		MDX	1 1	
0025 0	80E6		CMP	STACK	IS IT NUMERIC
0026 0	7021		MDX	ALPHA	* NO, ALPHA (A-F)
0027 0	1800	FACT	SRA	0	* YES (CONSTANT)
0028 0	E8FE		OR	FACT	* YES

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0029 0	D001		STO	SHIFT	
002A 0	C0DF		LD	SPSW	CARD CODE FOR ZERO
002B 0	1800		SHIFT SRA	0	SHIFT AMOUNT WAS ADDED
002C 0	D100		THERE STO	1 0	PLACE IN OUTPUT AREA
002D 0	1010		SLA	16	
002E 0	72FF		MDX	2 -1	
002F 0	70F3		MDX	MOVE	
*					
0030 0	7101		MDX	1 1	
0031 0	D100		STO	1 0	STORE A BLANK
0032 0	C300		LD	3 0	GET NEXT WORD
0033 0	7301		MDX	3 1	
0034 00	66000000	IX2	L2	---	NUMBER OF ENTRIES PER CARD
0036 0	72FF		MDX	2 -1	
0037 0	70E8		MDX	CONV	
*					
0038 0	C1FF		LD	1 -1	GET LAST COLUMN
0039 0	E8D2		OR	STACK	ADD TERMINATOR BIT
003A 0	D1FF		STO	1 -1	AND STORE BACK
*					
003B 0	08D0		XIO	STACK	SELECT STACKER
003C 0	08C7		XIO	PUNCH	PUNCH A CARD
003D 0	08C8	CK1	XIO	DSW	
003F 0	4804		BSC	E	IS 1442 READY
003F 0	70FD		MDX	CK1	* NO
0040 0	C0C3		LD	PUNCH	* YES
0041 0	D004		STO	IX1+1	RESTORE XR1 ADRS
0042 0	73FF		MDX	3 -1	
0043 0	68D9		STX	3 IX3+1	
0044 0	C0D8		LD	IX3+1	GET NEXT ADRS
0045 00	65000000	IX1	L1	---	RESTORE XR 1
0047 0	70D7		MDX	NEW	
*					
0048 0	90C3	ALPHA	S	STACK	ADJUST CONSTANT
0049 0	E8DD		OR	FACT	DEVELOP SHIFT
004A 0	D001		STO	HERE	
004B 0	C0BE		LD	SPSW	CARD CODE FOR ZERO
004C 0	1800	HERE	SRA	0	
004D 0	E888		OR	DSW	ADD
004E 0	70DD		MDX	THERE	12 ZONE
004F 0	8000		DC	/8000	PLUS FOR HEX CARD
*					
0050	0800		END	FEED	

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6.3 PUNCH IPL CARD - 1 CARD

1. PROGRAM DESCRIPTION

THIS PROGRAM MAY BE IPL-ED IN AT ANY EVEN LOCATION BY SETTING THE I COUNTER. WHEN AT WAIT 1, SET THE ADDRESS IN THE DATA ENTRY SWITCHES THAT THE PROGRAM IS TO PUNCH AN IPL CARD FROM AND PRESS START. ONE IPL CARD WILL BE PUNCHED AND THE PROGRAM WILL STOP AT IF ANOTHER IPL CARD STARING FROM THE SAME ADDRESS IS DESIRED, PRESS START IF THE ADDRESS IS TO BE DIFFERENT, CHANGE THE DATA ENTRY SWITCHES AND PRESS START.

2. OPERATING PROCEDURE

1. PLACE THE IPL CARD WITH AT LEAST THREE BLANKS IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON.
2. SET 'CHECK STOP' SWITCH ON. TO LOAD RELOCATABLE SEE 3.1.
3. PRESS 'RESET' AND 'PROGRAM LOAD' CONSOLE BUTTONS. THE PROGRAM WILL LOAD AND STOP AT WAIT 1.
4. SET THE ADDRESS TO PUNCH THE IPL CARD FROM THE DATA ENTRY SWITCHES. PRESS CONSOLE START. PROGRAM WILL PUNCH ONE CARD AND COME TO WAIT 2.
5. PRESS START TO PUNCH ANOTHER IPL CARD. IF A DIFFERENT ADDRESS IS DESIRED, CHANGE THE DATA ENTRY SWITCHES & THEN PRESS START

*** PUNCH IPL CARD ***

02BC		ABS	0		
0000 0	0823	BEGIN	XIO	FDSTK	MAY BE IPL-ED AT ANY EVEN
0001 0	3001		WAIT	1	FEED AND STACK PRG CARD
0002 0	6801		STX	IX2+1	SET REQUIRED SWITCHES
0003 00	66000000	IX2	LDX	L2 *-*	STORE I COUNTER
0005 0	7225		MDX	2 37	GET I COUNT
0006 0	6A1B		STX	2 WRITE	ADD 37 TO GET PCH AREA ADR
0007 0	6328		LDX	3 40	STORE IN WRITE IOCC
0008 0	0815		XIO	DESW	40 COLUMNS PER IPL CARD
0009 0	0002		STO	LD+1	SENSE DATA ENTRY SWITCHES
000A 0	6100		LDX	1 0	GET STARTING ADR
000B 00	C5000000	LD	LD	L1 *-*	CLEAR IX 1
000D 0	18D8		RTE	24	LOAD WORD TO SEPARATE
000E 0	D200		STO	2 0	GET SECOND HALF
000F 0	1098		SLT	24	STORE BITS 8 TO 15
0010 0	7201		MDX	2 1	GET FIRST HALF
0011 0	D200		STO	2 0	CHANGE STORE LOCATION
0012 0	7101		MDX	1 1	STORE BITS 0 TO 7
0013 0	7201		MDX	2 1	
0014 0	73FF		MDX	3 -1	
0015 0	70F5		LD		GO BACK FOR ANOTHER WORD
0016 0	C2FF		LD	2 -1	LOAD LAST COLUMN
0017 0	E808		OR	DSW	* OR IN PCH TERM BIT
0018 0	D2FF		STO	2 -1	* AND STORE BACK
0019 0	0808		XIO	WRITE	PUNCH IPL CARD
001A 0	0805	CK	CIO	DSW	SENSE DSW
001B 0	4804		BSC	E	IS 1442 READY
001C 0	70FD		MDX	CK	* NO
001D 0	3002		WAIT	2	* YES
001E 0	70E4	DESW	MDX	IX2	PCH ANOTHER CARD
001F 0	0740		DC	/0740	SENSE DATA ENTRY SWITCHES
0020 0	0008	DSW	DC	/0008	PUNCH TERM BIT
0021 0	1701		DC	/1701	SENSE DSW IOCC
0022 0	0000	WRITE	DC		PUNCH AREA ADDRESS
0023 0	1500		DC	/1500	PUNCH IOCC
0024 0	0000	FDSTK	DC		
0025 0	1482		DC	/1482	STACK AND FEED IOCC
0026	0000		END	BEGIN	END CARD NOT ED ON IPL

6.4 TRACE - ADDRESS STOP

1. PROGRAM DESCRIPTION

THIS PROGRAM CAN BE IPL-ED INTO ANY EVEN LOCATION IN ANY AREA OF CORE NOT USED BY THE PROGRAM TO BE TRACED. (SEE PARAGRAPH 3.1) WITH THE MACHINE IN TRACE MODE, THE TRACE INTERRUPT AFTER EACH INSTRUCTION WILL INTERRUPT INTO THIS PROGRAM AND COMPARE THE -I- REGISTER AND THE DATA ENTRY SWITCHES. IF EQUAL, THIS PROGRAM WILL WAIT WITH THE A & Q REGISTERS CONTAINING EITHER THE LAST VALUES OF A & Q OR THE LAST INSTRUCTION ADDRESS AND THE NEXT INSTRUCTION ADDRESS. (DEPENDING UPON SETTING OF BIT 0 OF DATA ENTRY SWITCHES). SINCE THE TRACE INTERRUPT IS THE LOWEST ONE, THIS PROGRAM WILL NOT STOP AT AN ADDRESS INSIDE AN INTERRUPT SERVICE ROUTINE.

2. OPERATING PROCEDURES

1. AFTER THE PROGRAM TO BE TRACED IS LOADED, PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO MOVE THE CARD IN AND ONCE TO BRING UP READY. FOR PAPER TAPE INPUT, PLACE THE DELETE HOLES SECTION OF THE PAPER TAPE OVER THE READ STATION.
2. SET 'CHECK STOP' SWITCH ON. SET DATA ENTRY SWITCHES TO THE ADDRESS THE TRACE PROGRAM WILL BE IPL-ED INTO. (AN UNUSED CORE AREA) LOAD I TO THIS VALUE.
3. PLACE THE MODE SWITCH IN 'SI W/CS' POSITION. PRESS 'PROGRAM LOAD' CONSOLE BUTTON. AFTER THE CARD HAS BEEN READ, AGAIN LOAD I TO STARTING ADDRESS OF THIS TRACE PROGRAM. PLACE THE MODE SWITCH IN 'RUN' MODE AND PRESS START. PROGRAM WILL STOP AT WAIT 1.
4. AT WAIT 1 SET THE STOP ADDRESS DESIRED IN THE DATA ENTRY SWITCHES AND THE MODE SWITCH TO TRACE. SET THE DATA ENTRY SWITCH BIT 0 AS DESIRED. START THE PROGRAM TO BE TRACED.
5. A WAIT 2 WILL INDICATE THE ADDRESS HAS BEEN REACHED, A + Q NORMAL.
6. AT WAIT 3 THE ACCUMULATOR WILL SHOW THE LAST ADDRESS AND THE Q-REG WILL SHOW THE NEXT ADDRESS TO BE EXECUTED.

*** TRACE - ADDRESS STOP ***

```

*
0000 0 0803 BEGIN XIO DESW SENSE IPL ADDRESS
0001 0 8006 A FACT ADD FACTOR
0002 0 04000009 STO L /0009 STORE TRACE VECTOR
0004 0 3001 DESW WAIT 1 SET DESIRED ADDRESS
0005 0 0740 DC /0740 IOCC DATA ENTRY SWITCHS
0006 00 00000000 STO1 DEC 0 A AND Q STG FOR MAINLINE
0008 0 0018 FACT DC TRACE+1-BEGIN
0009 0 0000 DC /0000 TRACE INTR ENTRY IF IPL-ED AT ZERO
000A 00 00000000 STO2 DEC 0 INST ADRS STORAGE
000C 0 1001 CK SLA 1 REMOVE BIT ZERO
000D 0 4820 BSC Z STOP WITH TO AND FROM ADRS
000E 0 7004 MDX NO * NO
000F 0 C008 LD TRACE+1 * YES
0010 0 D0FA STO ST02+1
0011 0 C8F8 LDD ST02
0012 0 3003 NO WAIT 3 ACC LAST ADRS, Q NEXT ADRS
0013 0 C004 LD TRACE+1 GET RETURN ADDRESS
0014 0 18D0 RTE 16
0015 0 D8F4 STD ST02 SAVE TRACE ADDRESSES
0016 0 C8EF LDD ST01 RESTORE MAINLINE A AND Q
0017 00 4C400000 TRACE BOSC L *-* ENTRY AND RETURN LOCATION
0019 0 D8EC STD ST01 SAVE MAINLINE A + Q REG
001A 0 C8EF LDD ST02
001B 0 08E8 XIO DESW SENSE STOP ADDRESS
001C 0 F0EE EOR ST02+1 COMPARE ADDRESS
001D 0 4820 BSC Z IS THIS STOP ADDRESS
001E 0 70ED MDX CK * NO
001F 0 C0F8 LD TRACE+1 * YES
0020 0 18D0 RTE 16
0021 0 D8E8 STD ST02 SAVE TO AND FROM ADDRESSES
0022 0 C8E3 LDD ST01 RESTORE A AND Q REGISTERS
0023 0 3002 WAIT 2 ADDRESS FOUND
0024 0 70F2 MDX TRACE
0026 0 0000 END BEGIN
  
```

6.5 80/80 REPRODUCE - 1 CARD

1. PROGRAM DESCRIPTION

THIS PROGRAM WILL REPRODUCE A DECK OF CARDS. THE CARDS ARE READ INTO CONSECUTIVE CORE LOCATIONS STARTING AT /0050. AFTER THE LAST CARD ROUTINE IS PERFORMED, BLANK CARDS ARE PLACED IN HOPPER AND A NEW DECK IS PUNCHED.

2. OPERATING PROCEDURES

1. PLACE SINGLE IPL CARD IN THE 1442 HOPPER WITH THE CARDS TO BE DUPLICATED FOLLOWING. PRESS START ON 1442 TO BRING UP ITS READY.
2. SET 'CHECK STOP' SWITCH ON. IF A DECK WHICH IS LARGER THAN CAN BE HELD IN CORE IS READ IN, THE MEMORY WILL WRAP AROUND AND WIPE OUT THIS PROGRAM, PROBABLY STOPPING WITH AN OP CODE CHECK.
3. PRESS 'RESET' AND 'PROGRAM LOAD' ON THE 1800 CONSOLE. WHEN THE HOPPER GOES EMPTY, PRESS START ON THE 1442 TO INITIATE THE LAST CARD ROUTINE.
4. WHEN WAIT 1 IS REACHED, LOAD 1442 HOPPER WITH BLANK CARDS AND PRESS START ON 1442. (THE PROGRAM DOES NOT CHECK FOR BLANK CARDS BEFORE PUNCHING SO BE SURE CARDS ARE BLANK). PRESS START ON THE 1800 CONSOLE AND PUNCHING WILL BEGIN.
5. WHEN THE DECK HAS BEEN PUNCHED, THE PROGRAM AGAIN EXECUTES A FEED CYCLE TO PLACE THE LAST CARD OF THE NEW DECK IN THE HOPPER. THE PROGRAM WILL STOP AT WAIT 2 (EVEN THOUGH THE HOPPER STILL HAS CARDS IN IT).
6. WHEN WAIT 2 IS REACHED, THE DUPLICATION IS COMPLETE, IF ANOTHER NEW DECK IS DESIRED, PRESS 'START' ON THE 1800 CONSOLE.

3. SERVICE HINTS

1. NO CHECK IS MADE TO DETERMINE THE SIZE OF MEMORY AVAILABLE. IF THE DECK IS A LARGE ONE, IT MAY BE NECESSARY TO REPRODUCE

IT IN SEVERAL PASSES. APPROXIMATELY 50 CARDS CAN BE REPRODUCED FOR EVERY 4K OF MEMORY.

2. NO CHECK IS MADE PRIOR TO PUNCHING TO INSURE THAT THE CARDS LOADED IN THE HOPPER ARE BLANK. IF A PUNCHED DECK IS LOADED, IT WILL PUNCH THE NEW DATA OVER THE OLD AND RENDER BOTH PROGRAMS USELESS.

*** 80/80 REPRODUCE ***

```

*
* ABS
* ORG 0
* ***** READ SECTION *****
*
0000 0 6150
0001 0 6922
0002 0 081F
0003 0 4804
0004 0 70FD
0005 0 1003
0006 0 4828
0007 0 7003
0008 0 0818
0009 0 7150
000A 0 70F6
000B 0 0814

RD LDX 1 80 FIRST DATA ADDRESS
STX 1 READ STORE XR 1 AT READ IOCC
CK1 XIO SENSE SENSE DSW
BSC E SKIP IF 1442 IS READY
MDX CK1
SLA 3
BSC Z+ IS THIS THE LAST CARD
MDX CNT DONE WITH READING DCS
XIO READ READ THE CARDS
MDX 1 80 NEXT CARD ADDRESS SET-UP
MDX RD CONTINUE READING CARDS
CNT XIO CNTRL DO FEED CYCLE
*
* ***** PUNCH SECTION *****
*
000C 0 3001
000D 0 6150
000E 0 0813
000F 0 4804
0010 0 70FD
0011 0 6914
0012 0 C14F
0013 0 E80E
0014 0 D14F
0015 0 C00E
0016 0 900F
0017 0 4808
0018 0 7003
0019 0 080C
001A 0 7150
001B 0 70F2

PNCH WAIT 1 NOW READY TO PUNCH CARDS
LDX 1 80
CK2 XIO SENSE SENSE DSW
BSC E SKIP IS 1442 IS READY
MDX CK2
STX 1 PUNCH
LD 1 79 PLACES THE
OR SENSE * END OF PUNCH
STO 1 79 * BIT IN LAST COLUMN.
LD 1 READ CHECK IF THIS
S PUNCH * IS THE LAST CARD
BSC + * OF THE DECK.
MDX DONE
XIO PUNCH PUNCH THE CARDS
MDX 1 80 NEXT CARD ADDRESS SET-UP
MDX CK2
*
DONE XIO CNTRL FEED CYCLE
WAIT 2 DONE PUNCHING DECK.PRESS
MDX PNCH START TO PUNCH ANOTHER
MDX X -1 COPY.
* ***** IOCC WORDS *****
*
BSS E 0
CNTRL DC 0 FEED CYCLE
DC /1402
SENSE DC /0008 SENSE DSW
DC /1701
READ DC *-* READ CARDS
DC /1600
PUNCH DC *-* PUNCH CARDS
DC /1500
END 0

```

6.6 80/80 AUX LIST - AUX PROGRAM 7 CARDS

1. PROGRAM DESCRIPTION

** CHECK CUSTOMER'S OPERATION BEFORE USING THIS PROGRAM. THE 1442 AND THE 1443 MUST NOT BE ON A CHANNEL WITH ANOTHER DEVICE THE CUSTOMER IS USING.

THIS PROGRAM LIST CARDS ON THE 1443 THAT ARE READ ON THE 1442 AND RUNS IN AUX STORAGE (CE MODE). THE PROGRAM WILL LEAVE A BLANK FOR ANY CHARACTER NOT FOUND.

2. PREREQUISITES

2.1 DEVICE AREA CODE

IF THE DEVICE TO BE TESTED USES A CUSTOMER ASSIGNED AREA CODE A NEW AUX PROGRAM DECK OR PAPER TAPE MUST BE CREATED. THE PROCEDURE IS PRESENTED IN THE DOCUMENTATION OF THE AUX PROGRAM GENERATOR UTILITY (PID 08AC - CARD VERSION). THE PROGRAM LOCATIONS THAT MUST BE ALTERED ARE SPECIFIED BY A STATEMENT AT THE BEGINNING OF THE PROGRAM LISTING.

2.2 CARD INPUT

--CAUTION--

DO NOT ATTEMPT TO LOAD THIS PROGRAM IF THE CARD READER SHARES A CHANNEL WITH ANOTHER DEVICE WHILE THAT DEVICE IS OPERATING.

THE AUX DIAGNOSTIC LOADER (PID 08A1) MUST BE PRESENT IN AUX STORAGE BEFORE AN AUX PROGRAM DECK CAN BE LOADED.

3. USE PROCEDURE

BEFORE PROCEEDING, A PROGRAM MUST BE IN MAIN-CORE STORAGE RUNNING OR AT A WAIT INSTRUCTION READY TO START RUNNING.

3.1 CARD INPUT LOADING PROCEDURE

- A. BE SURE THE 1442 IS AVAILABLE AND ALL CARDS ARE REMOVED.
- B. ON THE CE PANEL SET THE INTERRUPT SWITCH TO AUX INTERRUPT AND ALL THE CE SWITCHES TO THEIR ON POSITION (UP).
- C. DEPRESS CE INTERRUPT TWO TIMES TO ASSURE THE 1442 IS IN CE MODE.
- D. PLACE THE SEVEN CARDS OF THE AUX 80/80 LIST PROGRAM IN THE HOPPER OF THE 1442 AND FOLLOW WITH A BLANK CARD.

NOTE

EACH PROGRAM CARD HAS A CHARACTER ENTERED INTO COLUMN 80. THIS CHARACTER DEFINES THE CARD'S POSITION IN THE DECK ACCORDING TO THE FOLLOWING SEQUENCE, X(FIRST), THEN 0,1,2,3,4, AND 5. THE CARDS CANNOT BE READ UNLESS THEY ARE PLACED IN THE HOPPER IN THE CORRECT ORDER.

- E. DEPRESS THE 1442 START PUSHBUTTON. READY INDICATOR SHOULD LIGHT.
- F. SELECT THE DESIRED ROUTINE FROM TABLE 1.
- G. DEPRESS CE LEVEL INTERRUPT PUSHBUTTON (ON CE PANEL) TO LOAD THE PROGRAM.

3.2 TAPE INPUT - DOES NOT APPLY

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3.3 OPERATING PROCEDURE

THE ROUTINE SELECTED WILL AUTOMATICALLY START AFTER THE PROGRAM HAS BEEN ENTERED INTO AUX STORAGE. SUBSEQUENT ROUTINES MAY BE SELECTED AT ANY TIME USING THE SWITCH SETTINGS LISTED IN TABLE 1. MAKE THE 1443 READY.

TABLE 1. CE PROGRAM SWITCH SETTINGS

ROUTINE	BIT SWITCHES							FUNCTION	
	8	9	10	11	12	13	14		15
	0	0	0	0	0	0	0	0	LIST CARDS 80/80
CE SERVICE STOP	0	0	0	0	0	0	0	1	THIS SWITCH SETTING CAUSES THE PROGRAM TO STOP BUT DOES NOT TERMINATE. IT IS RECOMMENDED TO USE THIS SETTING WHEN ADJUSTING THIS DEVICE. TO START THE ROUTINE, SELECT THE CE PROGRAM SWITCH SETTINGS AND DEPRESS CE INTERRUPT BUTTON.
	0	0	0	0	1	1	1	1	
PROGRAM TERMINATOR	1	1	1	1	1	1	1	1	THIS SWITCH SETTING INITIATES A ROUTINE THAT TERMINATES THIS PROGRAM. (ALL AUX PROGRAMS USE THE SAME PROGRAM-TERMINATOR SETTING.)

CAUTION-

FOR THE TERMINATING PROCEDURE IN SECTION 3.5

3.4 CE SERVICE STOP

THIS SWITCH SETTING WILL NOT TERMINATE THE PROGRAM BUT IT WILL CAUSE THE DEVICE TO STOP AND STAY IN CE MODE. TO START THE ROUTINE, SELECT THE CE PROGRAM SWITCH SETTINGS AND DEPRESS CE INTERRUPT.

3.5 TERMINATING PROCEDURE

- A. SET THE CE PROGRAM SWITCHES TO 00000001 -CE SERVICE STOP (THE ONLY REASON FOR USING THIS SETTING IS TO STOP ANY DEVICE ACTION WHICH MAY CAUSE AN INTERRUPT).
- B. SET THE CE PROGRAM SWITCHES TO 11111111 -TERMINATOR SETTING, AND DEPRESS THE CE INTERRUPT LEVEL KEY ONCE AND ONL ONCE (A SECOND DEPRESSION OF THE CE INT. KEY WILL RESULT IN THE AUX DIAGNOSTIC LOADER TRYING TO LOAD A NEW PROGRAM IF THE READER IS READY.)

NOTE

TO OFFSET THE POSSIBILITY THAT THE INPUT DEVICE MIGHT BE MALFUNCTIONING, THE NEXT TIME THE 1800 SYSTEM NEEDS SERVICING THE FOLLOWING PROGRAM SHOULD BE LOADED INTO AUX CORE AT THE CONCLUSION OF EACH SERVICE CALL -

A. CARD INPUT

LOAD THE AUX 1442 PACKED READ EXERCISE PROGRAM (PID 08AA) AFTER ASSURING THE PROGRAM IS BY PUNCHING CARDS, CE SWITCH SETTING 00000001, SET IN THE FAREWEL OPTION, CE SWITCH SETTING 00000000 AND LEAVE THE SWITCHES AT THIS SETTING, TO ENSURE THE GREATEST PROTECTION TO THE CUSTOMER. DEPRESS CE INTERRUPT.

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B. TAPE INPUT

LOAD THE AUX 1054/55 EXERCISE PROGRAM (PID 08A8).
AFTER ASSURING THE PROGRAM IS IN BY PUNCHING TAPE, CE
SWITCH SETTINGS 00000001, SET IN THE FAREWELL OPTION,
CE SWITCH SETTING 00000000 AND LEAVE THE SWITCHES AT
THIS SETTING TO ENSURE THE GREATEST PROTECTION TO THE
CUSTOMER. DEPRESS CE INTERRUPT.

4. PRINTOUTS

5. COMMENTS

A PROGRAM MUST BE IN MAIN-CORE STORAGE AND MUST BE RUNNING OR
READY TO START BEFORE THIS PROGRAM CAN BE LOADED. THE AUX LOADER
MUST BE PRESENT IN AUXILIARY STORAGE. THE PROGRAM WILL START
AUTOMATICALLY WITH THE ROUTINE SETTING IN THE CE PROGRAM SWITCHES

*** AUX LIST 80/80 ***

ABS
ORG /36

02BC

* IF THIS PROG IS TO BE USED FOR A MACHINE
* WITH A DIFFERENT AREA CODE, THE LOCATION WHICH
* REFER TO THE LABEL AREA IN SYMBOL TABLE MUST
* BE CHANGED BY HEX CORRECTION CARDS TO OBTAIN A
* MODIFIED AUX 8-8 OBJECT DECK. SEE AUX CE PROG
* GENERATOR WRITE-UP FOR PROCEDURE.

80/80 LIST 1442-1443

CE BIT SWITCH SETTINGS

00000001 CE SERVICE STOP
11111111 TERMINATE PROGRAM

ALL OTHER SETTINGS ARE VOID

* FOR ADDITIONAL INFORMATION ABOUT PROG. OPERATION
* REFER TO THE PROGRAM DESCRIPTION WRITE-UP.

AUX PROG ENTRY POINTS

1ST PASS ENTRY ONLY

0036 00 4C0000B8	READ BSC L	SETUP	BCH TO INIL ROUTINE LATER READ IOCC
0038 0 0006	PRINT DC	PAREA	PRINT AREA
0039 0 0500	DC	/0500	PRINT IOCC
003A 0 00FF	SENBI DC	/00FF	CONSTANT
003B 0 0760	STG DC	/0760	SENSE BIT SWITCHES
003C 0 0000	DSWP DC		TEMP STORAGE
003D 0 0701	DC	/0701	SENSE PTR DSW
003E 0 6A11	RETUR STX	2 SAVE2+1	SAVE XR 2
003E 0 6B12	STX	3 SAVE3+1	SAVE XR 3
0040 0 08FB	XIQ	DSWP	SENSE PTR DSW
0041 0 0826	XIQ	DSWR	SENSE RDR DSW
0042 0 08F7	XIQ	SENBI	SENSE BIT SWITCHES
0043 0 E0F6	AND	SENBI	REMOVE 0 THRU 7

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0044 0 F0F5	EOR	SENBI	
0045 00 4C18004A	BSC L	NOTRD,+-	BCH TERMINATE PROGRAM
0047 00 4C040089	WORK BSC L	GET,E	BCH TO PROGRAM
0049 0 7005	MDX	SAVE2	
004A 00 650000813	NOTRD LDX	L1 WWWW	
004C 0 6987	STX	1 /04	RESTORE LOADER
004D 0 0820	XIQ	CEOFR	TURN CE MODE OFF RDR
004E 0 0811	XIQ	CEOFP	TURN CE MODE OFF PTR
004F 00 66000000	SAVE2 LDX	L2	RESTORE XR 2
0051 00 67000000	SAVE3 LDX	L3	RESTORE XR 3
0053 0 7089	MDX	QQQQ	EXIT TO AUX LOADER

0054 0 200A	TABLE DC	/200A	ZERO
0055 0 00AB	DC	/00AB	EQUAL
0056 0 022C	DC	/022C	EACH SIGN
0057 0 012D	DC	/012D	APOS
0058 0 20AE	DC	/20AE	GREATER THAN
0059 0 206F	DC	/206F	QUESTION MARK
005A 0 0000	DC	/0000	SPACE AND END CK
005B 0 282A	DC	/282A	LOZEN
005C 0 8000	DC	/8000	AMPERSAND
005D 0 882D	DC	/882D	CENT SIGN
005E 0 842B	DC	/842B	PERIOD
005F 0 822E	DC	/822E	LESS THAN
0060 0 412C	CEOFP DC	/412C	RT BRACKET
0061 0 0000	DC	/0000	PRINTER CE OFF IOCC
0062 0 0003	DC	/0003	END CHECK
0063 0 4000	DC	/4000	DASH
0064 0 482D	DC	/482D	EXCLAMATION
0065 0 442B	DC	/442B	DOLLAR SIGN
0066 0 422C	DC	/422C	ASTERISK
0067 0 40AE	DC	/40AE	SEMICOLON
0068 0 042A	DSWR DC	/042A	NUMBER SIGN
0069 0 0701	DC	/0701	SENSE RDR DSW
006A 0 0002	DC	/0002	END CHECK
006B 0 812C	DC	/812C	LEFT BRACKET
006C 0 80A0	DC	/80A0	PLUS
006D 0 242B	DC	/242B	COMMA
006E 0 222A	CEOFR DC	/222A	PERCENT
006F 0 0000	DC	/0000	RDR CE OFF IOCC
0070 0 082E	DC	/082E	COLON
0071 0 006F	DC	/006F	QUOTE
0072 0 0001	ONE DC	/0001	END CHECK

0073 0 4820	DEV BSC	Z	
0074 0 7026	MDX	SPEC	
0075 0 C0C6	LD	DSWP	LOAD TENS DIGIT
0076 0 1004	SLA	4	
0077 0 6AC4	STX	2 DSWP	OR IN UNITS DIGIT
0078 0 E8C3	DR	DSWP	SAVE IN Q REG
0079 0 1888	SRT	8	
007A 0 C0C0	OUT LD	STG	ODD AND EVEN CHECK
007B 0 F0F6	EOR	ONE	
007C 0 D0BE	STO	STG	
007D 0 4804	BSC	E	WHICH PASS
007E 0 7003	MDX	HERE	* FIRST
007F 0 1090	SLT	16	* SECOND
0080 0 D37F	STO	3 /7F	STORE 2 CHAR IN PRT AREA
0081 0 73FF	MDX	3 -1	
0082 0 71FF	HERE MDX	1 -1	
0083 0 7009	MDX	CONT	CONTINUE TO CONVERT
0084 0 6128	LDX	1 40	WORD COUNT

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```
0085 0 6950      STX 1 PAREA
0086 0 0881      XIO PRINT
0087 0 40C0      BSI WORK+1 PRINT COMMAND
0088 0 408F      BSI WORK+1 FIRST PRINTER INTERRUPT
0089 0 08AC      GET XIO READ SET UP RETURN
008A 0 R0BD      BSI WORK+1 READ A CARD
008B 0 637F      LDX 3 /7F
008C 0 6150      LDX 1 80 COLUMN COUNT
008D 00 C50000AF CONT LD L1 RAREA-1 GET LAST CHAR FIRST
008E 0 6203      LDX 2 3
008F 0 12C0      SLCA 2 0
0090 0 6AAA      STX 2 DSWP XR 2 EQUAL TENS DIGIT
0091 0 1200      SLA 2 0
0092 0 6200      LDX 2 0 CLEAR XR 2
0093 0 4818      BSC +- ANY MORE DIGITS
0094 0 7005      MDX SPEC * NO, CHECK SPECIAL CHAR
0095 0 7201      LOOP MDX 2 1 * YES
0096 0 1001      SLA 1
0097 0 4802      BSC C HAS DIGIT BEEN SHIFTED OUT
0098 0 70D9      MDX DEV * YES, GO TO DEVELOP
0099 0 70FB      MDX LOOP * NO
*
009B 0 62E1      SPEC LDX 2 -31
009C 0 C273      LOOK LD 2 TABLE+31
009D 0 1884      SRT 4
009E 0 1004      SLA 4 SAVE UNITS DIGIT
009F 00 F50000AF EOR L1 RAREA-1 ADJUST ACC
00A1 00 4C1800A9 BSC L TENS,+ C-CHAR IN READ AREA
00A3 0 1084      SLT 4 BCH IF SPEC CHAR FOUND
00A4 0 7201      MDX 2 1 REMOVE UNITS DIGIT
00A5 0 70F6      MDX LOOK
*
00A6 0 1010      SLA 16 NO CHARACTER FOUND
00A7 0 1088      SLT 8 * USE BLANK
00A8 0 70D1      MDX OUT * AND CONTINUE
*
00A9 0 C273      TENS LD 2 TABLE+31
00AA 0 1884      SRT 4
00AB 00 4C18007A BSC L OUT,+ SAVE TENS DIGIT
00AD 0 1084      SLT 4 BCH IF END CK FOUND
00AE 0 7201      MDX 2 1 REMOVE TENS DIGIT
00AF 0 70F9      MDX TENS
*
*
* READ AREA WILL BE USED
* FOR PRINT AREA
*
* READ AREA
*
00B0 0000      BSS E
00B0 0 00B0      RAREA DC RAREA THE FOLLOWING PROGRAM IS
00B1 0 0600      DC /0600 * PART OF INITIALIZING
00B2 0 0000      CEONR DC
00B3 0 0001      DC /0001 TURN CE MODE ON RDR
00B4 0 0000      CEONP DC
00B5 0 0001      DC /0001 TURN CE MODE ON PTR
00B6 0 1000      AREA1 DC /1000 READER AREA
00B7 0 3000      AREA2 DC /3000 PRINTER AREA
00B8 00 650070D7 SETUP LDX L1 NNNN
00B9 00 6D000035 STX L1 /35 RESTORE AUX LOADER
00BA 00 65007039 LDX L1 TTTT
00BB 00 6D000004 STX L1 /04 SETUP BCH FROM LDR TO PGM
00BC 0 C8EF      LDD RAREA
00BD 00 DC000036 STD L READ CHG LOCATION /36
*
00C3 00 C4000037 LD L READ+1
00C5 0 E8F0      OR AREA1
00C6 00 D4000037 STO L READ+1
00C8 00 C4000069 LD L DSWR+1
```

```
00CA 0 E8E8      OR AREA1
00CB 00 D4000069 STO L DSWR+1
00CC 00 C40000B3 LD L CEONR+1
00CD 0 E8E6      OR AREA1
00CE 00 D40000B3 STO L CEONR+1
00CF 0 C400006F LD L CEONR+1
00D0 0 E8E1      OR AREA1
00D1 00 D400006F STO L CEONR+1
00D2 0 C400003D LD L DSWP+1
00D3 0 E8DD      OR AREA2
00D4 0 D400003D STO L DSWP+1
00D5 0 C40000B5 LD L CEONP+1
00D6 0 E8D8      OR AREA2
00D7 00 D40000B5 STO L CEONP+1
00D8 0 C40000B5 LD L CEONP+1
00D9 0 E8D3      OR AREA2
00DA 00 D4000061 STO L CEONP+1
00DB 0 C4000039 LD L CEONP+1
00DC 0 E8CE      OR AREA2
00DD 00 D4000039 STO L PRINT+1
*
00EB 0 08C6      XIO CEONR
00EC 0 08C7      XIO CEONP
00ED 00 4C0003E BSC L RETUR RETURN TO PROGRAM
*
00D6 PAREA EQU 214
*****
000D QQQQ EQU /D GO TO LOADER AT /D
70D7 NNNN EQU /70D7 FOR CARD LOADER AT /35
0813 WWWW EQU /0813 SET IN LOADER AT /04
7039 TTTT EQU /7000+RETUR-/4-1 THIS IS EQUAL TO
* THE BRANCH FROM THE LOADER
* TO RETUR IN THIS PROGRAM.
*****
00F0 00EE END *-1 END CARD NEVER USED
```

6.7 PUNCH IPL PAPER TAPE - PAPER TAPE

1. PROGRAM DESCRIPTION

THIS PROGRAM MAY BE RELOCATED AT ANY EVEN ADDRESS. AT WAIT 1 (B REGISTER - 3001) SET THE DESIRED STARTING ADDRESS OF THE DATA ENTRY SWITCHES, PRESS START. DELETE HOLES WILL BE PUNCHED, THEN IPL FORMAT WILL CONTINUE UNTIL THE END ADDRESS IS REACHED. BIT 0 ON IS AN INDICATION OF AN END ADDRESS. AT WAIT 2, THE PROGRAM WILL BE COMPLETED AND IF ANOTHER TAPE IS DESIRED, SET THE STARTIN ADDRESS, PRESS START.

2. OPERATING PROCEDURE

1. LOAD PAPER TAPE READER AND MAKE READY.
2. SET 'CHECK STOP' SWITCH ON. TO LOAD RELOCATABLE SEE 3.1.
3. PRESS 'RESET' AND 'PROGRAM LOAD' CONSOLE BUTTONS. THE PROGRAM WILL LOAD AND STOP AT WAIT 1.
4. SET THE DATA ENTRY SWITCHES TO THE STARTING ADDRESS AND PRESS START.
5. AFTER SETTING THE ENDING ADDRESS AND THE DATA ENTRY SWITCHES, PUT BIT 0 ON TO INDICATE AN ENDING ADDRESS.
6. WAIT 2 INDICATES THE TAPE IS PUNCHED.
7. WAIT 6 INDICATES THAT THE ERROR BIT ON THE DSW IS ON. GO TO STEP 4 FOR RESTART.

3. SERVICE HINTS

1. ANY PORTION OF MEMORY MAY BE DUMPED ON TAPE, BUT IT MUST BE IPL-ED IN THE SAME PLACE TO RUN UNLESS IT IS A RELOCATABLE PROGRAM AS IS THIS PROGRAM.
2. IF A SMALL PROGRAM HAS BEEN BIT SWITCHED INTO MEMORY, IT CAN BE PUNCHED OUT AND PLACED IN AT A LATER DATE.
3. THIS PROGRAM MAY BE LEFT IN CORE AS IT DOES NOT INTERFERE WITH ANOTHER PROGRAM. BY SETTING THE I COUNTER TO THE STARTING ADDRESS AND PRESSING START, YOU WILL GO TO WAIT 1. IT MASKS ALL INTERRUPT LEVELS.

*** PUNCH IPL PAPER TAPE ***

```

*
ABS
ORG 0
0000 0 7009 SENSE MDX START
0001 0 1F01 DC /1F01 SENSE DSW IOCC
0002 0 0009 PUNCH DC OUT OUTPUT AREA
0003 0 1900 DC /1900 PUNCH IOCC
0004 0 FFFF MASK DC /FFFF MASK COMMAND
0005 0 0400 DC /0400 MASK IOCC
0006 0 0000 SWTCH DC /0000 STARTING ADRS
0007 0 0740 DC /0740 SENSE DES IOCC
0008 0 7FFF STOP DC /7FFF STOP ADDRESS
0009 0 0000 OUT DC OUTPUT CHARACTER
*
START XIO MASK MASK INTERRUPTS
000A 0 08F9 START XIO MASK RELOC+1
000B 0 6801 STX RELOC+1
000C 00 65000000 RELDC LDX L1 *-* LOAD 1 COUNT
000E 0 71FD MDX 1 OUT-RELOC COMPUTE OUTPUT ADRS
000F 0 69F2 STX 1 PUNCH STORE IN IOCC
0010 0 3001 WAIT 1 SET DATA ENTRY SWITCHES
0011 0 08F4 READ XIO SWTCH SENSE - DATA ENTRY SWS
0012 0 4828 BSC +2
0013 0 70FD MDX READ ASSURE BIT ZERO OFF
0014 0 000A STO ADR+1
*
LDX L1 /7FFF
0015 00 65007FFF LDX L1 /7FFF
0017 0 69F1 STX 1 OUT SET DELETE PUNCHES
0018 0 69EF STX 1 STOP
0019 0 6114 LDX 1 20 NUMBER OF DELETE HOLES
001A 0 4025 DELTE BSI PCH+1 USE PUNCH ROUTINE
001B 0 71FF MDX 1 -1
001C 0 70FD MDX DELETE
*
WORD LDX 1 4 PUNCH IPL MODE
001D 0 6104 WORD LDX L2 *-* PUNCHING ADDRESS
001E 00 66000000 ADR LDX L2 *-* PUNCHING ADDRESS
0020 0 C200 LD 2 0 FETCH WORD TO PUNCH
0021 0 7201 MDX 2 1 UPDATE PUNCH ADRS
0022 0 6AFC STX 2 ADR+1
*
CHAR RTE 12 GET THE NEXT CHAR
0023 0 18CC CHAR RTE 12
0024 0 1008 SLA 8
0025 0 D0E3 STO OUT STORE IN OUTPUT
0026 0 4019 BSI PCH+1 USEPUNCH ROUTINE
0027 0 1090 SLT 16
0028 0 71FF MDX 1 -1 SKIP IF WORD DONE
0029 0 70F9 MDX CHAR FETCH NEXT CHARACTER
002A 0 08DB XIO SWTCH SENSE - DATA ENTRY SWS
002B 0 4828 BSC +2 IS THIS A STOP ADDRESS
002C 0 D0DB STO STOP * YES
002D 0 C0DA LD STOP * NO
002E 0 1001 TERM SLA 1 ALSO USED AS TERM BIT
002F 0 1801 SRA 1
0030 0 90EE S ADR+1
0031 0 4810 BSC - HAS STOP ADR BEEN REACHED
0032 0 70EA MDX WORD * NO
*
LD TERM * YES
0033 0 C0FA LD TERM * YES
0034 0 D0D4 STO OUT SET TERMINATOR BIT
0035 0 610A LDX 1 10
0036 0 4009 END BSI PCH+1 USE PUNCH ROUTINE
0037 0 1010 SLA 16
0038 0 D0D0 STO OUT SET BLANKS
0039 0 71FF MDX 1 -1
003A 0 70FB MDX END
003B 0 3002 WAIT 2 TAPE FINISHED
003C 0 70D4 MDX READ
*

```

```

003D 0 3006      ERR  WAIT   6      ERROR FOUND IN DSW
003E 0 70D2      MDX   READ
*
003F 00 4C000000 PCH  BSC   L  *-*    PUNCH ROUTINE
0041 0 088E      CK   XIO   SENSE  RETURN TO USER
0042 0 1002      SLA   2      SENSE DEVICE STATUS
0043 0 4828      BSC   +Z     ANY PUNCH PARITY
0044 0 70F8      MDX   ERR     * YES
0045 0 1005      SLA   5      * NO
0046 0 4820      BSC   Z      IS PUNCH READY
0047 0 70F9      MDX   CK     * NO
0048 0 0889      XIO   PUNCH  * YES, PCH ONE FRAME
0049 0 70F5      MDX   PCH
*
004A 0000      END   0
    
```

6.8 1053 DUMP - 1 CARD/PAPER TAPE

1. PROGRAM DESCRIPTION

THIS PROGRAM WILL BEGIN A CORE DUMP AT LOCATION /0028 UNLESS XR2 HAS BEEN SET TO ANOTHER VALUE. THE CORE STORAGE ADDRESS FOLLOWED BY 8 LOCATIONS WILL BE ON ONE LINE. LOCATION /0039 IS DESTROYED THE PROGRAM.

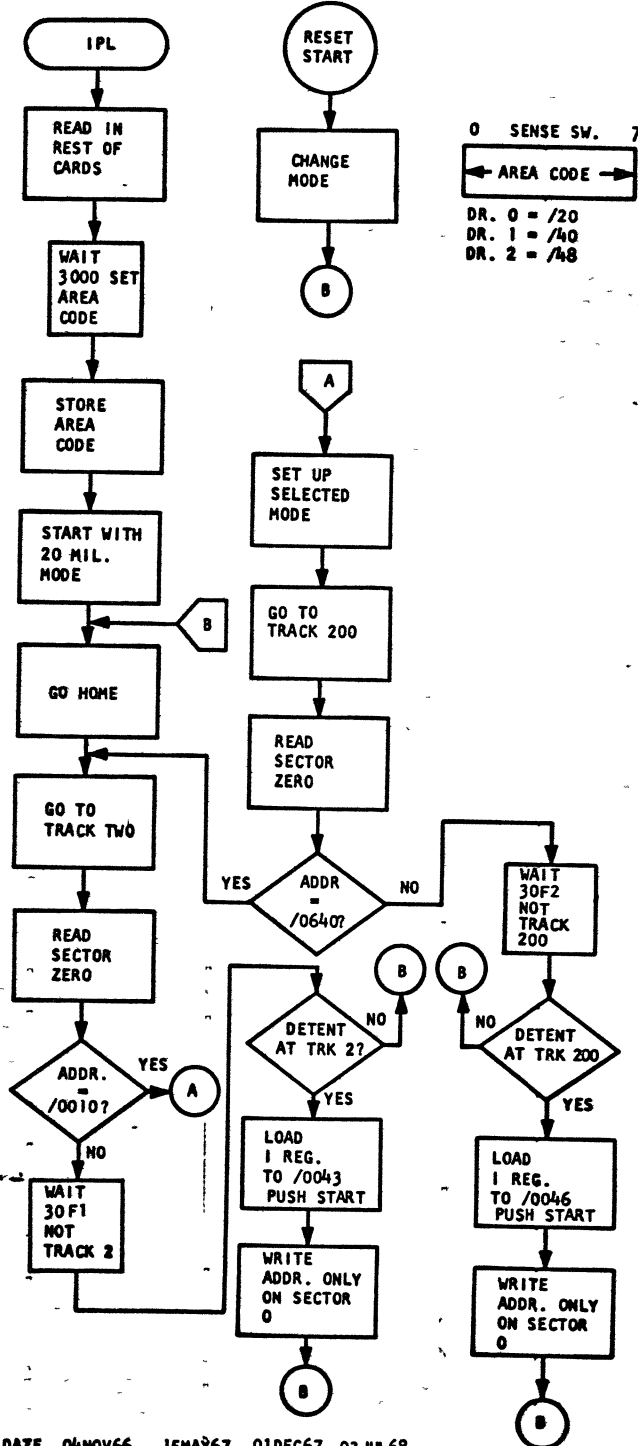
2. OPERATING PROCEDURES

1. PLACE THE SINGLE IPL CARD IN THE 1442 HOPPER. PRESS THE 1442 START BUTTON ONCE TO READ THE CARD IN AND ONCE TO BRING UP READY. FOR PAPER TAPE INPUT, PLACE THE DELETE HOLES SECTION OF THE PAPER TAPE OVER THE READ STATION.
2. SET CHECK STOP SWITCH ON.
3. PRESS RESET AND PROGRAM LOAD CONSOLE BUTTONS.

*** 1053 DUMP ***

```

*
028C      ABS
0000 0 6228  ADR  ORG   0      SET STARTING ADDRESS
0001 0 6360  LINE LDX  2 /28  SET 17 WORDS PER LINE
0002 0 6AFD  STX  2 ADR
0003 0 72FF  MDX  2 -1
0004 0 C8F8  LDD  ADR   FETCH THE LINE ADDRESS
0005 0 7019  MDX  GO    GO PRINT THE ADDRESS
0006 0 E18A  TABLE DC  /E18A  0 1
0007 0 E879  DC    /EB79  2 3
0008 0 F784  DC    /F784  4 5
0009 0 E773  DC    /E773  6 7
000A 0 F178  DC    /F178  8 9
000B 0 9E94  DC    /9E94  A B
000C 0 8E9F  DC    /8E9F  C D
000D 0 9A8E  DC    /9A8E  E F
*
000E 0 1083  CHAR  SLT   3      BRING IN THREE BITS
000F 0 8011  A      FETCH   CONVERT TO 1053 CODE
0010 0 D000  STO    *
0011 0 80F4  A      TABLE  THIS ADDRESS MODIFIED
0012 0 1081  SLT    1
0013 0 4804  BSC    E      SKIP IF LHS CHAR
0014 0 1008  SAVE  SLA   8
0015 0 9010  S      PRINT   CORRECT THE OUTPUT CODE
0016 0 D022  SP    STO   ADR+/39  SAVE OUTPUT CHAR
0017 0 080E  XIO   PRINT  PRINT THE CHARACTER
0018 0 080B  CK    XIO   SENSE-1  IDLE TILL PRINTED
0019 0 4820  BSC    Z      SKIP IF READY
001A 0 70FD  MDX    CK
001B 0 71FF  MDX   1 -1    SKIP IF WORD FINISHED
001C 0 70F1  MDX   CHAR
001D 0 7201  MDX   2 1     UPDATE WORD POINTER
001E 0 C200  LD    2 0     FETCH NEXT WORD
001F 0 18D0  GO    RTE   16
0020 0 6105  LDX   1 5
0021 0 80F4  FETCH A    SP    SPACE BEFORE NEXT WORD
0022 0 73F6  MDX   3 -10   SKIP IF DONE WITH LINE
0023 0 70F0  MDX   SAVE
0024 0 70DC  MDX   LINE
0025 0 0F03  SENSE DC  /0F03  SENSE DSW - RESET
0026 0 0039  PRINT DC  ADR+/39  PRINT COMMAND
0027 0 0902  DC    /0902
0028 0000  END    0
    
```



- PROGRAM DESCRIPTION WILL MOVE CARRIAGE BETWEEN TRACKS TWO AND 200 AND COMPARE SECTOR ZERO ADDRESS AT THOSE TWO TRACKS. THE SEEK CAN BE DONE IN 10 OR 20 MIL MODE. THIS PROGRAM WAS DESIGNED TO BE USED WITH THE ACCESS ADJUSTMENT PROCEDURE IN THE SDS MAINTENANCE MANUAL.
- OPERATING PROCEDURE
 - PLACE THREE CARDS PLUS BLANK CARD IN THE 1442 HOPPER.
 - SET "CHECK STOP" SWITCH ON
 - PRESS "RESET" AND "PROGRAM LOAD" CONSOLE BUTTONS. PROGRAM WILL LOAD AND STOP AT WAIT 0.
 - SET SENSE SWITCHES TO SELECT THE DRIVE TO BE RUN.
 - PRESS CONSOLE "START" BUTTON.
 - PROGRAM WILL SEEK BETWEEN CYLINDERS TWO AND 200 IN 20 MIL MODE
 - STOP-RESET-AND START TO CHANGE MODES
- SERVICE HINTS
 - DO NOT LOAD I REG TO /0043 OR /0046 UNTIL WAIT 30F1 OR 30F2 HAS BEEN ENCOUNTERED.
 - WHEN USING THE ABOVE REWRITE OPTION THE ORIGINAL SECTOR DATA WILL BE DESTROYED.

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6.9 10/20 MIL SEEK ADJ

```

0280          ABS          0
              ORG
0000 0 0821      START XIO  RD1 OR NOP IN P.T.
0001 0 0824      BACK1 XIO RDDSW OR NOP IN P.T.
0002 0 4804          BSC     E OR NOP IN P.T.
0003 0 70FD          MDX    BACK1 OR NOP IN P.T.
0004 0 081F          XIO    RD2 OR NOP IN P.T.
              *
0005 0 3000          DC      /3000
0006 0 C849          LDD    RESRT  ** SET AREA CODE IN SENSE
0007 0 D8F8          STD    START  * SWITCHES
              *
0008 0 6110          LDX    1 16
0009 0 0848          XIO    RDSPS  **
000A 00 C5000053    AGAN1 LD  L1 SNDSW-1  **
000C 0 E857          OR     AREA   ** SET AREA CODE
000D 00 D5000053    STO    L1 SNDSW-1  **
000F 0 71FE          MDX    1 -2
0010 0 70F9          MDX    AGAN1  *
              *
0011 0 084A          * SKHME XIO HOME
0012 0 4036          BSI    TEST  * GO HOME
              *
0013 0 084A          * XIO TRK2
0014 0 4034          BSI    TEST  ** GO TO TRACK TWO
0015 0 7021          MDX    CHCK2  *
              *
0016 0 C04E          * ONWDO LD TOGGL
0017 00 4C200020    BSC L ONWD1,Z  ** JUMP IF 10 MIL MODE
0019 00 650000C6    LDX L1 198
0018 0 6944          STX 1 TWHND  **
001C 0 6945          STX 1 TWO  **
001D 0 6101          LDX 1 1
001E 0 6201          LDX 2 1
001F 0 7007          MDX CMND1  ** SET FOR PROPER
0020 0 6101          ONWD1 LD 1 1  * MODE
0021 0 693E          STX 1 TWHND  **
              *
0022 0 004A          RD1 DC 74
0023 0 1601          DC /1601
0024 0 0022          RD2 DC 34
0025 0 1601          DC /1601
0026 0 0000          RDDSW DC 0
0027 0 1701          DC /1701
              *
0028 0 693F          ORG RD1
0023 00 650000C6    STX 1 TWO  ** PART OF MODE SET
0025 00 660000C6    LDX L1 198  **
0025 00 660000C6    LDX L2 198  *
              *
0027 0 0838          CMND1 XIO TWHND
0028 0 4020          BSI TEST
0029 0 71FF          MDX 1 -1  ** GO TO TRACK 200
002A 0 70FC          MDX CMND1  *
              *
0028 0 082E          XIO READ
002C 0 401C          BSI TEST
002D 0 C03D          LD INPUT&1
002E 0 F03A          EOR OUT20&1
002F 00 4C180033    BSC L CMND2,&-  ** READ AND COMPARE
0031 0 30F2          DC /30F2  ** ADDR. AT TRACK 200
0032 0 70DE          MDX SKHME  * TRACK DID NOT COMPARE
              *
0033 0 082E          CMND2 XIO TWO
0034 0 4014          BSI TEST  ** GO TO TRACK TWO
    
```

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```

0035 0 72FF          MDX  2 -1      **
0036 0 70FC          MDX  CMND2    *
*
0037 0 0822          CHCK2 XIO  READ      *
0038 0 4010          BSI    TEST      **
0039 0 C031          LD     INPUT&1  **
003A 0 F02C          EDR    OUT02&1  * * READ AND COMPARE
003B 00 4C180016     BSC  L ONWDO,&- * * ADDRESS AT TRACK TWO
003D 0 30F1          DC     /30F1    ** TRACK DID NOT COMPARE
003E 0 70D2          MDX    SKHME    *
*
003F 0 C025          RSTRT LD  TOGGL    *
0040 0 F025          EDR    OUT02    ** CHANGE MODE
0041 0 D023          STO    TOGGL    **
0042 0 70CE          MDX    SKHME    *
*
0043 0 0812          WTTWO XIO  WRT02    *
0044 0 4004          BSI    TEST      ** WRITE ADDRESS
0045 0 70CB          MDX    SKHME    * AT TRACK TWO
*
0046 0 0811          WTHND XIO  WRT20    *
0047 0 4001          BSI    TEST      ** WRITE ADDRESS
0048 0 70CB          MDX    SKHME    * AT TRACK 200
*
0049 0 0000          TEST DC  *--*      *
004A 0 0809          AGAN2 XIO  SNDSW    * *
004B 0 180D          SRA    13      * * TEST FOR
004C 0 4804          BSC    E        * * FILE READY
004D 0 70FC          MDX    AGAN2    * *
004E 00 4C800049     BSC  I  TEST    *
*
0050 0000            BSS  E  0
0050 00 4C00003F     RESRT BSC L RSTRT
0052 0 0064          RDSPS DC  AREA
0053 0 0260          DC     /0260    IOCC READ S/P SWITCHES
0054 0 0000          SNDSW DC  0
0055 0 0701          DC     /0701    IOCC SENSE DSW-RESET
0056 0 0066          WRT02 DC  OUT02
0057 0 0500          DC     /0500    IOCC WRITE TRACK TWO
0058 0 0068          WRT20 DC  OUT20
0059 0 0500          DC     /0500    IOCC WRITE TRACK 200
005A 0 006A          READ DC  INPUT
005B 0 0600          DC     /0600    IOCC READ ADDRESS
005C 0 00CA          HOME DC  202
005D 0 0404          DC     /0404    IOCC SEEK HOME
005E 0 0002          TRK2 DC  2
005F 0 0400          DC     /0400    IOCC-GO TO TRACK TWO
0060 0 0000          TWHND DC  *--*
0061 0 0400          DC     /0400    IOCC-OUT TO TWOHUNDRED
0062 0 0000          TWO  DC  *--*
0063 0 0404          DC     /0404    IOCC-BACK TO TRACK TWO
0064 0 0000          AREA DC  *--*
0065 0 0000          TOGGL DC  *--*
0066 0 0001          OUT02 DC  1
0067 0 0010          DC     /0010    WRITE TRACK TWO TABLE
0068 0 0001          OUT20 DC  1
0069 0 0640          DC     /0640    WRITE TRACK 200 TABLE
006A 0 0002          INPUT DC  2
*
006C 0000            END    START
  
```

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1. PURPOSE

THE CORE TEST TESTS THE CORES, READ/WRITE CIRCUITRY, AND THE CORE ADDRESSING CIRCUITRY OF THE 1801 AND 1802 PROCESSOR-CONTROLLERS.

2. REQUIREMENTS

2.1 PROGRAM REQUIREMENTS

THE 1800 BASIC DIAGNOSTIC LOADER MUST BE USED TO LOAD THE CORE FUNCTION TEST.

2.2 EQUIPMENT REQUIREMENTS

THE FOLLOWING EQUIPMENT IS REQUIRED,

- A. 1801 OR 1802 PROCESSOR-CONTROLLER.
- B. 1442 CARD READ-PUNCH, OR 1054 PAPER TAPE READER.
- C. EITHER A 1053-1816, OR 1443 PRINTER.

3. OPERATING PROCEDURE

3.1 PROGRAM LOADING

THE CORE FUNCTION TESTS ARE LOADED BY THE 1800 BASIC LOADER. SEE THE 1800 BASIC LOADER DOCUMENTATION FOR THE DESCRIPTION OF THE LOADING PROCEDURE.

3.2 PROGRAM OPERATION

THE CORE FUNCTION TESTS CONSIST OF PROGRAMS, WHICH ARE EXECUTED IN THE SEQUENCE —

1. HI CORE (TEST CORE LOCATIONS ABOVE 07FF) THE HIGH CORE TEST IS LOADED INTO STORAGE STARTING AT 012C.
2. 0-9 CORE (TESTS THREE HIGHEST CORE LOCATIONS AND LOCATIONS 0000-0009) THE 0-9 CORE TEST IS LOADED INTO STORAGE STARTING AT 012C.
3. LOW CORE (TEST CORE LOCATIONS 0009-07FF) THE LOW CORE TEST IS LOADED INTO THE HIGHEST 2K OF STORAGE.

EACH PROGRAM IS LOADED INTO CORE AND EXECUTED BEFORE THE NEXT PROGRAM IS LOADED. BEFORE THE EXECUTION OF EACH PROGRAM, A WAIT OCCURS TO ALLOW ANY REQUIRED SWITCHES TO BE SET. AFTER THE EXECUTION OF EACH PROGRAM A WAIT OCCURS TO ALLOW REQUIRED SWITCHES TO BE SET PRIOR TO LOADING THE NEXT PROGRAM.

WHEN A WAIT OCCURS REFER TO THE WAIT TABLES IN THE LISTING TO DETERMINE THE ACTION REQUIRED. (SEC. 3.3)

NOTE

IT IS POSSIBLE TO SEPARATE THE OBJECT DECK INTO THREE INDEPENDENT DECKS SUCH THAT EACH PROGRAM CAN BE LOADED AND EXECUTED INDEPENDENTLY. THIS PROVIDES THE ABILITY, TO LOAD AND EXECUTE ANY CORE PROGRAM WITHOUT PREVIOUSLY EXECUTING ANOTHER CORE PROGRAM. IN ORDER TO RUN THE THREE PROGRAMS IN SEQUENCE, THEY MUST BE IN THE FOLLOWING ORDER- HIGH CORE, 0-9 CORE, AND LOW CORE.

COLUMNS 79 AND 80 OF THE OBJECT DECK CONTAIN A HEXADECIMAL SEQUENCE NUMBER. THE START OF EACH PROGRAM OBJECT DECK BEGINS WITH 00 (PUNCHES IN ROW ZERO OF COLUMNS 79 AND 80). BY SEARCHING FOR THESE CARDS, THE ORIGINAL DECK CAN BE DIVIDED INTO THREE PARTS. THE FIRST PART IS THE HIGH CORE PROGRAM, THE SECOND PART IS THE 0-9 CORE PROGRAM, AND THE THIRD PART IS THE LOW CORE PROGRAM. EACH OF THESE DECKS CAN BE LOADED WITH THE BASIC LOADER.

TABLE 1. PROGRAM OPTIONS

DATA ENTRY SWITCHES	HIGH CORE	0-9 CORE	LOW CORE	DESCRIPTION
SW 14 ON	X	X	X	BYPASS ERROR WAIT
SW 13 ON	X	X	X	SUPRESS ALL PRINTOUTS
SW 11 ON	X	X	X	LOOP PROGRAM
SW 10 ON	X	X	X	LOOP ROUTINE
SW 9 ON	X	X	X	PRINTOUTS ON 1443
SW 9 OFF	X	X	X	PRINTOUTS ON 1816
SW 8 ON	X	X	X	LOOP ON ADDRESS PRESENTLY BEING TESTED, (USED FOR SCOPING).

3.3 PROGRAM WAITS

ALL WAITS ARE DESCRIBED IN THE WAIT SECTION AT THE BEGINNING OF THE PROGRAM LISTING AND ARE IN THE FOLLOWING FORMAT.

B-REG	I-REG	WAIT	DESCRIPTION OF WAIT
300F	010E ₀	DC /300F+1	IN THIS AREA WILL BE A DESCRIPTION OF THE WAIT.

4. PRINTOUTS

4.1 NORMAL SEQUENCE OF PRINTOUTS

START HIGH CORE TEST
 END HIGH CORE TEST
 START 0 THRU 9 CORE TEST
 END 0 THRU 9 CORE TEST
 START LOW CORE TEST
 END LOW CORE TEST

4.2 ERROR PRINTOUTS

4.2.1 THE FOLLOWING ERROR PRINTOUTS APPLY ONLY TO HIGH-CORE AND LOW-CORE TESTS.

- A. ER 1 ERROR DETECTED IN THE READ/WRITE-IN MEMORY AND ADDRESSING TEST (RSABI).
- B. ER 2 ERROR DETECTED IN THE ZERO-READ/WRITE SECTION OF BIT-ISOLATION TEST (RSABR).
- C. ER 3 ERROR DETECTED IN THE ONE-READ/WRITE SECTION OF BIT-ISOLATION TEST (RSABR).
- D. ER 4 ERROR DETECTED IN WORST-CASE-PATTERN TEST (RSACJ)
- E. ER 5 ERROR DETECTED IN STORAGE-PROTECT/ WRITE-ZEROS-ON PROTECTED-AREA ONES TEST (RSACU).
- G. ERROR INT STORG PROT - ERROR INTERRUPT OCCURED SHOWING A STORAGE PROTECT VIOLATION.
- H. ERROR INT PARITY - ERROR INTERRUPT OCCURED SHOWING A PARITY ERROR.
- I. ERROR INT INV OP CODE-- ERROR INTERRUPT OCCURED SHOWING AN OPERATION CODE VIOLATION.
- F. ER 6 ERROR DETECTED IN STORAGE-PROTECT/ UNPROTECT AND CLEAR-MEMORY-OF-ONES TEST (RSACQ-5).

4.2.2 THE 0-THROUGH-9 CORE TEST HAS ONLY ONE ERROR PRINTOUT. THE WORD ERROR WILL PRINTOUT. LOOK AT STORAGE ADDRESS REGISTER AND Q REGISTER WHEN THE ERROR WAIT OCCURS TO DETERMINE ERROR AND LOCATION IN PROGRAM WHERE FAILURE OCCURED. THE EXACT MEANING OF THE REGISTERS IS EXPLAINED UNDER THE ERROR WAIT SECTION OF THE LISTING.

5. COMMENTS

5.1 DESCRIPTION OF HIGH-CORE MEMORY TEST

5.1.1 INITIALIZATIONS (RSDKS)

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

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

THE READ/WRITE-IN-MEMORY AND ADDRESSING TEST LOADS EACH CORE POSITION WITH ITS OWN ADDRESS. THE TEST THEN COMPARES THE CONTENTS OF EACH CORE POSITION WITH THE ADDRESS INTERROGATED TO ASSURE THAT THE CORES CAN BE CORRECTLY ADDRESSED. AN ERROR OCCURRING DURING THIS ROUTINE WILL CAUSE AN ERR 1 PRINTOUT.

5.1.3 BIT-ISOLATION TEST (RSABR)

THE BIT-ISOLATION TEST IS IN TWO PARTS. THE FIRST PART CHECKS THE ABILITY TO READ AND WRITE ZEROS IN MEMORY. A FAILURE TO READ OR WRITE ZEROS WILL RESULT IN AN ERROR WAIT. THE SECOND PART IS A BIT-ISOLATION TEST. THIS TEST DETERMINES THE ABILITY OF MEMORY TO DISTINGUISH EACH ONE OF THE 16 BITS IN A STORED WORD. THE PATTERN READ INTO MEMORY HAS FIFTEEN 0 BITS AND A SINGLE 1 BIT IN EACH WORD. FIRST THE 1 BIT IS PLACED IN POSITION 0. THE BIT IS THEN MOVED TO THE RIGHT ONE POSITION PER PASS FOR A TOTAL OF 15 TIMES UNTIL THE ENTIRE CORE WORD HAS BEEN TESTED. ANY ERROR IN THE BIT ISOLATION RESULTS IN AN ERR 3 PRINTOUT.

5.1.4 WORST-CASE-PATTERN TEST (RSACJ)

THE WORST-CASE-PATTERN TEST ESTABLISHES A WORST-CASE PATTERN CONSISTING OF BLOCKS OF WORDS CONTAINING EITHER ALL ONES OR ALL ZEROS. THIS PATTERN IS READ AND STORED INTO MEMORY AND IS THEN COMPLEMENTED AND STORED AGAIN. IF ANY BITS ARE OMITTED OR ADDED, BECAUSE OF THIS WORST-CASE (MAXIMUM NOISE) EXERCISE, AN ERR 4 PRINTOUT WILL OCCUR. THE COMPLEMENT WORST CASE PATTERN IS ALSO EXECUTED.

5.1.5 STORAGE-PROTECT/WRITE-ZEROS-ON-PROTECTED-AREA ONES TEST (RSACU)

THE STORAGE-PROTECT TESTS ARE USED ONLY FOR THE 1801/1802 PROCESSOR CONTROLLER. THIS ROUTINE PLACES ONES IN ALL CORES UNDER TEST AND THEN WRITES A STORAGE-PROTECT BIT ON THESE AREAS. ANY SUBSEQUENT ATTEMPT TO WRITE ZEROS ON THESE STORAGE PROTECTED CORES SHOULD FAIL AND INITIATE AN ERROR INTERRUPT. ERROR INTERRUPT PRINTOUTS AND WAITS ARE SUPPRESSED DURING THIS ROUTINE SINCE THE STORAGE-PROTECT VIOLATION IS FORCED WHEN THE ATTEMPT TO WRITE ON A PROTECTED AREA IS EXECUTED. ANY FAILURE OF THE MEMORY TO WRITE STORAGE PROTECT BITS OR TO SAVE PROTECTED AREAS RESULTS IN AN ERROR 5 PRINTOUT.

5.1.6 STORAGE-PROTECT/UNPROTECT AND CLEAR-MEMORY-OF-ONES TEST (RSACQ-5)

THIS TEST FIRST REMOVES STORAGE-PROTECT BITS AND ATTEMPTS TO WRITE INTO THE CLEARED AREA. ANY FAILURE TO CLEAR BITS OR TO WRITE WILL BE NOTED BY AN ERROR 6 PRINTOUT.

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

THIS ROUTINE CONTAINS THE PROGRAM-PASS COUNTER AND THE INSTRUCTIONS NECESSARY TO SENSE CONSOLE ENTRY SWITCH 11. WITH SWITCH 11 OFF, A WAIT INSTRUCTION SIGNIFIES PROGRAM END.

5.1.8 ERROR TEST DESCRIPTION

A. INTERRUPT-LEVEL ERROR TEST (RSCCA)

THIS TEST SENSES THE ILSW FOR INTERRUPT-LEVEL ERROR ON THE 1800 DATA ACQUISITION AND CONTROL SYSTEM AND PRINTS OUT A MESSAGE INDICATING A STORAGE-PROTECT INVALID-OPERATION CODE OR A PARITY ERROR. THE PROGRAM WILL THEN EXECUTE A WAIT INSTRUCTION. SEE THE WAIT SECTION OF THE LISTING FOR REGISTER VALUES AND WAIT DESCRIPTION.

B. ERROR ROUTINE TO SERVICE NON-INTERRUPT ERRORS (RSDDD)

THIS ROUTINE PROCESSES AND IDENTIFIES THE ERRORS THAT ARE DETECTED BY THE PROGRAM'S TEST ROUTINES. AN ERROR MESSAGE IS PRINTED OUT AND THEN THE ERROR WAIT IS EXECUTED. SEE THE WAIT SECTION OF THE LISTING FOR REGISTER VALUES AND WAIT DESCRIPTION.

NOTE

AFTER THE PROGRAM HAS COMPLETED ITS INITIALIZATION ON THE FIRST PASS, A BOOTSTRAP BRANCH IS AVAILABLE FOR RESTARTING THE PROGRAM. THIS BOOTSTRAP IS INITIATED BY PRESSING THE STOP, RESET, AND START PUSHBUTTONS AND WILL RESULT IN A BRANCH TO THE START OF THE PROGRAM.

5.1.9 SWITCHES

A. NORMAL CONDITIONS OF SWITCHES

ALL CONSOLE ENTRY SWITCHES SHOULD BE OFF, EACH ROUTINE IS EXECUTED FOUR TIMES PER EACH PROGRAM PASS, AND THE PROGRAM IS REPEATED THREE TIMES. THIS RESULTS IN A RUN TIME OF BETWEEN 1 AND 10 MINUTES DEPENDING ON CORE SPEED AND CORE SIZE.

B. IMPROPER CONDITION OF SWITCHES

IF CONSOLE ENTRY SWITCH 13 AND 14 ARE ON AND SWITCH 8 IS OFF, AN ERROR WOULD INADVERTENTLY BE BYPASSED SINCE BOTH ERROR WAITS AND PRINTOUTS WOULD BE SUPPRESSED. TO AVOID THIS IMPROPER COMBINATION, A UNIQUE WAIT INSTRUCTION IS EXECUTED. WHEN THIS CONDITION EXISTS, CORRECT THE CONDITION AND DEPRESS THE START PUSHBUTTON TO INITIALIZE THE PROGRAM. THE WAIT DESCRIPTION IS FOUND IN THE WAIT SECTION OF THE LISTING.

5.2 DESCRIPTION OF MEMORY TEST (0 THROUGH 9 CORES)

5.2.1 INITIALIZATIONS (RSSTA)

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

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

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

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

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

5.2.4 ADDRESSING TEST (RSR03)

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

5.2.5 BIT-ISOLATION TEST (RSR04)

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

5.2.6 STORAGE-PROTECT TEST (RSSPT)

THIS TEST WRITES ZEROS IN THE MEMORY WORD UNDER TEST AND THEN STORAGE PROTECTS THE MEMORY WORD WITH A STS INSTRUCTION (FORMAT = 1, IA = 1). AN ATTEMPT IS THEN MADE TO WRITE ONES ON THIS PROTECTED AREA. THIS ATTEMPT SHOULD FAIL AND AN ERROR INTERRUPT WOULD ORDINARILY OCCUR. THIS INTERRUPT WILL NOT OCCUR, HOWEVER, SINCE INTERRUPTS ARE DISABLED DURING THIS ROUTINE. THE STORAGE-PROTECT BITS ARE THEN REMOVED AND THE MEMORY WORD IS READ INTO AND TESTED FOR THE ABILITY TO CLEAR STORAGE-PROTECT BITS AND READ INTO MEMORY CORRECTLY.

5.2.7 PROGRAM-END ROUTINE (RSPER)

THIS ROUTINE INCREMENTS THE PROGRAM PASS COUNTER AND INTERROGATES CONSOLE ENTRY SWITCH 11.

5.2.8 ERROR ROUTINE (RSEOR)

THE ERROR ROUTINE IS USED WHEN EVER AN ERROR OCCURS. THE ERROR ROUTINE PRINTS OUT THE ERROR MESSAGE IF BYPASS ERROR PRINTOUT IS NOT SPECIFIED AND THE WAIT ON ERROR IS SPECIFIED. SEE THE WAIT SECTION OF THE LISTING FOR REGISTER VALUES AND WAIT DESCRIPTION.

NOTE

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

5.2.9 NORMAL CONDITIONS OF SWITCHES

ALL CONSOLE ENTRY SWITCHES SHOULD BE OFF.

5.2.10 IMPROPER CONDITION OF SWITCHES

IF CONSOLE ENTRY SWITCHES 13 AND 14 ARE ON AND SWITCH 8 IS OFF, AN ERROR WOULD INADVERTENTLY BE BYPASSED SINCE BOTH ERROR WAITS AND PRINTOUTS WOULD BE SUPPRESSED. TO AVOID THIS IMPROPER COMBINATION, A UNIQUE WAIT INSTRUCTION IS EXECUTED. WHEN THIS CONDITION EXISTS, CORRECT THE CONDITION AND DEPRESS THE START BUTTON TO INITIALIZE THE PROGRAM. THE WAIT DESCRIPTION IS FOUND IN THE WAIT SECTION OF THE LISTING.

5.3 DESCRIPTION OF LOW-CORE MEMORY TEST

5.3.1 INITIALIZATIONS (RSDKS)

THE INITIALIZATIONS DETERMINE MACHINE TYPE AND ESTABLISH AREA CODES.

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

THIS TEST LOADS EACH CORE POSITION WITH ITS OWN ADDRESS AND COMPARES THE CONTENTS OF EACH CORE POSITION WITH THE ADDRESS INTERROGATED TO ASSURE THAT THE CORES CAN BE CORRECTLY ADDRESSED. ANY ERROR OCCURRING DURING THIS ROUTINE WILL CAUSE AN ERR 1 PRINTOUT.

5.3.3 BIT-ISOLATION TEST

THIS TEST DETERMINES THE ABILITY OF MEMORY TO DISTINGUISH EACH ONE OF THE 16 BITS IN A STORED WORD. FIRST THE 1 BIT IS PLACED IN POSITION ZERO. THEN, THE BIT MOVED TO THE RIGHT ONE POSITION PER PASS FOR A TOTAL OF 15 PASSES UNTIL THE ENTIRE CORE WORD HAS BEEN TESTED. ANY ERROR IN THE BIT ISOLATION RESULTS IN AN ERR 3 PRINTOUT.

5.3.4 WORST-CASE-PATTERN TEST (RSACJ)

THE WORST-CASE-PATTERN TEST ESTABLISHES A WORST-CASE PATTERN CONSISTING OF BLOCKS OF WORDS CONTAINING EITHER ALL ONES OR ALL ZEROS. THIS PATTERN IS READ AND STORED INTO MEMORY AND IS THEN COMPLEMENTED AND STORED AGAIN. IF ANY BITS ARE DROPPED OR ADDED DURING THIS WORST-CASE (MAXIMUM NOISE) EXERCISE, AN ERR 4 PRINTOUT WILL OCCUR. THE COMPLEMENT WORST CASE PATTERN IS ALSO EXECUTED.

5.3.5 STORAGE-PROTECT/WRITE-ZEROS-ON-PROTECTED-AREA ONES TEST (RSACU)

THE STORAGE-PROTECT TESTS ARE USED ONLY FOR THE 1801/1802 PROCESSOR CONTROLLER. THIS ROUTINE PLACES ONES IN ALL CORES UNDER TEST AND THEN WRITES A STORAGE-PROTECT BIT ON THESE AREAS. ANY SUBSEQUENT ATTEMPT TO WRITE ZEROS ON THESE STORAGE-PROTECTED CORES SHOULD FAIL AND INITIATE AN ERROR INTERRUPT. ERROR INTERRUPT PRINTOUTS AND WAITS ARE SUPPRESSED DURING THIS ROUTINE SINCE THE STORAGE-PROTECT VIOLATION IS FORCED WHEN THE ATTEMPT TO WRITE ON A PROTECTED AREA IS EXECUTED. ANY FAILURE OF THE MEMORY TO WRITE STORAGE-PROTECT BITS OR TO SAVE PROTECTED AREAS RESULTS IN AN ERROR 5 PRINTOUT.

5.3.6 STORAGE-PROTECT/UNPROTECT AND CLEAR-MEMORY-OF ONES TEST.
(RSACQ-5)

THIS TEST FIRST REMOVES STORAGE-PROTECT BITS AND ATTEMPTS TO WRITE INTO THE CLEARED AREA. ANY FAILURE TO CLEAR BITS OR TO WRITE WILL BE NOTED BY AN ERROR & PRINTOUT.

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

THIS ROUTINE CONTAINS THE PROGRAM-PASS COUNTER AND INTER-ROGATES CONSOLE ENTRY SWITCH 11. A WAIT INSTRUCTION SIGNIFIES PROGRAM END. THE WAIT DESCRIPTION IS FOUND IN THE WAIT SECTION OF THE LISTING.

5.3.8 ERROR-TEST DESCRIPTION

A. INTERRUPT-LEVEL ERROR TEST (RSCCA)

THIS ROUTINE SENSES THE ILSW FOR INTERRUPT-LEVEL ERROR ON THE 1800 DATA ACQUISITION AND CONTROL SYSTEM AND PRINTS OUT A MESSAGE INDICATING A STORAGE-PROTECT INVALID-OPERATION CODE OR PARITY ERROR. THE PROCESSOR WILL THEN EXECUTE A WAIT INSTRUCTION. SEE THE WAIT SECTION OF THE LISTING FOR REGISTER VALUES AND WAIT DESCRIPTION.

B. ERROR ROUTINE TO SERVICE NON-INTERRUPT ERRORS (RSDDD)

THIS ROUTINE PROCESSES AND IDENTIFIES THE ERRORS THAT ARE DETECTED BY THE PROGRAM'S TESTS. AN ERROR MESSAGE IS PRINTED AND AN ERROR-WAIT INSTRUCTION IS EXECUTED. SEE THE WAIT SECTION OF THE LISTING FOR REGISTER VALUES AND WAIT DESCRIPTION.

5.3.9 SWITCHES

A. NORMAL CONDITIONS OF SWITCHES

ALL CONSOLE ENTRY SWITCHES SHOULD BE OFF.

B. IMPROPER CONDITION OF SWITCHES

IF CONSOLE ENTRY SWITCHES 13 AND 14 ARE ON AND SWITCH 8 IS OFF, AN ERROR WOULD INADVERTENTLY BE BYPASSED SINCE BOTH ERROR WAITS AND PRINTOUTS WOULD BE SUPPRESSED. TO AVOID THIS IMPROPER COMBINATION, A UNIQUE WAIT INSTRUCTION IS EXECUTED. WHEN THIS CONDITION EXISTS, CORRECT THE CONDITION AND DEPRESS THE START BUTTON TO INITIALIZE THE PROGRAM. THE WAIT DESCRIPTION IS FOUND IN THE WAIT SECTION OF THE LISTING.

6. APPENDIX (NONE)



```

3001          ABS          8CA00020
          DRG          /3001          8CA00030
*****          8CA00040
B-REG  I-REG  *  PROG WAITS          COMMENTS          8CA00050
*****          8CA00060
3001 0 03A0          DC          RSCCH&1          CAR CHECK ERROR-A          8CA00070
          *          *          *          FALSE CAR CHECK HAS          8CA00080
          *          *          *          OCCURRED-RUN THE CAR          8CA00090
          *          *          *          CHECK PROGRAM.          8CA00100
          *          *          *          *****          8CA00110
          *          *          *          8CA00120
          *          *          *          8CA00130
3002 0 03A0          DC          RSCCH&1          STORAGE PROTECT          8CA00140
          *          *          *          VIOLATION.          8CA00150
          *          *          *          8CA00160
          *          *          *          USE THE Q REG TO FURTHER          8CA00170
          *          *          *          IDENTIFY THE ERROR. TO          8CA00180
          *          *          *          CONTINUE THE TEST, PRESS          8CA00190
          *          *          *          THE START BUTTON.          8CA00200
          *          *          *          *****          8CA00210
          *          *          *          Q-REG          COMMENTS          8CA00220
          *          *          *          8CA00230
          *          *          *          0001          ROUTINE TO READ AND WRITE          8CA00240
          *          *          *          IN EACH CORE LOCATION FAILED.          8CA00250
          *          *          *          8CA00260
          *          *          *          THE ACCUMULATOR AND INDEX          8CA00270
          *          *          *          REGISTER 1 SHOW THE ADDRESS          8CA00280
          *          *          *          BEING WRITTEN WHEN THE SPV          8CA00290
          *          *          *          OCCURRED.          8CA00300
          *          *          *          *****          8CA00310
          *          *          *          8CA00320
          *          *          *          0002          BIT BY BIT ISOLATION FAILED.          8CA00330
          *          *          *          8CA00340
          *          *          *          THE ACCUMULATOR SHOWS THE          8CA00350
          *          *          *          CORRECT PATTERN.          8CA00360
          *          *          *          8CA00370
          *          *          *          INDEX REGISTER 1 SHOWS THE          8CA00380
          *          *          *          CORE LOCATION WHICH FAILED.          8CA00390
          *          *          *          *****          8CA00400
          *          *          *          8CA00410
          *          *          *          0003          BIT BY BIT ISOLATION FAILED.          8CA00420
          *          *          *          8CA00430
          *          *          *          THE ACCUMULATOR SHOWS THE          8CA00440
          *          *          *          CORRECT PATTERN.          8CA00450
          *          *          *          8CA00460
          *          *          *          INDEX REGISTER 1 SHOWS THE          8CA00470
          *          *          *          CORE LOCATION WHICH FAILED.          8CA00480
          *          *          *          *****          8CA00490
          *          *          *          8CA00500
          *          *          *          0004          WORST CASE PATTERN ROUTINE          8CA00510
          *          *          *          FAILED.          8CA00520
          *          *          *          8CA00530
          *          *          *          INDEX REGISTER 2 SHOWS THE          8CA00540
          *          *          *          CORRECT DATA PATTERN.          8CA00550
          *          *          *          8CA00560
          *          *          *          INDEX REGISTER 1 SHOWS THE          8CA00570
          *          *          *          CORE LOCATION WHICH FAILED.          8CA00580
          *          *          *          *****          8CA00590
          *          *          *          8CA00600
          *          *          *          0005          WORST CASE PATTERN ROUTINE          8CA00610
          *          *          *          FAILED.          8CA00620
          *          *          *          8CA00630
          *          *          *          INDEX REGISTER 3 SHOWS THE          8CA00640
          *          *          *          CORRECT PATTERN.          8CA00650
          *          *          *          8CA00660
          *          *          *          INDEX REGISTER 1 SHOWS THE          8CA00670
          *          *          *          CORE LOCATION WHICH FAILED.          8CA00680
          *          *          *          *****          8CA00690

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          *          *          *          0006          WORST CASE PATTERN ROUTINE          8CA00700
          *          *          *          FAILED.          8CA00710
          *          *          *          8CA00720
          *          *          *          THE CORRECT DATA PATTERN          8CA00730
          *          *          *          IS 0000.          8CA00740
          *          *          *          8CA00750
          *          *          *          INDEX REGISTER 1 SHOWS THE          8CA00760
          *          *          *          CORE LOCATION WHICH FAILED.          8CA00770
          *          *          *          *****          8CA00780
          *          *          *          8CA00790
          *          *          *          0007          WRITE ZEROS IN PROTECTED          8CA00800
          *          *          *          AREA OF ONES FAILED.          8CA00810
          *          *          *          8CA00820
          *          *          *          THE CORRECT DATA PATTERN          8CA00830
          *          *          *          IS FFFF.          8CA00840
          *          *          *          8CA00850
          *          *          *          INDEX REGISTER 1 CONTAINS          8CA00860
          *          *          *          THE CORE LOCATION WHICH          8CA00870
          *          *          *          FAILED.          8CA00880
          *          *          *          *****          8CA00890
          *          *          *          8CA00900
          *          *          *          0008          UNPROTECT AND CLEAR CORE          8CA00910
          *          *          *          OF ONES ROUTINE FAILED.          8CA00920
          *          *          *          8CA00930
          *          *          *          THE CORRECT PATTERN IS 0000.          8CA00940
          *          *          *          8CA00950
          *          *          *          INDEX REGISTER 1 CONTAINS          8CA00960
          *          *          *          THE CORE LOCATION WHICH          8CA00970
          *          *          *          FAILED.          8CA00980
          *          *          *          *****          8CA00990
          *          *          *          8CA01000
          *          *          *          NOTE          8CA01010
          *          *          *          8CA01020
          *          *          *          8CA01030
          *          *          *          IF THE Q REGISTER CONTAINS          8CA01040
          *          *          *          ANY OTHER VALUE, RUN THE          8CA01050
          *          *          *          LOW CORE TEST.          8CA01060
          *          *          *          *****          8CA01070
          *          *          *          B-REG  I-REG  *  PROG WAITS          COMMENTS          8CA01080
          *          *          *          *****          8CA01090
          *          *          *          3003 0 013E          DC          RSDKW&1          WAIT FOR SWITCHES.          8CA01100
          *          *          *          *          *          *          8CA01110
          *          *          *          *          *          *          INDEX REGISTER 1 (X1)          8CA01120
          *          *          *          *          *          *          CONTAINS THE CORE SIZE          8CA01130
          *          *          *          *          *          *          FOUND BY THE PROGRAM.          8CA01140
          *          *          *          *          *          *          SET DISPLAY REGISTER          8CA01150
          *          *          *          *          *          *          SWITCH TO X1 IN ORDER          8CA01160
          *          *          *          *          *          *          TO DISPLAY THIS P/C          8CA01170
          *          *          *          *          *          *          CORE STORAGE SIZE.          8CA01180
          *          *          *          *          *          *          8CA01190
          *          *          *          *          *          *          1. SET REQUIRED SWITCHES          8CA01200
          *          *          *          *          *          *          8CA01210
          *          *          *          *          *          *          8CA01220
          *          *          *          *          *          *          A. OPERATOR MONITOR-OFF          8CA01230
          *          *          *          *          *          *          B. DISABLE INTERRUPT-OFF          8CA01240
          *          *          *          *          *          *          C. CHECK STOP-OFF          8CA01250
          *          *          *          *          *          *          D. WRITE STORAGE          8CA01260
          *          *          *          *          *          *          PROTECT-YES          8CA01270
          *          *          *          *          *          *          E. ANY DESIRED DATA          8CA01280
          *          *          *          *          *          *          ENTRY SWITCHES.          8CA01290
          *          *          *          *          *          *          B14- BYPASS ERROR WAIT          8CA01300
          *          *          *          *          *          *          B13- BYPASS PRINTING          8CA01310
          *          *          *          *          *          *          B11- LOOP SUBPROGRAM          8CA01320
          *          *          *          *          *          *          B10- LOOP ROUTINE          8CA01330
          *          *          *          *          *          *          B 9- OUTPUT ON 1443          8CA01340
          *          *          *          *          *          *          B 8- LOOP ADDRESS          8CA01350
          *          *          *          *          *          *          8CA01360
          *          *          *          *          *          *          2. PUSH START %PROGRAM          8CA01370
          *          *          *          *          *          *          8CA01370

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3004 0 03A0

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*
*          SHOULD LOAD<
*****
DC          RSCCH&1  PARITY ERROR.          8CA01380
*
*
*          A. DETERMINE CORE LOCATION
*          THAT CAUSED PARITY ERROR
*          BY-
*
*            1. SET CHECK STOP SWITCH
*              TO ON.                        8CA01390
*            2. SET STORAGE PROTECT
*              SWITCH TO NO.                 8CA01400
*            3. SET MODE SWITCH TO
*              DISPLAY.                      8CA01410
*            4. HOLD CLEAR STORAGE
*              BUTTON DOWN AND PRESS
*              START BUTTON.                8CA01420
*
*          B. IF THE SYSTEM DOES NOT
*          STOP A FALSE PARITY
*          CONDITION OCCURRED. THIS
*          INDICATES A PROBLEM IN
*          THE PARITY DETECTION
*          CIRCUITRY OR THE B
*          REGISTER.                        8CA01430
*
*          C. IF A PARITY ERROR IS
*          DETECTED LOOK AT THE
*          STORAGE ADDRESS REGISTER.
*          IF IT IS BETWEEN LOCATIONS
*          012C AND 07FF RUN THE LOW
*          CORE TEST.                      8CA01440
*
*          D. IF THE PARITY IS NOT IN
*          LOW CORE USE THE Q
*          REGISTER TO FURTHER
*          IDENTIFY THE ERROR.             8CA01450
*
*          E. TO RETURN TO THE TESTING
*          SEQUENCE SET THE I REGISTER
*          TO THE ADRS OF WAIT 4 %ABOVE<
*          AND PRESS START.                8CA01460
*
*****
Q-REG      COMMENTS
*
0009      ROUTINE TO READ AND WRITE
*          ADDRESS IN EACH CORE LOCATION
*          FAILED.                        8CA01470
*
*          THE ACCUMULATOR SHOWS THE
*          INCORRECT DATA.                8CA01480
*
*          INDEX REGISTER 1 SHOWS
*          CORRECT DATA.                  8CA01490
*****
000A      ROUTINE TO SET ALL CORE
*          LOCATIONS TO ZERO FAILED.      8CA01500
*
*          THE CORRECT PATTERN IS 0000.  8CA01510
*
*          THE ACCUMULATOR SHOWS THE
*          INCORRECT DATA.                8CA01520
*****
000B      BIT BY BIT ISOLATION TEST
*          FAILED.                        8CA01530
*
*          8CA01540
*          8CA01550
*          8CA01560
*          8CA01570
*          8CA01580
*          8CA01590
*          8CA01600
*          8CA01610
*          8CA01620
*          8CA01630
*          8CA01640
*          8CA01650
*          8CA01660
*          8CA01670
*          8CA01680
*          8CA01690
*          8CA01700
*          8CA01710
*          8CA01720
*          8CA01730
*          8CA01740
*          8CA01750
*          8CA01760
*          8CA01770
*          8CA01780
*          8CA01790
*          8CA01800
*          8CA01810
*          8CA01820
*          8CA01830
*          8CA01840
*          8CA01850
*          8CA01860
*          8CA01870
*          8CA01880
*          8CA01890
*          8CA01900
*          8CA01910
*          8CA01920
*****
*          8CA01930
*          8CA01940
*          8CA01950
*          8CA01960
*          8CA01970
*          8CA01980
*          8CA01990
*          8CA02000
*          8CA02010
*****
*          8CA02020
*          8CA02030
*          8CA02040
*          8CA02050

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*
*          INDEX REGISTER 2 SHOWS THE
*          CORRECT DATA.                  8CA02060
*
*          THE ACCUMULATOR SHOWS THE
*          INCORRECT DATA.                8CA02070
*****
000C      WORST CASE PATTERN ROUTINE
*          FAILED.                        8CA02080
*
*          THE CORRECT PATTERN IS
*          EITHER 0000 OR FFFF.            8CA02090
*
*          THE ACCUMULATOR SHOWS THE
*          INCORRECT DATA.                8CA02100
*****
000D      WRITE ZEROS ON STORAGE
*          PROTECTED AREA OF FFFF
*          ROUTINE FAILED.                 8CA02110
*
*          FAILURE OCCURRED WHILE
*          EXECUTING A WRITE STORAGE
*          PROTECT BIT INSTRUCTION.        8CA02120
*
*          THE CORRECT PATTERN IS FFFF.    8CA02130
*
*          THE ACCUMULATOR IS
*          MEANINGLESS.                      8CA02140
*****
000E      WRITE ZEROS ON STORAGE
*          PROTECTED AREA OF FFFF
*          ROUTINE FAILED.                 8CA02150
*
*          THE CORRECT PATTERN IS FFFF.    8CA02160
*
*          THE ACCUMULATOR SHOWS THE
*          INCORRECT DATA.                8CA02170
*****
000F      WRITE ZEROS ON STORAGE
*          PROTECTED AREA OF FFFF
*          ROUTINE FAILED.                 8CA02180
*
*          THE FAILURE OCCURRED WHILE
*          EXECUTING A CLEAR STORAGE
*          PROTECT BIT INSTRUCTION.        8CA02190
*
*          THE CORRECT PATTERN IS FFFF.    8CA02200
*
*          THE ACCUMULATOR IS
*          MEANINGLESS.                      8CA02210
*****
0010      UNPROTECT AND CLEAR MEMORY
*          OF ONES ROUTINE FAILED.         8CA02220
*
*          THE CORRECT PATTERN IS 0000.  8CA02230
*
*          THE ACCUMULATOR SHOWS THE
*          INCORRECT DATA.                8CA02240
*****
B-REG    I-REG    *    PROG WAITS    COMMENTS
*****
3005 0 0334    DC    RSQAW&1    PROGRAM END.
*
*          8CA02250
*          8CA02260
*          8CA02270
*          8CA02280
*          8CA02290
*          8CA02300
*          8CA02310
*          8CA02320
*          8CA02330
*          8CA02340
*          8CA02350
*****
*          8CA02360
*          8CA02370
*          8CA02380
*          8CA02390
*          8CA02400
*          8CA02410
*          8CA02420
*          8CA02430
*          8CA02440
*          8CA02450
*****
*          8CA02460
*          8CA02470
*          8CA02480
*          8CA02490
*          8CA02500
*          8CA02510
*          8CA02520
*          8CA02530
*          8CA02540
*          8CA02550
*          8CA02560
*          8CA02570
*          8CA02580
*          8CA02590
*****
*          8CA02600
*          8CA02610
*          8CA02620
*          8CA02630
*          8CA02640
*          8CA02650
*          8CA02660
*          8CA02670
*          8CA02680
*          8CA02690
*          8CA02700
*          8CA02710
*          8CA02720
*          8CA02730

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*
*           SET SWITCHES TO LOAD          8CA02740
*           0-9 CORE TEST.                8CA02750
*                                           8CA02760
*                                           8CA02770
*           1. CHECK STOP-ON.             8CA02780
*           2. PUSH START %0-9 CORE       8CA02790
*           TEST SHOULD LOAD<            8CA02800
*                                           8CA02810
*                                           8CA02820
*           NOTE                           8CA02830
*           IF NEXT PROGRAM IS TO BE      8CA02840
*           LOADED BY %A 1054, PLACE THE  8CA02850
*           0-9 CORE TEST IN THE 1054    8CA02860
*           BEFORE PUSHING START.         8CA02870
*           *****                       8CA02880
*           *****                       8CA02890
3006 0 0432      DC      RSWSC&1  ILLEGAL COMBINATION 8CA02900
*           OF DATA ENTRY SWITCHES.     8CA02910
*                                           8CA02920
*           %SW 13 ON, SW 14 ON AND      8CA02930
*           SW 8 OFF<                    8CA02940
*                                           8CA02950
*           PUSH START TO RERUN          8CA02960
*           THE PROGRAM.                 8CA02970
*           *****                       8CA02980
3007 0 0448      DC      LOG03&1  1443 NOT READY.  8CA02990
*                                           8CA03000
*                                           8CA03010
*           MAKE 1443 READY AND          8CA03020
*           PUSH START.                 8CA03030
*           *****                       8CA03040
3008 0 03A0      DC      RSCCH&1  INVALID CP CODE.  8CA03050
*                                           8CA03060
*           THE Q REGISTER SHOWS        8CA03070
*           ONE GREATER THAN THE        8CA03080
*           FAILING INSTRUCTION.        8CA03090
*                                           8CA03100
*           RUN THE LOW CORE TEST       8CA03110
*           %ASSUMING THE P-C           8CA03120
*           FUNCTION TEST HAS BEEN      8CA03130
*           RUN<                        8CA03140
*           *****                       8CA03150
3009 0 044A      DC      LOG04&1  1443 BUSY.       8CA03160
*                                           8CA03170
*                                           8CA03180
*           CLEAR 1443 AND PUSH         8CA03190
*           THE START BUTTON.          8CA03200
*           *****                       8CA03210
300A 0 045F      DC      WAITA&1  1816 NOT READY.  8CA03220
*                                           8CA03230
*                                           8CA03240
*           MAKE 1816 READY AND         8CA03250
*           PUSH START.                 8CA03260
*           *****                       8CA03270
300B 0 042E      DC      WAITB&1  DATA ERROR HAS BEEN 8CA03280
*           DETECTED.                  8CA03290
*                                           8CA03300
*                                           8CA03310
*           USE THE Q REG TO FURTHER    8CA03320
*           IDENTIFY THE ERROR.        8CA03330
*                                           8CA03340
*                                           8CA03350
*           NOTE                         8CA03360
*                                           8CA03370
*           DEPRESSING THE START BUTTON  8CA03380
*           RETURNS THE PROGRAM TO THE  8CA03390
*           TESTING SEQUENCE. %NORMALLY 8CA03400
*           AFTER THE ERROR WAIT OCCURS 8CA03410
*           BIT SW 8 SHOULD BE TURNED ON TO

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*
*           LOOP ON THE ADDRESS THAT FAILED< 8CA03420
*           *****                       8CA03430
*           Q-REG                        8CA03440
*           COMMENTS                     8CA03450
*           0011      ROUTINE TO READ AND WRITE 8CA03460
*           ADDRESS IN EACH CORE LOCATION 8CA03470
*           FAILED.                      8CA03480
*                                           8CA03490
*           INDEX REGISTER 1 SHOWS THE    8CA03500
*           CORRECT PATTERN AND THE CORE  8CA03510
*           LOCATION WHICH FAILED.       8CA03520
*                                           8CA03530
*           THE ACCUMULATOR SHOWS THE   8CA03540
*           INCORRECT DATA.            8CA03550
*           *****                       8CA03560
*           *****                       8CA03570
0012      ATTEMPT TO SET CORE LOCATION    8CA03580
*           TO ZEROS FAILED.            8CA03590
*                                           8CA03600
*           THE CORRECT PATTERN IS 0000. 8CA03610
*                                           8CA03620
*           THE ACCUMULATOR SHOWS THE   8CA03630
*           INCORRECT DATA.            8CA03640
*                                           8CA03650
*           INDEX REGISTER 1 SHOWS THE    8CA03660
*           CORE LOCATION WHICH FAILED.  8CA03670
*           *****                       8CA03680
*           *****                       8CA03690
0013      BIT BY BIT ISOLATION TEST      8CA03700
*           FAILED.                    8CA03710
*                                           8CA03720
*           INDEX REGISTER 2 SHOWS THE    8CA03730
*           CORRECT PATTERN.            8CA03740
*                                           8CA03750
*           THE ACCUMULATOR SHOWS THE   8CA03760
*           INCORRECT DATA.            8CA03770
*                                           8CA03780
*           INDEX REGISTER 1 SHOWS THE    8CA03790
*           CORE LOCATION WHICH FAILED.  8CA03800
*           *****                       8CA03810
*           *****                       8CA03820
0014      WORST CASE PATTERN ROUTINE     8CA03830
*           FAILED.                    8CA03840
*                                           8CA03850
*           THE CORRECT PATTERN IS EITHER 8CA03860
*           0000 OR FFFF.              8CA03870
*                                           8CA03880
*           THE ACCUMULATOR SHOWS THE   8CA03890
*           INCORRECT DATA.            8CA03900
*                                           8CA03910
*           INDEX REGISTER 1 CONTAINS    8CA03920
*           THE CORE LOCATION WHICH     8CA03930
*           FAILED.                    8CA03940
*           *****                       8CA03950
*           *****                       8CA03960
0015      WRITE ZEROS ON PROTECTED      8CA03970
*           AREA OF FFFF ROUTINE FAILED. 8CA03980
*                                           8CA03990
*           THE CORRECT PATTERN IS FFFF. 8CA04000
*                                           8CA04010
*           THE ACCUMULATOR SHOWS THE   8CA04020
*           INCORRECT DATA.            8CA04030
*                                           8CA04040
*           INDEX REGISTER 1 SHOWS THE    8CA04050
*           CORE LOCATION WHICH FAILED.  8CA04060
*           *****                       8CA04070
*           *****                       8CA04080
0016      UNPROTECT AND CLEAR CORE OF   8CA04090

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*
*      ONES ROUTINE FAILED.
*      8CA04100
*      THE CORRECT PATTERN IS 0000.
*      8CA04110
*      8CA04120
*      8CA04130
*      THE ACCUMULATOR SHOWS THE
*      INCORRECT DATA.
*      8CA04140
*      8CA04150
*      8CA04160
*      INDEX REGISTER 1 SHOWS THE
*      CORE LOCATION WHICH FAILED.
*      8CA04170
*      8CA04180
*****
*      MEMORY TEST-HIGH CORE
*      8CA04190
*      8CA04200
*      SWITCH SETTING
*      8CA04210
*      8CA04220
*      8CA04230
*      8CA04240
*      8CA04250
*      B14 # BYPASS ERROR WAIT
*      B13 # BYPASS PRINTING
*      B11 # LOOP SUB PROGRAM
*      B10 # LOOP ROUTINE
*      B9 # OUTPUT ON 1443
*      B8 # LOOP ADDRESS
*      8CA04290
*****
*      8CA04300
*****
*      8CA04310
*****
*      8CA04320
*****
*      8CA04330
*****
*      8CA04340
*****
*      8CA04350
*****
*      8CA04360
*****
*      8CA04370
*****
*      8CA04380
*****
*      8CA04390
*****
*      8CA04400
*****
*      8CA04410
*****
*      8CA04420
*****
*      8CA04430
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*      8CA04440
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*      8CA04450
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*      8CA04460
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*      8CA04470
*****
*      8CA04480
*****
*      8CA04490
*****
*      8CA04500
*****
*      8CA04510
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*      8CA04520
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*      8CA04570
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*      8CA04580
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*      8CA04590
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*      8CA04600
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*      8CA04610
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*      8CA04620
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*      8CA04630
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*      8CA04640
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*      8CA04650
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*      8CA04660
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*      8CA04670
*****
*      8CA04680
*****
*      8CA04690
*****
*      8CA04700
*****
*      8CA04710
*****
*      8CA04720
*****
*      8CA04730
*****
*      8CA04740
*****
*      8CA04750
*****
*      8CA04760
*****
*      8CA04770
*****

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012C
012C 0 CA00

012D 0 6100
012E 0 C007
012F 0 D1FF

0130 0 7500 1000
0132 0 1000
0133 0 1010
0134 0 D1FF

0135 0 C400 FFFF
0137 0 4C20 0130

0139 0 71FF

013A 0 1000

013B 0 691F
013C 0 7000

013D 0 3003
013E 0 C827
013F 0 DC00 0000
0141 0 C822
0142 0 DC00 0004
0144 0 C400 015A
0146 0 1890

0147 0 C400 015A
0149 0 D400 0003
014B 0 6700 FFFF
014D 0 C400 0003
014F 0 4C20 0153
0151 0 C007

DATE 01JUL66 15MAY67 14NOV69
EC NO. 415178 411731 431319

PROG ID 08CA-2
PAGE 4

0152 0 7001
0153 0 C004
0154 0 D007
0155 0 67C0 0000
0157 0 7019

0158 0 0001
0159 0 FFFE
015A 0 0000
015B 0 0800
015C 0 0000
015D 0 0003
015E 0 0000
015F 0 0800

0160 0 70C3
0162 0002
0164 0 4C00 0141
0166 0 4C00 0141
0168 0 016E
0169 0 3A40
016A 0 0800
016B 0 0338
016C 0 00C0
016D 0 0240
016E 0 0000
016F 0 0F03
0170 0 0902

0171 0 COEE
0172 0 D400 0000
0174 0 C0E7
0175 0 4C04 0182
0177 0 C0F5
0178 0 D0F0
0179 0 C0F1
017A 0 D400 0008
017C 0 C0F2
017D 0 D400 0495
017F 0 C0F0
0180 0 D400 0497
0182 0 08E5
0183 0 C0EA
0184 0 E400 02A2
0186 0 4C20 018B
0188 0 4400 0434
018A 0 04FD

018B 0 COD1
018C 0 D0D1
018D 0 6204
018E 0 6580 016A
0190 0 69DB
0191 0 CODA
0192 0 D480 016C
0194 0 FOC6
0195 0 4C18 019A
0197 0 7101

```

MDX X 1
RSAAB LD RSAAC
STO RSAAK
LDX L3 /0000 CLEAR XR 3
MDX RSABA

```

* STORAGE AREAS FOR INITIALIZATIONS

```

RSAAC DC 1 1130 CONSTANT
RSAAD DC -2 1800 CONSTANT
RSAAE DC 0 CONSTANT ZERO
RSAAH DC /0800 MEMORY SIZE
RSAAK DC 0 MACHINE TYPE
RSFAA DC 3 NUMBER OF PROGRAM PASSES
RSFAB DC 0 PROGRAM PASS BUFFER
RSFAC DC /0800 INITIALIZE MEM SIZE

```

* STORAGE AREAS PART 1

```

RSAAL MDX X 3
BSS E 2
RSAAM BSC L RSDKS BOOTSTRAP BRANCH INST
RSAAN BSC L RSDKS
RSQAF DC RSQAL READ BIT SWITCH IOCC
RSQAO DC /3A40 SECOND HALF IOCC-113
RSQAC DC /0800 FIRST LOC TESTED
RSQAD DC RSCCA INTERRUPT LEVEL ZERO VECT
RSQAE DC 0 WORK AREA
RSQAP DC /0240 SECOND HALF IOCC-180
RSQAL DC 0 BIT SWITCH BUFFER AREA
RSQAU DC /0F03 2ND HALF IOCC-180 DSW
RSQAV DC /0902 2ND HALF-1800 TYPE

```

* INITIALIZE MASKS AND INTERRUPTS TO LEVEL ZERO
* 1800 ONLY

```

RSABA LD RSAAL STORE BOOTSTRAP BRANCH AT
STO L 0 LOCATION ZERO
LD RSAAK
BSC L RSAOE,E IF 1130-GO TO FIRST ROUTIN
LD RSQAP CHANGE SECOND HALF IOCC
STO RSQAO FOR 1800 READ BIT SW
LD RSQAD INTERRUPT LEVEL ERROR VECT
STO L 8
LD RSQAU DSW 1800
STO L TWSNS&1 PRO1
LD RSQAV XIO WRITE 1800
STO L TWWRT&1 PRO2
RSOAE XIO
LD RSQAL
AND L RSRAX
BSC L RSABI,Z BYPASS LABEL PRINTOUT
BSI L LOG
DC MES01 MEMORY TEST-HI CORE

```

* FIRST ROUTINE-READ & WRITE IN MEMORY

```

RSABI LD RSFAA INITIALIZE PROGRAM
STO RSFAB PASS COUNTER
RSABH LDX X2 4 ADDRESSING PASSES
RSABB LDX I1 RSQAC
RSABC STX 1 RSQAE
LD RSQAE
SPVE1 STO I RSQAE
EOR RSAAH
BSC L RSABD,&-
MDX X1 1 INCR TO NEXT ADDRESS

```

8CA04780
8CA04790
8CA04800
8CA04810
8CA04820
8CA04830
8CA04840
8CA04850
8CA04860
8CA04870
8CA04880
8CA04890
8CA04900
8CA04910
8CA04920
8CA04930
8CA04940
8CA04950
8CA04960
8CA04970
8CA04980
8CA04990
8CA05000
8CA05010
8CA05020
8CA05030
8CA05040
8CA05050
8CA05060
8CA05070
8CA05080
8CA05090
8CA05100
8CA05110
8CA05120
8CA05130
8CA05140
8CA05150
8CA05160
8CA05170
8CA05180
8CA05190
8CA05200
8CA05210
8CA05220
8CA05230
8CA05240
8CA05250
8CA05260
8CA05270
8CA05280
8CA05290
8CA05300
8CA05310
8CA05320
8CA05330
8CA05340
8CA05350
8CA05360
8CA05370
8CA05380
8CA05390
8CA05400
8CA05410
8CA05420
8CA05430
8CA05440
8CA05450

DATE 01JUL66 15MAY67 14NOV69
EC NO. 415178 411731 431319

PROG ID 08CA-2
PAGE 4A

HI CORE FUNCTION TEST

```

0198 0 1000      NOP      0      SAFTY NOP      8CA05460
0199 0 70F6      MDX      RSABC     8CA05470
019A 0 6580 016A  RSABD  LDX  I1  RSQAC     8CA05480
019C 0 69CF      RSABE  STX  1  RSQAE     8CA05490
019D 0 C480 016C  PARE1  LD   I   RSQAE     8CA05500
019F 0 D400 022A  STO   L   RSQAN     STORE ACCUM FOR ERROR ROUT 8CA05510
01A1 0 FOCA      EOR    RSQAE     8CA05520
01A2 0 4C18 01AF  DATE1  BSC  L   RSABF,&-  ERROR 1 DETECTED          8CA05530
01A4 0 0C00 0168  XIO   L   RSQAF     8CA05540
01A6 C C400 016E  LD    L   RSQAL     8CA05550
01A8 0 E400 02A1  AND   L   RSRAI     8CA05560
01AA 0 4C20 019C  BSC   L   RSABE,Z    8CA05570
01AC 0 4400 03CF  BSI   L   RSDDD     8CA05580
01AE 0 FFFE      DC     /FFFE     ERROR 1 CONSTANT          8CA05590
01AF 0 08B8      RSABF  XIO  RSQAF     READ BIT SWITCHES        8CA05600
01B0 0 C400 016E  LD    L   RSQAL     8CA05610
01B2 0 E400 02A1  AND   L   RSRAI     ISOLATE SW 8              8CA05620
01B4 0 4C20 019C  BSC   L   RSABE,Z    IF SW 8 ON LOOP ADDR     8CA05630
01B6 0 C0B5      LD    RSQAE     8CA05640
01B7 0 FOA3      EOR    RSAAH     8CA05650
01B8 0 4C18 01BD  BSC   L   RSABG,&-   8CA05660
01BA 0 7101      MDX  X1  1      INCR TO NEXT ADDRESS     8CA05670
01BB 0 1000      NOP      0      SAFTY NOP      8CA05680
01BC 0 70DF      MDX      RSABE     8CA05690
01BD 0 72FF      RSABG  MDX  X2  -1    COUNT PASSES             8CA05700
01BE 0 70CF      MDX      RSABB     8CA05710
01BF 0 0C00 0168  XIO   L   RSQAF     REPEAT RT IF 10 ON       8CA05720
01C1 0 C400 016E  LD    L   RSQAL     8CA05730
01C3 0 E400 029F  AND   L   RSRAG     8CA05740
01C5 0 4C20 018D  BSC   L   RSABH,Z    REPEAT ADDRESSING ROUTINE 8CA05750
8CA05760
8CA05770
8CA05780
8CA05790
* SECOND ROUTINE
* BIT ISOLATION TEST-BIT BY BIT-ADRESS BY ADDRESS
*
01C7 0 6304      RSABR  LDX  X3  4      BIT ISOLATION PASSES     8CA05800
01C8 0 C400 016A  RSABP  LD   L   RSQAC     8CA05810
01CA 0 D05A      RSABN  STO   RSQAH     8CA05820
01CB 0 6580 0225  LDX  I1  RSQAH     8CA05830
01CD 0 C058      LD    RSQAI     8CA05840
01CE 0 D480 0225  SPVE2  STO  I   RSQAH     8CA05850
01D0 0 C480 0225  PARE2  LD   I   RSQAH     8CA05860
01D2 0 D400 022A  STO   L   RSQAN     STORE ACC FOR ERROR OUTI 8CA05870
01D4 0 4C18 01E1  DATE2  BSC  L   RSABJ,&-  ERROR 2 DETECTED          8CA05880
01D6 0 0C00 0168  XIO   L   RSQAF     8CA05890
01D8 0 C400 016E  LD    L   RSQAL     8CA05900
01DA 0 E400 02A1  AND   L   RSRAI     8CA05910
01DC 0 4C20 01CB  BSC   L   RSABN&1,Z  8CA05920
01DE 0 4400 03CF  BSI   L   RSDDD     8CA05930
01E0 0 FFFD      DC     /FFFD     IF SW 8 ON LOOP ADDR     8CA05940
01E1 0 0C00 0168  RSABJ  XIO  L   RSQAF     8CA05950
01E3 0 C400 016E  LD    L   RSQAL     8CA05960
01E5 0 E400 02A1  AND   L   RSRAI     8CA05970
01E7 0 4C20 01CB  BSC   L   RSABN&1,Z  8CA05980
01E9 0 C03D      LD    RSQAJ     8CA05990
01EA 0 D03D      STO   RSQAK     8CA06000
01EB 0 C03C      RSABL  LD   RSQAK     8CA06010
01EC 0 D480 0225  SPVE3  STO  I   RSQAH     8CA06020
01EE 0 6680 0228  LDX  I2  RSQAK     8CA06030
01F0 0 C480 0225  PARE3  LD   I   RSQAH     8CA06040
01F2 0 D400 022A  STO   L   RSQAN     8CA06050
01F4 0 F033      EOR    RSQAK     8CA06060
01F5 0 4C18 0202  DATE3  BSC  L   RSABK,&-  ERROR 3 DETECTED          8CA06070
01F7 0 0C00 0168  XIO   L   RSQAF     8CA06080
01F9 0 C400 016E  LD    L   RSQAL     8CA06090
01FB 0 E400 02A1  AND   L   RSRAI     8CA06100
01FD 0 4C20 01EB  BSC   L   RSABL,Z    8CA06110
01FF 0 4400 03CF  BSI   L   RSDDD     8CA06120
0201 0 FFFB      DC     /FFFB     ERROR 3 CONSTANT          8CA06130

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HI CORE FUNCTION TEST

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0202 0 0C00 0168  RSABK  XIO  L   RSQAF     8CA06140
0204 0 C400 016E  LD    L   RSQAL     8CA06150
0206 0 E400 02A1  AND   L   RSRAI     ISOLATE BIT 8            8CA06160
0208 0 4C20 01EB  BSC   L   RSABL,Z    IF SW 8 ON LOOP ADDR     8CA06170
020A 0 C01D      LD    RSQAK     8CA06180
020B 0 4804      BSC   E         IF ODD-BIT 15 IS REACHED 8CA06190
020C 0 7003      MDX   RSABM     BRANCH TO INCRE ADR ROUT 8CA06200
020D 0 1801      SRA   1         INCREMENT BIT            8CA06210
020E 0 D019      STO   RSQAK     POSITION BY ONE           8CA06220
020F 0 70DC      MDX   SPVE3     8CA06230
0210 0 C014      RSABM  LD   RSQAH     TEST FOR MEMORY END      8CA06240
0211 0 F400 015B  EOR   L   RSAAH     8CA06250
0213 0 4C18 0218  BSC   L   RSABO,&-   8CA06260
0215 0 C00F      LD    RSQAH     INCREMENT TO TEST NEXT   8CA06270
0216 0 8012      A     RSQAM     MEMORY LOCATION         8CA06280
0217 0 70B2      MDX   RSABN     8CA06290
0218 0 73FF      RSABO  MDX  X3  -1    COUNT PASSES            8CA06300
0219 0 70AE      MDX   RSABP     8CA06310
021A 0 0C00 0168  XIO   L   RSQAF     8CA06320
021C 0 C400 016E  LD    L   RSQAL     8CA06330
021E 0 E400 029F  AND   L   RSRAG     8CA06340
0220 0 4C20 01C7  BSC   L   RSABR,Z    REPEAT BIT ISOLATION     8CA06350
0222 0 7009      MDX   RSACJ     8CA06360
*
* STORAGE AREAS PART 2
*
0223 0 0004      RSQAJ  DC     4      WORST CASE PASSES       8CA06370
0224 0 0000      RSQAR  DC     0      WORST CASE PASS COUNT   8CA06380
0225 0 0000      RSQAH  DC     0      WORK AREA-ADR           8CA06390
0226 0 0000      RSQAI  DC     0      CONST ZERO              8CA06400
0227 0 8000      RSQAJ  DC    /8000    BIT ZERO CONSTANT       8CA06410
0228 0 00C0      RSQAK  DC     0      WORK AREA-BIT           8CA06420
0229 0 0001      RSQAM  DC     1      CONST 1                  8CA06430
022A 0 0000      RSQAN  DC     0      STORAGE FOR ACCUM       8CA06440
022B 0 0000      RSQAG  DC    /0000    PATTERN CONTROL WORD    8CA06450
8CA06460
8CA06470
8CA06480
8CA06490
8CA06500
* ESTABLISH WORST CASE PATTERN
*
022C 0 C0F9      RSACJ  LD   RSQAI     RESET PTRN CONTROL       8CA06510
022D 0 D0FD      STO   RSQAG     8CA06520
022E 0 62C0      RSACI  LDX  2 /0000    8CA06530
022F 0 67C0 FFFF  LDX  L3 /FFFF     8CA06540
0231 0 7003      MDX   RSACT     8CA06550
0232 0 6600 FFFF  LDX  L2 /FFFF     COMPLIMENT PATTERN      8CA06560
0234 0 63C0      LDX  3 /0000     8CA06570
0235 0 C0ED      RSACT  LD   RSQAQ     INITIALIZE WORST CASE    8CA06580
0236 0 D0ED      STO   RSQAR     PASS COUNTER            8CA06590
0237 0 74FF 0224  RSACK  MDX  L   RSQAR,-1  COUNT WORST CASE PASSES 8CA06600
0239 0 7001      MDX   RSACX     8CA06610
023A 0 7052      MDX   RSACW     8CA06620
023B 0 C400 016A  RSACX  LD   L   RSQAC     RESET STARTING ADDR      8CA06630
023D 0 D05C      STO   RSRAA     8CA06640
023E 0 C05B      RSACB  LD   RSRAA     8CA06650
023F 0 1806      SRA   6         8CA06660
0240 0 D05A      STO   RSRAB     8CA06670
0241 0 1802      SRA   2         8CA06680
0242 0 8058      A     RSRAB     8CA06690
0243 0 4C04 024D  BSC   L   RSACA,E    8CA06700
0245 0 6905      STX  1  RSADD&1    8CA06710
0246 0 6580 029A  LDX  I1  RSRAA     8CA06720
0248 0 6E80 029A  SPVE4  STX  I2  RSRAA     8CA06730
024A 0 6500 0000  RSADD  LDX  L1  0     8CA06740
024C 0 7007      MDX   RSACD     8CA06750
024D 0 6905      RSACA  STX  1  RSACZ&1 8CA06760
024E 0 6580 029A  LDX  I1  RSRAA     8CA06770
0250 0 6F80 029A  SPVE5  STX  I3  RSRAA     8CA06780
0252 0 65C0 0000  RSACZ  LDX  L1  0     8CA06790
0254 0 C045      RSACD  LD   RSRAA     8CA06800
8CA06810

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HI CORE FUNCTION TEST

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0255 0 F400 015B      EOR L RSAAH      TEST FOR MEMORY END      8CA06820
0257 0 4C18 025D      BSC L RSADB,&-    8CA06830
0259 0 7401 029A      MDX L RSRAA,1    ADR#ADR&1                8CA06840
025B 0 1000           NOP 0            SAFTY NOP                 8CA06850
025C 0 70E1           MDX RSACB       8CA06860
                                8CA06870
* WORST CASE TEST LOAD AND STORE THEN 8CA06880
* COMPLEMENT AND REPEAT              8CA06890
*                                     8CA06900
025D 0 6580 016A      RSADB LDX I1 RSQAC  LOAD STARTING ADR IN XR1 8CA06910
025F 0 693A          RSACL STX 1 RSRAA  8CA06920
0260 0 C042          RSACH LD  RSRAJ    INITIALIZE COMPLEMENT CNTR 8CA06930
0261 0 D042           STO  RSRAC        8CA06940
0262 0 C480 029A      PARE4 LD I  RSRAA  8CA06950
0264 0 D400 022A      STO L  RSQAN      8CA06960
0266 0 4C20 026A      BSC L  RSACE,Z    8CA06970
0268 0 F033          EOR  RSRAC        8CA06980
0269 0 700E          MDX SPVE6        8CA06990
026A 0 F031          RSACE EOR RSRAC   8CA07000
026B 0 4C18 0278      DATE4 BSC L SPVE6,&- ERROR 4 DETECTED        8CA07010
026D 0 0C00 0168      XIO L  RSQAF      8CA07020
026F 0 C400 016E      LD L  RSQAL       8CA07030
0271 0 E400 02A1      AND L  RSRAI      8CA07040
0273 0 4C20 0260      BSC L  RSACH,Z    8CA07050
0275 0 4400 03CF      BSI L  RSDDD      8CA07060
0277 0 FFF7          DC /FFF7          ERROR 4 CONSTANT        8CA07070
0278 0 D480 029A      SPVE6 STO I  RSRAA  8CA07080
027A 0 74FE 02A4      MDX L  RSRAC,-2   8CA07090
027C 0 70E5          MDX PARE4        8CA07100
027D 0 0C00 0168      XIO L  RSQAF      8CA07110
027F 0 C400 016E      LD L  RSQAL       8CA07120
0281 0 E400 02A1      AND L  RSRAI      8CA07130
0283 0 4C20 0260      BSC L  RSACH,Z    8CA07140
0285 0 C014          LD  RSRAA        8CA07150
0286 0 F400 015B      EOR L  RSAAH      TEST FOR MEMORY END      8CA07160
0288 0 4C18 028D      BSC L  RSACW,&-   BR IF END OF MEM        8CA07170
028A 0 7101          MDX X1 1         MEM ADR#ADR&1           8CA07180
028B 0 1000           NOP 0            SAFTY NOP                 8CA07190
028C 0 70D2          MDX RSACL        8CA07200
028D 0 0C00 0168      RSACH XIO L RSQAF  8CA07210
028F 0 C400 016E      LD L  RSQAL       8CA07220
0291 0 E0CD          AND  RSRAG        LOOP RT IF SW 10 ON     8CA07230
0292 0 6680 022B      LDX I2 RSQAG     8CA07240
0294 0 4EAO 02A5      BSC I2 RSRAD,Z   BR IF LOOP RTN         8CA07250
0296 0 7201          MDX 2 1          INDEX PATTERN CNTRL    8CA07260
0297 0 6A93          STX 2 RSQAG     8CA07270
0298 0 4E80 02A5      BSC I2 RSRAD    8CA07280
                                8CA07290
* STORAGE AREAS PART 3 °
*
029A 0 0000          RSRAA DC 0        WORK AREA-ADDRESS       8CA07300
029B 0 0000          RSRAB DC 0        BUFFER AREA-WORST CASE PA 8CA07310
029C 0 FFFF          RSRAC DC /FFFF   8CA07320
029D 0 0000          RSRAD DC 0        WORK AREA-ADDRESS       8CA07330
029E 0 0000          RSRAF DC 0        CONST ZERO              8CA07340
029F 0 0020          RSRAG DC /0020   BIT 10 ISOLATION CON    8CA07350
02A0 0 0010          RSRAH DC /0010   BIT 11 ISOLATION CON    8CA07360
02A1 0 0080          RSRAI DC /0080   BIT 8 ISOLATION CON     8CA07370
02A2 0 0004          RSRAX DC /0004   BIT 13 ISOLATION CON    8CA07380
02A3 0 0003          RSRAJ DC 3        8CA07390
02A4 0 0000          RSRAK DC 0        COMPLEMENT PASS COUNTER 8CA07400
*
02A5 0 022E          RSRAD DC RSACI    CONTROL BRANCH          8CA07410
02A6 0 0232          DC RSACY         ADDRESSES               8CA07420
02A7 0 02A8          DC RSACV         GO TO NEXT RTN         8CA07430
                                8CA07440
*                                     8CA07450
*                                     8CA07460
*                                     8CA07470
*                                     8CA07480
*                                     8CA07490

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HI CORE FUNCTION TEST

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* STORAGE PROTECTION TEST ROUTINES 8CA07500
*                                     8CA07510
02A8 0 C400 015C      RSACV LD L RSAAK  8CA07520
02AA 0 4CC8 02AE      BSC L  RSACU,&   8CA07530
02AC 0 6400 031D      LDX L  RSADA     NOT 1800 BRANCH TO E D N 8CA07540
                                8CA07550
* WRITE ZEROS ON PROTECTED AREA OF ONES 8CA07560
*                                     8CA07570
02AE 0 6204          RSACU LDX X2 4    STORAGE PROTECT PASSES 8CA07580
02AF 0 C400 016A      RSACS LD L  RSQAC  8CA07590
02B1 0 D0EB          STO  RSRAC        8CA07600
02B2 0 D008          STO  RSRAC        INITIALIZE STS ADDRESS 8CA07610
02B3 0 C400 03AD      LD L  RSSAH      TELL INTERRUPT ROUTINE TO 8CA07620
02B5 0 D400 03AB      STO L  RSSAF     DISREGARD SP ERROR     8CA07630
02B7 0 C0E4          RSACN LD RSRAC    ACC#/FFFF             8CA07640
02B8 0 D480 029D      STO I  RSRAC     8CA07650
02BA 0 2C41          PARE5 DC /2C41   ADD SP BITS           8CA07660
02BB 0 054F          RSACO DC RSEND&2 8CA07670
02BC 0 6580 029D      LDX I1 RSRAC     8CA07680
02BE 0 C0DF          LD  RSRAC        ACCUM#0              8CA07690
02BF 0 D480 029D      SPVE7 STO I  RSRAC  STO SHOULD NOT OCCUR 8CA07700
02C1 0 C480 029D      PARE6 LD I  RSRAC  8CA07710
02C3 0 D4C0 022A      STO L  RSQAN     8CA07720
02C5 0 F0D6          EOR  RSRAC        8CA07730
02C6 0 4C18 02D3      DATE5 BSC L RSACM,&- ERROR 5 DETECTED      8CA07740
02C8 0 0C00 0168      XIO L  RSQAF     8CA07750
02CA 0 C400 016E      LD L  RSQAL      8CA07760
02CC 0 E400 02A1      AND L  RSRAI     8CA07770
02CE 0 4C20 02B7      BSC L  RSACN,Z   8CA07780
02D0 0 4400 03CF      BSI L  RSDDD     8CA07790
02D2 0 FFEF          DC /FFEF         ERROR 5 CONSTANT      8CA07800
02D3 0 0C00 0168      RSACM XIO L RSQAF 8CA07810
02D5 0 C400 016E      LD L  RSQAL      8CA07820
02D7 0 E0C9          AND  RSRAI      ISOLATE BIT 8         8CA07830
02D8 0 4C20 02B7      BSC L  RSACN,Z   IF SW 8 CN LOOP ADDR 8CA07840
02DA 0 C0C2          LD  RSRAC        8CA07850
02DB 0 8400 0229      A L  RSQAM       8CA07860
02DD 0 D0BF          STO  RSRAC        8CA07870
02DE 0 D0DC          STO  RSACO       8CA07880
02DF 0 F400 015B      EOR L  RSAAH     8CA07890
02E1 0 4C20 02B7      BSC L  RSACN,Z   RETURN WITH ADR#ADR&1 8CA07900
*
* UNPROTECT AND CLEAR MEMORY OF ONES 8CA07910
*                                     8CA07920
*                                     8CA07930
*                                     8CA07940
LD L  RSSAG        SERVICE STORAGE PROTECT 8CA07950
STO L  RSSAF       8CA07960
LD L  RSQAC        8CA07970
STO  RSRAC        INITIALIZE STS ADDRESS 8CA07980
STO  RSACR        CLEAR SP BITS           8CA07990
PARE7 DC /2C40     8CA08000
RSACR DC RSEND&2  8CA08010
LDX I1 RSRAC     ACC#/0000          8CA08020
LD  RSRAC        8CA08030
SPVE8 STO I  RSRAC 8CA08040
PARE8 LD I  RSRAC 8CA08050
STO L  RSQAN     ERROR 6 DETECTED      8CA08060
DATE6 BSC L RSACP,&- 8CA08070
XIO L  RSQAF     8CA08080
LD L  RSQAL      8CA08090
AND L  RSRAI     8CA08100
BSC L  PARE7,Z   8CA08110
BSI L  RSDDD     8CA08120
DC /FFDF         ERROR 6 CONSTANT      8CA08130
RSACP XIO L RSQAF IF SW 8 ON LOOP ADDR 8CA08140
LD L  RSQAL      8CA08150
AND  RSRAI      8CA08160
BSC L  PARE7,Z   REPEAT ADRS           8CA08170
LD  RSRAC        8CA08170

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0308 0 8400 0229	A	L	RSQAM	8CA08180	
030D 0 D08F	STO		RSRAE	8CA08190	
030E 0 D0DD	STO		RSACR	8CA08200	
030F 0 F400 015B	EOR	L	RSAAH	8CA08210	
0311 0 4C20 02EB	BSC	L	PARE7,Z	8CA08220	
0313 0 72FF	MDX	X2	-1	8CA08230	
0314 0 709A	MDX		RSACS	8CA08240	
0315 0 0C00 0168	XIO	L	RSQAF	8CA08250	
0317 0 C400 016E	LD	L	RSQAL	8CA08260	
0319 0 E400 029F	AND	L	RSRAG	8CA08270	
031B 0 4C20 02AE	BSC	L	RSACU,Z	8CA08280	
* * COMMON PROGRAM END *					
031D 0 74FF 015E	RSADA	MDX	L	RSFAB,-1	8CA08310
031F 0 7016	MDX			RSCCQ	8CA08320
0320 0 0C00 0168	XIO	L	RSQAF	8CA08330	
0322 0 C400 016E	LD	L	RSQAL	8CA08340	
0324 0 E400 02A2	AND	L	RSRAX	8CA08350	
0326 0 4C20 032B	BSC	L	RSADC,Z	8CA08360	
0328 0 4400 0434	BSI	L	LOG	8CA08370	
032A 0 05C8	DC		MES02	8CA08380	
032B 0 0C00 0168	RSADC	XIO	L	RSQAF	8CA08390
032D 0 C400 016E	LD	L	RSQAL	8CA08400	
032F 0 E400 02A0	AND	L	RSRAH	8CA08410	
0331 0 4C20 0182	BSC	L	RSADZ,Z	8CA08420	
0333 0 3005	RSQAW	WAIT		5	8CA08430
0334 0 6400 0028	LDX	L	/0028		8CA08440
0336 0 6400 018D	RSCCQ	LDX	L	RSABH	8CA08450
* * INTERRUPT LEVEL ERROR ROUTINE *					
0338 0 0000	RSCCA	DC		0	8CA08490
0339 0 6862	STX	3	RSCCI&1		8CA08500
033A 0 D069	STO		RSSAA		8CA08510
033B 0 285E	STS		RSCCE		8CA08520
033C 0 086B	XIO		RSSAC		8CA08530
033D 0 D06C	STO		RSSAD		8CA08540
033E 0 4C40 0340	BOSC	L	NEXT		8CA08550
0340 0 0C00 0168	NEXT	XIO	L	RSQAF	8CA08560
0342 0 C400 016E	LD	L	RSQAL		8CA08570
0344 0 E070	AND		RSSAO		8CA08580
0345 0 F070	EOR		RSSAP		8CA08590
0346 0 4C18 0430	BSC	L	RSDDK,&-		8CA08600
0348 0 C061	LD		RSSAD		8CA08610
0349 0 E064	AND		RSSAE		8CA08620
034A 0 4C18 035F	BSC	L	RSCCB,&-		8CA08630
034C 0 C05E	LD		RSSAF		8CA08640
034D 0 4C10 035B	BSC	L	RSCCG,-		8CA08650
034F 0 0C00 0168	XIO	L	RSQAF		8CA08660
0351 0 C400 016E	LD	L	RSQAL		8CA08670
0353 0 E400 02A2	AND	L	RSRAX		8CA08680
0355 0 4C20 0375	BSC	L	RSCCD,Z		8CA08690
0357 0 4400 0434	BSI	L	LOG		8CA08700
0359 0 0512	DC		MES03		8CA08710
035A 0 7004	MDX		RSCCB		8CA08720
035B 0 C04E	RSCCG	LD		RSSAD	8CA08730
035C 0 F051	EOR		RSSAE		8CA08740
035D 0 4C98 0338	BSC	I	RSCCA,&-		8CA08750
035F 0 0C00 0168	RSCCB	XIO	L	RSQAF	8CA08760
0361 0 C400 016E	LD	L	RSQAL		8CA08770
0363 0 E400 02A2	AND	L	RSRAX		8CA08780
0365 0 4C20 0375	BSC	L	RSCCD,Z		8CA08790
0367 0 C042	LD		RSSAD		8CA08800
0368 0 E046	AND		RSSAI		8CA08810
0369 0 4C18 036E	BSC	L	RSCCC,&-		8CA08820
036B 0 4400 0434	BSI	L	LOG		8CA08830
036D 0 051E	DC		MES04		8CA08840
					8CA08850

036E 0 C03B	RSCCC	LD		RSSAD	TEST FOR INVALID OP CODE	8CA08860
036F 0 E040	AND			RSSAJ	ISOLATE INV OP ERROR	8CA08870
0370 0 4C18 0375	BSC	L		RSCCD,&-		8CA08880
0372 0 4400 0434	BSI	L		LOG		8CA08890
0374 0 0528	DC			MES05	ERROR INT-INV OP CODE	8CA08900
0375 0 0C00 0168	RSCCD	XIO	L	RSQAF	IF SW 14 OFF, STORE	8CA08910
0377 0 C400 016E	LD	L		RSQAL		8CA08920
0379 0 E037	AND			RSSAK	ACCUM, INS CTR, STATUS	8CA08930
037A 0 4CA0 0338	BSC	I		RSCCA,Z	AND WAIT	8CA08940
037C 0 C02D	LD			RSSAD	LOAD ILSW FOR ERROR	8CA08950
037D 0 180C	SRA			12	PLACE BITS 0-3 OF ILSW IN	8CA08960
037E 0 E835	OR			RSSAN	12-15 AND OR IN WAIT OP	8CA08970
037F 0 D01F	STO			RSCCH	STORE IN WAIT	8CA08980
0380 0 6A1D	STX	2		RSCCI&3		8CA08990
0381 0 C02B	LD			RSSAD		8CA09000
0382 0 E02D	AND			RSSAJ		8CA09010
0383 0 4C20 039B	BSC	L		RSCCI,Z		8CA09020
0385 0 C024	LD			RSSAD		8CA09030
0386 0 E01B	AND			RSSAR		8CA09040
0387 0 4C20 039B	BSC	L		RSCCI,Z		8CA09050
0389 0 6210	LDX	2		16		8CA09060
038A 0 6301	LDX	3		1		8CA09070
038B 0 C0AC	RSCCJ	LD		RSCCA		8CA09080
038C 0 F700 038B	EOR	L3		TBL		8CA09090
038E 0 4C18 0396	BSC	L		RSCCK,&-		8CA09100
0390 0 7301	MDX	3		1		8CA09110
0391 0 72FF	MDX	2		-1		8CA09120
0392 0 70F8	MDX			RSCCJ		8CA09130
0393 0 C00F	LD			TBL1		8CA09140
0394 0 D023	STO			TBL		8CA09150
0395 0 7001	MDX			RSCCK&1		8CA09160
0396 0 6B21	RSCCK	STX	3	TBL		8CA09170
0397 0 C020	LD			TBL		8CA09180
0398 0 1890	SRT			16		8CA09190
0399 0 C00A	LD			RSSAA	RESTORE ACCUM CONTENTS	8CA09200
039A 0 2000	RSCCE	LDX		0	RESTORE OFLO&CARRY INDICA	8CA09210
039B 0 67C0 0000	RSCCI	LDX	L3	0		8CA09220
039D 0 6600 0000	LDX	L2		0		8CA09230
039F 0 3000	RSCCH	WAIT				8CA09240
03A0 0 4C80 0338	BSC	I		RSCCA	RETURN TO MAINLINE	8CA09250
* * STORAGE AREAS FOR ERROR ROUTINES *						
03A2 0 1000	RSSAR	DC		/1000		8CA09260
03A3 0 FFFF	TBL1	DC		/FFFF		8CA09270
03A4 0 0000	RSSAA	DC		0	SAVED ACCUMULATOR BUFFER	8CA09300
03A6 0002	BSS	E		2		8CA09310
03A8 0 0000	RSSAC	DC		/0000	SENSE ILSW FOR	8CA09320
03A9 0 0300	DC			/0300	LEVEL ZERO	8CA09330
03AA 0 0000	RSSAD	DC		0	STORAGE FOR ILSW	8CA09340
03AB 0 FFFF	RSSAF	DC		-1	IN SP ROUTINE -1NO, 2YES	8CA09350
03AC 0 FFFF	RSSAG	DC		-1	NOT IN SP ROUTINE	8CA09360
03AD 0 0002	RSSAH	DC		2	IN STORAGE PROTECT ROUTIN	8CA09370
03AE 0 2000	RSSAE	DC		/2000		8CA09380
03AF 0 4000	RSSAI	DC		/4000		8CA09390
03B0 0 8000	RSSAJ	DC		/8000		8CA09400
03B1 0 0002	RSSAK	DC		/0002	ISOLATE SW 14	8CA09410
03B2 0 000C	RSSAL	DC		12		8CA09420
03B3 0 0001	RSSAM	DC		1		8CA09430
03B4 0 3000	RSSAN	DC		/3000	WAIT INSTRUCTION	8CA09440
03B5 0 0086	RSSAO	DC		/0086	SWITCHES 8, 13, 14	8CA09450
03B6 0 0006	RSSAP	DC		/0006	SWITCHES 13, 14	8CA09460
03B7 0 5555	RSSAQ	DC		/5555		8CA09470
03B8 0 0000	TBL	DC		0		8CA09480
03B9 0 0194	DC			SPVE1&2	ERROR ID	8CA09490
03BA 0 01D0	DC			SPVE2&2		8CA09500
03BB 0 01EE	DC			SPVE3&2		8CA09510
03BC 0 024A	DC			SPVE4&2		8CA09520
						8CA09530

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03BD 0 0252	DC	SPVE5&2	8CA09540
03BE 0 027A	DC	SPVE6&2	8CA09550
03BF 0 02C1	DC	SPVE7&2	8CA09560
03C0 0 02F2	DC	SPVE8&2	8CA09570
03C1 0 019F	DC	PARE1&2	8CA09580
03C2 0 01D2	DC	PARE2&2	8CA09590
03C3 0 01F2	DC	PARE3&2	8CA09600
03C4 0 0264	DC	PARE4&2	8CA09610
03C5 0 02BC	DC	PARE5&2	8CA09620
03C6 0 02C3	DC	PARE6&2	8CA09630
03C7 0 02ED	DC	PARE7&2	8CA09640
03C8 0 02F4	DC	PARE8&2	8CA09650
03C9 0 01A2	DC	DATE1	8CA09660
03CA 0 01D4	DC	DATE2	8CA09670
03CB 0 01F5	DC	DATE3	8CA09680
03CC 0 026B	DC	DATE4	8CA09690
03CD 0 02C6	DC	DATE5	8CA09700
03CE 0 02F6	DC	DATE6	8CA09710
* ERROR ROUTINE TO SERVICE NON-INTERRUPT ERRORS			
* * * * *			
03CF 0 0000	RSDDD DC	0	8CA09720
03D0 0 6B4A	STX	3 RSDDA&1	8CA09730
03D1 0 6A4B	STX	2 RSDDA&3	8CA09740
03D2 0 2859	STS	RSDDJ	8CA09750
03D3 0 0C00 0168	XIO L	RSQAF	8CA09760
03D5 0 C400 016E	LD L	RSQAL	8CA09770
03D7 0 E0DD	AND	RSSAD	8CA09780
03D8 0 F0DD	EOR	RSSAP	8CA09790
03D9 0 4C18 0430	BSC L	RSDDK,&-	8CA09800
03DB 0 0C00 0168	XIO L	RSQAF	8CA09810
03DD 0 C400 016E	LD L	RSQAL	8CA09820
03DF 0 E400 02A2	AND L	RSRAX	8CA09830
03E1 0 4C20 040A	BSC L	RSDDX,Z	8CA09840
03E3 0 C480 03CF	LD I	RSDDD	8CA09850
03E5 0 4C04 03EB	BSC L	RSDD,E	8CA09860
03E7 0 44C0 0434	BSI L	LOG	8CA09870
03E9 0 0535	DC	MES06	8CA09880
03EA 0 701F	MDX	RSDDX	8CA09890
03EB 0 1801	RSDD E	SRA 1	8CA09900
03EC 0 4C04 03F2	BSC L	RSDDF,E	8CA09910
03EE 0 4400 0434	BSI L	LOG	8CA09920
03F0 0 0539	DC	MES07	8CA09930
03F1 0 7018	MDX	RSDDX	8CA09940
03F2 0 1801	RSDD F	SRA 1	8CA09950
03F3 0 4C04 03F9	BSC L	RSDDG,E	8CA09960
03F5 0 4400 0434	BSI L	LOG	8CA09970
03F7 0 053D	DC	MES08	8CA09980
03F8 0 7011	MDX	RSDDX	8CA09990
03F9 0 1801	RSDD G	SRA 1	8CA10000
03FA 0 4C04 0400	BSC L	RSDDH,E	8CA10010
03FC 0 4400 0434	BSI L	LOG	8CA10020
03FE 0 0541	DC	MES09	8CA10030
03FF 0 700A	MDX	RSDDX	8CA10040
0400 0 1801	RSDD H	SRA 1	8CA10050
0401 0 4C04 0407	BSC L	RSDDI,E	8CA10060
0403 0 4400 0434	BSI L	LOG	8CA10070
0405 0 0545	DC	MES10	8CA10080
0406 0 7003	MDX	RSDDX	8CA10090
0407 0 4400 0434	RSDD I	BSI L LOG	8CA10100
0409 0 0549	DC	MES11	8CA10110
040A 0 6311	RSDD X	LDX 3 17	8CA10120
040B 0 6206	LDX	2 6	8CA10130
040C 0 C0C2	RSDD C	LD RSDDD	8CA10140
040D 0 90A4	S	RSSAL	8CA10150
040E 0 F700 03B8	RSDD B	EOR L3 TBL	8CA10160
0410 0 4C18 0418	BSC L	RSDDL,&-	8CA10170
0412 0 7301	MDX	3 1	8CA10180
			8CA10190
			8CA10200
			8CA10210

HI CORE FUNCTION TEST

0413 0 72FF	MDX	2 -1	8CA10220
0414 0 70F7	MDX	RSDDC	8CA10230
0415 0 C08D	LD	TBL1	8CA10240
0416 0 D0A1	STO	TBL	8CA10250
0417 0 7001	MDX	RSDDL&1	8CA10260
0418 0 6B9F	RSDDL STX	3 TBL	8CA10270
0419 0 C09E	LD	TBL	8CA10280
041A 0 6700 0000	RSDDA LDX	L3 0	8CA10290
041C 0 6600 0000	LDX	L2 0	8CA10300
041E 0 1890	SRT	16	8CA10310
041F 0 C0AF	LD	RSDDD	8CA10320
0420 0 8092	A	RSSAM	8CA10330
0421 0 D0AD	STO	RSDDD	8CA10340
0422 0 0C00 0168	XIO L	RSQAF	8CA10350
0424 0 C400 016E	LD L	RSQAL	8CA10360
0426 0 E400 03B1	AND L	RSSAK	8CA10370
0428 0 4CA0 03CF	BSC I	RSDDD,Z	8CA10380
042A 0 C400 022A	LD L	RSQAN	8CA10390
042C 0 2000	RSDDJ LDS	0	8CA10400
042D 0 300B	WAITB DC	/300B	8CA10410
042E 0 4C80 03CF	BSC I	RSDDD	8CA10420
0430 0 C086	RSDDK LD	RSSAQ	8CA10430
0431 0 3006	RSWSC WAIT	6	8CA10440
0432 0 4C40 0141	* BOSC L	RSDKS	8CA10450
		TIONS 13&14 ON 8 OFF	8CA10460
		RESET INTER-RETURN START	8CA10470
		***** LOG ROUTINE *****	8CA10480
		* * * * *	8CA10490
0434 0 0000	LOG DC	0	8CA10500
0435 0 6B1C	LOG01 STX	3 LOG06&1	8CA10510
0436 0 0C00 0168	XIO L	RSQAF	8CA10520
0438 0 C400 016E	LD L	RSQAL	8CA10530
043A 0 1009	SLA	9	8CA10540
043B 0 4C10 0457	BSC L	TWRTR,-	8CA10550
		BRANCH IF 1053 OUTPUT	8CA10560
043D 0 C480 0434	* LD I	LOG	8CA10570
043F 0 D052	STO	PRWRT	8CA10580
		GET MESSAGE ADDRESS	8CA10590
		SET IN IOCC	8CA10600
0440 0 084D	* LOG02 XIO	PRSNS	8CA10610
0441 0 4C04 0447	BSC L	LOG03,E	8CA10620
0443 0 1801	SRA	1	8CA10630
0444 0 4C04 0449	BSC L	LOG04,E	8CA10640
0446 0 7004	MDX	LOG05	8CA10650
		READY AND NOT BUSY	8CA10660
0447 0 3007	* LOG03 WAIT	7	8CA10670
0448 0 70F7	MDX	LOG02	8CA10680
		CHECK AGAIN	8CA10690
0449 0 3009	* LOG04 WAIT	9	8CA10700
044A 0 70F5	MDX	LOG02	8CA10710
		CHECK AGAIN	8CA10720
044B 0 0846	* LOG05 XIO	PRWRT	8CA10730
		OUTPUT MESSAGE	8CA10740
044C 0 0843	* XIO	PRSN	8CA10750
044D 0 1002	SLA	2	8CA10760
044E 0 4810	BSC	-	8CA10770
044F 0 70FC	MDX	*-4	8CA10780
0450 0 083D	XIO	PRSNS	8CA10790
		RESET DSW	8CA10800
		***** PRINTING COMPLETE *****	8CA10810
0451 0 6700 0000	* LOG06 LDX	L3 0	8CA10820
0453 0 7401 0434	MDX L	LOG,1	8CA10830
		RESTCRE IX 3	8CA10840
		BUMP RETURN	8CA10850
0455 0 4C80 0434	* BSC I	LOG	8CA10860
		RETURN TO USER	8CA10870
0457 0 1010	* TWRTR SLA	16	8CA10880
0458 0 D032	STO	WRDSW	8CA10890

HI CORE FUNCTION TEST

0459 0 083A	XIO	TWSNS	CHECK IF TYPEWRITER	8CA10900
045A 0 1005	SLA	5	READY	8CA10910
045B 0 180F	SRA	15		8CA10920
045C 0 4C18 0460	BSC L	TWR01,&-		8CA10930
	*			8CA10940
045E 0 300A	WAITA DC	/300A		8CA10950
045F 0 70F9	MDX	TWRTR&2		8CA10960
	*			8CA10970
0460 0 C028	TWR01 LD	TWRTO	CARRAIGE RETURN AND	8CA10980
0461 0 D02A	STO	IOARA	LINE SPACE TO IO ARA	8CA10990
	*			8CA11000
0462 0 0833	XIO	TWVRT	CARG RETURN/LINE SP	8CA11010
	*			8CA11020
0463 0 0830	XIO	TWSNS	HANG TILL NOT BUSY	8CA11030
0464 0 180B	SRA	11		8CA11040
0465 0 4804	BSC	E		8CA11050
0466 0 70FC	MDX	*-4		8CA11060
	*			8CA11070
0467 0 6301	LDX	3 1	BYPASS 1443 WORD COUNT	8CA11080
0468 0 C480 0434	LD I	LOG	GET MESSAGE ADDRESS	8CA11090
046A 0 D001	STO	TWR02&1		8CA11100
	*			8CA11110
046B 0 C700 0000	TWR02 L3	0	GET WORD TO PRINT	8CA11120
046D 0 D400 04C8	STO L	CODWD	SET IN CONVERSION RT	8CA11130
046F 0 F01A	EOR	TWRT1	CHECK IF TERMINATOR	8CA11140
0470 0 4C18 0451	BSC L	LOG06,&-	BRANCH IF TERMINATOR	8CA11150
	*			8CA11160
	*			8CA11170
0472 0 4400 0498	BSI L	CODCV	GO CCNVERT 43 TO TW SRC	8CA11180
	*			8CA11190
	*			8CA11200
0474 0 C400 04C8	LD L	CODWD		8CA11210
0476 0 D015	STO	IOARA		8CA11220
	*			8CA11230
	*		OUTPUT A CHARACTER	8CA11240
	*			8CA11250
0477 0 081E	XIOWR XIO	TWVRT	WRITE CHARACTER	8CA11260
	*			8CA11270
0478 0*081B	XIOSN XIO	TWSNS	HANG ON BUSY	8CA11280
0479 0 180B	SRA	11		8CA11290
047A 0 4804	BSC	E		8CA11300
047B 0 70FC	MDX	XIOSN	BUSY	8CA11310
	*			8CA11320
	*		CHECK IF 1ST 1/2 WORD	8CA11330
	*			8CA11340
047C 0 C00E	LD	WRDSW	GET 1/2 WORD SWITCH	8CA11350
047D 0 4804	BSC	E		8CA11360
047E 0 7006	MDX	TWR03	GO SET UP NEXT WORD	8CA11370
	*			8CA11380
	*		SET UP FOR 2ND 1/2 WORD	8CA11390
	*			8CA11400
	*			8CA11410
047F 0 C00C	LD	IOARA		8CA11420
0480 0 1008	SLA	8	POSITION 2ND 1/2 WD	8CA11430
0481 0 D00A	STO	IOARA		8CA11440
0482 0 7401 048B	MDX L	WRDSW,1	BUMP WORD SWITCH	8CA11450
0484 0 70F2	MDX	XIOWR	GO WRITE 2ND 1/2 WD	8CA11460
	*			8CA11470
	*		SET UP FOR NEXT WORD	8CA11480
	*			8CA11490
0485 0 7301	TWR03 MDX	3 1	NEXT WORD INDEX	8CA11500
0486 0 7401 048B	MDX L	WRDSW,1	BUMP WORD SWITCH	8CA11510
0488 0 70E2	MDX	TWR02	GO GET NEXT WORD	8CA11520
	*			8CA11530
	*		LOG CONSTANTS	8CA11540
	*			8CA11550
0489 0 8103	TWRTO DC	/8103	LINE SP/CARRAIGE RTN	8CA11560
048A 0 FFFF	TWRT1 DC	/FFFF	TERMINATOR	8CA11570
048B 0 0000	WRDSW DC	0	1/2 WORD SWITCH	

HI CORE FUNCTION TEST

048C 0 0000	IOARA DC	0	OUTPUT AREA	8CA11580
	*			8CA11590
048E 0000	BSS E	0		8CA11600
	*			8CA11610
048E 0 0000	PRSNS DC	/0000	PRINTER SENSE IOCC	8CA11620
048F 0 3701	DC	/3701		8CA11630
0490 0 0000	PRSN DC	0	NON RESET SENSE	8CA11640
0491 0 3700	DC	/3700		8CA11650
0492 0 0000	PRWRT DC	/0000	PRINTER WRITE IOCC	8CA11660
0493 0 3500	DC	/3500		8CA11670
0494 0 0000	TWSNS DC	/0000	TYPEWTR SENSE IOCC	8CA11680
0495 0 0F01	DC	/0F01	DSW RESET	8CA11690
0496 0 048C	TWVRT DC	IOARA	TYPEWTR WRITE IOCC	8CA11700
0497 0 0900	DC	/0900	WR TYPEWRITER	8CA11710
	*			8CA11720
	*			8CA11730
	*		1443 CODE TO 1916/1053 *	8CA11740
	*		CODE CONVERSION ROUTINE *	8CA11750
	*			8CA11760
	*			8CA11770
0498 0 0000	CODCV DC	0		8CA11780
0499 0 6927	STX	1 CODC4&1	SAVE INDEX REGS	8CA11790
049A 0 6A28	STX	2 CODC4&3		8CA11800
049B 0 6B29	STX	3 CODC4&5		8CA11810
	*			8CA11820
049C 0 1010	SLA	16	CLEAR LEFT HALF WORD	8CA11830
049D 0 D02B	STC	LHIND	*INDICATOR	8CA11840
049E 0 6300	LDX	3 0		8CA11850
	*			8CA11860
049F 0 C028	CODC1 LD	CODWD	GET WORD TO CONVERT	8CA11870
04A0 0 1890	SRT	16	SET IN Q	8CA11880
04A1 0 C027	LD	LHIND		8CA11890
04A2 0 4820	BSC	Z	SKIP IF LEFT HALF	8CA11900
04A3 0 1088	SLT	8	POSITION RIGHT HALF	8CA11910
	*			8CA11920
04A4 0 1010	SLA	16		8CA11930
04A5 0 1084	SLT	4	ZCNE TO ACCUM	8CA11940
04A6 0 D023	STO	COD00		8CA11950
04A7 0 6580 04CA	LDX	11 COD00	IX 1 # ZCNE	8CA11960
	*			8CA11970
04A9 0 1010	SLA	16		8CA11980
04AA 0 1084	SLT	4	DIGIT TO ACCUM	8CA11990
04AB 0 D01E	STO	COD00		8CA12000
04AC 0 6680 04CA	LDX	12 COD00	IX 2 # DIGIT	8CA12010
	*			8CA12020
04AE 0 C500 04CD	LD	L1 ZONE	GET ZONE TABLE ADDR	8CA12030
04B0 0 D001	STC	CODC2&1	SET IN CONVERSION WD	8CA12040
	*			8CA12050
04B1 0 C600 0000	CODC2 LD	L2 0	GET CONVERTED CODE	8CA12060
04B3 0 D700 04CB	STO	L3 COD01		8CA12070
	*			8CA12080
04B5 0 C013	LD	LHIND		8CA12090
04B6 0 4C20 04BC	BSC L	CODC3,Z	BRNCH IF RIGHT HALF	8CA12100
04B8 0 7401 04C9	MDX L	LHIND,1		8CA12110
04BA 0 7301	MDX	3 1		8CA12120
04BB 0 70E3	MDX	CODC1	GO CCNVERT RIGHT HLF	8CA12130
	*			8CA12140
04BC 0 C00E	CODC3 LD	COD01	PACK CONVERTED CODES	8CA12150
04BD 0 1008	SLA	8		8CA12160
04BE 0 E80D	OR	COD02		8CA12170
04BF 0 D008	STO	CODWD		8CA12180
	*			8CA12190
04C0 0 6500 0000	CODC4 LDX	L1 0	RESTORE INDEX REGS	8CA12200
04C2 0 6600 0000	LDX	L2 0		8CA12210
04C4 0 6700 0000	LDX	L3 0		8CA12220
	*			8CA12230
04C6 0 4C80 0498	BSC I	CODCV	RETURN TO USER	8CA12240
	*			8CA12250

HI CORE FUNCTION TEST

			* * * CONSTANTS	
04C8 0 0000	COCWD DC	0	WORD LOCATION	8CA12260
04C9 0 0000	LHIND DC	0	LEFT HALF INDICATOR	8CA12270
04CA 0 0000	COD00 DC	0	WORK AREA	8CA12280
04CB 0 0000	COD01 DC	0	CONVERTED LH CHARACT	8CA12290
04CC 0 0000	COD02 DC	0	CONVERTED RH CHARACT	8CA12300
			* * * 1443 TO 1816/1053 CODE CONVERSION TABLES	
04CD 0 04D1	ZONE DC	ZONE1	NO ZONE	8CA12310
04CE 0 04DC	DC	ZONE1	0 ZONE	8CA12320
04CF 0 04E7	DC	ZONE2	11 ZONE	8CA12330
04D0 0 04F1	DC	ZONE3	12 ZONE	8CA12340
			* * * ZONEN DC /0021 SPACE	
04D1 0 0021	ZONEN DC	/0021	SPACE	8CA12350
04D2 0 00FC	DC	/00FC	1	8CA12360
04D3 0 00D8	DC	/00D8	2	8CA12370
04D4 0 00DC	DC	/00DC	3	8CA12380
04D5 0 00F0	DC	/00F0	4	8CA12390
04D6 0 00F4	DC	/00F4	5	8CA12400
04D7 0 00D0	DC	/00D0	6	8CA12410
04D8 0 00D4	DC	/00D4	7	8CA12420
04D9 0 00E4	DC	/00E4	8	8CA12430
04DA 0 00E0	DC	/00E0	9	8CA12440
04DB 0 00C4	DC	/00C4	0	8CA12450
04DC 0 0000	ZONE1 DC	0		8CA12460
04DD 0 0000	DC	0		8CA12470
04DE 0 009A	DC	/009A	S	8CA12480
04DF 0 009E	DC	/009E	T	8CA12490
04E0 0 00B2	DC	/00B2	U	8CA12500
04E1 0 00B6	DC	/00B6	V	8CA12510
04E2 0 0092	DC	/0092	W	8CA12520
04E3 0 0096	DC	/0096	X	8CA12530
04E4 0 00A6	DC	/00A6	Y	8CA12540
04E5 0 00A2	DC	/00A2	Z	8CA12550
04E6 0 0021	DC	/0021	SPACE	8CA12560
04E7 0 0000	ZONE2 DC	0		8CA12570
04E8 0 007E	DC	/007E	J	8CA12580
04E9 0 005A	DC	/005A	K	8CA12590
04EA 0 005E	DC	/005E	L	8CA12600
04EB 0 0072	DC	/0072	M	8CA12610
04EC 0 0076	DC	/0076	N	8CA12620
04ED 0 0052	DC	/0052	O	8CA12630
04EE 0 0056	DC	/0056	P	8CA12640
04EF 0 0066	DC	/0066	Q	8CA12650
04F0 0 0062	DC	/0062	R	8CA12660
04F1 0 0000	ZONE3 DC	0		8CA12670
04F2 0 003E	DC	/003E	A	8CA12680
04F3 0 001A	DC	/001A	B	8CA12690
04F4 0 001E	DC	/001E	C	8CA12700
04F5 0 0032	DC	/0032	D	8CA12710
04F6 0 0036	DC	/0036	E	8CA12720
04F7 0 0012	DC	/0012	F	8CA12730
04F8 0 0016	DC	/0016	G	8CA12740
04F9 0 0026	DC	/0026	H	8CA12750
04FA 0 0022	DC	/0022	I	8CA12760
04FB 0 0086	DC	/0086	O ERROR	8CA12770
04FC 0 0000	DC	/0000	PERIOD	8CA12780
			* * * MES01 DC 9 WORD CT	
04FD 0 0009	MES01 DC	9	WORD CT	8CA12810
04FE 0 1213	DC	/1213	ST	8CA12820
04FF 0 3129	DC	/3129	AR	8CA12830
0500 0 1300	DC	/1300	T	8CA12840
0501 0 3839	DC	/3839	HI	8CA12850

HI CORE FUNCTION TEST

0502 0 0033	DC	/0033	C	8CA12940
0503 0 2629	DC	/2629	OR	8CA12950
0504 0 3500	DC	/3500	E	8CA12960
0505 0 1335	DC	/1335	TE	8CA12970
0506 0 1213	DC	/1213	ST	8CA12980
0507 0 FFFF	DC	/FFFF	TERM	8CA12990
			* * * MES02 DC 8 WORD CT	
0508 0 0008	MES02 DC	8	WORD CT	8CA13000
0509 0 3525	DC	/3525	EN	8CA13010
050A 0 3400	DC	/3400	D	8CA13020
050B 0 3839	DC	/3839	HI	8CA13030
050C 0 0033	DC	/0033	C	8CA13040
050D 0 2629	DC	/2629	OR	8CA13050
050E 0 3500	DC	/3500	E	8CA13060
050F 0 1335	DC	/1335	TE	8CA13070
0510 0 1213	DC	/1213	ST	8CA13080
0511 0 FFFF	DC	/FFFF	TERM	8CA13090
			* * * MES03 DC 11 WD CT	
0512 0 0008	MES03 DC	11	WD CT	8CA13100
0513 0 3529	DC	/3529	ER	8CA13110
0514 0 2926	DC	/2926	RO	8CA13120
0515 0 2900	DC	/2900	R	8CA13130
0516 0 3925	DC	/3925	IN	8CA13140
0517 0 1300	DC	/1300	T	8CA13150
0518 0 1213	DC	/1213	ST	8CA13160
0519 0 2629	DC	/2629	OR	8CA13170
051A 0 3700	DC	/3700	G	8CA13180
051B 0 2729	DC	/2729	PR	8CA13190
051C 0 2613	DC	/2613	CT	8CA13200
051D 0 FFFF	DC	/FFFF	TERM	8CA13210
			* * * MES04 DC 8 WD CT	
051E 0 0008	MES04 DC	8	WD CT	8CA13220
051F 0 3529	DC	/3529	ER	8CA13230
0520 0 2926	DC	/2926	RO	8CA13240
0521 0 2900	DC	/2900	R	8CA13250
0522 0 3925	DC	/3925	IN	8CA13260
0523 0 1300	DC	/1300	T	8CA13270
0524 0 2731	DC	/2731	PA	8CA13280
0525 0 2939	DC	/2939	RI	8CA13290
0526 0 1318	DC	/1318	TY	8CA13300
0527 0 FFFF	DC	/FFFF	TERM	8CA13310
			* * * MES05 DC 11 WD CT	
0528 0 0008	MES05 DC	11	WD CT	8CA13320
0529 0 3529	DC	/3529	ER	8CA13330
052A 0 2926	DC	/2926	RO	8CA13340
052B 0 2900	DC	/2900	R	8CA13350
052C 0 3925	DC	/3925	IN	8CA13360
052D 0 1300	DC	/1300	T	8CA13370
052E 0 3925	DC	/3925	IN	8CA13380
052F 0 1500	DC	/1500	V	8CA13390
0530 0 2627	DC	/2627	OP	8CA13400
0531 0 0033	DC	/0033	C	8CA13410
0532 0 2634	DC	/2634	OD	8CA13420
0533 0 3500	DC	/3500	E	8CA13430
0534 0 FFFF	DC	/FFFF	TERM	8CA13440
			* * * MES06 DC 2 WD CT	
0535 0 0002	MES06 DC	2	WD CT	8CA13450
0536 0 3529	DC	/3529	ER	8CA13460
0537 0 0001	DC	/0001	1	8CA13470
0538 0 FFFF	DC	/FFFF	TERM	8CA13480
			* * * MES07 DC 2 WD CT	
0539 0 0002	MES07 DC	2	WD CT	8CA13490
053A 0 3529	DC	/3529	ER	8CA13500
053B 0 0002	DC	/0002	2	8CA13510
053C 0 FFFF	DC	/FFFF	TERM	8CA13520
			* * * MES08 DC 2 WD CT	
053D 0 0002	MES08 DC	2	WD CT	8CA13530
053E 0 3529	DC	/3529	ER	8CA13540

```

053F 0 0003      DC      /0003      3
0540 0 FFFF      DC      /FFFF      TERM
*
0541 0 0002      MES09 DC      2          WD CT
0542 0 3529      DC      /3529      ER
0543 0 0004      DC      /0004      4
0544 0 FFFF      DC      /FFFF      TERM
*
0545 0 0002      MES10 DC      2          WD CT
0546 0 3529      DC      /3529      ER
0547 0 0005      DC      /0005      5
0548 0 FFFF      DC      /FFFF      TERM
*
0549 0 0002      MES11 DC      2          WD CT
054A 0 3529      DC      /3529      ER
054B 0 0006      DC      /0006      6
054C 0 FFFF      DC      /FFFF      TERM
054D 0 0000      RSEND DC      0
054E 0 0000      DC      0
054F 0 0000      DC      0
0550 0 012D      END      RSDKR
    
```

NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY

```

8CA13620
8CA13630
8CA13640
8CA13650
8CA13660
8CA13670
8CA13680
8CA13690
8CA13700
8CA13710
8CA13720
8CA13730
8CA13740
8CA13750
8CA13760
8CA13770
8CA13780
8CA13790
8CA13800
8CA13810
8CA13820
    
```

```

CODCV 0498 0472 04C6
CODC1 049F 048B
CODC2 04B1 04B0
CODC3 04BC 0486
CODC4 04C0 0499 049A 049B
CODWD 04C8 046D 0474 049F 04BF
COD00 04CA 04A6 04A7 04AB 04AC
COD01 04CB 04B3 04BC
COD02 04CC 04BE
DATE1 01A2 03C9
DATE2 01D4 03CA
DATE3 01F5 03CB
DATE4 026B 03CC
DATE5 02C6 03CD
DATE6 02F6 03CE
IDARA 048C 0461 0476 047F 0481 0496
LHIND 04C9 049D 04A1 0485 0488
LOG    0434 0188 0328 0357 036B 0372 03E7 03EE 03F5 03FC 0403 0407 043D 0453
      0455 0468
LOG01 0435
LOG02 0440 0448 044A
LOG03 0447 0441 3007
LOG04 0449 0444 3009
LOG05 044B 0446
LOG06 0451 0435 0470
MES01 04FD 018A
MES02 0508 032A
MES03 0512 0359
MES04 051E 036D
MES05 0528 0374
MES06 0535 03E9
MES07 0539 03F0
MES08 053D 03F7
MES09 0541 03FE
MES10 0545 0405
MES11 0549 0409
NEXT 0340 033E
PARE1 019D 03C1
PARE2 01D0 03C2
PARE3 01F0 03C3
PARE4 0262 027C 03C4
PARE5 02BA 03C5
PARE6 02C1 03C6
PARE7 02EB 02FE 0308 0311 03C7
PARE8 02F2 03C8
PRSN 0490 044C
PRSNS 048E 0440 0450
PRWRT 0492 043F 044B
RSAAB 0153 014F
RSAAC 0158 0153
RSAAD 0159 0151
RSAAE 015A 0144 0147
RSAAH 015B 013B 0194 0187 0211 0255 0286 02DF 030F
RSAAK 015C 0154 0174 02A8
RSAAL 0160 0171
RSAAM 0164 0141
RSAAN 0166 013E
RSABA 0171 0157
RSABB 018E 018E
RSABC 0190 0199
RSABD 019A 0195
RSABE 019C 01AA 01B4 01BC
RSABF 01AF 01A2
RSABG 01BD 0188
RSABH 018D 01C5 0336
RSABI 018B 0186
RSABJ 01E1 01D4
RSABK 0202 01F5
    
```

HI CORE FUNCTION TEST

RSABL 01EB 01FD 0208
 RSABM 0210 020C
 RSABN 01CA 01DC 01E7 0217
 RSABD 0218 0213
 RSABP 01C8 0219
 RSABR 01C7 0220
 RSACA 024D 0243
 RSACB 023E 025C
 RSACD 0254 024C
 RSACE 026A 0266
 RSACH 0260 0273 0283
 RSACI 022E 02A5
 RSACJ 022C 0222
 RSACK 0237
 RSACL 025F 028C
 RSACM 02D3 02C6
 RSACN 02B7 02CE 02D8 02E1
 RSACO 02BB 02B2 02DE
 RSACP 0303 02F6
 RSACR 02EC 02EA 030E
 RSACS 02AF 0314
 RSACT 0235 0231
 RSACU 02AE 02AA 031B
 RSACV 02A8 02A7
 RSACW 028D 023A 0288
 RSACX 023B 0239
 RSACY 0232 02A6
 RSACZ 0252 024D
 RSADA 031D 02AC
 RSADB 025D 0257
 RSADC 032B 0326
 RSADD 024A 0245
 RSAD E 0182 0175 0331
 RSACC 0338 016B 035D 037A 038B 03A0
 RSACB 035F 034A 035A
 RSACC 036E 0369
 RSACD 0375 0355 0365 0370
 RSAC E 039A 0338
 RSACG 035B 034D
 RSACH 039F 037F 30C1 3002 3004 3008
 RSACI 039B 0339 0380 0383 0387
 RSACJ 038B 0392
 RSACK 0396 038E 0395
 RSACC 0336 031F
 RSADD 041A 03D0 03D1
 RSADB 040E
 RSADC 040C 0414
 RSADD 03CF 01AC 01DE 01FF 0275 02D0 0300 03E3 040C 041F 0421 0428 042E
 RSDD E 03EB 03E5
 RSDDF 03F2 03EC
 RSDDG 03F9 03F3
 RSDDH 0400 03FA
 RSDDI 0407 0401
 RSDDJ 042C 03D2
 RSDDK 0430 0346 03D9
 RSDDL 0418 0410 0417
 RSDDX 040A 03E1 03EA 03F1 03F8 03FF 0406
 RSDKR 012D 0550
 RSDKS 0141 0164 0166 0432
 RSDKW 013D 013C 3003
 RSEND 054D 02BB 02EC
 RSFAA 015D 018B
 RSFAB 015E 018C 031D
 RSFAC 015F
 RSQAC 016A 018E 019A 01C8 023B 025D 02AF 02E7
 RSQAD 016B 0179
 RSQAE 016C 0190 0191 0192 019C 019D 01A1 01B6
 RSQAF 0168 0182 01A4 01AF 01BF 01D6 01E1 01F7 0202 021A 026D 027D 028D 02C8

HI CORE FUNCTION TEST

02D3 02F8 0303 0315 0320 032B 0340 034F 035F 0375 03D3 03DB 0422
 0436
 RSQAG 022B 022D 0292 0297
 RSQAH 0225 01CA 01CB 01CE 01D0 01EC 01F0 0210 0215
 RSQAI 0226 01CD 022C
 RSQAJ 0227 01E9
 RSQAK 0228 01EA 01EB 01EE 01F4 020A 020E
 RSQAL 016E 0168 0183 01A6 01B0 01C1 01D8 01E3 01F9 0204 021C 026F 027F 028F
 02CA 02D5 02FA 0305 0317 0322 032D 0342 0351 0361 0377 03D5 03DD
 0424 0438
 RSQAM 0229 0216 02DB 030B
 RSQAN 022A 019F 01D2 01F2 0264 02C3 02F4 042A
 RSQAO 0169 0178
 RSQAP 016D 0177
 RSQAQ 0223 0235
 RSQAR 0224 0236 0237
 RSQAU 016F 017C
 RSQAV 0170 017F
 RSQAW 0333 3005
 RSRAA 029A 023D 023E 0246 0248 024E 0250 0254 0259 025F 0262 0278 0285
 RSRA B 029B 0240 0242
 RSRA C 029C 0268 026A 02B7 02C5
 RSRA D 02A5 0294 0298
 RSRA E 029D 02B1 02B8 02BC 02BF 02C1 02DA 02DD 02E9 02ED 02F0 02F2 030A 030D
 RSRA F 029E 02BE 02EF
 RSRA G 029F 01C3 021E 0291 0319
 RSRA H 02A0 032F
 RSRA I 02A1 01A8 01B2 01DA 01E5 01FB 0206 0271 0281 02CC 02D7 02FC 0307
 RSRA J 02A3 0260
 RSRA K 02A4 0261 027A
 RSRA X 02A2 0184 0324 0353 0363 03DF
 RSSAA 03A4 033A 0399
 RSSAC 03A8 033C
 RSSAD 03AA 033D 0348 035B 0367 036E 037C 0381 0385
 RSSAE 03AE 0349 035C
 RSSAF 03AB 02B5 02E5 034C
 RSSAG 03AC 02E3
 RSSAH 03AD 02B3
 RSSAI 03AF 0368
 RSSAJ 0380 036F 0382
 RSSAK 0381 0379 0426
 RSSAL 03B2 040D
 RSSAM 03B3 0420
 RSSAN 03B4 037E
 RSSAD 03B5 0344 03D7
 RSSAP 03B6 0345 03D8
 RSSAQ 03B7 0430
 RSSAR 03A2 0386
 RSWSC 0431 3006
 SPVE1 0192 03B9
 SPVE2 01CE 03BA
 SPVE3 01EC 020F 03BB
 SPVE4 0248 03BC
 SPVE5 0250 03BD
 SPVE6 0278 0269 026B 03BE
 SPVE7 02BF 03BF
 SPVE8 02F0 03C0
 STGCK 0135 012E
 STGLP 0130 0137
 TBL 03B8 038C 0394 0396 0397 040E 0416 0418 0419
 TBL1 03A3 0393 0415
 TWRTR 0457 043B 045F
 TWRT0 0489 0460
 TWRT1 048A 046F
 TWRO1 0460 045C
 TWRO2 046B 046A 0488
 TWRO3 0485 047E
 TWSNS 0494 017D 0459 0463 0478

HI CORE FUNCTION TEST

TWRT 0496 0190 0462 0477
WAITA 045E 300A
WAITB 042D 300B
WRDSW 048B 0458 047C 0482 0486
XIOSN 0478 047B
XICWR 0477 0484
ZONE 04CD 04AE
ZONEN 04D1 04CD
ZONE1 04DC 04CE
ZONE2 04E7 04CF
ZONE3 04F1 04D0
END OF ASSEMBLY

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

```

3003          ABS          8CB00020
          ORG          /3003      8CB00030
          *          8CB00040
*****-*****          8CB00050
B-REG I-REG          *          8CB00060
          *          8CB00070
          *          8CB00080
          *          8CB00090
          *          8CB00100
          *          8CB00110
          *          8CB00120
          *          8CB00130
          *          8CB00140
          *          8CB00150
          *          8CB00160
          *          8CB00170
          *          8CB00180
          *          8CB00190
          *          8CB00200
          *          8CB00210
          *          8CB00220
          *          8CB00230
          *          8CB00240
          *          8CB00250
          *          8CB00260
          *          8CB00270
          *          8CB00280
          *          8CB00290
          *          8CB00300
          *          8CB00310
          *          8CB00320
          *          8CB00330
          *          8CB00340
          *          8CB00350
          *          8CB00360
          *          8CB00370
          *          8CB00380
          *          8CB00390
          *          8CB00400
          *          8CB00410
          *          8CB00420
          *          8CB00430
          *          8CB00440
          *          8CB00450
          *          8CB00460
          *          8CB00470
          *          8CB00480
          *          8CB00490
          *          8CB00500
          *          8CB00510
          *          8CB00520
          *          8CB00530
          *          8CB00540
          *          8CB00550
          *          8CB00560
          *          8CB00570
          *          8CB00580
          *          8CB00590
          *          8CB00600
          *          8CB00610
          *          8CB00620
          *          8CB00630
          *          8CB00640
          *          8CB00650
          *          8CB00660
          *          8CB00670
          *          8CB00680
          *          8CB00690

3003 0 0131          DC          RSDKW&1          WAIT FOR SWITCHES.
          *
          *          INDEX REGISTER 1 (X1)
          *          CONTAINS THE CORE SIZE
          *          FOUND BY THE PROGRAM.
          *          SET DISPLAY REGISTER
          *          SWITCH TO X1 IN ORDER
          *          TO DISPLAY THIS P/C
          *          CORE STORAGE SIZE.
          *
          *          1. SET REQUIRED SWITCHES
          *
          *          A. OPERATOR MONITOR-OFF
          *          B. DISABLE INTERRUPT-OFF
          *          C. CHECK STOP-OFF
          *          D. WRITE STORAGE
          *          PROTECT-YES
          *          E. ANY DESIRED DATA
          *          ENTRY SWITCHES.
          *
          *          B14- BYPASS ERROR WAIT
          *          B13- BYPASS PRINTING
          *          B11- LOOP SUBPROGRAM
          *          B 9- OUTPUT ON 1443
          *          B 8- LOOP ADDRESS
          *
          *          2. PUSH START %PROGRAM
          *          SHOULD LOAD<
          *          *****
          *          3004 0 0000          DC          0          THIS WAIT IS NOT USED
          *          *          * IN THIS PROGRAM
          *          *****
          *          3005 0 0208          DC          RSQAW&1          PROGRAM END.
          *
          *          *          SET SWITCHES TO LOAD
          *          *          0-9 CORE TEST.
          *
          *          *          1. CHECK STOP-ON.
          *          *          2. PUSH START %0-9 CORE
          *          *          TEST SHOULD LOAD<
          *
          *          *          NOTE
          *          *          IF NEXT PROGRAM IS TO BE
          *          *          LOADED BY A 1054, PLACE THE
          *          *          0-9 CORE TEST IN THE 1054
          *          *          BEFORE PUSHING START.
          *          *          *****
          *          3006 0 0259          DC          RSWSC&1          ILLEGAL COMBINATION
          *          *          OF DATA ENTRY SWITCHES.
          *
          *          *          %SW 13 ON, SW 14 ON AND
          *          *          SW 8 OFF<
          *
          *          *          PUSH START TO RERUN
          *          *          THE PROGRAM.
          *          *          *****
          *          3007 0 02A6          DC          LOG03&1          1443 NOT READY.

```

```

          *          8CB00700
          *          8CB00710
          *          8CB00720
          *          8CB00730
          *          8CB00740
          *          8CB00750
          *          8CB00760
          *          8CB00770
          *          8CB00780
          *          8CB00790
          *          8CB00800
          *          8CB00810
          *          8CB00820
          *          8CB00830
          *          8CB00840
          *          8CB00850
          *          8CB00860
          *          8CB00870
          *          8CB00880
          *          8CB00890
          *          8CB00900
          *          8CB00910
          *          8CB00920
          *          8CB00930
          *          8CB00940
          *          8CB00950
          *          8CB00960
          *          8CB00970
          *          8CB00980
          *          8CB00990
          *          8CB01000
          *          8CB01010
          *          8CB01020
          *          8CB01030
          *          8CB01040
          *          8CB01050
          *          8CB01060
          *          8CB01070
          *          8CB01080
          *          8CB01090
          *          8CB01100
          *          8CB01110
          *          8CB01120
          *          8CB01130
          *          8CB01140
          *          8CB01150
          *          8CB01160
          *          8CB01170
          *          8CB01180
          *          8CB01190
          *          8CB01200
          *          8CB01210
          *          8CB01220
          *          8CB01230
          *          8CB01240
          *          8CB01250
          *          8CB01260
          *          8CB01270
          *          8CB01280
          *          8CB01290
          *          8CB01300
          *          8CB01310
          *          8CB01320
          *          8CB01330
          *          8CB01340
          *          8CB01350
          *          8CB01360
          *          8CB01370

          *          MAKE 1443 READY AND
          *          PUSH START.
          *          *****
          *          3008 0 0000          DC          0          THIS WAIT IS NOT USED
          *          *          * IN THIS PROGRAM
          *          *****
          *          *          3009 0 02A8          DC          LOG04&1          1443 BUSY.
          *
          *          *          CLEAR 1443 AND PUSH
          *          *          THE START BUTTON.
          *          *          *****
          *          *          300A 0 02BD          DC          WAITA&1          1816 NOT READY.
          *
          *          *          MAKE 1816 READY AND
          *          *          PUSH START.
          *          *          *****
          *          *          300B 0 0253          DC          WAITB&1          DATA ERROR HAS BEEN
          *          *          DETECTED.
          *
          *          *          USE THE Q REG TO FURTHER
          *          *          IDENTIFY THE ERROR.
          *
          *          *          NOTE
          *          *          DEPRESSING THE START BUTTON
          *          *          RETURNS THE PROGRAM TO THE
          *          *          TESTING SEQUENCE. %NORMALLY
          *          *          AFTER THE ERROR WAIT OCCURS
          *          *          BIT SW 8 SHOULD BE TURNED ON TO
          *          *          LCOP ON THE ADDRESS THAT FAILED<
          *          *          *****
          *          *          Q-REG          COMMENTS
          *          *          0011          ROUTINE TO READ AND WRITE
          *          *          ADDRESS IN EACH CORE LOCATION
          *          *          FAILED.
          *
          *          *          INDEX REGISTER 1 SHOWS THE
          *          *          CORRECT PATTERN AND THE CORE
          *          *          LOCATION WHICH FAILED.
          *
          *          *          THE ACCUMULATOR SHOWS THE
          *          *          INCORRECT DATA.
          *          *          *****
          *          *          0012          ATTEMPT TO SET CORE LOCATION
          *          *          TO ZEROS FAILED.
          *
          *          *          THE CORRECT PATTERN IS 0000.
          *
          *          *          THE ACCUMULATOR SHOWS THE
          *          *          INCORRECT DATA.
          *
          *          *          INDEX REGISTER 1 SHOWS THE
          *          *          CORE LOCATION WHICH FAILED.
          *          *          *****
          *          *          0013          BIT BY BIT ISOLATION TEST
          *          *          FAILED.
          *
          *          *          INDEX REGISTER 2 SHOWS THE
          *          *          CORRECT PATTERN.

```

```

*
* THE ACCUMULATOR SHOWS THE 8CB01380
* INCORRECT DATA. 8CB01390
* 8CB01400
* INDEX REGISTER 1 SHOWS THE 8CB01410
* CORE LOCATION WHICH FAILED. 8CB01420
* ***** 8CB01430
* 8CB01440
* 0014 WORST CASE PATTERN ROUTINE 8CB01450
* FAILED. 8CB01460
* 8CB01470
* THE CORRECT PATTERN IS EITHER 8CB01480
* 0000 OR FFFF. 8CB01490
* 8CB01500
* THE ACCUMULATOR SHOWS THE 8CB01510
* INCORRECT DATA. 8CB01520
* 8CB01530
* INDEX REGISTER 1 CONTAINS 8CB01540
* THE CORE LOCATION WHICH 8CB01550
* FAILED. 8CB01560
* ***** 8CB01570
* 0015 WRITE ZEROS ON PROTECTED 8CB01580
* AREA OF FFFF ROUTINE FAILED. 8CB01590
* 8CB01600
* THE CORRECT PATTERN IS FFFF. 8CB01610
* 8CB01620
* THE ACCUMULATOR SHOWS THE 8CB01630
* INCORRECT DATA. 8CB01640
* 8CB01650
* INDEX REGISTER 1 SHOWS THE 8CB01660
* CORE LOCATION WHICH FAILED. 8CB01670
* ***** 8CB01680
* 0016 UNPROTECT AND CLEAR CORE OF 8CB01690
* ONES ROUTINE FAILED. 8CB01700
* 8CB01710
* 8CB01720
* THE CORRECT PATTERN IS 0000. 8CB01730
* 8CB01740
* 8CB01750
* THE ACCUMULATOR SHOWS THE 8CB01760
* INCORRECT DATA. 8CB01770
* 8CB01780
* INDEX REGISTER 1 SHOWS THE 8CB01790
* CORE LOCATION WHICH FAILED. 8CB01800
* ***** 8CB01810
* B-REG I-REG * PROG WAITS COMMENTS 8CB01820
* ***** 8CB01830
* 300C 0 0181 DC WAITC&1 SET DISABLE INTERRUPT 8CB01840
* SWITCH ON. 8CB01850
* ***** 8CB01860
* 300D 0 01FD DC WAITD&1 SET DISABLE INTERRUPT 8CB01870
* SWITCH OFF. 8CB01880
* ***** 8CB01890
* 8CB01900
* ***** 8CB01910
* MEMORY TEST- 0-9 CORE 8CB01920
* 8CB01930
* SWITCH SETTING 8CB01940
* 8CB01950
* 8CB01960
* B14 # BYPASS ERROR WAIT 8CB01970
* B13 # BYPASS PRINTING 8CB01980
* B11 # LOOP SUB PROGRAM 8CB01990
* B10 # LOOP ROUTINE 8CB02000
* B9 # OUTPUT ON 1443 8CB02010
* B8 # LOOP ADDRESS 8CB02020
* ***** 8CB02030
* ***** 8CB02040
* ***** 8CB02050

```

```

012C
012C 0 C800
012D 0 C850
012E 0 DC00 0000
0130 0 3003
0131 0 C400 0268
0133 0 D400 0267
0135 0 C400 01C8
0137 0 D400 01C3

0139 0 C400 01C6
013B 0 D400 0003
013D 0 63C0
013E 0 C400 0003
0140 0 4C18 0152

0142 0 C033
0143 0 D400 025F
0145 0 C032
0146 0 D400 02F3
0148 0 C02E
0149 0 D400 02F5
014B 0 C02E
014C 0 D400 0180
014E 0 C400 017B
0150 0 D400 01FC

0152 0 0C00 025E
0154 0 C400 0260
0156 0 E400 0262
0158 0 4C20 015D
015A 0 4400 0292
015C 0 035B

015D 0 6100
015E 0 C007
015F 0 D1FF

0160 0 7500 1000
0162 0 1000
0163 0 1010
0164 0 D1FF

0165 0 C400 FFFF
0167 0 4C20 0160

0169 0 71FF

016A 0 1000

016B 0 71FD
016C 0 1000
016D 0 6D00 01C3
016F 0 6D00 01C4

```

```

*
* ORG 300 8CB02060
* 8CB02070
* 8CB02080
* DC /C800 PID 8CB02090
RSSTB LDD RSAAN 8CB02100
STD L 0 8CB02110
RSDKW WAIT 3 SET REQUIRED SWITCHE 8CB02120
RSSTA LD L RSNPP 8CB02130
STO L RSPPC 8CB02140
LD L RSLAJ 8CB02150
STO L RSLAA 8CB02160
* 8CB02170
* DETERMINE MACHINE TYPE 8CB02180
* 8CB02190
LD L RSLAE 8CB02200
STO L 3 8CB02210
LDX X3 0 8CB02220
LD L 3 8CB02230
BSC L RS113,&- 8CB02240
* 8CB02250
* 1800 MODIFICATIONS 8CB02260
* 8CB02270
LD RSR18 8CB02280
STO L RSRBS&1 8CB02290
LD RSD18 8CB02300
STO L TWSNS&1 PRO1 8CB02310
LD RST18 8CB02320
STO L TWWRT&1 PRO2 8CB02330
LD WAIT0 8CB02340
STO L WAITC 8CB02350
LD L WAIT1 8CB02360
STO L WAITD 8CB02370
* 8CB02380
* LABEL TYPEOUT 8CB02390
* 8CB02400
RS113 XIO L RSRBS 8CB02410
LD L RSBSB 8CB02420
AND L RS810 8CB02430
BSC L RSDMS,Z 8CB02440
BSI L LOG 8CB02450
DC MES12 MEMORY 0-9 CORES 8CB02460
***** 8CB02470
* 8CB02480
* CORE SIZE DETERMINER * 8CB02490
* 8CB02500
***** 8CB02510
RSDMS LDX 1 0 SET CONTROL INDEX 8CB02520
LD STGCK&1 GET CONSTANT FFFF & SET 8CB02530
STO 1 -1 IN MAXIMUM ADDRESS 8CB02540
* 8CB02550
STGLP MDX L1 /1000 ADVANCE CONTROL INDEX 8CB02560
NOP 0 SAFETY NOP FOR 32K CORE 8CB02570
SLA 16 CLEAR ACCUMULATOR AND SET 8CB02580
STO 1 -1 IN 4K CORE BLOCK MAX ADDR 8CB02590
* 8CB02600
STGCK LD L /FFFF GET MAX CORE ADDRESS DATA 8CB02610
BSC L STGLP,Z CHECK IT FOR ZERO 8CB02620
* 8CB02630
* 8CB02640
MDX 1 -1 DECREMENT X1 TO ACTUAL 8CB02650
* 8CB02660
MAXIMUM ADDRESS THIS CPU 8CB02670
* 8CB02680
* 8CB02690
NOP 0 SAFTY NOP 8CB02700
* 8CB02710
MDX 1 -3 HI CORE ADDR -3 8CB02720
NOP 0 SAFTY NOP 8CB02730
STX L1 RSLAA SET CONTROL ADDR
STX L1 RSLAC SET CONTROL ADDR

```


0-9 CORE FUNCTION TEST

```

0171 0 710E      MDX  1 14      LOW 0-9 ADDRESSES      8CB02740
0172 0 1000      NOP    0          SAFTY NOP              8CB02750
0173 0 6D00 01C8 STX   L1 RSLAG    STORE MAX CORE SIZE  8CB02760
0175 0 700A      MDX    WAITC    BR TO CONTINUE      8CB02770
*
* STORAGE FOR INITIALIZATIONS
*
0176 0 0240      RSR18 DC  /0240    1800 READ SWITCH    8CB02780
0177 0 0902      RST18 DC  /0902    1800 TYPE              8CB02790
0178 0 0F03      RSD18 DC  /0F03    1800 TYPE DSW-RESET   8CB02800
0179 0 0000      RSZRO DC  /0000    CONST ZERO            8CB02810
017A 0 300C      WAIT0 DC  /300C    WAIT INSTRUCTION      8CB02820
017B 0 300D      WAIT1 DC  /300D    WAIT INSTRUCTION      8CB02830
017C 0002        BSS   E  2          8CB02840
017E 0 4C00 0131 RSAAN BSC L RSSTA    8CB02850
*
* WAIT TO TURN DISABLE INTERRUPT
* SWITCH TO ON POSITION-1800 ONLY
*
0180 0 1000      WAITC SLA  0        DISABLE INTERRUPTS    8CB02860
*
* MAIN ROUTINE
*
* LOAD ZEROS IN CORES
*
0181 0 C043      RSR01 LD   RSLAD    ACC#/0000    8CB02870
0182 0 D480 01C4 STO   I  RSLAC      8CB02880
0184 0 C480 01C4 LD    I  RSLAC      8CB02890
0186 0 4C18 018B BSC   L  RSQ01,&-   8CB02900
0188 0 4400 0217 BSI   L  RSEOR      8CB02910
018A 0 70F6      DATE1 MDX RSR01     8CB02920
018B 0 4400 0274 RSQ01 BSI L  RSLOP   8CB02930
*
* LOAD ONES IN CORES
*
018D 0 C038      RSR02 LD   RSLAE    ACC#/FFFF    8CB02940
018E 0 D480 01C4 STO   I  RSLAC      8CB02950
0190 0 C480 01C4 LD    I  RSLAC      8CB02960
0192 0 F033      EOR    RSLAE      8CB02970
0193 0 4C18 0199 BSC   L  RSQ02,&-   8CB02980
0195 0 F030      EOR    RSLAE      8CB02990
0196 0 4400 0217 BSI   L  RSEOR      8CB03000
0198 0 70F4      DATE2 MDX RSR02     8CB03010
0199 0 4400 0274 RSQ02 BSI L  RSLOP   8CB03020
*
* ADDRESSING ROUTINE
*
019B 0 C028      RSR03 LD   RSLAC    ACC#ADDRESS  8CB03030
019C 0 D480 01C4 STO   I  RSLAC      8CB03040
019E 0 C480 01C4 LD    I  RSLAC      8CB03050
01A0 0 F023      EOR    RSLAC      8CB03060
01A1 0 4C18 01A7 BSC   L  RSQ03,&-   8CB03070
01A3 0 F020      EOR    RSLAC      8CB03080
01A4 0 4400 0217 BSI   L  RSEOR      8CB03090
01A6 0 70F4      DATE3 MDX RSR03     8CB03100
01A7 0 4400 0274 RSQ03 BSI L  RSLOP   8CB03110
*
* BIT ISOLATION ROUTINE
*
01A9 0 C020      RSVBB LD   RSLAI    8CB03120
01AA 0 D01C      STO    RSLAF      8CB03130
01AB 0 C01B      LD     RSLAF      8CB03140
01AC 0 D480 01C4 RSR04 LD   RSLAF    ACC#BIT PATTERN 8CB03150
01AE 0 C480 01C4 STO   I  RSLAC      8CB03160
01B0 0 F016      LD    I  RSLAC      8CB03170
01B1 0 4C18 01B7 EOR    RSLAF      8CB03180
01B3 0 F013      BSC   L  RSQ04,&-   8CB03190
                                EOR    RSLAF      8CB03200
                                8CB03210
                                8CB03220
                                8CB03230
                                8CB03240
                                8CB03250
                                8CB03260
                                8CB03270
                                8CB03280
                                8CB03290
                                8CB03300
                                8CB03310
                                8CB03320
                                8CB03330
                                8CB03340
                                8CB03350
                                8CB03360
                                8CB03370
                                8CB03380
                                8CB03390
                                8CB03400
                                8CB03410

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0-9 CORE FUNCTION TEST

```

01B4 0 4400 0217 BSI   L  RSEOR      8CB03420
01B6 0 70F4      DATE4 MDX RSR04     8CB03430
01B7 0 C00F      RSQ04 LD   RSLAF    8CB03440
01B8 0 1801      SRA    1          8CB03450
01B9 0 D00D      STO    RSLAF      8CB03460
01BA 0 4C18 01BE BSC   L  RSBIL,&-   8CB03470
01BC 0 70EE      MDX    RSR04     8CB03480
01BD 0 70EB      MDX    RSVBB     8CB03490
01BE 0 4400 0274 RSBIL BSI L  RSLOP   8CB03500
01C0 0 700B      MDX    RSSPT     8CB03510
*
* STORAGE AREAS-1
*
01C1 0 000D      RSLAQ DC  13        NUMBER OF CORES TO TEST 8CB03520
01C2 0 0003      RSLAB DC  3          NUMBER OF CORES BELOW 0 8CB03530
01C3 0 0800      RSLAA DC  /0800     LOWEST ADDRESS TO TEST#-3 8CB03540
01C4 0 0000      RSLAC DC  0          ADDRESS UNDER TEST     8CB03550
01C5 0 0000      RSLAD DC  /0000     8CB03560
01C6 0 FFFF      RSLAE DC  /FFFF     8CB03570
01C7 0 8000      RSLAF DC  /8000     8CB03580
01C8 0 0000      RSLAG DC  0          BIT PATTERN UNDER TEST 8CB03590
01C9 0 0001      RSLAH DC  1          HIGHEST ADDR TO TEST 9 8CB03600
01CA 0 8000      RSLAI DC  /8000     INITIALIZE BIT PATTERN 8CB03610
01CB 0 0800      RSLAJ DC  /0800     INITIALIZE MEMORY SIZE 8CB03620
*
* STORAGE PROTECT TEST
*
01CC 0 C400 01C6 RRSPT LD   L  RSLAE  ACC#/FFFF    8CB03630
01CE 0 D400 0003 STO   L  3          8CB03640
01D0 0 6300      LDX   X3  0          8CB03650
01D1 0 C400 0003 LD    L  3          8CB03660
01D3 0 4C18 01F6 BSC   L  RSPER,&-   8CB03670
01D5 0 C0EF      RSR05 LD   RSLAD    ACC#/0000    8CB03680
01D6 0 D480 01C4 STO   I  RSLAC      8CB03690
01D8 0 2CC1      DC    /2CC1        STORAGE PRT-IA        8CB03700
01D9 0 01C4      DC    RSLAC        8CB03710
01DA 0 C0EB      LD    RSLAE        ACC # /FFFF        8CB03720
01DB 0 D480 01C4 STO   I  RSLAC      8CB03730
01DD 0 C480 01C4 LD    I  RSLAC      8CB03740
01DF 0 4C18 01E4 BSC   L  RSQ05,&-   8CB03750
01E1 0 4400 0217 BSI   L  RSEOR      8CB03760
01E3 0 70F1      DATE5 MDX RSR05     8CB03770
01E4 0 4400 0274 RSQ05 BSI L  RSLOP   8CB03780
01E6 0 2CC0      RSR06 DC  /2CC0     CLEAR SP-IA          8CB03790
01E7 0 01C4      DC    RSLAC        8CB03800
01E8 0 C0DD      LD    RSLAE        ACC # /FFFF        8CB03810
01E9 0 D480 01C4 STO   I  RSLAC      8CB03820
01EB 0 C480 01C4 LD    I  RSLAC      8CB03830
01ED 0 F0D8      EOR    RSLAE      8CB03840
01EE 0 4C18 01F4 BSC   L  RSQ06,&-   8CB03850
01F0 0 F0D5      EOR    RSLAE      8CB03860
01F1 0 4400 0217 BSI   L  RSEOR      8CB03870
01F3 0 70F2      DATE6 MDX RSR06     8CB03880
01F4 0 4400 0274 RSQ06 BSI L  RSLOP   8CB03890
*
* PROGRAM END ROUTINE
*
01F6 0 74FF 0267 RSPER MDX L  RSPPC,-1 COUNT PRGM PASSES 8CB03900
01F8 0 7018      MDX    RSBTB      8CB03910
01F9 0 C016      LD     RRSRX      8CB04000
01FA 0 D400 0008 STO   L  /8        8CB04010
*
* WAIT TO TURN DISABLE INTERRUPT SWITCH
* TO OFF POSITION-1800 ONLY
*
01FC 0 1000      WAITD SLA  0        ENABLE INTERRUPTS     8CB04020
01FD 0 0860      RSPES XIO RSRBS     8CB04030
01FE 0 C061      LD     RSBBS     8CB04040
                                8CB04050
                                8CB04060
                                8CB04070
                                8CB04080
                                8CB04090

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0-9 CORE FUNCTION TEST

01FF 0 E062	AND	RSB10	8CB04100
0200 0 4C20 0205	BSC L	RSBYP,Z	8CB04110
0202 0 4400 0292	BSI L	LOG	8CB04120
0204 0 0369	DC	MES13	8CB04130
0205 0 0858	RSBYP XIO	RSRBS	8CB04140
0206 0 C059	LD	RSBSB	8CB04150
0207 0 E05E	AND	RSB14	8CB04160
0208 0 4C20 0131	BSC L	RSSTA,Z	8CB04170
020A 0 3005	RSQAW WAIT	5	8CB04180
020B 0 64C0 0028	LDX L	/0028	8CB04190
020E 0000	BSS E	0	8CB04200
020E 0 0000	RSSIC DC	0	8CB04210
020F 0 0300	DC	/0300	8CB04220
0210 0 0213	RSRSX DC	RSRSI	8CB04230
0211 0 6400 0181	RSBTB LDX L	RSR01	8CB04240
0213 0 0000	RSRSI DC	0	8CB04250
0214 0 08F9	XIO	RSSIC	8CB04260
0215 0 4C40 01FD	BCSC L	RSPE5	8CB04270
* ERROR ROUTINE			
0217 0 0000	RSEOR DC	/C000	8CB04280
0218 0 6B34	STX 3	RSDDA&1	8CB04290
0219 0 6A35	STX 2	RSDDA&3	8CB04300
021A 0 D046	STO	RSARB	8CB04310
021B 0 0842	XIO	RSRBS	8CB04320
021C 0 C043	LD	RSBSB	8CB04330
021D 0 E045	AND	RSB11	8CB04340
021E 0 4C18 0222	BSC L	RSSBT,&-	8CB04350
0220 0 4C80 0217	BSC I	RSEOR	8CB04360
0222 0 C03D	RSSBT LD	RSBSB	8CB04370
0223 0 E045	AND	RSKXA	8CB04380
0224 0 F045	EOR	RSKXB	8CB04390
0225 0 4C18 0257	BSC L	RSILC,&-	8CB04400
0227 0 7401 0217	MDX L	RSEOR,1	8CB04410
0229 0 0834	XIO	RSRBS	8CB04420
022A 0 C035	LD	RSBSB	8CB04430
022B 0 E036	AND	RSB10	8CB04440
022C 0 4C20 0231	BSC L	RSS12,Z	8CB04450
022E 0 4400 0292	BSI L	LOG	8CB04460
0230 0 0376	DC	MES14	8CB04470
0231 0 082C	RSS12 XIO	RSRBS	8CB04480
0232 0 C02D	LD	RSBSB	8CB04490
0233 0 E030	AND	RSB12	8CB04500
0234 0 4C08 0238	BSC L	RSHOE,&	8CB04510
0236 0 4C80 0217	BSC I	RSEOR	8CB04520
0238 0 6918	RSHOE STX 1	RSERW&1	8CB04530
0239 0 6580 01C4	LDX I1	RSLAC	8CB04540
023B 0 6311	LDX 3	17	8CB04550
023C 0 62FA	LDX 2	-6	8CB04560
023D 0 C0D9	RSDDC LD	RSEOR	8CB04570
023E 0 9400 01C9	S	L RSLAH	8CB04580
0240 0 F600 0274	EOR L2	TBL&7	8CB04590
0242 0 4C18 024A	BSC L	RSDDL,&-	8CB04600
0244 0 73C1	MDX 3	1	8CB04610
0245 0 72C1	MDX 2	1	8CB04620
0246 0 70F6	MDX	RSDDC	8CB04630
0247 0 C024	LD	TBL1	8CB04640
0248 0 D024	STO	TBL	8CB04650
0249 0 70C1	MDX	RSDDL&1	8CB04660
024A 0 6B22	RSDDL STX 3	TBL	8CB04670
024B 0 C021	LD	TBL	8CB04680
024C 0 67C0 0000	RSDDA LDX L3	0	8CB04690
024E 0 66C0 0000	LDX L2	0	8CB04700
0250 0 1890	SRT	16	8CB04710
0251 0 C00F	LD	RSARB	8CB04720
0252 0 300B	WAITB WAIT	/B	8CB04730
0253 0 6500 0000	RSERW LDX L1	0	8CB04740
			8CB04750
			8CB04760
			8CB04770

PROG END 0-9 CORES
LOOP PROG IF SW11 ON

PROGRAM END
LINK TO NEXT PROG

RETURN ADDRESS FOR ERROR

CK LCOP ON ADDR SW

CONTINUE IF 8 OFF

CK BYPASS PRINT SW

ERROR
CK HALT ON ERR SW 14

STORE INDEX REG 1

CORRECT I REG

0-9 CORE FUNCTION TEST

0255 0 4C80 0217	BSC I	RSEOR	8CB04780
0257 0 C013	RSILC LD	RSALT	8CB04790
0258 0 3006	RSWSC WAIT	6	8CB04800
0259 0 6400 0131	LOX L	RSSTA	8CB04810
* STORAGE AREAS-2			
* BSS E 2			
025C 00C2	RSRBS DC	RSBSB	8CB04820
025E 0 0260	DC	/3A40	8CB04830
025F 0 3A40	RSBSB DC	0	8CB04840
0260 0 0000	RSARB DC	0	8CB04850
0261 0 0000	RSB10 DC	/0004	8CB04860
0262 0 0004	RSB11 DC	/0080	8CB04870
0263 0 0080	RSB12 DC	/0002	8CB04880
0264 0 00C2	RSB13 DC	/0020	8CB04890
0265 0 0020	RSB14 DC	/0010	8CB04900
0266 0 0010	RSPPC DC	0	8CB04910
0267 0 0000	RSNPP DC	50	8CB04920
0268 0 0032	RSKXA DC	/0086	8CB04930
0269 0 0086	RSKXB DC	/0086	8CB04940
026A 0 0086	RSALT DC	/5555	8CB04950
026B 0 5555	TBL1 DC	/FFFF	8CB04960
026C 0 FFFF	TBL DC	0	8CB04970
026D 0 0000	DC	DATE1	8CB04980
026E 0 018A	DC	DATE2	8CB04990
026F 0 0198	DC	DATE3	8CB05000
0270 0 01A6	DC	DATE4	8CB05010
0271 0 01B6	DC	DATE5	8CB05020
0272 0 01E3	DC	DATE6	8CB05030
0273 0 01F3	DC	DATE6	8CB05040
* CHECK SWITCH 13 TO LOOP ON ROUTINE			
0274 0 0000	RSLOP DC	0	8CB05050
0275 0 C400 01C4	LD L	RSLAC	8CB05060
0277 0 F400 01C8	EOR L	RSLAG	8CB05070
0279 0 4C18 0285	BSC L	RSCSE,&-	8CB05080
027B 0 C400 01C4	LD L	RSLAC	8CB05090
027D 0 8400 01C9	A L	RSLAH	8CB05100
027F 0 D400 01C4	STO L	RSLAC	8CB05110
0281 0 74FD 0274	MDX L	RSLOP,-3	8CB05120
0283 0 4C80 0274	BSC I	RSLOP	8CB05130
0285 0 C400 01C3	RSCSE LD L	RSLAA	8CB05140
0287 0 D400 01C4	STO L	RSLAC	8CB05150
0289 0 08D4	XIO	RSRBS	8CB05160
028A 0 C0D5	LD	RSBSB	8CB05170
028B 0 E0D9	AND	RSB13	8CB05180
028C 0 4C98 0274	BSC I	RSLOP,&-	8CB05190
028E 0 74FD 0274	MDX L	RSLOP,-3	8CB05200
0290 0 4C80 0274	BSC I	RSLOP	8CB05210
***** LOG ROUTINE *****			
0292 0 0000	LOG DC	0	8CB05220
0293 0 681C	STX 3	LOG06&1	8CB05230
0294 0 0CC0 025E	XIO L	RSRBS	8CB05240
0296 0 C400 0260	LD L	RSBSB	8CB05250
0298 0 1009	SLA	9	8CB05260
0299 0 4C10 02B5	BSC L	TWRTR,-	8CB05270
* BRANCH IF 1053 OUTPUT			
029B 0 C480 0292	LD I	LOG	8CB05280
029D 0 D052	STO	PRWRT	8CB05290
* GET MESSAGE ADDRESS SET IN IOCC			
029E 0 084D	LOG02 XIO	PRSNS	8CB05300
029F 0 4C04 02A5	BSC L	LOG03,E	8CB05310
02A1 0 1801	SRA	1	8CB05320
02A2 0 4C04 02A7	BSC L	LOG04,E	8CB05330
* CHECK PRINTER READY BRANCH IF NOT READY			
* BRANCH IF BUSY			

BIT SWITCH BUFFER
SAVE A REG BUFFER

CONSTANT
STORAGE

LOAD LOWEST ADDRESS

CK LOOP RT SW 10

0-9 CORE FUNCTION TEST

02A4 0 7004	MDX	LOG05	READY AND NOT BUSY	8CB05460
02A5 0 3007	* LOG03	WAIT 7	NOT READY	8CB05470
02A6 0 70F7	MDX	LOG02	CHECK AGAIN	8CB05480
02A7 0 3009	* LOG04	WAIT 9	BUSY	8CB05500
02A8 0 70F5	MDX	LOG02	CHECK AGAIN	8CB05510
02A9 0 0846	* LOG05	XIO PRWRT	OUTPUT MESSAGE	8CB05520
02AA 0 0843	* XIO	PRSN	CHECK FOR CP COMPLT	8CB05530
02AB 0 1002	SLA	2		8CB05540
02AC 0 4810	BSC	-		8CB05550
02AD 0 70FC	MDX	*-4		8CB05560
02AE 0 083D	XIO	PRSNS	RESET DSW	8CB05570
				8CB05580
				8CB05590
				8CB05600
				8CB05610
				8CB05620
				8CB05630
02AF 0 67C0 0000	* LOG06	L3 0	RESTORE IX 3	8CB05640
02B1 0 7401 0292	MDX	L LOG,1	BUMP RETURN	8CB05650
02B3 0 4C80 0292	* BSC	I LOG	RETURN TO USER	8CB05660
02B5 0 1010	* TWRTR	SLA 16		8CB05670
02B6 0 D032	STO	WRDSW		8CB05680
02B7 0 083A	XIO	TWSNS	CHECK IF TYPEWRITER	8CB05690
02B8 0 1005	SLA	5	READY	8CB05700
02B9 0 18CF	SRA	15		8CB05710
02BA 0 4C18 02BE	BSC	L TWR01,&-		8CB05720
02BC 0 300A	* WAITA	WAIT /A	NOT READY	8CB05730
02BD 0 70F9	MDX	TWRTR&2		8CB05740
02BE 0 C028	* TWR01	LD TWRTO	CARRAIGE RETURN AND	8CB05750
02BF 0 D02A	STO	IOARA	LINE SPACE TO IO ARA	8CB05760
02C0 0 0833	* XIO	TWVRT	CARG RETURN/LINE SP.	8CB05770
02C1 0 0830	* XIO	TWSNS	HANG TILL NOT BUSY	8CB05780
02C2 0 180B	SRA	11		8CB05790
02C3 0 4804	BSC	E		8CB05800
02C4 0 70FC	MDX	*-4		8CB05810
02C5 0 63C1	* LDX	3 1	BYPASS 1443 WORD COUNT	8CB05820
02C6 0 C480 0292	LD	I LOG	GET MESSAGE ADDRESS	8CB05830
02C8 0 D001	STO	TWR02&1		8CB05840
02C9 0 C700 0000	* TWR02	LD L3 0	GET WORD TO PRINT	8CB05850
02CB 0 D400 0326	STO	L CODWD	SET IN CONVERSION RT	8CB05860
02CD 0 F01A	EOR	TWRT1	CHECK IF TERMINATOR	8CB05870
02CE 0 4C18 02AF	BSC	L LOG06,&-	BRANCH IF TERMINATOR	8CB05880
02D0 0 4400 02F6	* BSI	L CODCV	GO CONVERT 43 TO TW SRC	8CB05890
02D2 0 C400 0326	* LD	L CODWD		8CB05900
02D4 0 D015	STO	IOARA		8CB05910
02D5 0 081E	* XIOWR	XIO TWVRT	WRITE CHARACTER	8CB05920
02D6 0 081B	* XIOSN	XIO TWSNS	HANG ON BUSY	8CB05930
02D7 0 180B	SRA	11		8CB05940
02D8 0 4804	BSC	E		8CB05950
02D9 0 70FC	MDX	XIOSN	BUSY	8CB05960
				8CB05970
				8CB05980
				8CB05990
				8CB06000
				8CB06010
				8CB06020
				8CB06030
				8CB06040
				8CB06050
				8CB06060
				8CB06070
				8CB06080
				8CB06090
				8CB06100
				8CB06110
				8CB06120
				8CB06130

0-9 CORE FUNCTION TEST

02DA 0 C00E	* LD	WRDSW	CHECK IF IST 1/2 WORD	8CB06140
02DB 0 4804	BSC	E	GET 1/2 WORD SWITCH	8CB06150
02DC 0 7006	MDX	TWR03	GO SET UP NEXT WORD	8CB06160
02DD 0 C00C	* LD	ICARA		8CB06170
02DE 0 1008	SLA	8	SET UP FOR 2ND 1/2 WORD	8CB06180
02DF 0 D00A	STC	IOARA	POSITION 2ND 1/2 WD	8CB06190
02E0 0 7401 02E9	MDX	L WRDSW,1	BUMP WORD SWITCH	8CB06200
02E2 0 70F2	MDX	XIOWR	GO WRITE 2ND 1/2 WD	8CB06210
02E3 0 7301	* TWR03	MDX 3 1	SET UP FOR NEXT WORD	8CB06220
02E4 0 74C1 02E9	MDX	L WRDSW,1	NEXT WORD INDEX	8CB06230
02E6 0 70E2	MDX	TWR02	BUMP WORD SWITCH	8CB06240
02E7 0 8103	* TWRTO	DC /8103	GO GET NEXT WORD	8CB06250
02E8 0 FFFF	TWRT1	DC /FFFF	LOG CONSTANTS	8CB06260
02E9 0 0000	WRDSW	DC 0		8CB06270
02EA 0 0000	IOARA	DC 0	LINE SP/CARRAIGE RTN	8CB06280
02EC 0000	* BSS	E 0	TERMINATOR	8CB06290
02EC 0 0000	PRSNS	DC /0000	1/2 WORD SWITCH	8CB06300
02ED 0 3701	DC	/3701	OUTPUT AREA	8CB06310
02EE 0 00C0	PRSN	DC 0		8CB06320
02EF 0 3700	DC	/3700	PRINTER SENSE IOCC	8CB06330
02F0 0 00C0	PRWRT	DC /0000	NON RESET SENSE	8CB06340
02F1 0 3500	DC	/3500	PRINTER WRITE IOCC	8CB06350
02F2 0 0000	TWSNS	DC /0000		8CB06360
02F3 0 0F01	DC	/0F01	TYPEWTR SENSE IOCC	8CB06370
02F4 0 02EA	TWVRT	DC IOARA	DSW RESET	8CB06380
02F5 0 0900	DC	/0900	TYPEWTR WRITE IOCC	8CB06390
02F6 0 0000	* CODCV	DC 0	WR TYPEWRITER	8CB06400
02F7 0 6927	STX	1 CODC4&1		8CB06410
02F8 0 6A28	STX	2 CODC4&3	*****	8CB06420
02F9 0 6B29	STX	3 CODC4&5	1443 CODE TO 1816/1053 *	8CB06430
02FA 0 1010	* SLA	16	CODE CONVERSION ROUTINE *	8CB06440
02FB 0 D02B	STO	LHIND	*****	8CB06450
02FC 0 6300	LDX	3 0		8CB06460
02FD 0 C028	* CODC1	LD CODWD	SAVE INDEX REGS	8CB06470
02FE 0 1890	SRT	16		8CB06480
02FF 0 C027	LD	LHIND		8CB06490
0300 0 4820	BSC	Z	GET WORD TO CONVERT	8CB06500
0301 0 1088	SLT	8	SET IN Q	8CB06510
0302 0 1010	* SLA	16	SKIP IF LEFT HALF	8CB06520
0303 0 1084	SLT	4	POSITION RIGHT HALF	8CB06530
0304 0 D023	STO	COD00		8CB06540
0305 0 6580 0328	LDX	I1 COD00	ZONE TO ACCUM	8CB06550
0307 0 1010	* SLA	16		8CB06560
0308 0 1084	SLT	4	IX 1 # ZONE	8CB06570
0309 0 D01E	STO	COD00	DIGIT TO ACCUM	8CB06580
				8CB06590
				8CB06600
				8CB06610
				8CB06620
				8CB06630
				8CB06640
				8CB06650
				8CB06660
				8CB06670
				8CB06680
				8CB06690
				8CB06700
				8CB06710
				8CB06720
				8CB06730
				8CB06740
				8CB06750
				8CB06760
				8CB06770
				8CB06780
				8CB06790
				8CB06800
				8CB06810

0-9 CORE FUNCTION TEST

```

030A 0 6680 0328      LDX  I2 COD00      IX 2 # DIGIT      8CB06820
*                               8CB06830
030C 0 C500 032B      LD   L1 ZONE      GET ZONE TABLE ADDR 8CB06840
030E 0 D001           STO  CODC2&1     SET IN CONVERSION WD 8CB06850
*                               8CB06860
030F 0 C600 0000      CODC2 LD  L2 0      GET CONVERTED CODE 8CB06870
0311 0 D700 0329      STO  L3 COD01     8CB06880
*                               8CB06890
0313 0 C013           LD   LHIND        8CB06900
0314 0 4C20 031A      BSC  L  CODC3,Z   BRNCH IF RIGHT HALF 8CB06910
0316 0 7401 0327      MDX  L  LHIND,1   8CB06920
0318 0 73C1           MDX  3 1          8CB06930
0319 0 70E3           MDX  CODC1        GO CONVERT RIGHT HLF 8CB06940
*                               8CB06950
031A 0 COCE          CODC3 LD  COD01     PACK CONVERTED CODES 8CB06960
031B 0 1008           SLA  8            8CB06970
031C 0 E8CD          OR   COD02        8CB06980
031D 0 D008           STO  CODWD        8CB06990
*                               8CB07000
031E 0 6500 0000      CODC4 LDX L1 0     RESTORE INDEX REGS 8CB07010
0320 0 6600 0000      LDX  L2 0         8CB07020
0322 0 6700 0000      LDX  L3 0         8CB07030
*                               8CB07040
0324 0 4C80 02F6      BSC  I  CODCV     RETURN TO USER      SX 8CB07050
*                               8CB07060
*                               8CB07070
*                               8CB07080
*                               8CB07090
*                               8CB07100
0326 0 0000          CODWD DC  0        WORD LOCATION      8CB07110
0327 0 0000          LHIND DC  0        LEFT HALF INDICATOR 8CB07120
0328 0 0000          COD00 DC  0        WORK AREA          8CB07130
0329 0 00C0          COD01 DC  0        CONVERTED LH CHARACT 8CB07140
032A 0 0000          COD02 DC  0        CONVERTED RH CHARACT 8CB07150
*                               8CB07160
*                               8CB07170
*                               8CB07180
*                               8CB07190
*                               8CB07200
*                               8CB07210
*                               8CB07220
*                               8CB07230
*                               8CB07240
*                               8CB07250
*                               8CB07260
*                               8CB07270
*                               8CB07280
*                               8CB07290
*                               8CB07300
*                               8CB07310
*                               8CB07320
*                               8CB07330
*                               8CB07340
*                               8CB07350
*                               8CB07360
*                               8CB07370
*                               8CB07380
*                               8CB07390
*                               8CB07400
*                               8CB07410
*                               8CB07420
*                               8CB07430
*                               8CB07440
*                               8CB07450
*                               8CB07460
*                               8CB07470
*                               8CB07480
*                               8CB07490

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1443 TO 1816/1053 CODE
CONVERSION TABLES

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032B 0 032F          ZONE DC  ZCNE1     NO ZONE
032C 0 033A          DC  ZCNE1     0 ZONE
032D 0 0345          DC  ZONE2     11 ZONE
032E 0 034F          DC  ZONE3     12 ZONE
*
032F 0 0021          ZONEN DC  /0021   SPACE
0330 0 00FC          DC  /00FC     1
0331 0 00D8          DC  /00D8     2
0332 0 00DC          DC  /00DC     3
0333 0 00F0          DC  /00F0     4
0334 0 00F4          DC  /00F4     5
0335 0 00D0          DC  /00D0     6
0336 0 00D4          DC  /00D4     7
0337 0 00E4          DC  /00E4     8
0338 0 00E0          DC  /00E0     9
0339 0 00C4          DC  /00C4     0
033A 0 0000          ZONE1 DC  0
033B 0 00C0          DC  0
033C 0 009A          DC  /009A     S
033D 0 009E          DC  /009E     T
033E 0 00B2          DC  /00B2     U
033F 0 00B6          DC  /00B6     V
0340 0 0092          DC  /0092     W
0341 0 0096          DC  /0096     X
0342 0 00A6          DC  /00A6     Y
0343 0 00A2          DC  /00A2     Z
0344 0 0021          DC  /0021     SPACE
0345 0 0000          ZONE2 DC  0
0346 0 007E          DC  /007E     J
0347 0 005A          DC  /005A     K

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0-9 CORE FUNCTION TEST

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0348 0 005E          DC  /005E     L      8CB07500
0349 0 0072          DC  /0072     M      8CB07510
034A 0 0076          DC  /0076     N      8CB07520
034B 0 0052          DC  /0052     O      8CB07530
034C 0 0056          DC  /0056     P      8CB07540
034D 0 0066          DC  /0066     Q      8CB07550
034E 0 0062          DC  /0062     R      8CB07560
034F 0 0000          ZONE3 DC  0      8CB07570
0350 0 003E          DC  /003E     A      8CB07580
0351 0 001A          DC  /001A     B      8CB07590
0352 0 001E          DC  /001E     C      8CB07600
0353 0 0032          DC  /0032     D      8CB07610
0354 0 0036          DC  /0036     E      8CB07620
0355 0 0012          DC  /0012     F      8CB07630
0356 0 0016          DC  /0016     G      8CB07640
0357 0 0026          DC  /0026     H      8CB07650
0358 0 0022          DC  /0022     I      8CB07660
0359 0 0086          DC  /0086     O ERROR 8CB07670
035A 0 0000          DC  /0000     PERIOD 8CB07680
*                               8CB07690
035B 0 000C          MES12 DC  12     WORD C 8CB07700
035C 0 1213          DC  /1213     ST      8CB07710
035D 0 3129          DC  /3129     AR      8CB07720
035E 0 1300          DC  /1300     T       8CB07730
035F 0 0A00          DC  /0A00     O       8CB07740
0360 0 1338          DC  /1338     TH      8CB07750
0361 0 2914          DC  /2914     RU      8CB07760
0362 0 0009          DC  /0009     9       8CB07770
0363 0 0033          DC  /0033     C       8CB07780
0364 0 2629          DC  /2629     OR      8CB07790
0365 0 3500          DC  /3500     E       8CB07800
0366 0 1335          DC  /1335     TE      8CB07810
0367 0 1213          DC  /1213     ST      8CB07820
0368 0 FFFF          DC  /FFFF     TERM   8CB07830
*                               8CB07840
0369 0 000B          MES13 DC  11     WORD C 8CB07850
036A 0 3525          DC  /3525     EN      8CB07860
036B 0 3400          DC  /3400     D       8CB07870
036C 0 0A00          DC  /0A00     O       8CB07880
036D 0 1338          DC  /1338     TH      8CB07890
036E 0 2914          DC  /2914     RU      8CB07900
036F 0 0009          DC  /0009     9       8CB07910
0370 0 0033          DC  /0033     C       8CB07920
0371 0 2629          DC  /2629     OR      8CB07930
0372 0 3500          DC  /3500     E       8CB07940
0373 0 1335          DC  /1335     TE      8CB07950
0374 0 1213          DC  /1213     ST      8CB07960
0375 0 FFFF          DC  /FFFF     TERM   8CB07970
*                               8CB07980
0376 0 0003          MES14 DC  3       WD CT 8CB07990
0377 0 3529          DC  /3529     ER      8CB08000
0378 0 2926          DC  /2926     RO      8CB08010
0379 0 2900          DC  /2900     R       8CB08020
037A 0 FFFF          DC  /FFFF     TERM   8CB08030
*                               8CB08040
037C 0 012D          END  RSSTB      8CB08050
NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY

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CCDCV 02F6 02D0 0324
 CCDC1 02FD 0319
 CODC2 030F 030E
 CODC3 031A 0314
 CODC4 031E 02F7 02F8 02F9
 CODWD 0326 02CB 02D2 02FD 031D
 COD00 0328 0304 0305 0309 030A
 COD01 0329 0311 031A
 COD02 032A 031C
 DATE1 018A 026E
 DATE2 0198 026F
 DATE3 01A6 0270
 DATE4 0186 0271
 DATE5 01E3 0272
 DATE6 01F3 0273
 ICARA 02EA 02BF 02D4 02DD 02DF 02F4
 LHIND 0327 02FB 02FF 0313 0316
 LOG 0292 015A 0202 022E 0298 02B1 02B3 02C6
 LOG02 029E 02A6 02A8
 LCG03 02A5 029F 3007
 LOG04 02A7 02A2 3009
 LCG05 02A9 02A4
 LOG06 02AF 0293 02CE
 MES12 035B 015C
 MES13 0369 0204
 MES14 0376 0230
 PRSN 02EE 02AA
 PRSNS 02EC 029E 02AE
 PRWRT 02F0 029D 02A9
 RSAAN 017E 012D
 RSALT 026B 0257
 RSARB 0261 021A 0251
 RSBIL 018E 018A
 RSBBS 0260 0154 01FE 0206 021C 0222 022A 0232 025E 028A 0296
 RSBTB 0211 01F8
 RSBYP 0205 0200
 RSB10 0262 0156 01FF 0228
 RSB11 0263 021D
 RSB12 0264 0233
 RSB13 0265 0288
 RSB14 0266 0207
 RSCSE 0285 0279
 RSDDA 024C 0218 0219
 RSDDC 023D 0246
 RSDDL 024A 0242 0249
 RSDKW 0130 3003
 RSDMS 015D 0158
 RSD18 0178 0145
 RSEOR 0217 0188 0196 01A4 01B4 01E1 01F1 0220 0227 0236 023D 0255
 RSERW 0253 0238
 RSHOE 0238 0234
 RSILC 0257 0225
 RSKXA 0269 0223
 RSKXB 026A 0224
 RSLAA 01C3 0137 016D 0285
 RSLAB 01C2
 RSLAC 01C4 016F 0182 0184 018E 0190 0198 019C 019E 01A0 01A3 01AC 01AE 01D6
 01D9 01DB 01DD 01E7 01E9 01EB 0239 0275 027B 027F 0287
 RSLAD 01C5 0181 01D5
 RSLAE 01C6 0139 018D 0192 0195 01CC 01DA 01E8 01ED 01F0
 RSLAF 01C7 01AA 01AB 0180 0183 01B7 01B9
 RSLAG 01C8 0173 0277
 RSLAH 01C9 023E 027D
 RSLAI 01CA 01A9
 RSLAJ 01CB 0135
 RSLAQ 01C1
 RSL0P 0274 018B 0199 01A7 01BE 01E4 01F4 0281 0283 028C 028E 0290
 RSNPP 0268 0131

RSPER 01F6 01D3
 RSPES 01FD 0215
 RSPPC 0267 0133 01F6
 RSQAW 020A 3005
 RSQ01 018B 0186
 RSQ02 0199 0193
 RSQ03 01A7 01A1
 RSQ04 01B7 01B1
 RSQ05 01E4 01DF
 RSQ06 01F4 01EE
 RSRBS 025E 0143 0152 01FD 0205 0218 0229 0231 0289 0294
 RRSI 0213 0210
 RRSX 0210 01F9
 RSR01 0181 018A 0211
 RSR02 018D 0198
 RSR03 019B 01A6
 RSR04 01AB 0186 018C
 RSR05 01D5 01E3
 RSR06 01E6 01F3
 RSR18 0176 0142
 RSSBT 0222 021E
 RSSIC 020E 0214
 RSSPT 01CC 01C0
 RSSTA 0131 017E 0208 0259
 RSSTB 012D 037C
 RSS12 0231 022C
 RST18 0177 0148
 RSVBB 01A9 018D
 RSWSC 0258 3006
 RSZRO 0179
 RS113 0152 0140
 STGCK 0165 015E
 STGLP 0160 0167
 TBL 026D 0240 0248 024A 024B
 TBL1 026C 0247
 TWRTR 02B5 0299 02BD
 TWRTO 02E7 02BE
 TWRT1 02E8 02CD
 TWR01 02BE 02BA
 TWR02 02C9 02C8 02E6
 TWR03 02E3 02DC
 TWSNS 02F2 0146 02B7 02C1 02D6
 TWVRT 02F4 0149 02C0 02D5
 WAITA 02BC 300A
 WAITB 0252 300B
 WAITC 0180 014C 0175 300C
 WAITD 01FC 0150 300D
 WAITO 017A 0148
 WAIT1 017B 014E
 WRDSW 02E9 02B6 02DA 02E0 02E4
 XIOSN 02D6 02D9
 XIDWR 02D5 02E2
 ZONE 032B 030C
 ZONEN 032F 032B
 ZONE1 033A 032C
 ZONE2 0345 032D
 ZONE3 034F 032E
 END OF ASSEMBLY

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

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3001 ABS 8CC00020
      DRG /3001 8CC00030
***** 8CC00040
B-REG I-REG * PROG WAITS COMMENTS 8CC00050
***** 8CC00060
3001 0 7A60 * DC RSCCH&1 CAR CHECK ERROR-A 8CC00070
          *          * FALSE CAR CHECK HAS 8CC00080
          *          * OCCURRED-RUN THE CAR 8CC00090
          *          * CHECK PROGRAM. 8CC00100
          *          * 8CC00110
          *          * 8CC00120
          *          * 8CC00130
3002 0 7A60 * DC RSCCH&1 STORAGE PROTECT 8CC00140
          *          * VIOLATION. 8CC00150
          *          * 8CC00160
          *          * USE THE Q REG TO FURTHER 8CC00170
          *          * IDENTIFY THE ERROR. TO 8CC00180
          *          * CONTINUE THE TEST, PRESS 8CC00190
          *          * THE START BUTTON. 8CC00200
          *          * ***** 8CC00210
          *          * Q-REG COMMENTS 8CC00220
          *          * 8CC00230
          *          * 0001 ROUTINE TO READ AND WRITE 8CC00240
          *          * IN EACH CORE LOCATION FAILED. 8CC00250
          *          * 8CC00260
          *          * THE ACCUMULATOR AND INDEX 8CC00270
          *          * REGISTER 1 SHOW THE ADDRESS 8CC00280
          *          * BEING WRITTEN WHEN THE SPV 8CC00290
          *          * OCCURRED. 8CC00300
          *          * ***** 8CC00310
          *          * 8CC00320
          *          * 0002 BIT BY BIT ISOLATION FAILED. 8CC00330
          *          * 8CC00340
          *          * THE ACCUMULATOR SHOWS THE 8CC00350
          *          * CORRECT PATTERN. 8CC00360
          *          * 8CC00370
          *          * INDEX REGISTER 1 SHOWS THE 8CC00380
          *          * CORE LOCATION WHICH FAILED. 8CC00390
          *          * ***** 8CC00400
          *          * 8CC00410
          *          * 0003 BIT BY BIT ISOLATION FAILED. 8CC00420
          *          * 8CC00430
          *          * THE ACCUMULATOR SHOWS THE 8CC00440
          *          * CORRECT PATTERN. 8CC00450
          *          * 8CC00460
          *          * INDEX REGISTER 1 SHOWS THE 8CC00470
          *          * CORE LOCATION WHICH FAILED. 8CC00480
          *          * ***** 8CC00490
          *          * 8CC00500
          *          * 0004 WORST CASE PATTERN ROUTINE 8CC00510
          *          * FAILED. 8CC00520
          *          * 8CC00530
          *          * INDEX REGISTER 2 SHOWS THE 8CC00540
          *          * CORRECT DATA PATTERN. 8CC00550
          *          * 8CC00560
          *          * INDEX REGISTER 1 SHOWS THE 8CC00570
          *          * CORE LOCATION WHICH FAILED. 8CC00580
          *          * ***** 8CC00590
          *          * 8CC00600
          *          * 0005 WORST CASE PATTERN ROUTINE 8CC00610
          *          * FAILED. 8CC00620
          *          * 8CC00630
          *          * INDEX REGISTER 3 SHOWS THE 8CC00640
          *          * CORRECT PATTERN. 8CC00650
          *          * 8CC00660
          *          * INDEX REGISTER 1 SHOWS THE 8CC00670
          *          * CORE LOCATION WHICH FAILED. 8CC00680
          *          * ***** 8CC00690

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***** 8CC00700
0006 WORST CASE PATTERN ROUTINE 8CC00710
      FAILED. 8CC00720
      8CC00730
      THE CORRECT DATA PATTERN 8CC00740
      IS 0000. 8CC00750
      8CC00760
      INDEX REGISTER 1 SHOWS THE 8CC00770
      CORE LOCATION WHICH FAILED. 8CC00780
      ***** 8CC00790
      8CC00800
0007 WRITE ZFROS IN PROTECTED 8CC00810
      AREA OF ONE, FAILED. 8CC00820
      8CC00830
      THE CORRECT DATA PATTERN 8CC00840
      IS FFFF. 8CC00850
      8CC00860
      INDEX REGISTER 1 CONTAINS 8CC00870
      THE CORE LOCATION WHICH 8CC00880
      FAILED. 8CC00890
      ***** 8CC00900
      8CC00910
0008 UNPROTECT AND CLEAR CORE 8CC00920
      OF ONES ROUTINE FAILED. 8CC00930
      8CC00940
      THE CORRECT PATTERN IS 0000. 8CC00950
      8CC00960
      INDEX REGISTER 1 CONTAINS 8CC00970
      THE CORE LOCATION WHICH 8CC00980
      FAILED. 8CC00990
      ***** 8CC01000
      8CC01010
      NOTE 8CC01020
      8CC01030
      IF THE Q REGISTER CONTAINS 8CC01040
      ANY OTHER VALUE, RUN THE 8CC01050
      HIGH CORE TEST. 8CC01060
      ***** 8CC01070
B-REG I-REG * PROG WAITS COMMENTS 8CC01080
***** 8CC01090
3003 0 7805 * DC RSDKW&1 WAIT FOR SWITCHES. 8CC01100
          *          * 8CC01110
          *          * 1. SET REQUIRED SWITCHES 8CC01120
          *          * 8CC01130
          *          * 8CC01140
          *          * A. OPERATOR MONITOR-OFF 8CC01150
          *          * B. DISABLE INTERRUPT-OFF 8CC01160
          *          * C. CHECK STOP-OFF 8CC01170
          *          * D. WRITE STORAGE 8CC01180
          *          * PROTECT-YES 8CC01190
          *          * E. ANY DESIRED DATA 8CC01200
          *          * ENTRY SWITCHES. 8CC01210
          *          * 8CC01220
          *          * B14- BYPASS ERROR WAIT 8CC01230
          *          * B13- BYPASS PRINTING 8CC01240
          *          * B11- LOOP SUBPROGRAM 8CC01250
          *          * B10- LOOP ROUTINE 8CC01260
          *          * B10- LOOP ROUTINE 8CC01270
          *          * B 9- OUTPUT ON 1443 8CC01280
          *          * B 8- LOOP ADDRESS 8CC01290
          *          * 8CC01300
          *          * 2. PUSH START PROGRAM 8CC01310
          *          * SHOULD LOAD 8CC01320
          *          * ***** 8CC01330
          *          * 8CC01340
          *          * DC RSCCH&1 PARITY ERROR. 8CC01350
          *          * 8CC01360
          *          * A. DETERMINE CORE LOCATION 8CC01370

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*          THAT CAUSED PARITY ERROR          8CC01380
*          BY-                               8CC01390
*          1. SET CHECK STOP SWITCH          8CC01400
*          TO ON.                            8CC01410
*          2. SET STORAGE PROTECT           8CC01420
*          SWITCH TO NO.                     8CC01430
*          3. SET MODE SWITCH TO            8CC01440
*          DISPLAY.                          8CC01450
*          4. HOLD CLEAR STORAGE            8CC01460
*          BUTTON DOWN AND PRESS             8CC01470
*          START BUTTON.                     8CC01480
*          8CC01490
*          8CC01500
*          B. IF THE SYSTEM DOES NOT        8CC01510
*          STOP A FALSE PARITY              8CC01520
*          CONDITION OCCURRED. THIS         8CC01530
*          INDICATES A PROBLEM IN          8CC01540
*          THE PARITY DETECTION             8CC01550
*          CIRCUITRY OR THE B               8CC01560
*          REGISTER.                        8CC01570
*          8CC01580
*          C. IF A PARITY ERROR IS           8CC01590
*          DETECTED LOOK AT THE             8CC01600
*          STORAGE ADDRESS REGISTER.        8CC01610
*          IF IT IS BETWEEN LOCATIONS      8CC01620
*          AND RUN THE HIGH CORE TEST.     8CC01630
*          8CC01640
*          D. IF THE PARITY IS NOT IN       8CC01650
*          HIGH CORE USE THE Q              8CC01660
*          REGISTER TO FURTHER              8CC01670
*          IDENTIFY THE ERROR.              8CC01680
*          8CC01690
*          E. TO RETURN TO THE TESTING      8CC01700
*          SEQUENCE SET THE I REGISTER      8CC01710
*          TO THE ADRS OF WAIT 4 %ABOVEK    8CC01720
*          AND PRESS START.                 8CC01730
*          *****
*          Q-REG COMMENTS                   8CC01740
*          8CC01750
*          8CC01760
*          0009 ROUTINE TO READ AND WRITE    8CC01770
*          ADDRESS IN EACH CORE LOCATION    8CC01780
*          FAILED.                          8CC01790
*          8CC01800
*          THE ACCUMULATOR SHOWS THE       8CC01810
*          INCORRECT DATA.                 8CC01820
*          8CC01830
*          INDEX REGISTER 1 SHOWS           8CC01840
*          CORRECT DATA.                   8CC01850
*          *****
*          8CC01860
*          8CC01870
*          000A ROUTINE TO SET ALL CORE      8CC01880
*          LOCATIONS TO ZERO FAILED.        8CC01890
*          8CC01900
*          THE CORRECT PATTERN IS 0000.     8CC01910
*          8CC01920
*          THE ACCUMULATOR SHOWS THE       8CC01930
*          INCORRECT DATA.                 8CC01940
*          *****
*          8CC01950
*          8CC01960
*          000B BIT BY BIT ISOLATION TEST   8CC01970
*          FAILED.                          8CC01980
*          8CC01990
*          INDEX REGISTER 2 SHOWS THE        8CC02000
*          CORRECT DATA.                   8CC02010
*          8CC02020
*          THE ACCUMULATOR SHOWS THE       8CC02030
*          INCORRECT DATA.                 8CC02040
*          *****
*          8CC02050

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*          000C WORST CASE PATTERN ROUTINE 8CC02060
*          FAILED.                          8CC02070
*          8CC02080
*          8CC02090
*          THE CORRECT PATTERN IS          8CC02100
*          EITHER 0000 OR FFFF.            8CC02110
*          8CC02120
*          THE ACCUMULATOR SHOWS THE      8CC02130
*          INCORRECT DATA.                8CC02140
*          *****
*          8CC02150
*          8CC02160
*          000D WRITE ZEROS ON STORAGE      8CC02170
*          PROTECTED AREA OF FFFF          8CC02180
*          ROUTINE FAILED.                 8CC02190
*          8CC02200
*          FAILURE OCCURRED WHILE          8CC02210
*          EXECUTING A WRITE STORAGE        8CC02220
*          PROTECT BIT INSTRUCTION.         8CC02230
*          8CC02240
*          THE CORRECT PATTERN IS FFFF.     8CC02250
*          8CC02260
*          THE ACCUMULATOR IS              8CC02270
*          MEANINGLESS.                     8CC02280
*          *****
*          8CC02290
*          8CC02300
*          000E WRITE ZEROS ON STORAGE      8CC02310
*          PROTECTED AREA OF FFFF          8CC02320
*          ROUTINE FAILED.                 8CC02330
*          8CC02340
*          THE CORRECT PATTERN IS FFFF.     8CC02350
*          8CC02360
*          THE ACCUMULATOR SHOWS THE      8CC02370
*          INCORRECT DATA.                8CC02380
*          *****
*          8CC02390
*          8CC02400
*          000F WRITE ZEROS ON STORAGE      8CC02410
*          PROTECTED AREA OF FFFF          8CC02420
*          ROUTINE FAILED.                 8CC02430
*          8CC02440
*          THE FAILURE OCCURRED WHILE      8CC02450
*          EXECUTING A CLEAR STORAGE        8CC02460
*          PROTECT BIT INSTRUCTION.         8CC02470
*          8CC02480
*          THE CORRECT PATTERN IS FFFF.     8CC02490
*          8CC02500
*          THE ACCUMULATOR IS              8CC02510
*          MEANINGLESS.                     8CC02520
*          *****
*          8CC02530
*          8CC02540
*          0010 UNPROTECT AND CLEAR MEMORY   8CC02550
*          OF ONES ROUTINE FAILED.         8CC02560
*          8CC02570
*          THE CORRECT PATTERN IS 0000.     8CC02580
*          8CC02590
*          THE ACCUMULATOR SHOWS THE      8CC02600
*          INCORRECT DATA.                 8CC02610
*          *****
*          8CC02620
*          B-REG I-REG * PROG WAITS COMMENTS 8CC02630
*          *****
*          8CC02640
*          8CC02650
*          3005 0 79F4 DC RSQAW&1 PROGRAM END. 8CC02660
*          *****
*          8CC02670
*          8CC02680
*          3006 0 7AF2 DC RSWSC&1 ILLEGAL COMBINATION 8CC02690
*          OF DATA ENTRY SWITCHES.        8CC02700
*          8CC02710
*          %SW 13 ON, SW 14 ON AND         8CC02720
*          SW 8 OFF<                       8CC02730

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LOW CORE FUNCTION TEST

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*
*          PUSH START TO RERUN          8CC02740
*          THE PROGRAM.                  8CC02750
*          *****                      8CC02760
*          *****                      8CC02770
3007 0 7B08      DC      LOG0361  1443 NOT READY. 8CC02780
*          *****                      8CC02790
*          MAKE 1443 READY AND          8CC02800
*          PUSH START.                  8CC02810
*          *****                      8CC02820
*          *****                      8CC02830
3008 0 7A60      DC      RSCCH61  INVALID OP CODE. 8CC02840
*          *****                      8CC02850
*          THE Q REGISTER SHOWS        8CC02860
*          ONE GREATER THAN THE        8CC02870
*          FAILING INSTRUCTION.        8CC02880
*          *****                      8CC02890
*          RUN THE HIGH CORE TEST      8CC02900
*          ASSUMING THE P-C            8CC02910
*          FUNCTION TEST HAS BEEN      8CC02920
*          RUN.                         8CC02930
*          *****                      8CC02940
*          *****                      8CC02950
3009 0 7B0A      DC      LOG0461  1443 BUSY.      8CC02960
*          *****                      8CC02970
*          CLEAR 1443 AND PUSH         8CC02980
*          THE START BUTTON.           8CC02990
*          *****                      8CC03000
*          *****                      8CC03010
300A 0 7B1F      DC      WAITA61  1816 NOT READY. 8CC03020
*          *****                      8CC03030
*          MAKE 1816 READY AND         8CC03040
*          PUSH START.                 8CC03050
*          *****                      8CC03060
*          *****                      8CC03070
300B 0 7AEE      DC      WAITB61  DATA ERROR HAS BEEN 8CC03080
*          DETECTED.                   8CC03090
*          *****                      8CC03100
*          USE THE Q REG TO FURTHER    8CC03110
*          IDENTIFY THE ERROR.         8CC03120
*          *****                      8CC03130
*          NOTE                        8CC03140
*          DEPRESSING THE START BUTTON 8CC03150
*          RETURNS THE PROGRAM TO THE  8CC03160
*          TESTING SEQUENCE. NORMALLY 8CC03170
*          AFTER THE ERROR WAIT OCCURS 8CC03180
*          BIT SW 8 SHOULD BE TURNED ON 8CC03190
*          LOOP ON THE ADDRESS THAT FAILED 8CC03200
*          *****                      8CC03210
*          *****                      8CC03220
*          *****                      8CC03230
*          O-REG COMMENTS              8CC03240
*          *****                      8CC03250
*          0011 ROUTINE TO READ AND WRITE 8CC03260
*          ADDRESS IN EACH CORE LOCATION 8CC03270
*          FAILED.                      8CC03280
*          *****                      8CC03290
*          INDEX REGISTER 1 SHOWS THE  8CC03300
*          CORRECT PATTERN AND THE CORE 8CC03310
*          LOCATION WHICH FAILED.       8CC03320
*          *****                      8CC03330
*          THE ACCUMULATOR SHOWS THE  8CC03340
*          INCORRECT DATA.             8CC03350
*          *****                      8CC03360
*          *****                      8CC03370
*          0012 ATTEMPT TO SET CORE LOCATION 8CC03380
*          TO ZEROS FAILED.             8CC03390
*          *****                      8CC03400
*          THE CORRECT PATTERN IS 0000. 8CC03410

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LOW CORE FUNCTION TEST

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*          THE ACCUMULATOR SHOWS THE 8CC03420
*          INCORRECT DATA.           8CC03430
*          *****                      8CC03440
*          *****                      8CC03450
*          INDEX REGISTER 1 SHOWS THE  8CC03460
*          CORE LOCATION WHICH FAILED. 8CC03470
*          *****                      8CC03480
*          *****                      8CC03490
0013 BIT BY BIT ISOLATION TEST        8CC03500
*          FAILED.                     8CC03510
*          *****                      8CC03520
*          INDEX REGISTER 2 SHOWS THE  8CC03530
*          CORRECT PATTERN.            8CC03540
*          *****                      8CC03550
*          THE ACCUMULATOR SHOWS THE  8CC03560
*          INCORRECT DATA.            8CC03570
*          *****                      8CC03580
*          INDEX REGISTER 1 SHOWS THE  8CC03590
*          CORE LOCATION WHICH FAILED. 8CC03600
*          *****                      8CC03610
*          *****                      8CC03620
0014 WORST CASE PATTERN ROUTINE      8CC03630
*          FAILED.                     8CC03640
*          *****                      8CC03650
*          THE CORRECT PATTERN IS EITHER 8CC03660
*          0000 OR FFF.                 8CC03670
*          *****                      8CC03680
*          THE ACCUMULATOR SHOWS THE  8CC03690
*          INCORRECT DATA.            8CC03700
*          *****                      8CC03710
*          INDEX REGISTER 1 CONTAINS    8CC03720
*          THE CORE LOCATION WHICH     8CC03730
*          FAILED.                      8CC03740
*          *****                      8CC03750
*          *****                      8CC03760
0015 WRITE ZEROS ON PROTECTED        8CC03770
*          AREA OF FFFF ROUTINE FAILED. 8CC03780
*          *****                      8CC03790
*          THE CORRECT PATTERN IS FFFF. 8CC03800
*          *****                      8CC03810
*          THE ACCUMULATOR SHOWS THE  8CC03820
*          INCORRECT DATA.            8CC03830
*          *****                      8CC03840
*          INDEX REGISTER 1 SHOWS THE  8CC03850
*          CORE LOCATION WHICH FAILED. 8CC03860
*          *****                      8CC03870
*          *****                      8CC03880
0016 UNPROTECT AND CLEAR CORE OF     8CC03890
*          ONES ROUTINE FAILED.        8CC03900
*          *****                      8CC03910
*          THE CORRECT PATTERN IS 0000. 8CC03920
*          *****                      8CC03930
*          THE ACCUMULATOR SHOWS THE  8CC03940
*          INCORRECT DATA.            8CC03950
*          *****                      8CC03960
*          INDEX REGISTER 1 SHOWS THE  8CC03970
*          CORE LOCATION WHICH FAILED. 8CC03980
*          *****                      8CC03990
*          *****                      8CC04000
*          MEMORY TEST-LOW CORE        8CC04010
*          *****                      8CC04020
*          SWITCH SETTING              8CC04030
*          *****                      8CC04040
*          B14 # BYPASS ERROR WAIT     8CC04050
*          B13 # BYPASS PRINTING       8CC04060
*          B11 # LOOP SUB PROGRAM      8CC04070
*          B10 # LOOP ROUTINE          8CC04080
*          B9 # OUTPUT ON 1443         8CC04090

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*          B8 # LOOP ADDRESS          8CC04100
*****
*****
*****
*
7800          ORG          /7800          8CC04150
7800 0 CC00          DC          /CC00          PID          8CC04160
7801 0 C822          RSDKR LDD          RSAAM          8CC04170
7802 0 DC00 0000          STD          L          0          8CC04180
7804 0 3003          RSDKW WAIT          3          8CC04190
7805 0 C81E          RSDKS LDD          RSAAM          8CC04200
7806 0 DC00 0004          STD          L          4          8CC04210
7808 0 C013          LD          RSAAE          CLEAR Q REGISTER          8CC04220
7809 0 1890          SRT          16          8CC04230
*
* MACHINE DETERMINATION ROUTINE
*
780A 0 C011          LD          RSAAE          8CC04240
780B 0 D400 0003          STO          L          3          8CC04250
780C 0 6700 FFFF          LDX          L3 /FFFF          8CC04260
780F 0 C400 0003          LD          L          3          8CC04270
7811 0 4C20 7815          BSC          L          RSAAB,Z          8CC04280
7813 0 C007          LD          RSAAD          8CC04290
7814 0 7001          MDX          X          1          8CC04290
7815 0 C004          RSAAB LD          RSAAC          8CC04300
7816 0 D007          STO          RSAAC          8CC04310
7817 0 6700 0000          LDX          L3 /0000          CLEAR XR 3          8CC04320
7819 0 7015          MDX          /RSABA          8CC04330
*
* STORAGE AREAS FOR INITIALIZATION*
*
781A 0 0001          RSAAC DC          1          1130 CONSTANT          8CC04340
781B 0 FFFF          RSAAD DC          -2          1800 CONSTANT          8CC04350
781C 0 0000          RSAAE DC          0          CONSTANT ZERO          8CC04360
781D 0 07FD          RSAAH DC          2045          HIGHEST ADR TO TEST          8CC04370
781E 0 0000          RSAAK DC          0          MACHINE TYPE          8CC04380
781F 0 0003          RSFAA DC          3          NUMBER OF PROGRAM PASSES          8CC04390
7820 0 0000          RSFAB DC          0          PROGRAM PASS BUFFER          8CC04400
*
* STORAGE AREAS PART 1
*
7821 0 7003          RSAAL MDX          X          3          8CC04410
7822 0002          BSS          E          2          8CC04420
7824 0 4C00 7805          RSAAM BSC          L          RSDKS          BOOTSTRAP BRANCH INS          8CC04430
7826 0 782C          RSQAF DC          RSQAL          READ BIT SWITCH IOCC          8CC04440
7827 0 3A40          RSQAD DC          /3A40          SECOND HALF IOCC-113          8CC04450
7828 0 0009          RSQAC DC          9          LOWEST ADDRESS TC TEST          8CC04460
7829 0 79F8          RSQAD DC          RSCCA          INTERRUPT LEVEL ZERO VECT          8CC04470
782A 0 0000          RSQAF DC          0          WORK AREA          8CC04480
782B 0 0240          RSQAP DC          /0240          SECOND HALF IOCC-180          8CC04490
782C 0 0000          RSQAL DC          0          BIT SWITCH BUFFER AREA          8CC04500
782D 0 0F03          RSQAU DC          /0F03          2ND HALF IOCC-1800 DSW          8CC04510
782E 0 0902          RSQAV DC          /0902          2ND HALF IOCC-1900 TYPE          8CC04520
*
* INITIALIZE MASKS AND INTERRUPTS TO LEVEL ZERO
* 1800 ONLY
*
782F 0 C0F1          RSABA LD          RSAAL          STORE BOOTSTRAP BRANCH AT          8CC04530
7830 0 D400 0000          STO          L          0          LOCATION ZERO          8CC04540
7832 0 C0FB          LD          RSAAK          8CC04550
7833 0 4C04 7840          BSC          L          RSAAE,E          IF 1130-GO TO FIRST ROUTIN          8CC04560
7835 0 C0F5          LD          RSQAF          CHANGE SECOND HALF IOCC          8CC04570
7836 0 D0F0          STO          RSQAD          FOR 1800 READ BIT SW          8CC04580
7837 0 C0F1          LD          RSQAD          INTERRUPT LEVEL ERRO VECT          8CC04590
7838 0 D400 0008          STO          L          8          8CC04600
783A 0 C0F2          LD          RSQAU          DSW 1800          8CC04610
783B 0 D400 7855          STO          L          TWSNS&1          PRO1          8CC04620
8CC04630
8CC04640
8CC04650
8CC04660
8CC04670
8CC04680
8CC04690
8CC04700
8CC04710
8CC04720
8CC04730
8CC04740
8CC04750
8CC04760
8CC04770

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783D 0 C0F0          LD          RSQAV          XIO WRITE 1800          8CC04780
783E 0 D400 7857          STO          L          TWRWT&1          PRO2          8CC04790
7840 0 08E5          RSDAE XIO          RSQAF          8CC04800
7841 0 C400 782C          LD          L          RSQAL          8CC04810
7843 0 E400 7962          AND          L          RSRAX          8CC04820
7845 0 4C20 784A          BSC          L          RSABI,Z          BYPASS LABEL PRINTOUT          8CC04830
*
7847 0 4400 7AF4          BSI          L          LOG          8CC04840
7849 0 78BD          DC          MES15          MEMORY TEST-LOW CORE          8CC04850
* FIRST ROUTINE-READ & WRITE IN MEMORY
*
784A 0 C0D4          RSABI LD          RSFAA          INITIALIZE PROGRAM          8CC04860
784B 0 D0D4          STO          RSFAB          PASS JUMPER          8CC04870
784C 0 6204          PSABH LDX          X2 4          ADDRESSING PASSES          8CC04880
784D 0 6580 7828          PSABH LDX          I1 RSQAC          8CC04890
784F 0 69DA          PSABC STX          1 RSQAF          8CC04900
7850 0 C0D9          LD          PSQAE          8CC04910
7851 0 D4E0 782A          SPVFI STO          I          RSQAE          8CC04920
7853 0 F0C9          EOR          RSAAH          8CC04930
7854 0 4C18 7858          BSC          L          RSABD,E-          8CC04940
7856 0 7101          MDX          X1 1          INCR TO NEXT ADDRESS          8CC04950
7857 0 70F7          MDX          RSABC          8CC04960
7858 0 6580 7828          PSABD LDX          I1 RSQAC          8CC04970
785A 0 69CF          PSABE STX          1 RSQAE          8CC04980
785B 0 C480 782A          PAFPI D          I          RSQAE          8CC04990
785D 0 D400 78EC          STO          L          RSQAN          STORE ACCUM FOR ERROR ROU          8CC05000
785F 0 F0CA          EOR          RSQAE          8CC05010
7860 0 4C18 786D          DATEI BSC          L          RSABF,E-          ERROR 1 DETECTED          8CC05020
7862 0 0C00 7826          XIO          L          RSQAF          8CC05030
7864 0 C400 782C          LD          L          RSQAL          8CC05040
7866 0 E400 7961          AND          L          RSRAI          8CC05050
7868 0 4C20 785A          BSC          L          RSABE,Z          8CC05060
786A 0 4400 7AF4          BSI          L          RSDDD          8CC05070
786C 0 FFFF          DC          /FFFF          ERROR 1 CONSTANT          8CC05080
786D 0 08B8          RSABF XIO          RSQAF          HEAD BIT SWITCHES          8CC05090
786E 0 C400 782C          LD          L          RSQAL          8CC05100
7870 0 F400 7961          AND          L          RSRAI          ISOLATE SW 8          8CC05110
7872 0 4C20 785A          BSC          L          RSABE,Z          IF SW 8 CN LOOP ADDR          8CC05120
7874 0 C0B5          LD          RSQAF          8CC05130
7875 0 FOA7          EOR          RSAAH          8CC05140
7876 0 4C18 787A          BSC          L          RSABG,E-          8CC05150
7878 0 7101          MDX          X1 1          INCR TO NEXT ADDRESS          8CC05160
7879 0 70E0          MDX          RSABE          8CC05170
787A 0 72FF          RSABG MDX          X2 -1          COUNT PASSES          8CC05180
787B 0 70D1          MDX          RSABB          8CC05190
787C 0 0C00 7826          XIO          L          RSQAF          REPEAT RT IF 10 ON          8CC05200
787E 0 C400 782C          LD          L          RSQAL          8CC05210
7880 0 E400 795F          AND          L          RSRAG          8CC05220
7882 0 4C20 784C          BSC          L          RSABH,Z          REPEAT ADDRESSING ROUTINE          8CC05230
*
* SECOND ROUTINE
* BIT ISOLATION TEST-BIT BY BIT-ADDRESS BY ADDRESS
*
7884 0 6304          PSABR LDX          X3 4          BIT ISOLATION PASSES          8CC05240
7885 0 C400 7828          PSABP LD          L          RSQAC          8CC05250
7887 0 D05F          PSABN STC          RSQAH          8CC05260
7888 0 6580 78E7          LDX          I1 RSQAH          8CC05270
788A 0 C05D          LD          RSQAI          8CC05280
788B 0 D480 78E7          SPVE2 STO          I          RSQAH          8CC05290
788D 0 C480 78E7          PARE2 LD          I          RSQAH          8CC05300
788F 0 D400 78FC          STO          L          RSQAN          STORE ACC FOR ERROR OUTI          8CC05310
7891 0 4C18 789F          DATE2 BSC          L          RSABJ,E-          ERROR 2 DETECTED          8CC05320
7893 0 0C00 7826          XIO          L          RSQAF          8CC05330
7895 0 C400 782C          LD          L          RSQAL          8CC05340
7897 0 E400 7961          AND          L          RSRAI          8CC05350
7899 0 4C20 7888          BSC          L          RSABN&1,Z          8CC05360
789B 0 4400 7AF4          BSI          L          RSDDD          8CC05370
789D 0 FFFF          DC          /FFFF          8CC05380

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789E 0 0C00 7826 RSABJ XIO L RSQAF IF SW 8 ON LOOP ADDR 8CC05460
78A0 0 0400 782C LD L RSQAL 8CC05470
78A2 0 0400 7961 AND L RSRAI 8CC05480
78A4 0 4C20 7888 BSC L RSABN&1,Z 8CC05490
78A6 0 0042 LD RSQAJ 8CC05500
78A7 0 0042 STO RSQAK 8CC05510
78A8 0 0041 RSABL LD RSQAK 8CC05520
78A9 0 0400 78E7 SPVE3 STO I RSQAH 8CC05530
78AB 0 6000 78EA LDX I2 RSQAK 8CC05540
78AD 0 0400 78E7 PARE3 LD I RSQAH 8CC05550
78AF 0 0400 78FC STO L RSQAH 8CC05560
78B1 0 0038 EOR RSQAK 8CC05570
78B2 0 4C18 78C2 DATE3 BSC L RSABK,&- ERROR 3 DETECTED 8CC05580
78B4 0 0000 7926 XIO L RSQAF 8CC05590
78B6 0 0400 782C LD L RSQAL 8CC05600
78B8 0 0400 7961 AND L RSRAI 8CC05610
78BA 0 4C20 78A8 BSC L RSABL,Z 8CC05620
78BC 0 6908 STX I TAG&1 8CC05630
78BD 0 6500 78E7 LDX I1 RSQAH 8CC05640
78BF 0 4000 78BF BSI L RSQDD 8CC05650
78C1 0 0000 78C1 DC /FFFF ERROR 3 CONSTANT 8CC05660
78C2 0 0000 7826 RSABK XIO L RSQAF 8CC05670
78C4 0 6500 0000 TAG LDX L1 0 8CC05680
78C6 0 0400 782C LD L RSQAL 8CC05690
78C8 0 0400 7961 AND L RSRAI ISOLATE BIT 8 8CC05700
78CA 0 4C20 78A8 BSC L RSABL,Z IF SW 8 ON LOOP ADDR 8CC05710
78CC 0 0010 LD RSQAK 8CC05720
78CD 0 4004 BSC E IF ODD-BIT 15 IS REACHED 8CC05730
78CE 0 7003 MDX RSABM BRANCH TO INCR ADR POUTI 8CC05740
78CF 0 1001 SRA I INCREMENT BIT 8CC05750
78D0 0 0019 STO RSQAK POSITION BY ONE 8CC05760
78D1 0 7007 MDX SPVE3 8CC05770
78D2 0 0014 RSABM LD RSQAH TEST FOR MEMORY END 8CC05780
78D3 0 0400 7810 EOR L RSAAH 8CC05790
78D5 0 4C18 78DA BSC L RSABD,&- 8CC05800
78D7 0 0000 LD RSQAH INCREMENT TO TEST NEXT 8CC05810
78D8 0 8012 A RSQAH MEMORY LOCATION 8CC05820
78D9 0 70AD MDX RSABM 8CC05830
78DA 0 73FF RSABD MDX X3 -1 COUNT PASSES 8CC05840
78DB 0 70A9 MDX RSABP 8CC05850
78DC 0 0000 7826 XIO L RSQAF 8CC05860
78DE 0 0400 782C LD L RSQAL 8CC05870
78E0 0 0400 795F AND L RSRAG 8CC05880
78E2 0 4C20 7884 BSC L RSABP,Z REPEAT BIT ISOLATION 8CC05890
78E4 0 7009 MDX RSACJ 8CC05900

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* STORAGE AREAS PART 2

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78E5 0 0004 RSQAQ DC 4 WORST CASE PASSES 8CC05930
78E6 0 0000 RSQAR DC 0 WORST CASE PASS COUNT 8CC05940
78E7 0 0000 RSQAH DC 0 WORK AREA-ADR 8CC05950
78E8 0 0000 RSQAI DC 0 CONST ZERO 8CC05960
78E9 0 0000 RSQAJ DC /8000 BIT ZERO CONSTANT 8CC05970
78FA 0 0000 RSQAK DC 0 WORK AREA-BIT 8CC05980
78FB 0 0001 RSQAM DC 1 CONST 1 8CC05990
78FC 0 0000 RSOAN DC 0 STORAGE FOR ACCUM 8CC06000
78FD 0 0000 RSQAG DC /0000 PATTERN CONTROL WCRD 8CC06010

```

* ESTABLISH WOPST CASE PATTERN

```

78FE 0 0009 RSACJ LD RSQAI RESET PTRN CONTROL 8CC06050
78FF 0 0000 STO RSQAG 8CC06060
7900 0 6200 RSACI LDX 2 /0000 8CC06070
7901 0 6700 FFFF LDX L3 /FFFF 8CC06080
7903 0 7003 MDX RSACT 8CC06090
7904 0 6600 FFFF RSACI LDX L2 /FFFF COMPLIMENT PATTERN 8CC06100
7906 0 6300 LDX 3 /0000 8CC06110
7907 0 0000 RSACT LD RSQAQ INITIALIZE WORST CASE 8CC06120

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78F8 0 0000 78F8 STO RSQAR PASS COUNTER 8CC06140
78F9 0 74FF 78E6 RSACK MDX L RSQAR,-1 COUNT WORST CASE PASSES 8CC06150
78FB 0 7001 MDX RSACX 8CC06160
78FC 0 7050 MDX RSACW 8CC06170
78FD 0 0400 7828 RSACX LD L RSQAL RESET STARTING ADDR 8CC06180
78FF 0 005A STO RSRAA 8CC06190
7900 0 0059 RSACB LD RSRAA 8CC06200
7901 0 1806 SRA 6 8CC06210
7902 0 0058 STO RSRAB 8CC06220
7903 0 1802 SRA 2 8CC06230
7904 0 8056 A RSRAB 8CC06240
7905 0 4C04 790F BSC L RSACA,E 8CC06250
7907 0 6905 STX I RSADDE&1 8CC06260
7908 0 6580 795A LDX I1 RSRAA 8CC06270
790A 0 6E80 795A SPVE4 STX I2 RSRAA 8CC06280
790C 0 6500 0000 RSADD LDX L1 0 8CC06290
790E 0 7007 MDX RSACD 8CC06300
790F 0 6905 *RSACA STX I RSACZ&1 8CC06310
7910 0 6580 795A LDX I1 RSRAA 8CC06320
7912 0 6F80 795A SPVE5 STX I3 RSRAA 8CC06330
7914 0 6500 0000 RSACZ LDX L1 0 8CC06340
7916 0 0043 RSACD LD RSRAA 8CC06350
7917 0 F400 781D EOR L RSAAH TEST FOR MEMORY END 8CC06360
7919 0 4C18 791F BSC L RSADB,&- 8CC06370
791B 0 7401 795A *MDX L RSRAA,I ADR#ADRE&1 8CC06380
791D 0 70E2 MDX RSACB 8CC06390

```

* WORST CASE TEST LOAD AND STORE THEN
* COMPLEMENT AND REPEAT

```

791E 0 6580 7828 RSADB LDX I1 RSQAC LOAD STARTING ADR IN XR1 8CC06440
7920 0 6939 RSACL STX I RSRAA 8CC06450
7921 0 0041 RSACH LD RSRAJ INITIALIZE COMPLEMENT CNTR 8CC06460
7922 0 0041 STO RSRAK 8CC06470
7923 0 0480 795A PARE4 LD I RSRAA 8CC06480
7925 0 0400 78EC STO L RSQAN 8CC06490
7927 0 4C20 7928 BSC L RSACE,Z 8CC06500
7929 0 F032 EOR RSRAC 8CC06510
792A 0 700E MDX SPVE6 8CC06520
792B 0 F030 RSACE EOR RSRAC 8CC06530
792C 0 4C18 7939 DATE4 BSC L SPVE6,&- 8CC06540
792E 0 0000 7826 XIO L RSQAF 8CC06550
792F 0 0400 782C LD L RSQAL 8CC06560
7932 0 0400 7961 AND L RSRAI 8CC06570
7934 0 4C20 7921 BSC L RSACH,Z 8CC06580
7936 0 4400 78BF BSI L RSDDD 8CC06590
7938 0 FFF7 DC /FFFF ERROR 4 CONSTANT 8CC06600
7939 0 0480 795A SFVE6 STO I RSRAA 8CC06610
793B 0 74FE 7964 MDX L RSRAK,-2 8CC06620
793D 0 70E5 MDX PARE4 BRANCH FCP COMPLEMEM PAS 8CC06630
793E 0 0000 7826 XIO L RSQAF 8CC06640
7940 0 0400 782C LD L RSQAL 8CC06650
7942 0 0400 7961 AND L RSRAI ISOLATE BIT 9 8CC06660
7944 0 4C20 7921 BSC L RSACH,Z IF SW 8 ON LOOP ADDR 8CC06670
7946 0 0013 LD RSRAA 8CC06680
7947 0 F400 781D EOR L RSAAH TEST FOR MEMORY END 8CC06690
7949 0 4C18 794D BSC L RSACW,&- BR IF END OF MEM 8CC06700
794B 0 7101 MDX X1 I MEM ADR#ADRE&1 8CC06710
794C 0 70D3 MDX RSACL 8CC06720
794D 0 0000 7826 RSACW XIO L RSQAF 8CC06730
794F 0 0400 782C LD L RSQAL 8CC06740
7951 0 E00D AND RSRAG LOOP RT IF SW 10 ON 8CC06750
7952 0 6680 78ED LDX I2 RSQAG 8CC06760
7954 0 4EA0 7965 BSC I2 RSRAD,Z BR IF LOOP RTN 8CC06770
7956 0 7201 MDX 2 I INDEX PATTERN CNTRL 8CC06780
7957 0 6A95 STX 2 RSQAG 8CC06790
7958 0 4E80 7965 BSC I2 RSRAD 8CC06800

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```
* STORAGE AREAS PART 3
*
795A 0 0000  RSRAA DC 0      WORK AREA-ADDRESS
795B 0 0000  RSRAB DC 0      BUFFER AREA-WOPST CASE PA
795C 0 FFFF  RSRAC DC /FFFF
795D 0 0000  RSRAE DC 0      WORK AREA-ADDRESS
795E 0 0000  RSRAF DC 0      CONST ZERO
795F 0 0020  RSRAG DC /0020  BIT 10 ISOLATION CON
7960 0 0010  RSRAH DC /0010  BIT 11 ISOLATION CON
7961 0 0080  RSRAI DC /0080  BIT 8 ISOLATION CON
7962 0 0004  RSRAX DC /0004  BIT 13 ISOLATION CON
7963 0 0003  RSRAJ DC 3
7964 0 0000  RSRAK DC 0      COMPLEMENT PASS COUNTER
*
7965 0 78F0  RSRAD DC RSACI   CONTROL PRANCH
7966 0 78F4  DC      RSACY   ADDRESSES
7967 0 7968  DC      RSACV  GO TO NEXT RTN
*
*
* STORAGE PROTECTION TEST ROUTINES
*
7968 0 C400 781E  RSACV LD L RSAAK
796A 0 4C08 796E  BSC L RSACU,&
796C 0 6400 790D  LDX L RSADA  NOT 1800 BRANCH TO END
*
* WRITE ZEROS ON PROTECTED AREA OF ONES
*
796E 0 6204  RSACU LDX X2 4  STORAGE PRCTFCT PASSES
796F 0 C400 7828  RSACS LD L RSQAC
7971 0 D0EB  STO RSRAE
7972 0 D008  STO RSACO  INITIALIZE STS ADDRESS
7973 0 C400 7A6D  LD L RSSAH  TELL INTERRUPT ROUTINE TO
7975 0 D400 7A0B  LDX L RSSAF  DISREGARD SP ERROR
7977 0 C0E4  RSRAC LD RSRAE  ACC#/FFFF
7978 0 D480 795D  SPVE7 STO I RSRAE
797A 0 2C41  PARE5 DC /2C41  ADD SP BITS
797B 0 7C11  RSACD DC RSEND&2
797C 0 6580 795D  LDX I1 RSRAE
797E 0 C0DF  LD RSRAF  ACCUM#0
797F 0 D480 795D  STO I RSRAE  STO SHOULD NOT OCCUR
7981 0 C480 795D  PARE6 LD I RSRAE
7983 0 D400 78LC  STO L RSQAN
7985 0 F0D6  EOR RSRAC
7986 0 4C18 7993  DATES BSC L RSACH,&-  ERROR 5 DETECTED
7988 0 0C00 7826  XIO L RSQAF
798A 0 C400 782C  LD L RSQAL
798C 0 E400 7961  AND L RSRAI
798E 0 4C20 7977  BSC L RSACN,Z
7990 0 4400 7A8F  BSI L RSDDD
7992 0 FFEF  DC /FFEF  ERROR 5 CONSTANT
7993 0 0C00 7826  RSACM XIO L RSQAF
7995 0 C400 782C  LD L RSQAL
7997 0 E0C9  AND RSRAI  ISOLATE BIT 8
7998 0 4C20 7977  BSC L RSACN,Z  IF SW 8 CN LOOP ADDR
799A 0 C0C2  LD RSRAE
799B 0 8400 78EB  A L RSQAM
799D 0 D0BF  STO RSRAE
799E 0 D0DC  STO RSACO
799F 0 F400 781D  EOR L RSAAH
79A1 0 4C20 7977  BSC L RSACN,Z  RETURN WITH ADR#ADR&1
*
* UNPROTECT AND CLEAR MEMORY OF ONES
*
79A3 0 C400 7A6C  LD L RSSAG  SERVICE STORAGE PROT CT
79A5 0 D400 7A68  STO L RSSAF
79A7 0 C400 7828  LD L RSQAC
79A9 0 D0B3  STO RSRAE
```

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8CC06820
8CC06830
8CC06840
8CC06850
8CC06860
8CC06870
8CC06880
8CC06890
8CC06900
8CC06910
8CC06920
8CC06930
8CC06940
8CC06950
8CC06960
8CC06970
8CC06980
8CC06990
8CC07000
8CC07010
8CC07020
8CC07030
8CC07040
8CC07050
8CC07060
8CC07070
8CC07080
8CC07090
8CC07100
8CC07110
8CC07120
8CC07130
8CC07140
8CC07150
8CC07160
8CC07170
8CC07180
8CC07190
8CC07200
8CC07210
8CC07220
8CC07230
8CC07240
8CC07250
8CC07260
8CC07270
8CC07280
8CC07290
8CC07300
8CC07310
8CC07320
8CC07330
8CC07340
8CC07350
8CC07360
8CC07370
8CC07380
8CC07390
8CC07400
8CC07410
8CC07420
8CC07430
8CC07440
8CC07450
8CC07460
8CC07470
8CC07480
8CC07490
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79AA 0 D001  STO RSACR  INITIALIZE STS ADDRESS
79AB 0 2C40  PARE7 DC /2C40  CLEAR SP BIT
79AC 0 7C11  RSACR DC RSEND&2
79AD 0 6580 795D  LDX I1 RSRAF
79AF 0 COAE  LD RSRAF  ACC#/0000
79B0 0 D480 795D  SPVE8 STO I RSRAF
79B2 0 C480 795D  PARE8 LD I RSRAE
79B4 0 D400 78EC  STO L RSQAN
79B6 0 4C18 79C3  DATE6 BSC L RSACP,&-  ERROR 6 DETECTED
79B8 0 0C00 7826  XIO L RSQAF
79BA 0 C400 782C  LD L RSQAL
79BC 0 E400 7961  AND L RSRAI
79BE 0 4C20 79AB  BSC L PARE7,Z
79C0 0 4400 7A8F  BSI L RSDDD
79C2 0 FDFD  DC /FFDF  ERROR 6 CONSTANT
79C3 0 0C00 7826  RSACP XIO L RSQAF  IF SW 8 ON LOOP ADDR
79C5 0 C400 782C  LD L RSQAL
79C7 0 E099  AND RSRAI
79C8 0 4C20 79AB  BSC L PARE7,Z
79CA 0 C092  LD RSRAE
79CB 0 8400 78EB  A L RSQAM
79CD 0 D0BF  STO RSRAE
79CE 0 D0DD  STO RSACR
79CF 0 F400 781D  EOR L RSAAH
79D1 0 4C20 79AB  BSC L PARE7,Z
79D3 0 72FF  MDX X2 -1
79D4 0 709A  MDX RSACS  LOOP ROUTINE FOR 5 PASSES
79D5 0 0C00 7826  XIO L RSQAF  LOOP RT IF SW 10 ON
79D7 0 C400 782C  LD L RSQAL
79D9 0 E400 795F  AND L RSRAG
79DB 0 4C20 796E  BSC L RSACU,Z  REPEAT SP ROUTINE
*
* COMMON PROGRAM END
*
79DD 0 74FF 7820  RSACA MDX L RSFAB,-1
79DF 0 7016  MDX RSCCQ
79E0 0 0C00 7826  XIO L RSQAF  CK BYPASS LOG
79E2 0 C400 782C  LD L RSQAL
79E4 0 E400 7962  AND L RSRAX
79E6 0 4C20 79EB  BSC L RSADC,Z
79E8 0 4400 7AF4  BSI L LOG
79EA 0 7BC9  DC MES16  PROGRAM END
79EB 0 0C00 7826  RSADC XIO L RSQAF  CK LOOP SUB PROG SW
79ED 0 C400 782C  LD L RSQAL
79EF 0 E400 7960  AND L RSRAH
79F1 0 4C20 7840  BSC L RSAOE,Z  LOOP PROG IF 11 ON
79F3 0 3005  RSQAW WAIT 5  PROGRAM COMPLETE
79F4 0 6400 7805  LDX L RSDKS  PRESS START TO RE-RUN PROG
79F6 0 6400 784C  RSCCQ LDX L RSABH  LOOP PROGRAM
*
* INTERRUPT LEVEL ERROR ROUTINE
*
79F8 0 0000  RSCCA DC 0  RETURN ADDR TO MAIN INE
79F9 0 6862  STX 3 RSCC1&1
79FA 0 D069  STO RSSAA  SAVE A
79FB 0 285E  STS RSCCE  STORE STATUS CARY&OFLO
79FC 0 0868  XIO RSSAC  SENSE ILSW FOR LEVEL ERROR
79FD 0 D06C  STO RSSAD
79FE 0 4C40 7A00  BOSC L NEXT
7A00 0 0C00 7826  NEXT XIO L RSQAF  TEST FOR THE ILLEGAL
7A02 0 C400 782C  LD L RSQAL  SW COMBINATIONS--13,
7A04 0 E070  AND RSSAO  14 ON AND 8 OFF
7A05 0 F070  EOR RSSAP
7A06 0 4C18 7AF0  BSC L RSDDK,&-  BRANCH IF ILLFGAL
7A08 0 C061  LD RSSAD  RESTORE STATUS OF ILSW
7A09 0 E064  AND RSSAE  ISOLATE STGE PRT ERRR
7A0A 0 4C18 7A1F  BSC L RSCCB,&-  TEST FOR STORAGE PROT VIOL
7A0C 0 C05E  LD RSSAF
```

7A0D 0 4C10 7A1B BSC L RSCCG,- BYPASS PRINTOUT IF IN SP 8CC08180
7A0F 0 0C00 7826 XIO L RSQAF SW 13 TO BYPASS PRNT 8CC08190
7A11 0 0400 782C LD L RSQAL 8CC08200
7A13 0 0400 7962 AND L RSRAX 8CC08210
7A15 0 4C20 7A35 BSC L RSCCD,Z BYPASS PRINTOUT IF BRANCH 8CC08220
7A17 0 4400 7AF4 BSI L LCG 8CC08230
7A19 0 78D4 DC MES17 ERROR INT-STORG PROT 8CC08240
7A1A 0 7004 MDX RSCCB 8CC08250
7A1B 0 004E RSCCG LD RSSAD IF IN SP ROUTINE AN SP 8CC08260
7A1C 0 0051 EOR RSSAF ERROR ONLY THEN RETURN TO 8CC08270
7A1D 0 4C98 79F8 BSC I RSCCA,- MAINLINE 8CC08280
7A1E 0 0000 7826 RSCCB XIO L RSQAF SW 13 TO BYPASS PRNT 8CC08290
7A1F 0 0400 782C LD L RSQAL 8CC08300
7A21 0 0400 782C AND L RSRAX 8CC08310
7A23 0 0400 7962 BSC L RSCCD,Z BYPASS PRINTOUT IF BRANCH 8CC08320
7A25 0 4C20 7A35 LD RSSAD LOAD ILSW FOR ERROR INT-UP 8CC08330
7A27 0 0042 AND RSSAI ISOLATE PARITY ERROR 8CC08340
7A28 0 0046 BSC L RSCCG,- 8CC08350
7A29 0 4C18 7A2E BSI L LCG 8CC08360
7A2B 0 4400 7AF4 DC MES18 ERROR INT-PARITY 8CC08370
7A2D 0 78E0 RSCCC LD RSSAD TEST FOR INVALID OP CODE 8CC08380
7A2E 0 003B AND PSSAJ ISOLATE INV OP ERROR 8CC08390
7A2F 0 0040 BSC I RSCCD,- 8CC08400
7A30 0 4C18 7A35 BSI L LCG 8CC08410
7A32 0 4400 7AF4 DC MES19 ERROR INT INV OP CODE 8CC08420
7A34 0 78EA RSCCD XIO L RSQAF IF SW 14 OFF, STORE 8CC08430
7A35 0 0000 7826 LD L RSQAL 8CC08440
7A37 0 0400 782C AND PSSAK ACCUM, INS CTR, STATUS 8CC08450
7A39 0 0037 BSC I RSCCA,Z AND WAIT 8CC08460
7A3A 0 4CA0 79F8 LD RSSAD LOAD ILSW FOR ERROR 8CC08470
7A3C 0 002D SRA I2 PLACE BITS 0-4 OF ILSW IN 8CC08480
7A3D 0 180C OR PSSAN 11-15 AND OR IN WAIT OP 8CC08490
7A3E 0 0035 STO RSCCH STORE IN WAIT 8CC08500
7A3F 0 001F STX 2 RSCCI,2 8CC08510
7A40 0 001D LD RSSAD 8CC08520
7A41 0 0028 AND PSSAJ 8CC08530
7A42 0 002D BSC L RSCCI,Z BCH IF INV OP 8CC08540
7A43 0 4C20 7A5B LD RSSAD 8CC08550
7A45 0 0024 AND RSSAR 8CC08560
7A46 0 001B BSC L RSCCI,Z BCH IF CAR CHECK 8CC08570
7A47 0 4C20 7A5B LDX 2 I6 8CC08580
7A49 0 6210 LDX 3 I1 8CC08590
7A4A 0 6301 RSCCJ LD RSCCA 8CC08600
7A4B 0 00AC EOR L3 TBL 8CC08610
7A4C 0 0700 7A78 BSC L RSCCK,- 8CC08620
7A4E 0 4C18 7A56 MDX 3 I1 8CC08630
7A50 0 7301 MDX 2 -1 8CC08640
7A51 0 72FF MDX RSCCJ 8CC08650
7A52 0 70F8 LD TBL1 8CC08660
7A53 0 000F STO TBL 8CC08670
7A54 0 0023 MDX RSCCK,1 8CC08680
7A55 0 7001 RSCCK STX 3 TBL 8CC08690
7A56 0 6B21 LD TBL 8CC08700
7A57 0 0020 SRT 16 8CC08710
7A58 0 1890 IJ RSSAA RESTORE ACCUM CONTENTS 8CC08720
7A59 0 000A RSCCE LDS 0 RESTORE OFLO&CARRY INDICA 8CC08730
7A5A 0 2000 RSCCI LDX L3 0 8CC08740
7A5B 0 6700 0000 L X L2 0 8CC08750
7A5D 0 6600 0000 RSCCH WAIT 8CC08760
7A5F 0 3000 BSC I RSCCA RETURN TO MAINLINE 8CC08770
7A60 0 4C80 79F8 * 8CC08780
RSSAR DC /1000 8CC08790
TBL1 DC /FFFF 8CC08800
* 8CC08810
* STORAGE AREAS FOR ERROR ROUTINES 8CC08820
* 8CC08830
RSSAA DC 0 SAVED ACCUMULATOR BUFFER 8CC08840
BSS E 2 8CC08850

7A6R 0 00C0 RSSAC DC /0000 SENSE ILSW FOR 8CC08860
7A69 0 0300 DC /0300 LEVEL ZERO 8CC08870
7A6A 0 0000 RSSAU DC 0 STORAGE FOR ILSW 8CC08880
7A6B 0 FFFF RSSAF DC -1 IN SP ROUTINE -IND, YES 8CC08890
7A6C 0 FFFF RSSAG DC -1 NOT IN SP ROUTINE 8CC08900
7A6D 0 0002 RSSAH DC 2 IN STORAGE PROTECT ROUTINE 8CC08910
7A6E 0 2000 RSSAE DC /2000 8CC08920
7A6F 0 4000 RSSAI DC /4000 8CC08930
7A70 0 8000 RSSAJ DC /8000 8CC08940
7A71 0 0002 RSSAK DC /0002 ISOLATE SW 14 8CC08950
7A72 0 000C RSSAL DC 12 8CC08960
7A73 0 0001 RSSAM DC 1 8CC08970
7A74 0 3000 RSSAN DC /3000 WAIT INSTRUCTION 8CC08980
7A75 0 0086 RSSAD DC /0086 SWITCHES 8, 13, 14 8CC08990
7A76 0 0006 RSSAP DC /0006 SWITCHES 13, 14 8CC09000
7A77 0 5555 RSSAQ DC /5555 8CC09010
7A78 0 0000 TBL DC 0 8CC09020
7A79 0 7853 DC SPVE1&2 ERROR ID 8CC09030
7A7A 0 788D DC SPVE2&2 8CC09040
7A7B 0 78AB DC SPVE3&2 8CC09050
7A7C 0 790C DC SPVE4&2 8CC09060
7A7D 0 7914 DC SPVE5&2 8CC09070
7A7E 0 793B DC SPVE6&2 8CC09080
7A7F 0 797A DC SPVF7&2 8CC09090
7A80 0 7982 JC SPVF8&2 8CC09100
7A81 0 785D DC PARE1&2 8CC09110
7A82 0 788F DC PARE2&2 8CC09120
7A83 0 78AF DC PARE3&2 8CC09130
7A84 0 7925 DC PARE4&2 8CC09140
7A85 0 797C DC PARE5&2 8CC09150
7A86 0 7983 DC PARE6&2 8CC09160
7A87 0 79AD DC PARE7&2 8CC09170
7A88 0 79B4 DC PARE8&2 8CC09180
7A89 0 7860 DC DATE1 8CC09190
7A8A 0 7891 DC DATE2 8CC09200
7A8B 0 78B2 DC DATE3 8CC09210
7A8C 0 792C DC DATE4 8CC09220
7A8D 0 7986 DC DATE5 8CC09230
7A8E 0 7986 DC DATE6 8CC09240
* 8CC09250
* ERROR ROUTINE TO SERVICE NON-INTERRUPT ERRORS 8CC09260
* 8CC09270
RSSDD DC 0 STORAGE FOR RETURN ADDRESS 8CC09280
STX 3 RSDDA&1 8CC09290
STX 2 RSDDA&3 8CC09300
STS RSDDJ STORE STATUS OFLO&CARRY 8CC09310
XIO L RSQAF TEST FOR THE ILLEGAL 8CC09320
LD L RSQAL SW COMBINATIONS--13, 8CC09330
AND RSSAD 14 ON AND 8 OFF 8CC09340
EOR RSSAP 8CC09350
BSC L RSDDK,- BRANCH IF ILLEGAL 8CC09360
XIO L RSQAF SW 13 TO BYPASS PRNT 8CC09370
LD L RSQAL 8CC09380
AND L RSRAX 8CC09390
BSC L RSDDX,Z BYPASS PRINTOUT IF BRANCH 8CC09400
LD I RSDDD LOAD ERROR EXIT WORD 8CC09410
BSI L RSDDE,F 8CC09420
BSI L LCG 8CC09430
DC MES20 ER 1 8CC09440
MDX RSDDX 8CC09450
RSSDE SRA 1 8CC09460
BSC L RSDDF,E 8CC09470
BSI L LCG 8CC09480
DC MES21 ER 2 8CC09490
MDX RSDDX 8CC09500
RSSDF SRA 1 8CC09510
BSC L RSDDG,E 8CC09520
BSI L LCG 8CC09530

7AB7 0 7BFF DC MES22 ER 3
 7AB8 0 7011 MDX RSDDX
 7AB9 0 1801 SFA 1
 7ABA 0 4C04 7AC0 BSC L RSDDH,E
 7ABC 0 4400 7AF4 BSE L LOG
 7ABE 0 7C03 DC MES23 ER 4
 7ABF 0 700A MDX RSDDX
 7AC0 0 1801 RSDDH SFA 1
 7AC1 0 4C04 7AC7 BSC L RSDDI,E
 7AC3 0 4400 7AF4 BSE L LOG
 7AC5 0 7C07 DC MES24 ER 5
 7AC6 0 7003 MDX RSDDX
 7AC7 0 4400 7AF4 RSDDI BSE L LOG
 7AC9 0 7C0B DC MES25 ER 6
 7ACA 0 6311 RSDDX LTX 3 17
 7ACB 0 6206 LTX 2 6
 7ACC 0 C0C2 RSDDC L3 RSDD
 7ACD 0 90A4 S RSSAL CORRECT I REG
 7ACE 0 F700 7A78 RSDDC BSC L3 TBL
 7AD0 0 4C18 7AD8 BSC L RSDDL,E-
 7AD2 0 7301 MDX 3 1
 7AD3 0 72FF MDX 2 -1
 7AD4 0 70F7 MDX RSDDC
 7AD5 0 C0B8 L TBL1
 7AD6 0 D0A1 SFC TBL
 7AD7 0 7001 MDX RSDDL&1
 7AD8 0 6B9F RSDDL STX 3 TBL
 7ADJ 0 C09F L3 TBL
 7ADA 0 6700 0000 RSUDA LTX L3 0
 7ADC 0 6600 0000 LTX L2 0
 7ADE 0 1890 SRT 16
 7ADF 0 C0AF L3 RSDD
 7AF0 0 R092 A RSSAM INCREMENT RETURN #DD ESS
 7AE1 0 D0AD SFC RSDD TO SKIP CAL DC
 7AF2 0 0C00 7826 XIO L RSQAF IF SW 14 OFF SET JP
 7AF4 0 C400 782C L3 L RSQAL
 7AE6 0 E400 7A71 AND L RSSAK INDICATOR LAMPS AND WAIT
 7AE8 0 4CA0 7ABF BSC I RSDD,Z
 7AFA 0 C400 78EC L3 L RSQAN RELOAD A REG AS PER ERROR
 7AFC 0 2000 RSDDJ L3 0 SAVE CARY&OFLO STATUS
 7AED 0 30G8 WAITB WAIT /B DATA ERPOR FOUND
 7AEE 0 4C80 7ABF BSC I RSDD
 7AF0 0 C086 RSDDK L3 RSSAQ
 7AF1 0 3006 RSWSC WAIT 6 ILLEGAL SW COMBIN-
 * * * * * TIONS 13&14 ON B OFF
 * * * * * RESET INTER-RETURN START
 * * * * *
 * * * * * LOG ROUTINE * * * * *
 * * * * *
 7AF4 0 2000 LOG DC 0 SE
 7AF5 0 6B1C LOG01 STX 3 LOG06&1 SAVE IX 3
 7AF6 0 0C00 7826 XIO L RSQAF
 7AF8 0 C400 782C L3 L RSQAL CK OUTPUT SELECTION
 7AFA 0 1009 SLA 9
 7AFB 0 4C10 7B17 BSC L TWRTR,- BRANCH IF 1053 OUTPU
 * * * * *
 7AFD 0 C480 7AF4 L3 I LOG GET MESSAGE ADDRESS
 7AFF 0 D052 SFC PRWRT SET IN IOCC
 * * * * *
 7B00 0 0840 LOG02 XIO PRSNS CHECK PRINTER READY
 7B01 0 4C04 7B07 BSC L LOG03,E BRANCH IF NOT READY
 7B03 0 1801 SRA 1
 7B04 0 4C04 7B09 BSC L LOG04,E BRANCH IF BUSY
 7B06 0 7004 MDX LOG05 READY AND NOT BUSY
 * * * * *
 7B07 0 3007 LOG03 WAIT 7 NOT READY

8CC09540
 8CC09550
 8CC09560
 8CC09570
 8CC09580
 8CC09590
 8CC09600
 8CC09610
 8CC09620
 8CC09630
 8CC09640
 8CC09650
 8CC09660
 8CC09670
 8CC09680
 8CC09690
 8CC09700
 8CC09710
 8CC09720
 8CC09730
 8CC09740
 8CC09750
 8CC09760
 8CC09770
 8CC09780
 8CC09790
 8CC09800
 8CC09810
 8CC09820
 8CC09830
 8CC09840
 8CC09850
 8CC09860
 8CC09870
 8CC09880
 8CC09890
 8CC09900
 8CC09910
 8CC09920
 8CC09930
 8CC09940
 8CC09950
 8CC09960
 8CC09970
 8CC09980
 8CC09990
 8CC10000
 8CC10010
 8CC10020
 8CC10030
 8CC10040
 8CC10050
 8CC10060
 8CC10070
 8CC10080
 8CC10090
 8CC10100
 8CC10110
 8CC10120
 8CC10130
 8CC10140
 8CC10150
 8CC10160
 8CC10170
 8CC10180
 8CC10190
 8CC10200
 8CC10210

7B08 0 70F7
 7B09 0 3009
 7B0A 0 70F5
 7B0B 0 0846
 7B0C 0 0843
 7B0D 0 1002
 7B0E 0 4810
 7B0F 0 70FC
 7B10 0 083D
 7B11 0 67C0 0000
 7B13 0 7401 7AF4
 7B15 0 4C80 7AF4
 7B17 0 1010
 7B18 0 D032
 7B19 0 083A
 7B1A 0 1005
 7B1B 0 180F
 7B1C 0 4C18 7B20
 7B1E 0 300A
 7B1F 0 70F9
 7B20 0 C028
 7B21 0 D02A
 7B22 0 0833
 7B23 0 0830
 7B24 0 180B
 7B25 0 4804
 7B26 0 70FC
 7B27 0 6301
 7B28 0 C480 7AF4
 7B2A 0 D001
 7B2B 0 C700 0000
 7B2D 0 D400 7B88
 7B2F 0 F01A
 7B30 0 4C18 7B11
 7B32 0 4400 7B58
 7B34 0 C400 7B88
 7B36 0 D015
 7B37 0 081E
 7B38 0 081B
 7B39 0 180B
 7B3A 0 4804
 7B3B 0 70FC
 7B3C 0 C00E

MDX LOG02 CHECK AGAIN
 * * * * *
 LOG04 WAIT 9 BUSY
 MDX LOG02 CHECK AGAIN
 * * * * *
 LOG05 XIO PRWRT OUTPUT MESSAGE
 * * * * *
 XIO PRSN CHECK FOR CP COMPLT
 SLA 2
 BSC -
 MDX *-4
 XIO PRSNS RESET DSW
 * * * * *
 PRINTING COMPLETE
 * * * * *
 LOG06 LDX L3 0 RESTORE IX 3
 MDX L LOG,1 BUMP RETURN
 * * * * *
 BSC I LOG RETURN TO USER SX
 * * * * *
 TWRTR SLA 16
 STO WRDSW
 XIO TWSNS CHECK IF TYPEWRITER
 SLA 5 READY
 TWA TWA 5
 BSC L TWR01,E-
 * * * * *
 WAITA WAIT /A
 MDX TWRTR&2
 * * * * *
 TWR01 LD TWRTO CARRAIGE RETURN AND
 STO IOARA LINE SPACE TO IOARA
 * * * * *
 XIO TWRRT CARG RETURN/LINE SP
 * * * * *
 XIO TWSNS HANG TILL NOT BUSY
 SRA 11
 BSC E
 MDX *-4
 * * * * *
 LDX 3 1 BYPASS 1443 WORD COUNT
 LD I LOG GET MESSAGE ADDRESS
 STO TWP02&1
 * * * * *
 TWR02 LD L3 0 GET WORD TO PRINT
 STO L CODWD SET IN CONVERSION RT
 EOR TWR01 CHECK IF TERMINATOR
 BSC L LOG06,E- BRANCH IF TERMINATOR
 * * * * *
 BSI L CODCV GO CONVERT 43 TO TW SRC
 * * * * *
 LD L CODWD
 STO ICARA
 * * * * *
 * * * * *
 * * * * *
 XIOWR XIO TWRRT WRITE CHARACTER
 * * * * *
 XIOSN XIO TWSNS HANG ON BUSY
 SRA 11
 BSC E
 MDX XIOSN BUSY
 * * * * *
 * * * * *
 * * * * *
 LD WRDSW GET 1/2 WORD SWITCH

8CC10220
 8CC10230
 8CC10240
 8CC10250
 8CC10260
 8CC10270
 8CC10280
 8CC10290
 8CC10300
 8CC10310
 8CC10320
 8CC10330
 8CC10340
 8CC10350
 8CC10360
 8CC10370
 8CC10380
 8CC10390
 8CC10400
 8CC10410
 8CC10420
 8CC10430
 8CC10440
 8CC10450
 8CC10460
 8CC10470
 8CC10480
 8CC10490
 8CC10500
 8CC10510
 8CC10520
 8CC10530
 8CC10540
 8CC10550
 8CC10560
 8CC10570
 8CC10580
 8CC10590
 8CC10600
 8CC10610
 8CC10620
 8CC10630
 8CC10640
 8CC10650
 8CC10660
 8CC10670
 8CC10680
 8CC10690
 8CC10700
 8CC10710
 8CC10720
 8CC10730
 8CC10740
 8CC10750
 8CC10760
 8CC10770
 8CC10780
 8CC10790
 8CC10800
 8CC10810
 8CC10820
 8CC10830
 8CC10840
 8CC10850
 8CC10860
 8CC10870
 8CC10880
 8CC10890

LOW CORE FUNCTION TEST

```

7B3D 0 4804      BSC E          8CC10900
7B3E 0 7006      MDX TWR03     GO SET UP NEXT WORD 8CC10910
*                                       SET UP FOR 2ND 1/2 WORD 8CC10920
*                                       8CC10930
*                                       8CC10940
7B3F 0 C00C      LD IOARA       8CC10950
7B40 0 1008      SLA 8          POSITION 2ND 1/2 WD 8CC10960
7B41 0 D00A      STO IOARA      8CC10970
7B42 0 7401 7B4B MDX L WRDSW,1  BUMP WORD SWITCH 8CC10980
7B44 0 70F2      MDX XIOWR     GO WRITE 2ND 1/2 WD 8CC10990
*                                       8CC11000
*                                       SET UP FOR NEXT WORD 8CC11010
*                                       8CC11020
7B45 0 7301      TWR03 MDX 3 1  NEXT WORD INDEX 8CC11030
7B46 0 7401 7B4B MDX L WRDSW,1  DUMP WORD SWITCH 8CC11040
7B48 0 70E2      MDX TWR02     GO GET NEXT WORD 8CC11050
*                                       8CC11060
*                                       LOG CONSTANTS 8CC11070
*                                       8CC11080
7B49 0 8103      TWRTO DC /E103  LINE SP/CARRIAGE RTN 8CC11090
7B4A 0 FFFF      TWRTO DC /FFFF  TERMINATOR 8CC11100
7B4B 0 0000      WRDSW DC 0     1/2 WORD SWITCH 8CC11110
7B4C 0 0000      IOARA DC 0     OUTPUT AREA 8CC11120
*                                       8CC11130
*                                       BSS E 0 8CC11140
*                                       8CC11150
7B4E 0 0000      PRSNS DC /0000  PRINTER SENSE IOCC 8CC11160
7B4F 0 3701      DC /3701      8CC11170
7B50 0 0000      PRSN DC 0     NON RESET SENSE 8CC11180
7B51 0 3700      DC /3700      8CC11190
7B52 0 0000      PRWRT DC /0000  PRINTER WRITE IOCC 8CC11200
7B53 0 3500      DC /3500      8CC11210
7B54 0 0000      TWSNS DC /0000  TYPEWTR SENSE IOCC 8CC11220
7B55 0 0F01      DC /0F01     DSW RESET PM01 8CC11230
7B56 0 7B4C      TWRTO DC IOARA  TYPEWTR WRITE IOCC 8CC11240
7B57 0 0900      DC /0900     WR TYPEWRITER PM02 8CC11250
*                                       8CC11260
*                                       8CC11270
*                                       8CC11280
*                                       8CC11290
*                                       8CC11300
*                                       8CC11310
*                                       8CC11320
*                                       8CC11330
*                                       8CC11340
*                                       8CC11350
*                                       8CC11360
*                                       8CC11370
*                                       8CC11380
*                                       8CC11390
*                                       8CC11400
*                                       8CC11410
*                                       8CC11420
*                                       8CC11430
*                                       8CC11440
*                                       8CC11450
*                                       8CC11460
*                                       8CC11470
*                                       8CC11480
*                                       8CC11490
*                                       8CC11500
*                                       8CC11510
*                                       8CC11520
*                                       8CC11530
*                                       8CC11540
*                                       8CC11550
*                                       8CC11560
*                                       8CC11570
*****
*          1443 CODE TO 1816/1053 *
*          CODE CONVERSION ROUTINE *
*****
7B58 0 0000      CODCV DC 0     SAVE INDEX REGS SE
7B59 0 6927      STX 1 CODC4E1
7B5A 0 6A28      STX 2 CODC4E3
7B5B 0 6B29      STX 3 CODC4E5
*
7B5C 0 1010      SLA 16        CLEAR LEFT HALF WORD
7B5D 0 D02B      STO LHIND     *INDICATOR
7B5E 0 6300      LDX 3 0
*
7B5F 0 C028      CODC1 LD CODWD  GET WORD TO CONVERT
7B60 0 1890      SRT 16       SET IN Q
7B61 0 C027      LD LHIND
7B62 0 4820      ESC 2        SKIP IF LEFT HALF
7B63 0 1088      SLT 8        POSITION RIGHT HALF
*
7B64 0 1010      SLA 16
7B65 0 1084      SLT 4        ZONE TO ACCUM
7B66 0 D023      STO COD00
7B67 0 6580 7B8A LDX 11 COD00 IX 1 # ZONE
*
7B69 0 1010      SLA 16
7B6A 0 1084      SLT 4        DIGIT TO ACCUM
7B6B 0 D01E      STO COD00
7B6C 0 6680 7B8A LDX 12 COD00 IX 2 # DIGIT
*
7B6E 0 C500 7B8D LD L1 ZONE  GET ZONE TABLE ADDR

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LOW CORE FUNCTION TEST

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7B70 0 D001      STO CODC2E1   SET IN CONVERSION WD 8CC11580
*                                       *                                       8CC11590
* CODC2 LD L2 0  GET CONVERTED CODE 8CC11600
7B71 0 C600 0000 STO L3 COD01 8CC11610
7B73 0 D700 7B8B *                                       8CC11620
*                                       LD LHIND 8CC11630
7B75 0 C013      BSC L CODC3,Z BRNCH IF RIGHT HALF 8CC11640
7B76 0 4C20 7B7C MDX L LHIND,1 8CC11650
7B78 0 7401 7B89 MDX 3 1 8CC11660
7B7A 0 7301      MDX CODC1    GO CONVERT RIGHT HLF 8CC11670
7B7B 0 70E3      *                                       8CC11680
* CODC3 LD COD01  PACK CONVERTED CODES 8CC11690
7B7C 0 C00E      SLA 8        8CC11700
7B7D 0 1008      OR COD02     8CC11710
7B7E 0 E80D      STC CODWD    8CC11720
7B7F 0 D008      *                                       8CC11730
* CODC4 LDX L1 0 RESTORE INDEX REGS 8CC11740
7B80 0 6500 0000 LDX L2 0 8CC11750
7B82 0 66C0 0000 LDX L3 0 8CC11760
7B84 0 6700 0000 *                                       8CC11770
* BSC I CODCV  RETURN TO USER SX 8CC11780
*                                       8CC11790
*                                       8CC11800
*                                       8CC11810
*                                       8CC11820
* CODWD DC 0    WORD LOCATION 8CC11830
7B88 0 0000      LHIND DC 0    LEFT HALF INDICATOR 8CC11840
7B89 0 0000      COD00 DC 0    WORK AREA 8CC11850
7B8A 0 0000      COD01 DC 0    CONVERTED LH CHARACT 8CC11860
7B8B 0 0000      COD02 DC 0    CONVERTED RH CHARACT 8CC11870
7B8C 0 0000      *                                       8CC11880
*                                       8CC11890
*                                       1443 TO 1816/1053 CODE 8CC11900
*                                       CONVERSION TABLES 8CC11910
*                                       8CC11920
7B8D 0 7B91      ZONE DC ZONEN NO ZONE 8CC11930
7B8E 0 7B9C      DC ZONE1 0 ZONE 8CC11940
7B8F 0 7BA7      DC ZONE2 11 ZONE 8CC11950
7B90 0 7BB1      DC ZONE3 12 ZONE 8CC11960
*                                       8CC11970
* ZONEN DC /0021 SPACE 8CC11980
7B91 0 0021      DC /00FC 1 8CC11990
7B92 0 00FC      DC /00D8 2 8CC12000
7B93 0 00D8      DC /00DC 3 8CC12010
7B94 0 00DC      DC /00F0 4 8CC12020
7B95 0 00F0      DC /00F4 5 8CC12030
7B96 0 00F4      DC /00D0 6 8CC12040
7B97 0 00D0      DC /00D4 7 8CC12050
7B98 0 00D4      DC /00E4 8 8CC12060
7B99 0 00E4      DC /00E0 9 8CC12070
7BA0 0 00E0      DC /00C4 0 8CC12080
7BA1 0 00C4      ZONE1 DC 0 8CC12090
7BA2 0 0000      DC 0 8CC12100
7BA3 0 0000      DC /009A S 8CC12110
7BA4 0 009A      DC /009E T 8CC12120
7BA5 0 009E      DC /00B2 U 8CC12130
7BA6 0 00B2      DC /00B6 V 8CC12140
7BA7 0 00B6      DC /0092 W 8CC12150
7BA8 0 0092      DC /0096 X 8CC12160
7BA9 0 0096      DC /00A6 Y 8CC12170
7BAA 0 00A6      DC /00A2 Z 8CC12180
7BAB 0 00A2      DC /0021 SPACE 8CC12190
7BAC 0 0021      ZONE2 DC 0 8CC12200
7BAD 0 0000      DC /007E J 8CC12210
7BAE 0 007E      DC /005A K 8CC12220
7BAF 0 005A      DC /005E L 8CC12230
7BB0 0 005E      DC /0072 M 8CC12240
7BB1 0 0072      DC /0076 N 8CC12250
7BB2 0 0076

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LOW CORE FUNCTION TEST

7BAD 0 0052	DC	/0052	O
7BAE 0 0056	DC	/0056	P
7BAF 0 0066	DC	/0066	Q
7BB0 0 0062	DC	/0062	R
7BB1 0 0000	ZONE3 DC	0	
7BB2 0 003E	DC	/003E	A
7BB3 0 001A	DC	/001A	B
7BB4 0 001E	DC	/001E	C
7BB5 0 0032	DC	/0032	D
7BB6 0 0036	DC	/0036	E
7BB7 0 0012	DC	/0012	F
7BB8 0 0016	DC	/0016	G
7BB9 0 0026	DC	/0026	H
7BBA 0 0022	DC	/0022	I
7BBB 0 0086	DC	/0086	O ERROR
7BBC 0 0000	DC	/0000	PERIOD
* MES15			
7BRD 0 000A	DC	10	WORD CT
7BBE 0 1213	DC	/1213	ST
7BDF 0 3129	DC	/3129	AR
7BC0 0 1300	DC	/1300	T
7BC1 0 2326	DC	/2326	LO
7BC2 0 1600	DC	/1600	W
7BC3 0 3326	DC	/3326	CO
7BC4 0 2935	DC	/2935	RE
7BC5 0 0013	DC	/0013	T
7BC6 0 3512	DC	/3512	ES
7BC7 0 1300	DC	/1300	T
7BC8 0 FFFF	DC	/FFFF	TERM
* MES16			
7BC9 0 0009	DC	9	WORD CT
7BCA 0 3525	DC	/3525	EN
7BCB 0 3400	DC	/3400	D
7BCC 0 2326	DC	/2326	LO
7BCD 0 1600	DC	/1600	W
7BCE 0 3326	DC	/3326	CO
7BCF 0 2935	DC	/2935	RE
7BD0 0 0013	DC	/0013	T
7BD1 0 3512	DC	/3512	ES
7BD2 0 1300	DC	/1300	T
7BD3 0 FFFF	DC	/FFFF	TERM
* MES17			
7BD4 0 000A	DC	10	WD CT
7BD5 0 3529	DC	/3529	ER
7BD6 0 2926	DC	/2926	RD
7BD7 0 2900	DC	/2900	R
7BD8 0 3925	DC	/3925	IN
7BD9 0 1300	DC	/1300	T
7BDA 0 1213	DC	/1213	ST
7BDB 0 2629	DC	/2629	OR
7BDC 0 3700	DC	/3700	G
7BDD 0 2729	DC	/2729	PR
7BDE 0 2613	DC	/2613	OT
7BDF 0 FFFF	DC	/FFFF	TERM
* MES18			
7BE0 0 0008	DC	8	WD CT
7BE1 0 3529	DC	/3529	ER
7BE2 0 2926	DC	/2926	RD
7BE3 0 2900	DC	/2900	R
7BE4 0 3925	DC	/3925	IN
7BE5 0 1300	DC	/1300	T
7BE6 0 2731	DC	/2731	PA
7BE7 0 2939	DC	/2939	RI
7BE8 0 1318	DC	/1318	TY
7BE9 0 FFFF	DC	/FFFF	TERM
* MES19			
7BFA 0 000C	DC	12	WD CT
7BFB 0 3529	DC	/3529	ER

8CC12260	
8CC12270	
8CC12280	
8CC12290	
8CC12300	
8CC12310	
8CC12320	
8CC12330	
8CC12340	
8CC12350	
8CC12360	
8CC12370	
8CC12380	
8CC12390	
8CC12400	
8CC12410	
8CC12420	
8CC12430	
8CC12440	
8CC12450	
8CC12460	
8CC12470	
8CC12480	
8CC12490	
8CC12500	
8CC12510	
8CC12520	
8CC12530	
8CC12540	
8CC12550	
8CC12560	
8CC12570	
8CC12580	
8CC12590	
8CC12600	
8CC12610	
8CC12620	
8CC12630	
8CC12640	
8CC12650	
8CC12660	
8CC12670	
8CC12680	
8CC12690	
8CC12700	
8CC12710	
8CC12720	
8CC12730	
8CC12740	
8CC12750	
8CC12760	
8CC12770	
8CC12780	
8CC12790	
8CC12800	
8CC12810	
8CC12820	
8CC12830	
8CC12840	
8CC12850	
8CC12860	
8CC12870	
8CC12880	
8CC12890	
8CC12900	
8CC12910	
8CC12920	
8CC12930	

LOW CORE FUNCTION TEST

7BEC 0 2926	DC	/2926	RD
7BED 0 2900	DC	/2900	R
7BEE 0 3925	DC	/3925	IN
7BEF 0 1300	DC	/1300	T
7BF0 0 3925	DC	/3925	IN
7BF1 0 1500	DC	/1500	V
7BF2 0 2627	DC	/2627	OP
7BF3 0 0033	DC	/0033	C
7BF4 0 2634	DC	/2634	OD
7BF5 0 3500	DC	/3500	E
7BF6 0 FFFF	DC	/FFFF	TERM
* MES20			
7BF7 0 0002	DC	2	WD CT
7BF8 0 3529	DC	/3529	ER
7BF9 0 0001	DC	/0001	1
7BFA 0 FFFF	DC	/FFFF	TERM
* MES21			
7BFB 0 0002	DC	2	WD CT
7BFC 0 3529	DC	/3529	ER
7BFD 0 0002	DC	/0002	2
7BFE 0 FFFF	DC	/FFFF	TERM
* MES22			
7BFF 0 0002	DC	2	WD CT
7C00 0 3529	DC	/3529	ER
7C01 0 0003	DC	/0003	3
7C02 0 FFFF	DC	/FFFF	TERM
* MES23			
7C03 0 0002	DC	2	WD CT
7C04 0 3529	DC	/3529	ER
7C05 0 0004	DC	/0004	4
7C06 0 FFFF	DC	/FFFF	TERM
* MES24			
7C07 0 0002	DC	2	WD CT
7C08 0 3529	DC	/3529	ER
7C09 0 0005	DC	/0005	5
7C0A 0 FFFF	DC	/FFFF	TERM
* MES25			
7C0B 0 0002	DC	2	WD CT
7C0C 0 3529	DC	/3529	ER
7C0D 0 0006	DC	/0006	6
7C0E 0 FFFF	DC	/FFFF	TERM
* RSEND			
7C0F 0 0000	DC	0	
7C10 0 0000	DC	0	
7C11 0 0000	DC	0	
7C12 7801	END	RSDKR	

NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY

8CC12940	
8CC12950	
8CC12960	
8CC12970	
8CC12980	
8CC12990	
8CC13000	
8CC13010	
8CC13020	
8CC13030	
8CC13040	
8CC13050	
8CC13060	
8CC13070	
8CC13080	
8CC13090	
8CC13100	
8CC13110	
8CC13120	
8CC13130	
8CC13140	
8CC13150	
8CC13160	
8CC13170	
8CC13180	
8CC13190	
8CC13200	
8CC13210	
8CC13220	
8CC13230	
8CC13240	
8CC13250	
8CC13260	
8CC13270	
8CC13280	
8CC13290	
8CC13300	
8CC13310	
8CC13320	
8CC13330	
8CC13340	
8CC13350	
8CC13360	
8CC13370	
8CC13380	
8CC13390	

CODCV 7B58 7B32 7B86
 CODC1 7B5F 7B7B
 CODC2 7B71 7B70
 CODC3 7B7C 7B76
 CODC4 7B80 7B59 7B5A 7B5B
 CODWD 7B88 7B2D 7B34 7B5F 7B7F
 COD00 7B8A 7B66 7B67 7B6B 7B6C
 COD01 7B8B 7B73 7B7C
 COD02 7B8C 7B7E
 DATE1 7B60 7A89
 DATE2 7B91 7A9A
 DATE3 7B82 7A8B
 DATE4 792C 7A8C
 DATE5 7986 7A8D
 DATE6 7986 7A8E
 IOARA 7B4C 7B21 7B36 7B3F 7B41 7B56
 LHIND 7B89 7B5D 7B61 7B75 7A78
 LOG 7AF4 7B47 79E8 7A17 7A2B 7A32 7AA7 7AAE 7AB5 7ABC 7AC3 7AC7 7AFD 7B13
 7B15 7B2B
 LOG01 7AF5
 LOG02 7B00 7B08 7B0A
 LOG03 7B07 3007 7B01
 LOG04 7B09 3009 7B04
 LOG05 7B0C 7B06
 LOG06 7B11 7AF5 7B30
 MES15 7B8D 7B49
 MES16 7BC9 79EA
 MES17 7B04 7A19
 MES18 7BEO 7A2D
 MES19 7BEA 7A34
 MES20 7BF7 7AA9
 MES21 7BFB 7AB0
 MES22 7BFF 7AB7
 MES23 7C03 7AE
 MES24 7C07 7AC5
 MES25 7C0B 7AC9
 NEXT 7A00 79FE
 PARE1 7B5B 7A8
 PARE2 7B8D 7A8
 PARE3 7B8D 7A83
 PARE4 7923 793D 7A84
 PARE5 797A 7A85
 PARE6 7981 7A86
 PARE7 79AB 798E 79C8 79D1 7A87
 PARE8 79B2 7A88
 PRSN 7B50 7B0C
 PRSNS 7B4E 7B00 7B10
 PRWRT 7B52 7AFF 7B0B
 RSAAB 7B15 7B11
 RSAAC 7B1A 7B15
 RSAAD 7B1B 7B13
 RSAAE 7B1C 7B03 7B0A
 RSAAH 7B1D 7B53 7B75 7B83 7917 7947 799F 79CF
 RSAAK 7B1E 7B16 7B32 7968
 RSAAL 7B21 7B2F
 RSAM 7B24 7B01 7B05
 RSABA 7B2F 7B19
 RSABB 7B4D 7B7B
 RSABC 7B4F 7B57
 RSABD 7B5B 7B54
 RSABE 7B5A 7B68 7B72 7B79
 RSABF 7B6D 7B60
 RSABG 7B7A 7B76
 RSABH 7B4C 7B82 79F6
 RSABI 7B4A 7B45
 RSABJ 7B9E 7B91
 RSABK 7B22 7B82
 RSABL 7B8B 7B8A 7B8A

RSABM 7B02 7BCE
 RSABN 7B87 7B99 7BAA 7B09
 RSABO 7BDA 7B05
 RSABP 7B85 7B0B
 RSABR 7B84 7B2
 RSACA 790F 7905
 RSACB 7900 791D
 RSACD 7916 790E
 RSACE 792B 7927
 RSACH 7921 7934 7944
 RSACI 7BFO 7965
 RSACJ 7BEE 7B84
 RSACK 79F9
 RSACL 7920 794C
 RSACM 7993 7986
 RSACN 7977 798E 7998 79A1
 RSACO 797B 7972 799E
 RSACP 79C3 7986
 RSACR 79AC 79AA 79CE
 RSACS 796F 79D4
 RSACT 7B77 79F3
 RSACU 796E 796A 79DB
 RSACV 7968 7967
 RSACW 794D 7BFC 7949
 RSACX 7BFD 7BFB
 RSACY 7B84 7966
 RSACZ 7914 790F
 RSADA 79DD 796C
 RSADB 791E 7919
 RSADC 79EB 79E6
 RSADD 790C 7907
 RSAD E 7B40 7B33 79F1
 RSACA 79F8 7B29 7A1D 7A3A 7A4B 7A60
 RSACB 7A1F 7A0A 7A1A
 RSACC 7A2E 7A29
 RSACD 7A35 7A15 7A25 7A30
 RSACE 7A5A 79FB
 RSACG 7A1B 7A0D
 RSACH 7A5F 3001 3002 3004 3008 7A3F
 RSACI 7A5B 79F9 7A40 7A43 7A47
 RSACJ 7A4B 7A52
 RSACK 7A56 7A4E 7A55
 RSACQ 79F6 79DF
 RSADA 7ADA 7A90 7A91
 RSADB 7ACE
 RSDDC 7ACC 7AD4
 RSDDD 7A8F 7B6A 7B9B 7B8F 7936 7990 79C0 7AA3 7ACC 7ADF 7AE1 7AEB 7AEE
 RSDD E 7AAB 7AA5
 RSDDF 7AB2 7AAC
 RSDDG 7AB9 7AB3
 RSDDH 7ACO 7ABA
 RSDDI 7AC7 7AC1
 RSDDJ 7AEC 7A92
 RSDDK 7AF0 7A06 7A99
 RSDDL 7AD8 7AD0 7AD7
 RSDDX 7ACA 7AA1 7AAA 7AB1 7AB8 7ABF 7AC6
 RSDKR 7B01 7C12
 RSDKS 7B05 7B24 79F4 7AF2
 RSDKW 7B04 3003
 RSEND 7C0F 797B 79AC
 RSFAA 7B1F 7B4A
 RSFAB 7B20 7B4B 79DD
 RSQAC 7B28 7B4D 7B58 7B85 7BFD 791E 796F 79A7
 RSQAD 7B29 7B37
 RSQAE 7B2A 7B4F 7B50 7B51 7B5A 7B5B 7B5F 7B74
 RSQAF 7B26 7B40 7B62 7B6D 7B7C 7B93 7B9E 7B84 7B82 7BDC 792E 793E 794D 7988
 7993 7988 79C3 79D5 79E0 79EB 7A00 7A0F 7A1F 7A35 7A93 7A9B 7AE2
 7AF6

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RSQAG 78ED 78EF 7952 7957
RSQAH 78E7 7887 7888 788B 788D 78A9 78AD 78BD 78D2 78D7
RSQAI 78E8 788A 78EE
RSQAJ 78E9 78A6
RSQAK 78EA 78A7 78AB 78AB 78B1 78CC 78DD
RSQAL 782C 7826 7841 7864 786E 787E 7895 78A0 78B6 78C6 78DE 7930 7940 794F
798A 7995 798A 79C5 79D7 79E2 79ED 7A02 7A11 7A21 7A37 7A95 7A9D
7AE4 7AF8
RSQAM 78EB 78D8 795B 79CB
RSQAN 78EC 785D 788F 78AF 7925 7983 79B4 7AEA
RSQAO 7827 7836
RSQAP 782B 7835
RSQAQ 78E5 78F7
RSQAR 78E6 78F8 78F9
RSQAU 782D 783A
RSQAV 782E 783D
RSQAW 79F3 3005
RSRAA 795A 78FF 7900 7908 79CA 7910 7912 7916 7918 7920 7923 7939 7946
RSRAB 795B 7902 7904
RSRAC 795C 7929 7928 7977 7985
RSRAD 7965 7954 7958
RSRAE 795D 7971 7978 797C 797F 7981 799A 799D 79A9 79AD 79B0 79B2 79CA 79CD
RSRAF 795E 797E 79AF
RSRAG 795F 7880 78E0 7951 79D9
RSRAH 7960 79EF
RSRAI 7961 7866 7870 7897 78A2 78B8 78C8 7932 7942 798C 7997 79BC 79C7
RSPAJ 7963 7921
RSRAK 964 7922 793B
RSRAX 7962 7843 79E4 7A13 7A23 7A9F
RSSAA 7A64 79FA 7A59
RSSAC 7A68 79FC
RSSAD 7A6A 79FD 7A08 7A1B 7A27 7A2E 7A3C 7A41 7A45
RSSAE 7A6E 7A09 7A1C
RSSAF 7A6B 7974 79A5 7A0C
RSSAG 7A6C 79A3
RSSAH 7A6D 7973
RSSAI 7A6F 7A28
RSSAJ 7A70 7A2F 7A42
RSSAK 7A71 7A39 7AE6
RSSAL 7A72 7ACD
RSSAM 7A73 7AE0
RSSAN 7A74 7A3E
RSSAO 7A75 7A04 7A97
RSSAP 7A76 7AC5 7A98
RSSAQ 7A77 7AF0
RSSAR 7A62 7A46
RSWSC 7AF1 3006
SPVE1 7851 7A79
SPVE2 788B 7A7A
SPVE3 78A9 78D1 7A7B
SPVE4 790A 7A7C
SPVE5 7912 7A7D
SPVE6 7939 792A 792C 7A7E
SPVE7 7976 7A7F
SPVE8 79E0 7A80
TAG 78C4 788C
TBL 7A78 7A4C 7A54 7A56 7A57 7ACE 7AD6 7AD8 7AD9
TBL1 7A63 7A53 7AD5
TWRTR 7B17 7AFB 7B1F
TWRTO 7B49 7B20
TWR1 7B4A 7B2F
TWR01 7B20 7B1C
TWR02 7B2B 7B2A 7B48
TWR03 7B45 7B3E
TWSNS 7B54 7B3B 7B19 7B23 7B38
TWRRT 7B56 7B3E 7B22 7B37
WAITA 7B1E 300A
WAITB 7AED 300B

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WRDSW 7B4B 7B18 7B3C 7B42 7B46
XIOSN 7B38 7B38
XIOWR 7B37 7B44
ZONE 788D 786E
ZONEN 7B91 7B8D
ZONE1 7B9C 788E
ZONE2 7BA7 788F
ZONE3 78B1 7B90
END OF ASSEMBLY

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1. PURPOSE

THE CORE FUNCTION TEST PROGRAM VERIFIES THE PROPER OPERATION OF THE CORE MEMORY OF AN 1800. THE PROGRAM EXERCISES THE READ/WRITE, SENSE/INHIBIT, ADDRESSING AND STORAGE PROTECT CIRCUITRY. POSITIONS THAT DO NOT FUNCTION CORRECTLY ARE INDICATED BY ERROR LOGS OR ABNORMAL WAITS.

2. REQUIREMENTS

2.1 PROGRAM

THE 1800 RELOCATABLE DIAGNOSTIC LOADER IS USED TO LOAD THE OBJECT DECK OR PAPER TAPE OBJECT PROGRAM.

2.2 EQUIPMENT

AN 1800 PROCESSOR-CONTROLLER WITH 8 - 65K OF MEMORY. (1801, 1802, 1803)

A 1442 CARD READ PUNCH OR 1054 PAPER TAPE READER.

A 1443 OR 1816 OR 1053 PRINTER FOR DIAGNOSTIC MESSAGES.

3. OPERATING PROCEDURE

3.1 PROGRAM LOADING

THE CORE FUNCTION TEST CAN BE LOADED AND EXECUTED ON ANY 4K WORD BOUNDARY. NORMALLY THE PROGRAM IS INITIALLY LOADED AND EXECUTED IN THE HI 4K OF THE FIRST BSM, HOWEVER, IF THE FIRST BSM IS SUSPECT, IT IS POSSIBLE TO LOAD THE CORE FUNCTION TEST IN THE HI 4K OF ANY BSM BY PATCHING THE RELOCATABLE LOADER.

IF THE OBJECT PROGRAM IS ON CARDS, THE LOADER SHOULD BE PATCHED WITH ONE OF THE FOLLOWING CARDS TO ACCOMPLISH RELOCATION.

BSM	ADDRESS RANGE OF BSM	PATCH CARD COLS. 1-10
1	/0000-1FFF	80125 17FF
2	/2000-3FFF	80125 37FF
3	/4000-5FFF	80125 57FF
4	/6000-7FFF	80125 77FF
5	/8000-9FFF	80125 97FF
6	/A000-BFFF	80125 B7FF
7	/C000-DFFF	80125 D7FF
8	/E000-FFFF	80125 F7FF

* IMPORTANT OPERATING INSTRUCTION *

* THE 8 PATCH CARDS SHOWN ABOVE ARE SENT TO THE FIELD *
* IN FRONT OF THE OBJECT DECK. THE CUSTOMER ENGINEER *
* SHOULD SELECT ONE FOR USE AND REMOVE AND SAVE THE *
* OTHER SEVEN DURING OPERATION. THE SELECTED PATCH *
* CARD IS PLACED BETWEEN THE OBJECT AND LOADER DECKS. *
* **NOTE - THE PATCH CARDS AFFECT THE LOADER. THEY *
* ARE NOT SHOWN IN THE OBJECT DECK LISTING. *

IF THE OBJECT PROGRAM IS ON PAPER TAPE, THE RELOCATABLE PAPER TAPE LOADER (PROGRAM 08R0) WILL HAVE TO BE PATCHED AFTER IT HAS BEEN LOADED.

OF COURSE, IF THE 1800 HAS ONLY ONE BSM, THE OPERATOR WILL HAVE TO ATTEMPT TO LOAD THE CORE FUNCTION TEST IN THE NORMAL MANNER OR ATTEMPT TO TROUBLESHOOT THE MEMORY WITH SOME OTHER METHOD.

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TO LOAD THE CORE FUNCTION TEST OBJECT DECK OR PAPER TAPE OBJECT PROGRAM -

3.2 PROGRAM OPERATION

1. CLEAR THE MEMORY, RESET THE MACHINE.
2. A) CARD - PLACE TEST DECKS IN CARD READER, PRESS READER START BUTTON.
- B) PAPER TAPE - PUT PAPER TAPE LOADER PROGRAM, 08B0, IN THE PAPER TAPE READER AND LOAD THE PROGRAM. WHEN IT COMES TO WAIT /30FF AND THE IAR IS AT /0083, PATCH WORD /0125 USING THE DATA ENTRY SWITCHES -

THE CORE FUNCTION TEST CONSISTS OF EIGHT PATTERN TESTS. THEY CAN ALL BE RUN TOGETHER OR ONE CAN BE SELECTED. THE TEST CAN BE RUN IN ALL BASIC STORAGE MODULES OF A MACHINE OR IT CAN BE RUN IN A SELECTED BASIC STORAGE MODULE. IT IS ALSO POSSIBLE FOR THE CORE FUNCTION TEST TO BE RESIDING IN ONE BASIC STORAGE MODULE AND RUNNING PATTERN TESTS IN ANOTHER BASIC STORAGE MODULE (EXTERNAL TEST.) THERE ARE PROVISIONS FOR LOOPING ON A PATTERN TEST AND LOOPING ON THE ENTIRE PROGRAM.

PATTERN TEST SELECTION IS MADE BY SETTING DATA ENTRY SWITCHES 0 - 3. SETTINGS ARE INDICATED BELOW -

BSM	ADDRESS RANGE OF BSM	HEX PATCH IN WORD /0125
1	/0000-1FFF	/17FF
2	/2000-3FFF	/37FF
3	/4000-5FFF	/57FF
4	/6000-7FFF	/77FF
5	/8000-9FFF	/97FF
6	/A000-BFFF	/B7FF
7	/C000-DFFF	/D7FF
8	/E000-FFFF	/F7FF

DATA ENTRY SWITCHES 0123	PATTERN TEST SELECTED
0000	ALL EIGHT PATTERN TESTS ARE TO BE EXECUTED.
0001	1 - READ/WRITE ADDRESSES
0010	2 - BIT ISOLATION
0011	3 - FLOATING ZERO
0100	4 - WORST CASE
0101	5 - ALTERNATE 0 AND 1
0110	6 - ALTERNATE 1 AND 0
0111	7 - ADD TO MEMORY
1000	8 - STORAGE PROTECT AND RESET STORAGE PROTECT
1111	15 - SUMMARY LOG

WHEN THE PATCH IS COMPLETED, RETURN TO WAIT /30FF AT LOCATION /0082. PUT THE OBJECT PROGRAM TAPE INTO THE PAPER TAPE READER AND READY IT.

* NOTE - ALL SWITCH SETTINGS FOR DES. 0-3 BETWEEN 1000 AND 1111 ARE INVALID AND IF SELECTED WILL RESULT IN AN ERROR LOG.

3. SET DATA ENTRY SWITCH 9 TO INDICATE PRINTER FOR MESSAGE LOGGING.
SWITCH 9 OFF, LOG ON 1443.
SWITCH 9 ON, LOG ON 1816 OR 1053.
READY INDICATED PRINTER.
4. A) CARD - PRESS THE PROGRAM LOAD BUTTON. THE PROGRAM WILL BE LOADED, A HEADING PRINTED AND THE PROGRAM WILL WAIT FOR THE DATA ENTRY SWITCH SETTINGS.
- B) PAPER TAPE - PRESS THE START BUTTON AND THE PROGRAM WILL BE LOADED, A HEADING PRINTED AND THE PROGRAM WILL WAIT FOR DATA ENTRY SWITCH SETTINGS.

```

*****
*
*   IMPORTANT OPERATING INSTRUCTION
*
*****
*
* 5. SET WRITE STORAGE PROTECT BITS SWITCH TO YES.
*   SET CHECK STOP SWITCH TO OFF.
*
*****

```

THE CORE FUNCTION TEST IS LOADED AND READY TO RUN.



STORAGE MODULE SELECTION IS INDICATED BY DATA ENTRY SWITCHES 4 - 7. SETTINGS ARE INDICATED BELOW -

DATA ENTRY SWITCHES 4567	BSM SELECTED FOR TESTING	ADDRESS RANGE OF BSM
0000	ALL	
0001	1	/0000-/1FFF
0010	2	/2000-/3FFF
0011	3	/4000-/5FFF
0100	4	/6000-/7FFF
0101	5	/8000-/9FFF
0110	6	/A000-/BFFF
0111	7	/C000-/DFFF
1000	8	/E000-/FFFF

* NOTE - ALL OTHER SWITCH SETTINGS FOR DES. 4-7 ARE INVALID AND IF SELECTED WILL RESULT IN AN ERROR LOG. ALSO, SELECTING A BSM NOT IN THE RANGE OF THE PARTICULAR MACHINE WILL RESULT IN AN ERROR LOG.

DATA ENTRY SWITCH 8 DETERMINES WHETHER THE BSM SELECTED BY DES. 4-7 WILL BE EXERCISED INTERNALLY OR EXTERNALLY.

BELOW ARE THE FUNCTIONS OF DATA ENTRY SWITCHES 8 - 15.

DES	FUNCTION
8	(OFF) THE BSM SELECTED BY DES. 4-7 IS TO BE EXERCISED INTERNALLY. (ON) THE BSM SELECTED BY DES. 4-7 IS TO BE EXERCISED EXTERNALLY.
9	(OFF) LOG ON 1443. (ON) LOG ON 1816 OR 1053.
10	(ON) LOOP ON PATTERN TEST.
11	(ON) LOOP ON PROGRAM.
13	(ON) BYPASS IMMEDIATE ERROR LOG.
14	(ON) WAIT ON ERROR.
15	(ON) WAIT BEFORE STARTING PATTERN TEST.

WHEN THE DATA ENTRY SWITCHES HAVE BEEN SET, PRESS THE START BUTTON AND THE CORE FUNCTION TEST WILL BE EXECUTED. WHEN ERRORS ARE DETECTED, AN IMMEDIATE ERROR LOG IS PRINTED, UNLESS DES. 13 IS ON. (SEE SECTION 4.2 FOR DESCRIPTION OF ERROR LOGS.) WHEN THE CORE FUNCTION TEST IS COMPLETE, THE SUMMARY LOG WILL BE PRINTED. IT CANNOT BE BYPASSED. (SEE SECTION 4.3 FOR A DESCRIPTION OF THE SUMMARY LOG.)

```
*****
*
*   IMPORTANT OPERATING NOTE
*
*****
*
*   AT ANY TIME THE OPERATOR MAY RETURN TO THE BEGINNING OF
*   THE PROGRAM BY PRESSING THE IMMEDIATE STOP AND START
*   BUTTONS. DATA ON ERRORS, FOR THE SUMMARY LOG, IS NOT LOST.*
*
*   CAUTION - STOPPING AND RESETTING THE MACHINE DURING PATTERN*
*   TEST 6 OR 8 CAN LEAVE STORAGE PROTECT BITS SET IN MEMORY
*   AND IT WILL BE IMPOSSIBLE TO RUN OTHER PATTERN TESTS.
*
*****
```

3.3 WAITS

ALL WAITS ARE DESCRIBED IN THE WAIT SECTION AT THE BEGINNING OF THE PROGRAM.

3.4 TERMINATIONS

CERTAIN CONDITIONS CAN CAUSE THE ABNORMAL TERMINATION OF THE CORE FUNCTION TEST. THESE TERMINATIONS ARE SPECIAL WAITS WITHOUT LOGS. SEE THE WAIT SECTION AT THE BEGINNING OF THE PROGRAM.

4. PRINTOUTS

4.1 STATUS MESSAGES

ALL STATUS AND ERROR MESSAGES ARE PRECEDED BY A FOUR DIGIT DECIMAL CODE. THE FIRST TWO DIGITS INDICATE THE ROUTINE THAT CAUSED THE MESSAGE. THE LAST TWO DIGITS ARE THE MESSAGE CODE.

ROUTINE IDENTIFICATIONS ARE LISTED BELOW -

CODE	ROUTINE
00	INITIALIZATION AND HOUSEKEEPING
01	READ/WRITE ADDRESS PATTERN TEST
02	BIT ISOLATION PATTERN TEST
03	FLOATING ZERO PATTERN TEST
04	WORST CASE PATTERN TEST
05	ALTERNATE 0 AND 1 PATTERN TEST
06	ALTERNATE 1 AND 0 PATTERN TEST
07	ADD TO MEMORY PATTERN TEST
08	STORAGE PROTECT AND RESET STORAGE PROTECT PATTERN TEST
15	SUMMARY LOG

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MESSAGE CODES ARE GROUPED INTO GENERAL AREAS -

- 00 - 09 GENERAL MESSAGES
- 10 - 19 DATA ENTRY SWITCH SETTING ERRORS
- 20 - 29 TEST PATTERN ERRORS
- 30 - 39 ERRORS DETECTED BY INTERNAL INTERRUPT

BELOW IS A LIST OF GENERAL MESSAGES AND DATA ENTRY SWITCH ERROR LOGS WITH ACTION REQUIRED -

MESSAGE	ACTION
0000 08CF CORE TEST	HEADING, NO ACTION REQUIRED.
0001 SET DES	SET DATA ENTRY SWITCHES FOR PROGRAM OPTIONS. PRESS START TO EXECUTE CORE FUNCTION TEST.
0008 PASS COMPLETE	THE LOOP ON PROGRAM SWITCH, DES. 11, IS ON. A PASS OF THE PROGRAM HAS BEEN EXECUTED.
0010 DES 8	SWITCH 8 IS ON INDICATING AN EXTERNAL TEST, BUT NO BSM HAS BEEN IDENTIFIED BY DES. 4-7. EITHER RESET SWITCH 8, OR SET DES. 4-7 TO A VALID COMBINATION AND PRESS START TO RE-INITIALIZE..
0011 DES 4-7	A BSM HAS BEEN SPECIFIED BY DES. 4-7 WHICH IS OUT OF RANGE FOR THIS MACHINE. RESET DES. 4-7 TO A VALID COMBINATION AND PRESS START TO RE-INITIALIZE.
0012 ONE BSM	THIS 1800 HAS ONLY ONE BSM. IT IS NOT POSSIBLE TO RUN AN EXTERNAL TEST ON AN 8K MACHINE. RESET DES. 8 AND PRESS START TO RE-INITIALIZE.
0014 DES 0-3	AN INVALID PATTERN TEST HAS BEEN SPECIFIED BY DES. 0-3. RESET THE SWITCHES TO A VALID COMBINATION AND PRESS START TO RE-INITIALIZE.
0X00 WAIT	X IS THE ROUTINE IDENTIFICATION. THIS IS THE PREPROCESSING WAIT, DATA ENTRY SWITCH 15 IS ON.
0X08 PASS COMPLETE	X IS THE ROUTINE IDENTIFICATION. THE LOOP ON ROUTINE SWITCH, DES. 10, IS ON. A PASS OF THE PATTERN TEST HAS BEEN EXECUTED.
1509 END CORE TEST	HEADING, NO ACTION REQUIRED.

* NOTE - THESE MESSAGES CANNOT BE BYPASSED BY SETTING DATA ENTRY SWITCH 14.

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4.2 ERROR LOGS

THE IMMEDIATE ERROR LOG IS A ONE LINE MESSAGE THAT HAS AN ERROR CODE TO IDENTIFY THE TYPE OF ERROR, AND THE BINARY CODING OF THE ERROR ADDRESS, TEST PATTERN AND FAILURE PATTERN.

CODE ADDRESS TEST PATTERN SP FAIL. PATTERN SP
 XXYY AAA BBB CCC DDD EEEE TTTT TTTT TTTT TTTT TT FFFF FFFF FFFF FFFF FF

WHERE -

XX - TEST ROUTINE ID., 00 - 08.
 YY - MESSAGE ID., 00 - 99.

AAA - BSM NUMBER
 BBB - HI X BIT PATTERN
 CCC - LO X BIT PATTERN
 DDD - HI Y BIT PATTERN
 EEEE - LO Y BIT PATTERN

TTTT - TEST PATTERN
 FFFF - FAILURE PATTERN
 SP - STORAGE PROTECT BIT, PARITY BIT

MESSAGE IDENTIFICATION CODES ARE LISTED BELOW -

- 21 - BIT PATTERN ERROR DETECTED BY PATTERN TEST.
- 31 - OP CODE CHECK.
- 32 - PARITY CHECK IN PATTERN.
- 33 - PARITY CHECK IN CORE FUNCTION TEST PROGRAM.
- 34 - TWO OR MORE PARITY CHECKS.
- 35 - TWO OR MORE PARITY CHECKS, IN CORE FUNCTION TEST PROGRAM.
- 36 - INVALID STORAGE PROTECT CHECK.
- 37 - FALSE CAR CHECK.
- 38 - FALSE INTERRUPT.
- 39 - AUX CORE ERROR INTERRUPT.

* NOTE -

- ERROR 31 - DOES NOT PRINT A TEST PATTERN OR FAILURE PATTERN IN THE ERROR LOG.
- ERROR 33 - THE TEST PATTERN IS UNKNOWN, FOUR ASTERISKS (****) ARE PRINTED INSTEAD.
- ERROR 35 - THE TEST PATTERN IS UNKNOWN, FOUR ASTERISKS (****) ARE PRINTED INSTEAD.
- ERROR 36 -
- ERROR 37 -
- ERROR 38 -
- ERROR 39 - ARE ENGLISH LANGUAGE ERROR LOGS.

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4.3 SUMMARY LOG

WHEN THE CORE FUNCTION TEST HAS COMPLETED ALL DESIGNATED PATTERN TEST EXERCISES, IT WRITES A SUMMARY LOG. ALSO BY SETTING DES. 0-3 ON AT INITIALIZATION AND PRESSING START, THE SUMMARY LOG WILL BE PRINTED.

A SUMMARY LOG IS WRITTEN FOR EACH BASIC STORAGE MODULE THAT WAS EXERCISED. IF NO ERRORS WERE DETECTED, ONLY THE FAILURE BY PATTERN TEST SUMMARY IS LOGGED SO THE OPERATOR WILL KNOW HOW MANY LOUPS WERE MADE ON AN EXERCISE.

SUMMARY FOR BSM X (X IS THE BSM NUMBER, 1 - 8.)

BIT FAILURES

HIT	DROP	PICK
0	-----	-----
1	-----	56
2	-----	9
3	-----	153
4	-----	68
5	-----	-----
6	-----	-----
7	-----	508
8	-----	12
9	-----	-----
10	-----	1
11	-----	-----
12	-----	-----
13	-----	3
14	-----	-----
15	-----	-----
S	-----	-----
R	-----	108

(S INDICATES THE STORAGE PROTECT BIT, P INDICATES THE PARITY BIT. THE VALUES INDICATED ARE ONLY FOR ILLUSTRATION.)

FAIL. BY ADDR. LINE

	HI	LO	HI	LO
	X	X	Y	Y
000	-	-	-	-
001	1	-	-	-
010	-	2	-	-
011	-	1	-	-
100	-	4	-	-
101	-	-	2	-
110	-	-	-	-
111	5	-	-	-
1000	*	*	*	-
1001	*	*	*	9
1010	*	*	*	-
1011	*	*	*	-
1100	*	*	*	-
1101	*	*	*	-
1110	*	*	*	-
1111	*	*	*	-

SCALE FACTOR = 5

(EACH ENTRY IN THE TABLE IS SCALED IN THE RANGE 1-9, TO MAKE THE TABLE CONCISE AND EASY TO INTERPRET. A (-) INDICATES THAT NO FAILURES OCCURRED FOR THAT LINE. THE ASTERISK DENOTES THAT THERE ARE NO X OR Y ADDRESS LINES WITH THAT CORRESPONDING VALUE.

THE SCALE FACTOR IS THE DIVISOR USED TO REDUCE THE NUMBER OF ERRORS FOR EACH LINE TO A SINGLE VALUE IN THE RANGE OF 1-9. BY MULTIPLYING EACH ENTRY IN THE TABLE BY THE SCALE FACTOR, A CLOSE APPROXIMATION OF THE ACTUAL NUMBER OF ERRORS CAN BE DETERMINED FOR EACH ADDRESS LINE.

THE VALUES INDICATED ARE ONLY FOR ILLUSTRATION.)

FAILURE BY 4K SEGMENT

LO 4K = ----- HI 4K = 387

FAILURE BY PATTERN TEST

TEST	FAILURES	LOOPS
0	-----	-----
1	-----	2
2	-----	2
3	376	10
4	-----	2
6	8	2
6	-----	2
7	1518	2
8	9	2

(THE 0 ENTRY INDICATES ERRORS DETECTED BY THE INTERRUPT SUBROUTINE THAT DID NOT OCCUR DURING A PATTERN TEST. THERE WILL NEVER BE A LOOP COUNT DISPLAYED FOR THIS ENTRY.)

FOR INTERNAL TESTING THE LOOP COUNTER WILL BE SOME MULTIPLE OF TWO, BUT FOR EXTERNAL TESTS THE LOOP COUNTER WILL BE A MULTIPLE OF ONE. THE LOOP COUNTER INDICATES THE RELATIVE AMOUNT OF TESTING DONE WHEN THE LOOP ON ROUTINE OR LOOP ON PROGRAM OPTIONS ARE SELECTED.

THE VALUES INDICATED ARE ONLY FOR ILLUSTRATION.)

* NOTE - THE FAILURE BY PATTERN TEST SUMMARY IS PRINTED FOR EACH BSM TESTED. IF THERE WERE NO ERRORS DETECTED FOR A BSM, THE OTHER SUMMARIES ARE NOT WRITTEN.

5. COMMENTS

5.1 DESCRIPTION OF CORE FUNCTION TEST

5.1.1 INITIALIZATION AND HOUSEKEEPING

ROUTINES AND SUBROUTINES WITH THE LABELS AA000 - AA200 TAKE CARE OF ALL ASPECTS OF INITIALIZATION AND HOUSEKEEPING. THESE ROUTINES DETERMINE MACHINE SIZE, RECOGNIZE OPERATOR OPTIONS AND CONTROL INITIAL ENTRY AND RE-ENTRY TO THE CORE TEST.

5.1.2 READ/WRITE ADDRESSES IN STORAGE PATTERN TEST

ROUTINE BA010 IS THE READ/WRITE ADDRESS PATTERN TEST. THE ADDRESS OF EACH POSITION IS WRITTEN/READ/WRITTEN AND COMPARED TO THE ADDRESS, THEN THE NEXT POSITION IS TESTED AND SO ON, UNTIL ALL CORE POSITIONS HAVE BEEN TESTED. FOUR PASSES ARE MADE, RIPPLING UP CORE AND THEN RIPPLING DOWN CORE ON ALTERNATE PASSES.

5.1.3 BIT ISOLATION PATTERN TEST

ROUTINE CA010 IS THE BIT ISOLATION PATTERN TEST. EACH SINGLE BIT IN EACH WORD IS TESTED STARTING WITH BIT 17, THE PARITY BIT. THEN BIT 15, 14, 13...1, AND 0 IS TESTED. BIT 16, THE STORAGE PROTECT BIT IS NOT TESTED. THE BIT IS WRITTEN/READ/WRITTEN AND CHECKED IN EACH WORD, THEN THE NEXT WORD IS TESTED AND SO ON, UNTIL ALL CORE POSITIONS HAVE BEEN TESTED. FOUR PASSES ARE MADE, RIPPLING UP CORE, THEN RIPPLING DOWN CORE ON ALTERNATE PASSES. THEN THE BIT IS SHIFTED LEFT ONE POSITION AND THE TEST RUN AGAIN, UNTIL ALL BITS HAVE BEEN TESTED.

5.1.4 FLOATING ZERO PATTERN TEST

ROUTINE DA010 IS THE FLOATING ZERO PATTERN TEST. A SINGLE ZERO IS SET IN A WORD WITH ALL OTHER BITS SET TO ONE. THE ZERO STARTS IN BIT 15 AND IS SHIFTED LEFT ONE POSITION UNTIL IT REACHES BIT POSITION ZERO. THE PATTERN IS WRITTEN/READ/WRITTEN AND CHECKED IN EACH WORD, THEN THE NEXT WORD IS TESTED AND SO ON, UNTIL ALL CORE POSITIONS HAVE BEEN TESTED. FOUR PASSES ARE MADE, RIPPLING UP CORE, THEN RIPPLING DOWN CORE ON ALTERNATE PASSES. THEN THE FLOATING ZERO IS SHIFTED LEFT ONE POSITION AND THE TEST REPEATED.

5.1.5 WORST CASE PATTERN TEST

ROUTINE DC010 IS THE WORST CASE PATTERN TEST. A WORST CASE PATTERN IS BLOCKS OF 64 WORDS OF ONES AND 64 WORDS OF ZEROS WRITTEN IN CORE IN THE PATTERN -

```

64 WORDS /FFFF
64 WORDS /0000
64 WORDS /FFFF
64 WORDS /0000
64 WORDS /0000
64 WORDS /FFFF
64 WORDS /0000
64 WORDS /FFFF
64 WORDS /FFFF
64 WORDS /0000

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THE TEST CONSISTS OF READ/WRITE/READ, SET STORAGE PROTECT BIT, RESET PARITY BIT/WRITE/READ, RESET STORAGE PROTECT BIT, SET PARITY BIT/WRITE/READ/WRITE. THE NEXT WORD IS THEN EXERCISED AND SO ON, UNTIL ALL CORE POSITIONS HAVE BEEN EXERCISED. FOUR PASSES ARE MADE RIPPLING UP CORE, THEN RIPPLING DOWN CORE ON ALTERNATE PASSES. WHEN THE EXERCISE IS COMPLETE, EACH WORD IS READ AND CHECKED FOR THE CORRECT WORST CASE PATTERN.

5.1.6 ALTERNATE 0 AND 1 PATTERN TEST

ROUTINE DF010 IS THE ALTERNATE 0 AND 1 PATTERN TEST. THE PATTERN 0101 0101 0101 0101 01 IS WRITTEN/READ/WRITTEN AND THEN CHECKED IN A WORD, THEN THE NEXT WORD IS TESTED AND SO ON, UNTIL ALL CORE POSITIONS HAVE BEEN TESTED. FOUR PASSES ARE MADE, RIPPLING UP CORE, THEN RIPPLING DOWN CORE ON ALTERNATE PASSES.

5.1.7 ALTERNATE 1 AND 0 PATTERN TEST

ROUTINE DK010 IS THE ALTERNATE 1 AND 0 PATTERN TEST. THIS PATTERN TEST IS THE COMPLEMENT OF THE TEST DESCRIBED IN 5.1.6 ABOVE. THERE IS ONE EXTRA STEP, HOWEVER, THE STORAGE PROTECT BIT IS TESTED BY TRYING TO WRITE A ZERO ON THE WORD AND MAKING SURE THERE IS A STORAGE PROTECT INTERRUPT.

DATE 14NOV69 30JAN70 17APR70 04DEC70
FC NO. 431319 431319A 431321 421284

PRG ID 08CF-*
PAGE 6

DATE 14NOV69 30JAN70 17APR70 04DEC70
EC NO. 431319 431319A 431321 421284

PRG ID 08CF-*
PAGE 6A



5.1.8 ADD TO MEMORY PATTERN TEST

ROUTINE DP010 IS THE ADD TO MEMORY PATTERN TEST. THE ADD TO MEMORY INSTRUCTION, MDX LO /7400,0, IS PUT IN EACH WORD IN THE CORE BLOCK TO BE EXERCISED. THE INSTRUCTION STREAM IS ENTERED AT SOME ADDRESS AND THEN THE INSTRUCTION STREAM IS LOOPED 39 TIMES. THEN THE ENTRY ADDRESS IS ALTERED AND THE STREAM ENTERED AGAIN. FORTY EVEN ADDRESS ENTRIES AND FORTY ODD ADDRESS ENTRIES ARE MADE.

5.1.9 STORAGE PROTECT AND RESET STORAGE PROTECT PATTERN TEST

ROUTINE DZ010 IS THE STORAGE PROTECT PATTERN TEST. THE STORAGE BLOCK IS FILLED WITH WORDS OF ALL ONES AND THE STORAGE PROTECT BIT IS SET ON EACH WORD. THE TEST CONSISTS OF TRYING TO WRITE A ZERO ON EACH WORD AND CHECKING FOR THE STORAGE PROTECT INTERRUPT, THEN TESTING THE NEXT WORD AND SO ON UNTIL ALL CORE POSITIONS HAVE BEEN TESTED. FOUR PASSES ARE MADE RIPPLING UP CORE, THEN RIPPLING DOWN CORE ON ALTERNATE PASSES. WHEN THE EXERCISE IS COMPLETE, THE STORAGE PROTECT BIT IS CLEARED AND A ZERO IS WRITTEN INTO AND READ BACK AND CHECKED ON EACH WORD.

5.1.10 SUMMARY LOG ROUTINE

ROUTINE HZ100 CONTROLS THE PRINTING OF THE SUMMARY LOG. IF THERE WERE ERRORS DETECTED IN A BASIC STORAGE MODULE, A COMPLETE SUMMARY IS LOGGED ON THE MODULE. IF NO ERRORS WERE DETECTED, ONLY THE LOOP SUMMARY IS PRINTED FOR THE BASIC STORAGE MODULE.

5.1.11 INTERNAL INTERRUPT SUBROUTINES

SUBROUTINES WHOSE LABELS BEGIN WITH I HANDLE ALL ASPECTS OF INTERNAL INTERRUPTS. FOR SOME CHECKS, A LOG IS PRINTED AND AN ABNORMAL WAIT HALTS PROCESSING. FOR MOST PARITY ERRORS, DATA IS STORED FOR THE SUMMARY LOG, AN IMMEDIATE ERROR LOG IS PRINTED AND CONTROL RETURNS TO THE PATTERN TEST IN PROGRESS.

5.1.12 NON-INTERRUPT ERROR HANDLING

SUBROUTINES WHOSE LABELS BEGIN WITH J HANDLE ERRORS, THAT DO NOT CAUSE INTERRUPTS, DETECTED BY THE PATTERN TESTS. THESE SUBROUTINES STORE DATA ON THE ERROR FOR THE SUMMARY LOG AND PREPARE AN IMMEDIATE ERROR LOG. CONTROL RETURNS TO THE PATTERN TEST IN PROGRESS.

5.1.13 WRITE SUBROUTINES

SUBROUTINE MA010 CONTROLS THE WRITING OF MESSAGES ON THE 1443 OR 1816 OR 1053 PRINTERS. MESSAGES ARE STORED IN 1443 CODE AND CONVERTED IF THEY ARE TO BE WRITTEN ON THE 1816 OR 1053.

5.1.14 RELOCATION SUBROUTINES

SUBROUTINES WHOSE LABELS BEGIN WITH N HANDLE RELOCATION OF THE CORE FUNCTION TEST. RELOCATION CAN BE MADE BETWEEN THE 4K BLOCKS OF A BASIC STORAGE MODULE OR BETWEEN BASIC STORAGE MODULES.

5.1.15 TALLEY SUBROUTINES

SUBROUTINES WHOSE LABELS BEGIN WITH P ARE CALLED BY THE ERROR DETECTION SUBROUTINES AND ACTUALLY ANALYZE AND TALLEY THE ERRORS INTO THE SUMMARY TABLES.

5.1.16 SET ADDRESS LIMITS FOR PATTERN TESTS

SUBROUTINES SA010, SA100 AND SA200 DETERMINE THE ACTUAL ADDRESS LIMITS FOR THE PATTERN TEST. SA100 DETERMINES LIMITS WHEN THE TEST IS TO RIPPLE UP CORE AND SA200 DETERMINES LIMITS WHEN THE TEST IS TO RIPPLE DOWN CORE.

5.1.17 IMMEDIATE AND SUMMARY PRINT SUBROUTINES

ALL OTHER SUBROUTINES WHOSE LABELS BEGIN WITH S ARE CALLED TO EDIT AND PRINT THE ERROR AND SUMMARY LOGS. MOST OF THE SUBROUTINES ARE CALLED BY THE SUMMARY LOG ROUTINE, HZ100. THESE SUBROUTINES EDIT AND CONVERT DATA IN THE SUMMARY TABLES TO LINES OF 1443 CHARACTERS AND THEN CALL THE WRITE SUBROUTINE, MA010.

6. APPENDIX

6.1 RUNNING TIMES FOR PATTERN TESTS

PATTERN TEST	TIME TO RUN IN 8K		TIME TO RUN IN 65K
	INTERNAL	EXTERNAL	
1	0 02	0 02	0 16
2	0 24	0 24	3 12
3	0 23	0 23	3 04
4	0 03	0 03	0 24
5	0 02	0 02	0 16
6	0 07	0 07	0 56
7	1 13	2 25	9 42
8	0 07	0 07	0 56
			TOTAL 18 46

TIMES ARE ILLUSTRATED IN MINUTES SECONDS.
THESE TIMINGS WERE MADE ON AN 1800 WITH 65K OF SJ2 MEMORY.

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

10-10-50
10-10-50

10-10-50
10-10-50

10-10-50
10-10-50

10-10-50
10-10-50

10-10-50
10-10-50

10-10-50
10-10-50

10-10-50
10-10-50

10-10-50
10-10-50



CORE FUNCTION TEST

```

0000 0          ZERO0 EQU          *          8CF00020
3002          ORG          ZERO0+/3002      8CF00030
*****          8CF00040
*          *          8CF00050
*          1800 CORE FUNCTION TEST      *          8CF00060
*          *          8CF00070
*****          8CF00080
*          *          8CF00090
*          PROGRAM AND ERROR WAITS      *          8CF00100
*          *          8CF00110
*****          8CF00120
*          *          8CF00130
          DC          WAT02+1  THE PROGRAM HAS BEEN READ* 8CF00140
*          *          8CF00150
          *          8CF00160
          *          8CF00170
          *          8CF00180
          *          8CF00190
          *          8CF00200
          *          8CF00210
          *          8CF00220
*****          8CF00230
*          *          8CF00240
          DC          WAT04+1  NONE OF THE STORAGE      * 8CF00250
          *          8CF00260
          *          8CF00270
          *          8CF00280
          *          8CF00290
          *          8CF00300
          *          8CF00310
          *          8CF00320
          *          8CF00330
          *          8CF00340
          *          8CF00350
          *          8CF00360
          *          8CF00370
*****          8CF00380
*          *          8CF00390
          DC          WAT06+1  THIS 1800 HAS ONLY ONE   * 8CF00400
          *          8CF00410
          *          8CF00420
          *          8CF00430
          *          8CF00440
          *          8CF00450
          *          8CF00460
          *          8CF00470
          *          8CF00480
          *          8CF00490
          *          8CF00500
          *          8CF00510
          *          8CF00520
          *          8CF00530
          *          8CF00540
          *          8CF00550
          *          8CF00560
          *          8CF00570
          *          8CF00580
          *          8CF00590
          *          8CF00600
          *          8CF00610
          *          8CF00620
          *          8CF00630
          *          8CF00640
          *          8CF00650
          *          8CF00660
          *          8CF00670
          *          8CF00680
          *          8CF00690
          *          8CF00690

```

B I
300C 1 00B3

300D 0023

B I
3030 1 0715

B I
3031 1 0718

B I
3032 1 0761

3033 0010

B I
3050 1 038C

3051 0021

B I
3072 1 0489

3073 0001

B I
3074 1 05CA

B I
3075 1 05DF

```

*          *          8CF00700
*          *          8CF00710
*          *          8CF00720
*****          8CF00730
*          *          8CF00740
          DC          WAT0C+1  WAIT BEFORE STARTING PAT- * 8CF00750
          *          8CF00760
          *          8CF00770
          *          8CF00780
          *          8CF00790
          *          8CF00800
          *          8CF00810
          *          8CF00820
          *          8CF00830
          *          8CF00840
          *          8CF00850
          *          8CF00860
          *          8CF00870
          *          8CF00880
          *          8CF00890
          *          8CF00900
          *          8CF00910
          *          8CF00920
          *          8CF00930
          *          8CF00940
          *          8CF00950
          *          8CF00960
          *          8CF00970
          *          8CF00980
          *          8CF00990
          *          8CF01000
          *          8CF01010
          *          8CF01020
          *          8CF01030
          *          8CF01040
          *          8CF01050
          *          8CF01060
          *          8CF01070
          *          8CF01080
          *          8CF01090
          *          8CF01100
          *          8CF01110
          *          8CF01120
          *          8CF01130
          *          8CF01140
          *          8CF01150
          *          8CF01160
          *          8CF01170
          *          8CF01180
          *          8CF01190
          *          8CF01200
          *          8CF01210
          *          8CF01220
          *          8CF01230
          *          8CF01240
          *          8CF01250
          *          8CF01260
          *          8CF01270
          *          8CF01280
          *          8CF01290
          *          8CF01300
          *          8CF01310
          *          8CF01320
          *          8CF01330
          *          8CF01340
          *          8CF01350
          *          8CF01360
          *          8CF01370

```

CORE FUNCTION TEST

```

*
* ***** 8CF01380
* ***** 8CF01390
* ***** 8CF01400
* DC WAT76+1 NO INTERRUPT CONDITION * 8CF01410
* SENSED FOR INTERNAL * 8CF01420
* INTERRUPT. PRESS START * 8CF01430
* TO CONTINUE. * 8CF01440
* ***** 8CF01450
* ***** 8CF01460
* ***** 8CF01470
* DC WAT77+1 AUX CORE ERROR. AN INTER- * 8CF01480
* NAL INTERRUPT WAS GEN- * 8CF01490
* ERATED WHILE AUX CORE WAS * 8CF01500
* SELECTED * 8CF01510
* ***** 8CF01520
* ***** 8CF01530
* DC WAT78+1 HALT ON ERROR. DES. 14 * 8CF01540
* IS ON. THIS ERROR WAS * 8CF01550
* DETECTED BY THE PATTERN * 8CF01560
* TEST EXERCISE ROUTINE. * 8CF01570
* ***** 8CF01580
* ***** 8CF01590
* BSS /78 * 8CF01600
* ***** 8CF01610
* ***** 8CF01620
* ***** 8CF01630
* ***** 8CF01640
* ***** 8CF01650
* DC WATF1+1 AN OP CODE CHECK WAS * 8CF01660
* DETECTED AT THE ADDRESS * 8CF01670
* PRINTED IN THE ERROR LOG. * 8CF01680
* IF THE OP CODE CHECK WAS * 8CF01690
* CAUSED BY A PARITY ERROR, * 8CF01700
* THAT ERROR IS ALSO LOGGED * 8CF01710
* IF DES. 13 IS OFF. THIS * 8CF01720
* IS AN UNRECOVERABLE ER- * 8CF01730
* ROR. IF THE ERROR DID * 8CF01740
* NOT OCCUR IN THE SUMMARY * 8CF01750
* LOG, WRITE OR INTERRUPT * 8CF01760
* ROUTINES, PRESSING START * 8CF01770
* WILL START THE SUMMARY * 8CF01780
* LOG. * 8CF01790
* ***** 8CF01800
* ***** 8CF01810
* ***** 8CF01820
* DC WATF2+1 ONE OR MORE INTERNAL * 8CF01830
* INTERRUPTS HAS OCCURRED * 8CF01840
* IN THE INTERNAL INTERRUPT * 8CF01850
* SUBROUTINE. THIS IS AN * 8CF01860
* UNRECOVERABLE ERROR, DO * 8CF01870
* NOT PRESS START. IT MAY * 8CF01880
* BE POSSIBLE TO GET THE * 8CF01890
* SUMMARY LOG BY PRESSING * 8CF01900
* RESET, SETTING DES. 0-3 * 8CF01910
* ON AND PRESSING START. * 8CF01920
* AFTER THE HEADING HAS * 8CF01930
* PRINTED, PRESS START * 8CF01940
* AGAIN. * 8CF01950
* ***** 8CF01960
* ***** 8CF01970
* ***** 8CF01980
* DC WATF3+1 A PARITY ERROR WAS * 8CF01990
* DETECTED WITHIN THE CORE * 8CF02000
* FUNCTION TEST PROGRAM. * 8CF02010
* THIS IS AN UNRECOVERABLE * 8CF02020
* ERROR. DO NOT PRESS * 8CF02030
* START. IF THE ERROR DID * 8CF02040
* NOT OCCUR IN THE SUMMARY * 8CF02050

```

B I
3076 1 05FD

B I
3077 1 05ED

B I
3078 1 0629

3079 0078

B I
30F1 1 0438

B I
30F2 1 04D6

B I
30F3 1 04D8

CORE FUNCTION TEST

```

* LOG OR WRITE ROUTINES, IT* 8CF02060
* MAY BE POSSIBLE TO GET * 8CF02070
* THE SUMMARY LOG. PRESS * 8CF02080
* RESET AND SET DES. 0-3 * 8CF02090
* ON. PRESS START AND * 8CF02100
* AFTER THE HEADING PRINTS,* 8CF02110
* PRESS START AGAIN. * 8CF02120
* ***** 8CF02130
* ***** 8CF02140
* ***** 8CF02150
* ***** 8CF02160
* ***** 8CF02170
* ***** 8CF02180
* ***** 8CF02190
* ***** 8CF02200
* ***** 8CF02210
* ***** 8CF02220
* ***** 8CF02230
* ***** 8CF02240
* ***** 8CF02250
* ***** 8CF02260
* ***** 8CF02270
* ***** 8CF02280
* ***** 8CF02290
* ***** 8CF02300
* ***** 8CF02310
* ***** 8CF02320
* ***** 8CF02330
* ***** 8CF02340
* ***** 8CF02350
* ***** 8CF02360
* ***** 8CF02370
* ***** 8CF02380
* ***** 8CF02390
* ***** 8CF02400
* ***** 8CF02410
* ***** 8CF02420
* ***** 8CF02430
* ***** 8CF02440
* ***** 8CF02450
* ***** 8CF02460
* ***** 8CF02470
* ***** 8CF02480
* ***** 8CF02490
* ***** 8CF02500
* ***** 8CF02510
* ***** 8CF02520
* ***** 8CF02530
* ***** 8CF02540
* ***** 8CF02550
* ***** 8CF02560
* ***** 8CF02570
* ***** 8CF02580
* ***** 8CF02590
* ***** 8CF02600
* ***** 8CF02610
* ***** 8CF02620
* ***** 8CF02630
* ***** 8CF02640
* ***** 8CF02650
* ***** 8CF02660
* ***** 8CF02670
* ***** 8CF02680
* ***** 8CF02690
* ***** 8CF02700
* ***** 8CF02710
* ***** 8CF02720
* ***** 8CF02730

```

```

0000 0
0001 0
0002 0
0003 0
0004 0
0005 0
0006 0
0007 0
0008 0
0009 0
000A 0
0010 0
0000 0
0000 0
0000 0 61FF
0001 0 6D00 FFFF
0003 0 1810
0004 0
0004 0 7500 2000
0006 0 1000
0007 0 D100
0008 0 7400 FFFF
000A 0 70F9
000B 0 694E
000C 0 4053
000D 0 C04C
000E 0 D700 043C
0010 0 1800
0011 0 8047
0012 0 D047
0013 0 4700 08B2
0015 0
0015 0 4700 0691
0017 0 F000
0018 0 4700 0691
001A 0 0BEB
001B 0 4700 0691
001D 0 0BF6
001E 0 3002
001F 0

```

```

* PQTPOURRI
* ***** 8CF02190
* ***** 8CF02200
* ***** 8CF02210
* ***** 8CF02220
* ***** 8CF02230
* ***** 8CF02240
* ***** 8CF02250
* ***** 8CF02260
* ***** 8CF02270
* ***** 8CF02280
* ***** 8CF02290
* ***** 8CF02300
* ***** 8CF02310
* ***** 8CF02320
* ***** 8CF02330
* ***** 8CF02340
* ***** 8CF02350
* ***** 8CF02360
* ***** 8CF02370
* ***** 8CF02380
* ***** 8CF02390
* ***** 8CF02400
* ***** 8CF02410
* ***** 8CF02420
* ***** 8CF02430
* ***** 8CF02440
* ***** 8CF02450
* ***** 8CF02460
* ***** 8CF02470
* ***** 8CF02480
* ***** 8CF02490
* ***** 8CF02500
* ***** 8CF02510
* ***** 8CF02520
* ***** 8CF02530
* ***** 8CF02540
* ***** 8CF02550
* ***** 8CF02560
* ***** 8CF02570
* ***** 8CF02580
* ***** 8CF02590
* ***** 8CF02600
* ***** 8CF02610
* ***** 8CF02620
* ***** 8CF02630
* ***** 8CF02640
* ***** 8CF02650
* ***** 8CF02660
* ***** 8CF02670
* ***** 8CF02680
* ***** 8CF02690
* ***** 8CF02700
* ***** 8CF02710
* ***** 8CF02720
* ***** 8CF02730

```

CORE FUNCTION TEST

```

001F 0 0868      XIO  AAC50  CHECK DES 4-7.      8CF02740
0020 0 1004      SLA  FOUR   GET RID OF OTHER SWITCHES. 8CF02750
0021 0 180C      SRA  12     8CF02760
0022 0 4820      SKP  Z      SKIP IF NONE SET.      8CF02770
0023 0 700A      B    AA030  BRANCH FOR EXPLICIT TEST. 8CF02780
0024 0 0036      STO  AAC10  ALL MODULES TO BE TESTED. 8CF02790
0025 0 0862      XIO  AAC50  TEST FOR DES 8.          8CF02800
0026 0 1008      SLA  EIGHT  SHOULD BE OFF.          8CF02810
0027 0 4810      SKP  -      SKIP IF ON.              8CF02820
0028 0 7055      B    AA100  BRANCH IF OFF.          8CF02830
0029 0 4700 0691 BSI  L3 MA010-BASE ILLEGAL DES SETTING. 8CF02840
002B 0 08FE      DC   MSG03-BASE MESSAGE. 8CF02850
002C 0 3004      WAT04 WAIT /04 WAIT.      8CF02860
002D 0 70F1      B    AA022  RETRY TEST.          8CF02870
002E 0          AA030 EQU  *          8CF02880
002E 0 002C      STO  AAC10  SAVE SW. SET. AS BSM KEY. 8CF02890
002F 0 902A      S    AAC04  COMPARE TO MAX BSM.      8CF02900
0030 0 4830      SKP  -Z     SKIP IF VALID BSM.      8CF02910
0031 0 7022      B    AA040  BRANCH IF ILLEGAL BSM. 8CF02920
0032 0 0855      XIO  AAC50  TEST FOR DES SWITCH 8. 8CF02930
0033 0 1008      SLA  EIGHT  8CF02940
0034 0 4810      SKP  -      SKIP IF ON.              8CF02950
0035 0 701B      B    AA038  BRANCH IF OFF.          8CF02960
0036 0 C023      LD   AAC04  MAKE SURE THAT THERE ARE 8CF02970
0037 0 9021      S    AAC02  AT LEAST TWO BSMS.      8CF02980
0038 0 4830      SKP  -Z     SKIP IF NOT.          8CF02990
0039 0 7005      B    AA034  BRANCH IF ALL RIGHT.    8CF03000
003A 0 4700 0691 BSI  L3 MA010-BASE PRINT ERROR MESSAGE. 8CF03010
003C 0 0C05      DC   MSG04-BASE MESSAGE. 8CF03020
003D 0 3006      WAT06 WAIT /06 WAIT.      8CF03030
003E 0 70E0      B    AA022  RETURN TO TEST. 8CF03040
003F 0          AA034 EQU  *          8CF03050
003F 0 C301      LD   3 ONE  MAKE SURE CFT NOT IN BSM 8CF03060
0040 0 180C      SRA  12     FOR EXTERNAL TEST.      8CF03070
0041 0 8017      A    AAC02  8CF03080
0042 0 1801      SRA  ONE    8CF03090
0043 0 F017      EOR  AAC10  COMPARE TO EXPLICIT BSM. 8CF03100
0044 0 4820      SKP  Z      SKIP IF EQUAL.      8CF03110
0045 0 7038      B    AA100  BRANCH TO EXECUTE.      8CF03120
0046 0 C301      LD   3 ONE  IF THIS IS AN EXTERNAL 8CF03130
0047 0 180D      SRA  13     TEST AND THE CORE TEST IS 8CF03140
0048 0 9010      S    AAC02  RESIDING IN THE BSM TO 8CF03150
0049 0 4810      SKP  -      BE EXERCISED, MOVE IT TO 8CF03160
004A 0 7003      B    AA036  THE NEXT LOWER BSM IF    8CF03170
004B 0 C301      LD   3 ONE  POSSIBLE. OTHERWISE, MOVE 8CF03180
004C 0 180D      SRA  13     IT TO THE NEXT HIGHER    8CF03190
004D 0 800B      A    AAC02  BSM.          8CF03200
004E 0          AA036 EQU  *          8CF03210
004E 0 800A      A    AAC02  8CF03220
004F 0 4F00 073C B    L3 NA010-BASE RELOCATE CORE TEST. 8CF03230
0051 0          AA038 EQU  *          8CF03240
0051 0 C009      LD   AAC10  INDICATE BSM TO RELOCATE 8CF03250
0052 0 4F00 073C B    L3 NA010-BASE AND RELOCATE. 8CF03260
0054 0          AA040 EQU  *          8CF03270
0054 0 4700 0691 BSI  L3 MA010-BASE ILLEGAL BSM INDICATED. 8CF03280
0056 0 0C0D      DC   MSG06-BASE PRINT ERROR MESSAGE. 8CF03290
0057 0 300A      WAT0A WAIT /0A ERROR WAIT. 8CF03300
0058 0 70C6      B    AA022  RETURN TO TEST. 8CF03310
*****
*          *          8CF03320
*          *          8CF03330
*          *          8CF03340
*          *          8CF03350
*****
*          *          8CF03360
*          *          8CF03370
*****
0059 0 0001      AAC02 DC    1      INCREMENT.      8CF03380
005A 0 0001      AAC04 BSS   1      NO. OF BSMS, 1-8. 8CF03390
005B 0 0001      AAC10 BSS   1      BSM KEY STORAGE. 8CF03400
005C 0 7003      AAC20 B    X THREE BRANCH FROM WORD 0 TO 4. 8CF03410

```

CORE FUNCTION TEST

```

005D 0 4C00      *          *          OP CODE, FORMAT FOR 8CF03420
005E 0 FFB3      AAC22 DC    /4C00 BRANCH LONG.      8CF03430
005F 0 0406      AAC24 DC    AA020-BASE DISPLACEMENT OF AA020. 8CF03440
*          *          AAC26 DC    II010-BASE DISPLACEMENT FOR II010. 8CF03450
*          *          *          8CF03460
*****          *          8CF03470
*****          *          8CF03480
*          *          *          8CF03490
* INITIALIZE BASE REGISTER *          8CF03500
*          *          *          8CF03510
*****          *          8CF03520
*          *          *          8CF03530
* THIS SUBROUTINE INITIALIZES THE BASE REGISTER IN* 8CF03540
* XR3, THE INTERNAL INTERRUPT CELL IN CORE STORAGE* 8CF03550
* POSITION 8 AND THE RESTART BRANCHES IN LOW CORE.* 8CF03560
*          *          *          8CF03570
* CALL -          *          8CF03580
*          *          *          8CF03590
*          BSI    AA050 THE CALL MUST BE A SHORT * 8CF03600
*          *          INSTRUCTION.          * 8CF03610
*          *          *          8CF03620
*          *          XR1 MUST BE UNSPECIFIED. * 8CF03630
*          *          *          8CF03640
*          *          XR2 IS NOT USED.          * 8CF03650
*          *          *          8CF03660
*          *          XR3 IS INITIALIZED AS THE PSEUDO BASE * 8CF03670
*          *          REGISTER.          * 8CF03680
*          *          *          8CF03690
*****          *          8CF03700
*          *          *          8CF03710
*          *          *          8CF03720
0060 0 0000      AA050 DC    *--          8CF03730
0061 0 6801      STX  0 BASE+1 PUTS ADDRESS OF BASE IN 8CF03730
0062 0 6700 0000 BASE LDX L3 *-- INDEX REGISTER 3. 8CF03740
0064 0 6100      LDX  1 ZERO  XR1 POINTER TO WORD ZERO 8CF03750
0065 0 C0F6      LD   AAC20  SET RESTART BRANCHES 8CF03760
0066 0 D100      STO  1 ZERO  IN LOW CORE. 8CF03770
0067 0 C0F5      LD   AAC22  PUT BRANCH LONG TO 8CF03780
0068 0 D104      STO  1 FOUR  AA020 IN LOW CORE. 8CF03790
0069 0 C301      LD   3 ONE   8CF03800
006A 0 80F3      A    AAC24  8CF03810
006B 0 D105      STO  1 FIVE  8CF03820
006C 0 C301      LD   3 ONE   INITIALIZE INTERNAL 8CF03830
006D 0 80F1      A    AAC26  INTERRUPT CELL. 8CF03840
006E 0 D108      STO  1 EIGHT 8CF03850
006F 0 C02C      LD   AAC60  COMPUTE ABSOLUTE ADDRESS 8CF03860
0070 0 8301      A    3 ONE  OF BASE OF TEST PATTERN 8CF03870
0071 0 D02C      STO  AAC64  AREA IN LINE BUFFER. 8CF03880
0072 0 C02A      LD   AAC62  COMPUTE ABSOLUTE ADDRESS 8CF03890
0073 0 8301      A    3 ONE  OF BASE OF FAILURE PATTERN 8CF03900
0074 0 D02A      STO  AAC66  AREA IN LINE BUFFER. 8CF03910
0075 0 4F80 FFFE B    I3 AA050-BASE RETURN. 8CF03920
*****          *          8CF03930
*          *          *          8CF03940
* RE-ENTRY SUBROUTINE *          8CF03950
*          *          *          8CF03960
*****          *          8CF03970
*          *          *          8CF03980
* THIS ROUTINE RESTORES CONTROL TO THE PATTERN * 8CF03990
* TEST THAT INITIATED THE RELOCATION.          * 8CF04000
*          *          *          8CF04010
* CALL -          *          8CF04020
*          *          *          8CF04030
*          BSI  L  AA080 THE CALLING ROUTINE MUST * 8CF04040
*          *          CALCULATE THE ENTRY * 8CF04050
*          *          ADDRESS.          * 8CF04060
*          DC    XXXXX-BASE THE CALLING ROUTINE ALSO* 8CF04070
*          *          SUPPLIES THE RELATIVE * 8CF04080
*          *          RE-ENTRY ADDRESS. * 8CF04090

```

CORE FUNCTION TEST

CORE FUNCTION TEST

```

*
* XR1 AND XR2 ARE NOT USED.
*
* XR3 IS RE-INITIALIZED AS THE PSEUDO BASE REGISTER.
*
*****
0077 0 0000 AA080 DC *-- ENTRY.
* INITIALIZE. THIS INSTRU-
* TION MUST ALWAYS BE SHORT.
0078 0 40E7 BSI AA050 TION MUST ALWAYS BE SHORT.
0079 0 C780 0015 LD I3 AA080-BASE GET RELATIVE DISPLACEMENT
007B 0 D001 STO AA085+1 OF RETURN ENTRY AND STORE
007C 0 4F00 0000 AA085 B L3 *-- IN BRANCH OPERAND.
*****
* HOUSEKEEPING
*
*****
007E 0 AA100 EQU *
007E 0 0809 XIO AAC50 SENSE DATA ENTRY SWITCHES
007F 0 180C SRA 12 AND GET SWITCHES 0-3.
0080 0 D009 STO AAC52 SAVE EXPLICIT ROUTINE NO.
0081 0 8009 A AAC56 COMPUTE TABLE ENTRY AND
0082 0 D001 STO AA130+1 STORE IN NEXT INSTRUCTION.
0083 0 C700 0000 AA130 LD L3 *-- GET TABLE ENTRY AND STORE
0085 0 D001 STO AA140+1 IN BRANCH INSTRUCTION.
0086 0 4F00 0000 AA140 B L3 *-- BRANCH TO EXPLICIT ROUTINE
*****
* CONSTANTS AND WORK AREAS
*
*****
0088 0001 AAC50 BSS E 1 IOCC TO SENSE DES.
0089 0 0740 DC /0740
008A 0001 AAC52 BSS 1 ROUTINE NUMBER.
008B 0 002A AAC56 DC AAC58-BASE TABLE BASE ADDRESS.
008C 0 0079 AAC58 DC BA010-BASE START FULL TEST AT BA010.
008D 0 0079 DC BA010-BASE PATTERN TEST ONE.
008E 0 00CD DC CA010-BASE PATTERN TEST TWO.
008F 0 00FE DC DA010-BASE PATTERN TEST THREE.
0090 0 012D DC DC010-BASE PATTERN TEST FOUR.
0091 0 01AE DC DF010-BASE PATTERN TEST FIVE.
0092 0 01D7 DC DK010-BASE PATTERN TEST SIX.
0093 0 0200 DC DP010-BASE PATTERN TEST SEVEN.
0094 0 0272 DC DZ010-BASE PATTERN TEST EIGHT.
0095 0 003E DC AA200-BASE NULL TEST.
0096 0 003E DC AA200-BASE NULL TEST.
0097 0 003E DC AA200-BASE NULL TEST.
0098 0 003E DC AA200-BASE NULL TEST.
0099 0 003E DC AA200-BASE NULL TEST.
009A 0 003E DC AA200-BASE NULL TEST.
009B 0 0328 DC HZ100-BASE SUMMARY LOG
*
* RELATIVE ADDRESS OF TEST
*
009C 0 0B86 AAC60 DC SUC88-BASE PATTERN AREA.
* RELATIVE ADDRESS OF
* FAILURE PATTERN AREA.
009D 0 0B92 AAC62 DC SUC90-BASE
009E 0001 AAC64 BSS 1 ABSOLUTE ADDRESS OF SUC88.
009F 0001 AAC66 BSS 1 ABSOLUTE ADDRESS OF SUC90.
*
*****
00A0 0 AA200 EQU *
00A0 0 4700 0691 BSI L3 MA010-BASE WRITE ERROR MESSAGE.
00A2 0 0C50 DC MSG10-BASE MESSAGE.
00A3 0 300B WATOB WAIT /OB ERROR WAIT.
* BRANCH TO AA022.
00A4 0 70B3 B WATOA+1 READ SWITCHES AGAIN.

```

```

00A5 0
00A5 0 0000
00A6 0 0B26
00A7 0 4804
00A8 0 7001
00A9 0 7009
00AA 0
00AA 0 6A0B
00AB 0 C00A
00AC 0 4700 03B0
00AE 0 D007
00AF 0 4700 0691
00B1 0 0053
00B2 0 300C
00B3 0
00B3 0 4F80 0043
00B5 0 0005
00B6 0 0000
00B7 0 0A0A
00B8 0 0000
00B9 0 1631
00BA 0 3913

```

```

* LOWER ADDRESS LIMIT OF PATTERN TESTS.
*
PTEST EQU *
*****
* PREPROCESSING WAIT SUBROUTINE
*
*****
* THIS SUBROUTINE TESTS DATA ENTRY SWITCH 15 AND
* PROVIDES FOR A PREPROCESSING WAIT IF IT IS ON.
*
* CALL -
*
* BSI L3 AB010-BASE
*
* XR1 AND XR2 ARE NOT USED.
*
* XR3 IS THE PSEUDO BASE REGISTER.
*
*****
AB010 DC *-- ENTRY.
XIO 3 AAC50-BASE SENSE DATA ENTRY SWS
SKP E SKIP IF OFF.
B AB015 SKIP IF ON.
B AB020 BRANCH IF OFF.
AB015 EQU *
STX 2 ABC92 CONVERT ROUTINE ID. TO
LD ABC92 TWO 1443 CHARACTERS.
BSI L3 IC010-BASE STORE IN MESSAGE.
STO ABC92
BSI L3 MA010-BASE WRITE MESSAGE.
DC ABC90-BASE MESSAGE.
WATOC WAIT /OC WAIT.
AB020 EQU *
B I3 AB010-BASE RETURN.
*
*****
* CONSTANTS AND MESSAGE
*
*****
ABC90 DC 5 MESSAGE.
ABC92 DC /0000 MESSAGE ID., FILLED IN.
DC /0A0A 00
DC /0000
DC /1631 WA
DC /3913 IT
*
*****
* SET STATUS FLAG WORD
*
*****
* THIS SUBROUTINE BUILDS A WORD OF FIVE FLAGS
* TO INDICATE THE STATUS OF THE PROGRAM AFTER
* A PATTERN TEST.
*
* UPON EXIT THREE OF THE FLAGS WILL BE IN THE
* ACCUMULATOR, BITS 13-15, AND TWO OF THE FLAGS
* WILL BE IN THE EXTENSION, BITS 0 & 1.
*
* CALL -

```



```
*
* BSI L3 AC010-BASE
* XR1 AND XR2 ARE NOT USED.
* XR3 IS THE PSEUDO BASE REGISTER.
* THE SIGNIFICANCE OF THE VALUE IN THE ACCUMULATOR*
* IS -
* 0 - FULL, NORMAL TEST.
* 1 - LOOP ON ROUTINE.
* 2 - EXPLICIT BSM TEST.
* 3 - LOOP ON ROUTINE IN AN EXPLICIT BSM.
* 4 - EXTERNAL BSM TEST.
* 5 - LOOP ON ROUTINE IN EXTERNAL BSM TEST*
* 6 & 7 ARE NOT USED.
* THE SIGNIFIGANCE OF THE VALUES IN THE Q IS -
* 0 - PROGRAM RESIDES IN LOW HALF OF BSM.
* 1 - PROGRAM RESIDES IN HIGH HALF OF BSM.*
* 2 - PROGRAM IS IN LOW HALF OF THE LAST
* BSM.
* 3 - PROGRAM IS IN THE HIGH HALF OF THE
* LAST BSM.
*****
AC010 DC *-* ENTRY.
X10 3 AAC50-BASE TEST FOR SWS 8 & 10
AND ACC05 LEAVE BITS 8 & 10.
SRA FOUR SHIFT TO POSITION 12 & 14.
STO ACC10 SET WORD AND SAVE FLAGS.
SRA THREE IF EXTERNAL INDICATOR
SKP E ON BRANCH AROUND TEST
B AC020 FOR EXPLICIT BSM.
LD 3 AAC10-BASE TEST FOR EXPLICIT BSM.
SKP + SKIP IF SET.
B AC020 BRANCH NO EXPLICIT TEST.
LD ACC10 SET INDICATOR ON
OR ACC15 IN FLAG WORD.
STO ACC10 BIT 13.
AC020 EQU *
LD 3 ONE PUT HILOW BSM INDICATOR
SRA FOUR INTO BIT 0 OF Q AND SHIFT
SRT NINE BSM ADDRESS TO BITS 13-15.
A ACC20 COMPUTE BSM OF RESIDENCE.
EOR 3 AAC04-BASE IS TEST RESIDENT IN
SKP Z LAST BSM. SKIP IF SO.
B AC040 BRANCH IF NOT.
LD ACC10 SET FLAG.
OR ACC20 BIT 15.
B AC050 SKIP.
AC040 EQU *
LD ACC10 LOAD FLAG WORD.
AC050 EQU *
SRT ONE POSITION FLAG WORD.
B 13 AC010-BASE RETURN.
*****
*
* CONSTANTS AND WORK AREAS
*****
ACC05 DC /00A0 MASK TO LEAVE BITS 8 & 10.
ACC10 BSS 1 FLAG WORD STORAGE.
ACC15 DC /0004 BIT 13.
```

```
00BB 0 0000
00BC 0 0B26
00BD 0 E019
00BE 0 1804
00BF 0 D018
00C0 0 1803
00C1 0 4804
00C2 0 7006
00C3 0 C3F9
00C4 0 4808
00C5 0 7003
00C6 0 C011
00C7 0 E811
00C8 0 D00F
00C9 0
00CA 0 C301
00CB 0 1804
00CC 0 1889
00CD 0 800D
00CE 0 F3F8
00CF 0 4820
00D0 0 7003
00D1 0 C007
00D2 0 E808
00D3 0 7001
00D4 0
00D5 0 1881
00D6 0 4F80 0059
```

```
00DA 0 0001
00DB 0
00DC 0 6201
00DD 0 4343
00DE 0
00DF 0 C038
00E0 0 D038
00E1 0 C039
00E2 0 D019
00E3 0 C040
00E4 0 4700 0876
00E5 0
00E6 0 C032
00E7 0 4804
00E8 0 7003
00E9 0 4700 08E3
00EA 0 7002
00EB 0 4700 08EB
00EC 0
00ED 0 D027
00EE 0
00EF 0 6927
00F0 0 C026
00F1 0 D700 0492
00F2 0 D100
00F3 0 C100
00F4 0 F021
00F5 0 4820
00F6 0 702D
00F7 0 C01E
00F8 0 F01C
00F9 0 4818
00FA 0 7101
00FB 0 70F1
00FC 0
00FD 0 C01A
00FE 0 901A
00FF 0 4808
0100 0 7005
0101 0 D016
```

```
ACC20 DC /0001 BIT 15 AND CONSTANT ONE.
*****
* READ AND WRITE IN MEMORY PATTERN TEST
*****
* THE READ AND WRITE IN MEMORY PATTERN TEST STORES*
* THE ADDRESS OF EACH LOCATION INTO THE LOCATION.*
* THEN THE ADDRESS IS READ BACK AND CHECKED.
*****
BA010 EQU * ENTER PATTERN TEST.
LDX 2 ONE XR2 INDICATES ROUTINE ID.
BSI 3 AB010-BASE GO TO WAIT TEST
* LOAD ADDRESS OF POSITION INTO EACH POSITION.
BA020 EQU *
LD BAC06 INITIALIZE PASS
STO BAC08 COUNTER.
LD BAC16 INITIALIZE INCREMENT
STO BA080 INDEX REGISTER INSTRUCTION
LD BAC24 INCREMENT PASS
BSI L3 PS010-BASE COUNTER.
* PATTERN TEST EXERCISE.
BA040 EQU *
LD BAC08 TEST PASS COUNTER FOR EVEN
SKP E SKIP EVEN.
B BA050 BRANCH ODD.
BSI L3 SA100-BASE SET ADDRESS LIMITS, UP.
B BA060 BRANCH TO CONTINUE.
BA050 EQU *
BSI L3 SA200-BASE SET ADDRESS LIMITS, DOWN.
BA060 EQU *
STO BAC02 SAVE END ADDRESS.
BA070 EQU *
STX 1 BAC04 SAVE ADDRESS AND COMPARE
LD BAC04 WRITE AND READ PATTERN
STO L3 IXC12-BASE SAVE PATTERN FOR INTRPT.
STO 1 ZERO AND COMPARE.
LD 1 ZERO READ/WRITE.
EOR BAC04 COMPARE.
SKP Z SKIP IF OK.
B BA200 BRANCH ON ERROR.
BA075 EQU *
LD BAC04 COMPARE TO
EOR BAC02 LAST POSITION.
SKP +- SKIP NOT EQUAL.
B BA085 BRANCH IF DONE.
* THE FOLLOWING INSTRUCTION IS MODIFIED TO
* INCREMENT AND DECREMENT XR1 ALTERNATELY.
*
BA080 MDX 1 ONE
B BA070 LOOP.
BA085 EQU *
LD BAC08 DECREMENT LOOP COUNTER.
S BAC12
SKP + SKIP NOT DONE.
B BA090 BRANCH IF DONE.
STO BAC08 UPDATE COUNTER.
```


CORE FUNCTION TEST

```

* THE FOLLOWING INSTRUCTIONS MODIFY BA080 TO
* INCREMENT AND DECREMENT XRI ON ALTERNATE
* PASSES.
*
0101 0 C0F8      LD      BA080
0102 0 F017      EOR      BAC18
0103 0 D0F6      STO      BA080
0104 0 70DF      B        BA040      MAKE ANOTHER PASS.
*
* PATTERN TEST EXERCISE COMPLETE.
*
0105 0          BA090 EQU      *
0105 0 4359      BSI      3 AC010-BASE  SET STATUS FLAG WORD
*
* UPON RETURN THERE IS A VALUE OF 0-5 IN THE ACC.
*
0106 0 8014      A        BAC20      COMPUTE TABLE ADDRESS.
0107 0 D001      STO      BA100+1  STORE IN NEXT INSTRUCTION.
0108 0 C700 0000 BA100 LD      L3 *-*  GET LABEL ENTRY AND
010A 0 D001      STO      BA110+1  BUILD BRANCH TO ENTRY.
010B 0 4F00 0000 BA110 B      L3 *-*  BRANCH TO PROPER ROUTINE.
*
* FULL, NORMAL TEST
*
010D 0          BA120 EQU      *
010D 0 4700 0790 BSI      L3 NE010-BASE  RELOCATE CORE TEST.
010F 0 007B      DC        BA020-BASE  RE-ENTRY ADDRESS
0110 0 00CB      DC        BA520-BASE  PARAMETERS.
0111 0          BA150 EQU      *
0111 0 4700 07A7 BSI      L3 NE200-BASE  OSCILLATE.
0113 0 007B      DC        BA020-BASE  RE-ENTER AT BA020.
*****
*
* CONSTANTS AND WORK AREAS
*
0114 0001      BAC02 BSS      1      STORAGE FOR END ADDRESS.
0115 0001      BAC04 BSS      1      TEMPORARY STORAGE.
0116 0 0004      BAC06 DC        4      NUMBER OF PASSES.
0117 0001      BAC08 BSS      1      LOOP COUNTER.
0118 0 0001      BAC12 DC        1      ONE.
0119 0 7101      BAC16 MDX     1 ONE  INSTRUCTION TO MODIFY XRI.
011A 0 00FE      BAC18 DC        /00FE  MASK TO CHANGE BITS 8-14.
*
011B 0 00BA      BAC20 DC        BAC22-BASE  OF FLAG TABLE BASE.
011C 0 00AB      BAC22 DC        BA120-BASE  FULL, NORMAL TEST.
011D 0 00C4      DC        BA300-BASE  LOOP ON ROUTINE.
011E 0 00C7      DC        BA400-BASE  EXPLICIT BSM TEST.
011F 0 00AF      DC        BA150-BASE  LOOP AND EXPLICIT.
0120 0 00CB      DC        BA520-BASE  EXTERNAL BSM TEST.
0121 0 007B      DC        BA020-BASE  LOOP AND EXTERNAL.
*
0122 0 0F24      BAC24 DC        PXK60-BASE  LOOP TALLEY TABLE ADDRESS
*
*****
*
* ERROR SUBROUTINE.
*
0123 0          BA200 EQU      *
0123 0 4700 059D BSI      L3 JA010-BASE  LOG NONINTERRUPT ERRORS.
0125 0 70D0      B        BA075      RETURN TO TEST.
*
* LOOP ON PATTERN TEST.
*
0126 0          BA300 EQU      *
0126 0 4700 07AB BSI      L3 NE300-BASE  MOVE ANYWHERE.
0128 0 007B      DC        BA020-BASE  RE-ENTER AT BA020.

```

CORE FUNCTION TEST

```

*
* EXPLICIT BSM TEST.
*
0129 0          BA400 EQU      *
0129 0 4700 07AF BSI      L3 NE400-BASE
012B 0 007B      DC        BA020-BASE  RE-ENTRY ADDRESS
012C 0 00CB      DC        BA520-BASE  PARAMETERS.
012D 0          BA520 EQU      *
*
* TEST FOR EXPLICIT ROUTINE.
*
012D 0 4700 0BE4 BSI      L3 UA010-BASE  GO TO EXPLICIT ROUTINE
*
*****
*
* BIT ISOLATION PATTERN TEST
*
*****
* THE BIT ISOLATION PATTERN TEST READS AND WRITES
* A PATTERN OF A SINGLE BIT IN EACH WORD. EACH OF
* THE 16 BIT POSITIONS AND THE PARITY BIT IS
* TESTED.
*
*****
*
012F 0          CA010 EQU      *      ENTER PATTERN TEST.
012F 0 6202      LDX      2 TWO      XR2 INDICATES ROUTINE ID.
0130 0 4343      BSI      3 AB010-BASE  GO TO WAIT TEST
*
* INITIALIZE FOR PATTERN TEST.
*
0131 0          CA020 EQU      *
0131 0 C024      LD        CAC24      INCREMENT PASS
0132 0 4700 0876 BSI      L3 PS010-BASE  COUNTER.
0134 0 1810      SRA      16      INITIAL PATTERN IS 0.
0135 0          CA030 EQU      *
0135 0 4700 02B3 BSI      L3 EX010-BASE  RUN EXERCISE ROUTINE.
*
* DETERMINE IF EACH BIT HAS BEEN TESTED.
*
0137 0 4808      SKP      +      SKIP IF TESTING SINGLE
0138 0 7002      B        CA100      BIT, BRANCH 0 OR DONE.
0139 0 1001      SLA      ONE      MOVE BIT TO NEXT POSITION.
013A 0 70FA      B        CA030      RUN ANOTHER PATTERN TEST.
013B 0          CA100 EQU      *
013B 0 4820      SKP      Z      SKIP IF FIRST TEST PASS.
013C 0 7002      B        CA110      BRANCH IF DONE.
013D 0 C010      LD        CAC02      LOAD FIRST BIT PATTERN.
013E 0 70F6      B        CA030      RUN ANOTHER PATTERN TEST.
*
* PATTERN TEST EXERCISE COMPLETE.
*
013F 0          CA110 EQU      *
013F 0 4359      BSI      3 AC010-BASE  SET STATUS FLAG WORD
*
* UPON RETURN THERE IS A VALUE OF 0-5 IN THE ACC.
*
0140 0 800E      A        CAC18      COMPUTE TABLE ADDRESS AND
0141 0 D001      STO      CA120+1  STORE IN NEXT INSTRUCTION.
0142 0 C700 0000 CA120 LD      L3 *-*  GET TABLE ENTRY AND BUILD
0144 0 D001      STO      CA125+1  BRANCH TO ROUTINE
0145 0 4F00 0000 CA125 B      L3 *-*  ENTRY.
*
* FULL, NORMAL TEST.
*
0147 0          CA130 EQU      *
0147 0 4700 0790 BSI      L3 NE010-BASE  RELOCATE CORE TEST.

```

CORE FUNCTION TEST

```

0149 0 00CF          DC      CA020-BASE RE-ENTRY ADDRESS      8CF08180
014A 0 00FC          DC      CA520-BASE PARAMETERS          8CF08190
014B 0              CA140 EQU      *                          8CF08200
014B 0 4700 07A7    BSI      L3 NE200-BASE OSCILLATE          8CF08210
014D 0 00CF          DC      CA020-BASE RE-ENTER AT CA020.    8CF08220
*****
* CONSTANTS AND WORK AREAS
*****
014E 0 0001          CAC02 DC      /0001      INITIAL BIT PATTERN, 15.    8CF08280
*                          *                          *          8CF08290
*                          *                          *          8CF08300
*                          *                          *          8CF08310
014F 0 00EE          CAC18 DC      CAC20-BASE FLAG TABLE BASE.          8CF08320
0150 0 00E5          CAC20 DC      CA130-BASE FULL NORMAL TEST. 8CF08330
0151 0 00F5          DC      CA300-BASE LOOP ON ROUTINE.     8CF08340
0152 0 00F8          DC      CA400-BASE EXPLICIT BSM TEST.   8CF08350
0153 0 00E9          DC      CA140-BASE LOOP AND EXPLICIT.     8CF08360
0154 0 00FC          DC      CA520-BASE EXTERNAL BSM TEST.   8CF08370
0155 0 00CF          DC      CA020-BASE LOOP AND EXTERNAL.   8CF08380
*                          *                          *          8CF08390
*                          *                          *          8CF08400
0156 0 0F24          CAC24 DC      PXX60-BASE LOOP TALLEY TABLE ADDRESS 8CF08410
*                          *                          *          8CF08420
*                          *                          *          8CF08430
*                          *                          *          8CF08440
*                          *                          *          8CF08450
0157 0              CA300 EQU      *                          8CF08460
0157 0 4700 07AB    BSI      L3 NE300-BASE MOVE ANYWHERE.      8CF08470
0159 0 00CF          DC      CA020-BASE RE-ENTER AT CA020.    8CF08480
*                          *                          *          8CF08490
*                          *                          *          8CF08500
*                          *                          *          8CF08510
015A 0              CA400 EQU      *                          8CF08520
015A 0 4700 07AF    BSI      L3 NE400-BASE RE-ENTRY ADDRESS      8CF08530
015C 0 00CF          DC      CA020-BASE RE-ENTRY ADDRESS      8CF08540
015D 0 00FC          DC      CA520-BASE PARAMETERS.          8CF08550
015E 0              CA520 EQU      *                          8CF08560
*                          *                          *          8CF08570
*                          *                          *          8CF08580
*                          *                          *          8CF08590
015E 0 4700 0BE4    BSI      L3 UA010-BASE GO TO EXPLICIT ROUTINE    8CF08600
*                          *                          *          8CF08610
*                          *                          *          8CF08620
*                          *                          *          8CF08630
*                          *                          *          8CF08640
*                          *                          *          8CF08650
*                          *                          *          8CF08660
*                          *                          *          8CF08670
*                          *                          *          8CF08680
*                          *                          *          8CF08690
*                          *                          *          8CF08700
*                          *                          *          8CF08710
*                          *                          *          8CF08720
0160 0              DA010 EQU      *          ENTER PATTERN TEST. 8CF08730
0160 0 6203          LDX      2 THREE      XR2 INDICATES ROUTINE ID. 8CF08740
0161 0 4343          BSI      3 AB010-BASE GO TO WAIT TEST      8CF08750
0162 0              DA020 EQU      *          8CF08760
0162 0 C022          LD      DAC26      INCREMENT PASS      8CF08770
0163 0 4700 0876    BSI      L3 PS010-BASE COUNTER.          8CF08780
*                          *          8CF08790
*                          *          8CF08800
*                          *          8CF08810
*                          *          8CF08820
0165 0 C016          LD      DAC02      INITIAL BIT PATTERN.    8CF08820
0166 0              DA030 EQU      *          8CF08830
0166 0 4700 02B3    BSI      L3 EX010-BASE RUN EXERCISE ROUTINE. 8CF08840
*                          *          8CF08850

```

CORE FUNCTION TEST

```

* DETERMINE IF EACH BIT HAS BEEN TESTED. 8CF08860
*                                          8CF08870
*          SKP      -          ZERO, SKIP IF NOT.          8CF08880
*          B        DA110     BRANCH IF TEST DONE.        8CF08890
*          SLA      ONE      MOVE FLOATING ZERO AND      8CF08900
*          OR       DAC16     ADD LOW BIT.                8CF08910
*          B        DA030     RUN ANOTHER PATTERN TEST.   8CF08920
*                                          8CF08930
* PATTERN TEST EXERCISE COMPLETE.          8CF08940
*                                          8CF08950
016D 0              DA110 EQU      *          8CF08960
016D 0 4359          BSI      3 AC010-BASE SET STATUS FLAG WORD 8CF08970
*                                          8CF08980
* UPON RETURN THERE IS A VALUE OF 0-5 IN THE ACC.      8CF08990
*                                          8CF09000
*          A        DAC20     COMPUTE TABLE ADDRESS AND 8CF09010
*          STO      DA120+1   STORE IN NEXT INSTRUCTION. 8CF09020
DA120 LD      L3 *--      GET TABLE ENTRY AND BUILD    8CF09030
*          STO      DA130+1   BRANCH TO ROUTINE          8CF09040
DA130 B      L3 *--      ENTRY.                          8CF09050
*                                          8CF09060
* FULL, NORMAL TEST.                            8CF09070
*                                          8CF09080
DA140 EQU      *          8CF09090
*          BSI      L3 NE010-BASE RELOCATE CORE TEST.     8CF09100
*          DC      DA020-BASE RE-ENTRY ADDRESS          8CF09110
*          DC      DA520-BASE PARAMETERS.                8CF09120
DA150 EQU      *          8CF09130
*          BSI      L3 NE200-BASE OSCILLATE.              8CF09140
*          DC      DA020-BASE RE-ENTER AT DA020.         8CF09150
*****
* CONSTANTS AND WORK AREAS
*****
017C 0 FFFE          DAC02 DC      /FFFE      INITIAL BIT PATTERN. 8CF09160
017D 0 0001          DAC16 DC      1          ONE.          8CF09170
017E 0 011D          DAC20 DC      DAC22-BASE FLAG TABLE BASE. 8CF09180
017F 0 0113          DAC22 DC      DA140-BASE FULL NORMAL TEST. 8CF09190
0180 0 0124          DC      DA300-BASE LOOP ON ROUTINE.   8CF09200
0181 0 0127          DC      DA400-BASE EXPLICIT BSM TEST. 8CF09210
0182 0 0117          DC      DA150-BASE LOOP AND EXPLICIT. 8CF09220
0183 0 012B          DC      DA520-BASE EXTERNAL BSM TEST. 8CF09230
0184 0 0100          DC      DA020-BASE LOOP AND EXTERNAL. 8CF09240
*                          *          8CF09250
*                          *          8CF09260
*                          *          8CF09270
*                          *          8CF09280
*                          *          8CF09290
*                          *          8CF09300
*                          *          8CF09310
*                          *          8CF09320
0185 0 0F24          DAC26 DC      PXX60-BASE LOOP TALLEY TABLE ADDRESS 8CF09330
*                          *          8CF09340
*                          *          8CF09350
*                          *          8CF09360
*                          *          8CF09370
*                          *          8CF09380
*                          *          8CF09390
*                          *          8CF09400
*                          *          8CF09410
*                          *          8CF09420
*                          *          8CF09430
*                          *          8CF09440
0189 0              DA400 EQU      *          8CF09450
0189 0 4700 07AF    BSI      L3 NE400-BASE RE-ENTRY ADDRESS      8CF09460
018B 0 0100          DC      DA020-BASE RE-ENTRY ADDRESS      8CF09470
018C 0 012B          DC      DA520-BASE PARAMETERS.          8CF09480
018D 0              DA520 EQU      *          8CF09490
*                          *          8CF09500
* TEST FOR EXPLICIT ROUTINE.                  8CF09510
*                                          8CF09520
018D 0 4700 0BE4    BSI      L3 UA010-BASE GO TO EXPLICIT ROUTINE 8CF09530
*                          *          8CF09540
*                          *          8CF09550

```

CORE FUNCTION TEST

CORE FUNCTION TEST

```

***** 8CF09540
* 8CF09550
* WORST CASE PATTERN TEST 8CF09560
* 8CF09570
***** 8CF09580
* 8CF09590
* 8CF09600
* THIS PATTERN TEST SETS UP THE WORST CASE BIT 8CF09610
* PATTERN AND EXERCISES A STORAGE MODULE. 8CF09620
* 8CF09630
* 4/15/69 8CF09640
* 8CF09650
***** 8CF09660
* 8CF09670
DC010 EQU * 8CF09680
LDX 2 FOUR XR2 INDICATES PATTERN ID. 8CF09690
BSI 3 AB010-BASE GO TO WAIT TEST
* 8CF09700
* INITIALIZE WORST CASE PATTERN. 8CF09710
* 8CF09720
DC020 EQU * 8CF09730
LD DCC02 INITIALIZE PASS 8CF09740
STO DCC04 COUNTER. 8CF09750
LD DCC06 INITIALIZE INCREMENT INDEX 8CF09760
STO DC070 REGISTER INSTRUCTION. 8CF09770
LD DCC16 INCREMENT PASS 8CF09780
BSI L3 PS010-BASE COUNTER. 8CF09790
BSI L3 SA100-BASE SET ADDRESS LIMITS. 8CF09800
STO DCC08 SAVE END ADDRESS. 8CF09810
DC030 EQU * 8CF09820
STX 1 DCC10 SET PATTERN OF 64 WORDS 8CF09830
LD DCC10 OF ZEROS AND 64 WORDS 8CF09840
SRA SIX OF ONES. 8CF09850
STO DCC10 8CF09860
SRA TWO 8CF09870
EOR DCC10 8CF09880
SKP E 8CF09890
B DC040 BRANCH ODD. 8CF09900
LD DCC12 STORE /FFFF. 8CF09910
B DC050 8CF09920
DC040 EQU * 8CF09930
SRA 16 STORE /0000. 8CF09940
DC050 EQU * 8CF09950
STO 1 ZERO PUT PATTERN IN CORE. 8CF09960
STX 1 DCC10 TEST FOR END ADDRESS. 8CF09970
LD DCC10 8CF09980
EOR DCC08 8CF09990
SKP +- SKIP NOT DONE. 8CF10000
B DC060 BRANCH TO TEST. 8CF10010
MDX 1 ONE INCREMENT ADDRESS 8CF10020
B DC030 AND LOOP. 8CF10030
* 8CF10040
* PATTERN TEST EXERCISE. 8CF10050
* 8CF10060
DC060 EQU * 8CF10070
LD DCC04 TEST PASS COUNTER. 8CF10080
SKP E SKIP TO RIPPLE UP CORE. 8CF10090
B DC062 BRANCH TO RIPPLE DOWN CORE 8CF10100
BSI L3 SA100-BASE SET ADDRESS LIMITS, UP. 8CF10110
B DC064 BRANCH TO CONTINUE. 8CF10120
DC062 EQU * 8CF10130
BSI L3 SA200-BASE SET ADDRESS LIMITS, DOWN. 8CF10140
DC064 EQU * 8CF10150
STO DCC08 SAVE END ADDRESS. 8CF10160
DC066 EQU * 8CF10170
LD 1 ZERO READ/WRITE, READ/SET SP 8CF10180
STS L1 ZERO,/41 BIT/WRITE, READ/RESET SP 8CF10190
DC068 EQU * 8CF10200
STS L1 ZERO,/40 IAR AT INTERRUPT TIME. 8CF10210
***** 8CF10210

```

```

01BC 0 C100
01BD 0 693E
01BE 0 C03D
01BF 0 F03B
01C0 0 4818
01C1 0 7002
01C2 0 7101
01C3 0 70F3
01C4 0
01C4 0 C034
01C5 0 8037
01C6 0 4808
01C7 0 7005
01C8 0 D030
01C9 0 C0F8
01CA 0 F033
01CB 0 D0F6
01CC 0 70E1
01CD 0
01CD 0 4700 08E3
01CF 0 D02B
01D0 0
01D0 0 692B
01D1 0 C02A
01D2 0 1806
01D3 0 D028
01D4 0 1802
01D5 0 F026
01D6 0 4804
01D7 0 7002
01D8 0 C024
01D9 0 7001
01DA 0
01DA 0 1810
01DB 0
01DB 0 D700 0492
01DD 0 F100
01DE 0 4F18 0180
01E0 0 4700 059D
01E2 0
01E2 0 6919
01E3 0 C018
01E4 0 F016
01E5 0 4818
01E6 0 7002
01E7 0 7101
01E8 0 70E7
01E9 0
01E9 0 4359

```

```

LD 1 ZERO READ/WRITE. 8CF10220
STX 1 DCC10 TEST FOR END 8CF10230
LD DCC10 ADDRESS. 8CF10240
EOR DCC08 8CF10250
SKP +- SKIP NOT DONE. 8CF10260
B DC080 BRANCH IF DONE. 8CF10270
* 8CF10280
* THE FOLLOWING INSTRUCTION IS MODIFIED TO 8CF10290
* INCREMENT OR DECREMENT XR1 ON ALTERNATE TEST 8CF10300
* PASSES. 8CF10310
* 8CF10320
DC070 MDX 1 ONE INCREMENT OR DECREMENT 8CF10330
B DC066 ADDRESS POINTER AND LOOP. 8CF10340
* 8CF10350
* A PASS IS DONE. 8CF10360
* 8CF10370
DC080 EQU * 8CF10380
LD DCC04 DECREMENT PASS COUNTER 8CF10390
A DCC12 AND TEST FOR ZERO. 8CF10400
SKP + SKIP NOT DONE. 8CF10410
B DC090 BRANCH IF DONE. 8CF10420
STO DCC04 UPDATE PASS COUNTER. 8CF10430
* 8CF10440
* THE FOLLOWING INSTRUCTIONS MODIFY DC070 TO 8CF10450
* INCREMENT OR DECREMENT XR1 ON ALTERNATE PASSES. 8CF10460
* 8CF10470
LD DC070 8CF10480
EOR DCC14 8CF10490
STO DC070 8CF10500
B DC060 MAKE ANOTHER PASS. 8CF10510
* 8CF10520
* CHECK PATTERN. 8CF10530
* 8CF10540
DC090 EQU * 8CF10550
BSI L3 SA100-BASE SET ADDRESS LIMITS. 8CF10560
STO DCC08 SAVE END ADDRESS. 8CF10570
DC100 EQU * 8CF10580
STX 1 DCC10 8CF10590
LD DCC10 8CF10600
SRA SIX 8CF10610
STO DCC10 8CF10620
SRA TWO 8CF10630
EOR DCC10 8CF10640
SKP E 8CF10650
B DC110 BRANCH ODD. 8CF10660
LD DCC12 TEST FOR /FFFF 8CF10670
B DC112 8CF10680
DC110 EQU * 8CF10690
SRA 16 TEST FOR /0000. 8CF10700
DC112 EQU * 8CF10710
STO L3 IXC12-BASE SAVE PATTERN FOR TEST. 8CF10720
EOR 1 ZERO COMPARE TO PATTERN IN CORE 8CF10730
BZ L3 DC120-BASE BRANCH IF PATTERN CHECKS. 8CF10740
BSI L3 JA010-BASE SUMMARIZE ERROR. 8CF10750
DC120 EQU * 8CF10760
STX 1 DCC10 CHECK FOR END ADDRESS. 8CF10770
LD DCC10 8CF10780
EOR DCC08 8CF10790
SKP +- SKIP NOT DONE. 8CF10800
B DC122 SKIP IF DONE. 8CF10810
MDX 1 ONE INCREMENT ADDRESS POINTER. 8CF10820
B DC100 LOOP. 8CF10830
* 8CF10840
* PATTERN TEST DONE. 8CF10850
* 8CF10860
DC122 EQU * 8CF10870
BSI 3 AC010-BASE SET STATUS FLAG WORD 8CF10880
* 8CF10890

```

CORE FUNCTION TEST

```

* UPON RETURN THERE IS A VALUE OF 0 - 5 IN THE ACC. 8CF10900
* 8CF10910
01EA 0 8015      A      DCC18      COMPUTE TABLE ADDRESS AND 8CF10920
01EB 0 D001      STO     DC125+1    STORE IN LOAD OPERAND.    8CF10930
01EC 0 C700 0000 DC125 LD  L3  *-*    GET TABLE ENTRY AND    8CF10940
01EE 0 D001      STO     DC130+1  BUILD BRANCH TO        8CF10950
01EF 0 4F00 0000 DC130 B  L3  *-*    ROUTINE ENTRY.        8CF10960
* 8CF10970
* FULL, NORMAL TEST. 8CF10980
* 8CF10990
01F1 0          DC140 EQU  *      8CF11000
01F1 0 4700 0790 BSI  L3  NE010-BASE  RELOCATE CORE TEST. 8CF11010
01F3 0 012F      DC      DC020-BASE  RE-ENTRY ADDRESS 8CF11020
01F4 0 01AC      DC      DC520-BASE  PARAMETERS.    8CF11030
01F5 0          DC150 EQU  *      8CF11040
01F5 0 4700 07A7 BSI  L3  NE200-BASE  OSCILLATE.    8CF11050
01F7 0 012F      DC      DC020-BASE  RE-ENTER AT DC020. 8CF11060
***** 8CF11070
* 8CF11080
* CONSTANTS AND WORK AREAS 8CF11090
* 8CF11100
***** 8CF11110
* 8CF11120
01F8 0 0004      DCC02 DC      4      NUMBER OF PASSES.    8CF11130
01F9 0 0001      DCC04 BSS     1      PASS COUNTER.    8CF11140
01FA 0 7101      DCC06 MDX     1 ONE  INSTRUCTION TO MODIFY XR1. 8CF11150
01FB 0 0001      DCC08 BSS     1      END ADDRESS STORAGE. 8CF11160
01FC 0 0001      DCC10 BSS     1      WORK AREA.    8CF11170
01FD 0 FFFF      DCC12 DC      /FFFF  PATTERN, -1.    8CF11180
01FE 0 00FE      DCC14 DC      /00FE  MASK TO CHANGE BITS 8-14. 8CF11190
01FF 0 0F24      DCC16 DC      PXX60-BASE LOOP TALLEY TABLE ADDRESS 8CF11200
0200 0 019F      DCC18 DC      DCC20-BASE FLAG TABLE BASE ADDRESS. 8CF11210
0201 0 018F      DCC20 DC      DC140-BASE FULL, NORMAL TEST. 8CF11220
0202 0 01A5      DC      DC300-BASE  LOOP ON ROUTINE.    8CF11230
0203 0 01A8      DC      DC400-BASE  EXPLICIT BSM TEST.    8CF11240
0204 0 0193      DC      DC150-BASE  LOOP AND EXPLICIT.    8CF11250
0205 0 01AC      DC      DC520-BASE  EXTERNAL BSM TEST.    8CF11260
0206 0 012F      DC      DC020-BASE  LOOP AND EXTERNAL.    8CF11270
* 8CF11280
***** 8CF11290
* 8CF11300
* LOOP ON PATTERN TEST. 8CF11310
* 8CF11320
0207 0          DC300 EQU  *      8CF11330
0207 0 4700 07AB BSI  L3  NE300-BASE  MOVE ANYWHERE.    8CF11340
0209 0 012F      DC      DC020-BASE  RE-ENTER AT DC020. 8CF11350
* 8CF11360
* EXPLICIT BSM TEST. 8CF11370
* 8CF11380
020A 0          DC400 EQU  *      8CF11390
020A 0 4700 07AF BSI  L3  NE400-BASE  RELOCATE CORE TEST. 8CF11400
020C 0 012F      DC      DC020-BASE  RE-ENTRY ADDRESS 8CF11410
020D 0 01AC      DC      DC520-BASE  PARAMETERS.    8CF11420
* 8CF11430
* TEST FOR EXPLICIT ROUTINE. 8CF11440
* 8CF11450
020E 0          DC520 EQU  *      8CF11460
020E 0 4700 0BE4 BSI  L3  UA010-BASE  EXPLICIT TEST SUBROUTINE. 8CF11470
***** 8CF11480
* 8CF11490
* ALTERNATE 0 AND 1 8CF11500
* 8CF11510
***** 8CF11520
* 8CF11530
* THE ALTERNATE 0 AND 1 PATTERN TEST STORES A PAT- 8CF11540
* TERN OF 010101... IN EACH WORD, BEGINNING WITH * 8CF11550
* A ZERO IN BIT 0. ERRORS COULD INDICATE ADJACENT* 8CF11560
* PLANE NOISE PROBLEMS. * 8CF11570

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CORE FUNCTION TEST

```

* 8CF11580
* 8CF11590
* 4/1/69 * 8CF11600
* 8CF11610
***** 8CF11620
* 8CF11630
DF010 EQU  *      ENTER PATTERN TEST.
LDX  2 FIVE     XR2 INDICATES ROUTINE ID.
BSI  3 AB010-BASE GO TO WAIT TEST
DF020 EQU  *
LD  DFC10      INCREMENT PASS
BSI  L3 PS010-BASE COUNTER.
* 8CF11690
* INITIALIZE BIT PATTERN. 8CF11700
* 8CF11710
LD  DFC02      INITIALIZE BIT PATTERN.
BSI  L3 EX010-BASE RUN EXERCISE ROUTINE.
* 8CF11720
* 8CF11730
* PATTERN TEST COMPLETE. 8CF11740
* 8CF11750
* 8CF11760
BSI  3 AC010-BASE SET STATUS FLAG WORD
* 8CF11770
* UPON RETURN, THERE IS A VALUE OF 0 - 5 IN THE ACC 8CF11780
* 8CF11790
* 8CF11800
A  DFC04      COMPUTE TABLE ADDRESS AND
STO  DF120+1  STORE IN NEXT INSTRUCTION.
DF120 LD  L3  *-*    GET TABLE ENTRY AND BUILD
STO  DF130+1  BRANCH TO ROUTINE
DF130 B  L3  *-*    ENTRY.
* 8CF11860
* FULL, NORMAL TEST. 8CF11870
* 8CF11880
DF140 EQU  *      8CF11890
BSI  L3  NE010-BASE  RELOCATE CORE TEST. 8CF11900
DC  DF020-BASE  RE-ENTRY ADDRESS 8CF11910
DC  DF520-BASE  PARAMETERS.    8CF11920
DF150 EQU  *      8CF11930
BSI  L3  NE200-BASE  OSCILLATE.    8CF11940
DC  DF020-BASE  RE-ENTER AT DF020. 8CF11950
***** 8CF11960
* 8CF11970
* CONSTANTS AND WORK AREAS 8CF11980
* 8CF11990
***** 8CF12000
* 8CF12010
DFC02 DC      /5555  0101 0101 0101 0101 01
DFC04 DC      DFC06-BASE FLAG TABLE BASE ADDRESS.
DFC06 DC      DF140-BASE FULL, NORMAL TEST.
DC  DF300-BASE  LOOP ON ROUTINE.
DC  DF400-BASE  EXPLICIT BSM TEST.
DC  DF150-BASE  LOOP AND EXPLICIT.
DC  DF520-BASE  EXTERNAL BSM TEST.
DC  DF020-BASE  LOOP AND EXTERNAL.
* 8CF12090
* RELATIVE DISPLACEMENT OF 8CF12100
DFC10 DC      PXX60-BASE LOOP TALLEY TABLE ADDRESS 8CF12110
* 8CF12120
***** 8CF12130
* 8CF12140
* LOOP ON PATTERN TEST. 8CF12150
* 8CF12160
DF300 EQU  *      8CF12170
BSI  L3  NE300-BASE  MOVE ANYWHERE.    8CF12180
DC  DF020-BASE  RE-ENTER AT DF020. 8CF12190
* 8CF12200
* EXPLICIT BSM TEST. 8CF12210
* 8CF12220
DF400 EQU  *      8CF12230
BSI  L3  NE400-BASE  RELOCATE CORE TEST. 8CF12240
DC  DF020-BASE  RE-ENTRY ADDRESS 8CF12250

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CORE FUNCTION TEST

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0236 0 01D5      DC      DF520-BASE  PARAMETERS.      8CF12260
0237 0           DF520 EQU      *                    8CF12270
*                    *                    8CF12280
* TEST FOR EXPLICIT ROUTINE.      8CF12290
*                    *                    8CF12300
0237 0 4700 OBE4 BSI L3 UA010-BASE EXPLICIT TEST SUBROUTINE. 8CF12310
*****
*                    *                    8CF12330
* ALTERNATE 1 AND 0 PATTERN TEST  *                    8CF12340
*                    *                    8CF12350
*****
*                    *                    8CF12360
*                    *                    8CF12370
* THE ALTERNATE 1 AND 0 PATTERN TEST STORES A *                    8CF12380
* PATTERN OF 101010... IN EACH WORD, BEGINNING *                    8CF12390
* WITH A 1 IN BIT 0. ERRORS COULD INDICATE *                    8CF12400
* ADJACENT PLANE NOISE PROBLEMS. *                    8CF12410
*                    *                    8CF12420
*                    *                    8CF12430
*                    *                    8CF12440
*****
*                    *                    8CF12450
*                    *                    8CF12460
*                    *                    8CF12470
0239 0           DK010 EQU      *                    8CF12480
0239 0 6206      LDX      2 SIX      XR2 INDICATES ROUTINE ID. 8CF12480
023A 0 4343      BSI      3 AB010-BASE GO TO WAIT TEST 8CF12490
023B 0           DK020 EQU      *                    8CF12500
023B 0 C015      LD       DKC18      INCREMENT PASS      8CF12510
023C 0 4700 0876 BSI L3 PS010-BASE COUNTER.      8CF12520
023E 0 C011      LD       DKC08      LOAD PATTERN AND EXECUTE 8CF12530
023F 0 4700 02E8 BSI L3 EY010-BASE PATTERN EXERCISE.      8CF12540
*                    *                    8CF12550
* PATTERN TEST EXERCISE COMPLETE. *                    8CF12560
*                    *                    8CF12570
*                    *                    8CF12580
0241 0 4359      BSI      3 AC010-BASE SET STATUS FLAG WORD 8CF12590
*                    *                    8CF12600
* UPON RETURN THERE IS A VALUE OF 0 - 5 IN THE ACC. 8CF12610
*                    *                    8CF12620
0242 0 800F      A         DKC20      COMPUTE TABLE ADDRESS AND 8CF12620
0243 0 D001      STO      DK120+1    STORE IN LOAD OPERAND. 8CF12630
0244 0 C700 0000 DK120 LD L3 *-*      GET TABLE ENTRY AND 8CF12640
0246 0 D001      STO      DK130+1    BUILD BRANCH TO 8CF12650
0247 0 4F00 0000 DK130 B L3 *-*      ROUTINE ENTRY.      8CF12660
*                    *                    8CF12670
* FULL, NORMAL TEST. *                    8CF12680
*                    *                    8CF12690
0249 0           DK140 EQU      *                    8CF12700
0249 0 4700 0790 BSI L3 NE010-BASE RELOCATE CORE TEST. 8CF12710
024B 0 01D9      DC       DK020-BASE RE-ENTRY ADDRESS 8CF12720
024C 0 01FE      DC       DK520-BASE PARAMETERS.      8CF12730
024D 0           DK150 EQU      *                    8CF12740
024D 0 4700 07A7 BSI L3 NE200-BASE OSCILLATE.      8CF12750
024F 0 01D9      DC       DK020-BASE RE-ENTER AT DK020. 8CF12760
*****
*                    *                    8CF12770
*                    *                    8CF12780
*                    *                    8CF12790
*                    *                    8CF12800
*****
*                    *                    8CF12810
*                    *                    8CF12820
*                    *                    8CF12830
0250 0 AAAA      DKC08 DC      /AAAA      1010 1010 1010 1010 8CF12830
0251 0 0F24      DKC18 DC      PXX60-BASE LOOP TALLEY TABLE ADDRESS 8CF12840
0252 0 01F1      DKC20 DC      DKC22-BASE FLAG TABLE BASE ADDRESS. 8CF12850
0253 0 01E7      DKC22 DC      DK140-BASE FULL, NORMAL TEST. 8CF12860
0254 0 01F7      DC       DK300-BASE LOOP ON ROUTINE. 8CF12870
0255 0 01FA      DC       DK400-BASE EXPLICIT BSM TEST. 8CF12880
0256 0 01EB      DC       DK150-BASE LOOP AND EXPLICIT. 8CF12890
0257 0 01FE      DC       DK520-BASE EXTERNAL BSM TEST. 8CF12900
0258 0 01D9      DC       DK020-BASE LOOP AND EXTERNAL. 8CF12910
*                    *                    8CF12920
*****
*                    *                    8CF12930

```

CORE FUNCTION TEST

```

*                    *                    8CF12940
* LOOP ON PATTERN TEST. *                    8CF12950
*                    *                    8CF12960
0259 0           DK300 EQU      *                    8CF12970
0259 0 4700 07AB BSI L3 NE300-BASE MOVE ANYWHERE. 8CF12980
025B 0 01D9      DC       DK020-BASE RE-ENTER AT DK020. 8CF12990
*                    *                    8CF13000
* EXPLICIT BSM TEST. *                    8CF13010
*                    *                    8CF13020
025C 0           DK400 EQU      *                    8CF13030
025C 0 4700 07AF BSI L3 NE400-BASE 8CF13040
025E 0 01D9      DC       DK020-BASE RE-ENTRY ADDRESS 8CF13050
025F 0 01FE      DC       DK520-BASE PARAMETERS.      8CF13060
*                    *                    8CF13070
* TEST FOR EXPLICIT ROUTINE. *                    8CF13080
*                    *                    8CF13090
0260 0           DK520 EQU      *                    8CF13100
0260 0 4700 OBE4 BSI L3 UA010-BASE EXPLICIT TEST SUBROUTINE. 8CF13110
*****
*                    *                    8CF13120
*                    *                    8CF13130
* ADD TO MEMORY PATTERN TEST *                    8CF13140
*                    *                    8CF13150
*****
*                    *                    8CF13160
*                    *                    8CF13170
* THE ADD TO MEMORY PATTERN TEST CONSISTS OF *                    8CF13180
* STORING THE INSTRUCTION MDX LO /7400,0 IN *                    8CF13190
* EACH POSITION OF THE MEMORY AND THEN EXECUTING *                    8CF13200
* THE INSTRUCTION STREAM STARTING IN DIFFERENT *                    8CF13210
* ADDRESSES. IN EFFECT THIS IS A DIODE TEST. *                    8CF13220
*                    *                    8CF13230
*                    *                    8CF13240
*                    *                    8CF13250
*                    *                    8CF13260
*****
*                    *                    8CF13270
*                    *                    8CF13280
0262 0           DP010 EQU      *                    8CF13290
0262 0 6207      LDX      2 SEVEN      XR2 INDICATES ROUTINE ID. 8CF13290
0263 0 4343      BSI      3 AB010-BASE GO TO WAIT TEST 8CF13300
0264 0           DP020 EQU      *                    8CF13310
0264 0 C047      LD       DPC22      INCREMENT PASS      8CF13320
0265 0 4700 0876 BSI L3 PS010-BASE COUNTER.      8CF13330
0267 0 C700 039E LD L3 MAD01-BASE INITIALIZE /7400 FOR TEST 8CF13340
0269 0 D400 7400 STO L /7400 MUST BE DONE BEFORE 8CF13350
*                    *                    8CF13360
*                    *                    8CF13370
*                    *                    8CF13380
*                    *                    8CF13390
0268 0 4049      BSI      DP200      INITIALIZE LOOP COUNTER. 8CF13400
026C 0           DP025 EQU      *                    8CF13410
026C 0 C034      LD       DPC08      SAVE LOOP COUNT. 8CF13410
026E 0 0826      RTE      EXCHA      CK FOR EXTERNAL TEST 8CF13420
026F 0 1807      XIO      3 AAC50-BASE DES. SWITCH 8. 8CF13430
0270 0 4804      SRA      SEVEN      SKIP IF INTERNAL. 8CF13440
0271 0 1081      SKP      E          DOUBLE LOOP COUNT. 8CF13450
0272 0 18D0      SLT      ONE          RESTORE COUNT. 8CF13460
0273 0 D02E      RTE      16         SET COUNTER. 8CF13470
0274 0           DP030 EQU      *                    8CF13480
0274 0 C02C      LD       DPC08      INITIALIZE PASS 8CF13490
0275 0 1801      SRA      ONE          COUNTER TO LOOP 20 8CF13500
0276 0 D02C      STO      DPC12      TIMES. 8CF13510
0277 0 4C00 0000 DP036 B L *-*      ENTER INSTRUCTION STREAM. 8CF13520
0279 0           DP040 EQU      *                    8CF13530
0279 0 C029      LD       DPC12      DECREMENT PASS COUNTER 8CF13530
027A 0 9029      S          DPC14      AND TEST FOR MORE PASSES. 8CF13540
027B 0 4808      SKP      +          SKIP TO MAKE ANOTHER PASS. 8CF13550
027C 0 7003      B          DP050      BRANCH PASSES COMPLETE. 8CF13560
027D 0 D025      STO      DPC12      UPDATE COUNTER. 8CF13570
027E 0 4C00 0000 DP046 B L *-*      LOOP ON INSTRUCTION STREAM 8CF13580
*                    *                    8CF13590
*                    *                    8CF13600
*                    *                    8CF13610

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CORE FUNCTION TEST

```

0280 0          DP050 EQU      *          8CF13620
          LD      DPC10      DECREMENT ADDRESS LOOP 8CF13630
0281 0 C021     S          DPC14      COUNTER.      8CF13640
0282 0 4808     SKP      +          SKIP FOR MORE LOOPS. 8CF13650
0283 0 7005     B          DP060      BRANCH IF DONE. 8CF13660
0284 0 D01D     STO      DPC10      UPDATE LOOP COUNTER. 8CF13670
0285 0 C0F2     LD      DP036+1     INCREMENT ENTRY 8CF13680
0286 0 801E     A          DPC16      ADDRESS BY 100. 8CF13690
0287 0 D0F0     STO      DP036+1     8CF13700
0288 0 70EB     B          DP030      LOOP.          8CF13710
          *          8CF13720
          * TEST RUN COMPLETE. 8CF13730
          *          8CF13740
          *          8CF13750
0289 0          DP060 EQU      *          8CF13760
0289 0 C0EE     LD      DP036+1     TEST FOR EVEN ENTRY ADDR. 8CF13770
028A 0 4804     SKP      E          SKIP FOR ODD ADDRESS START 8CF13780
028B 0 7004     B          DP070      BRANCH IF DONE. 8CF13780
028C 0 C0F2     LD      DP046+1     INCREMENT STARTING ADDRESS 8CF13790
028D 0 8018     A          DPC18      BY 5 AND RUN PATTERN TEST 8CF13800
028E 0 D0E9     STO      DP036+1     AGAIN.          8CF13810
028F 0 70DC     B          DP025     8CF13820
          *          8CF13830
          * TEST DONE.        8CF13840
          *          8CF13850
          *          8CF13860
0290 0          DP070 EQU      *          8CF13870
0290 0 6A23     STX      2 DPC28     RESET MEMORY ADD RTN. SW. 8CF13870
0291 0 4359     BSI      3 AC010-BASE SET STATUS FLAG WORD 8CF13880
          *          8CF13890
          * UPON RETURN, THERE IS A VALUE OF 0 - 5 IN THE ACC 8CF13900
          *          8CF13910
          *          8CF13920
          *          8CF13930
0292 0 801A     A          DPC24      COMPUTE TABLE ADDRESS AND 8CF13920
0293 0 D001     STO      DP120+1     AND STORE IN LOAD OPERAND. 8CF13930
0294 0 C700 0000 DP120 LD      L3 *-*          GET TABLE ENTRY AND 8CF13940
0296 0 D001     STO      DP130+1     BUILD BRANCH TO 8CF13950
0297 0 4F00 0000 DP130 B      L3 *-*          ROUTINE ENTRY. 8CF13960
          *          8CF13970
          *          8CF13980
          *          8CF13990
          *          8CF14000
0299 0          DP140 EQU      *          8CF14010
0299 0 4700 0790 BSI      L3 NE010-BASE RELOCATE CORE TEST. 8CF14010
029B 0 0202     DC      DP020-BASE RE-ENTER AT DP020. 8CF14020
029C 0 0270     DC      DP520-BASE RE-ENTER AT DP520. 8CF14030
029D 0          DP150 EQU      *          8CF14040
029D 0 4700 07A7 BSI      L3 NE200-BASE OSCILLATE. 8CF14050
029F 0 0202     DC      DP020-BASE RE-ENTER AT DP020. 8CF14060
          *          8CF14070
          *          8CF14080
          *          8CF14090
          *          8CF14100
          *          8CF14110
          *          8CF14120
          *          8CF14130
          *          8CF14140
          *          8CF14150
          *          8CF14160
          *          8CF14170
          *          8CF14180
          *          8CF14190
          *          8CF14200
          *          8CF14210
          *          8CF14220
          *          8CF14230
          *          8CF14240
          *          8CF14250
          *          8CF14260
          *          8CF14270
          *          8CF14280
          *          8CF14290
          *          8CF14300
          *          8CF14310
          *          8CF14320
          *          8CF14330
          *          8CF14340
          *          8CF14350
          *          8CF14360
          *          8CF14370
          *          8CF14380
          *          8CF14390
          *          8CF14400
          *          8CF14410
          *          8CF14420
          *          8CF14430
          *          8CF14440
          *          8CF14450
          *          8CF14460
          *          8CF14470
          *          8CF14480
          *          8CF14490
          *          8CF14500
          *          8CF14510
          *          8CF14520
          *          8CF14530
          *          8CF14540
          *          8CF14550
          *          8CF14560
          *          8CF14570
          *          8CF14580
          *          8CF14590
          *          8CF14600
          *          8CF14610
          *          8CF14620
          *          8CF14630
          *          8CF14640
          *          8CF14650
          *          8CF14660
          *          8CF14670
          *          8CF14680
          *          8CF14690
          *          8CF14700
          *          8CF14710
          *          8CF14720
          *          8CF14730
          *          8CF14740
          *          8CF14750
          *          8CF14760
          *          8CF14770
          *          8CF14780
          *          8CF14790
          *          8CF14800
          *          8CF14810
          *          8CF14820
          *          8CF14830
          *          8CF14840
          *          8CF14850
          *          8CF14860
          *          8CF14870
          *          8CF14880
          *          8CF14890
          *          8CF14900
          *          8CF14910
          *          8CF14920
          *          8CF14930
          *          8CF14940
          *          8CF14950
          *          8CF14960
          *          8CF14970

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CORE FUNCTION TEST

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02B2 0 0270     DC      DP520-BASE EXTERNAL BSM TEST. 8CF14300
02B3 0 0202     DC      DP020-BASE LOOP AND EXTERNAL. 8CF14310
02B4 0 0007     DC      7          MEMORY ADD RTN. SW. RESET. 8CF14320
          *          8CF14330
          *          8CF14340
          *          8CF14350
          *          8CF14360
          *          8CF14370
          *          8CF14380
          *          8CF14390
          *          8CF14400
          *          8CF14410
          *          8CF14420
          *          8CF14430
          *          8CF14440
          *          8CF14450
          *          8CF14460
          *          8CF14470
          *          8CF14480
          *          8CF14490
          *          8CF14500
          *          8CF14510
          *          8CF14520
          *          8CF14530
          *          8CF14540
          *          8CF14550
          *          8CF14560
          *          8CF14570
          *          8CF14580
          *          8CF14590
          *          8CF14600
          *          8CF14610
          *          8CF14620
          *          8CF14630
          *          8CF14640
          *          8CF14650
          *          8CF14660
          *          8CF14670
          *          8CF14680
          *          8CF14690
          *          8CF14700
          *          8CF14710
          *          8CF14720
          *          8CF14730
          *          8CF14740
          *          8CF14750
          *          8CF14760
          *          8CF14770
          *          8CF14780
          *          8CF14790
          *          8CF14800
          *          8CF14810
          *          8CF14820
          *          8CF14830
          *          8CF14840
          *          8CF14850
          *          8CF14860
          *          8CF14870
          *          8CF14880
          *          8CF14890
          *          8CF14900
          *          8CF14910
          *          8CF14920
          *          8CF14930
          *          8CF14940
          *          8CF14950
          *          8CF14960
          *          8CF14970

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CORE FUNCTION TEST

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02D4 0 6208          LDX  2 EIGHT      XR2 INDICATES ROUTINE ID. 8CF14980
02D5 0 4700 0043    BSI  L3 AB010-BASE GO TO WAIT TEST. 8CF14990
02D7 0              EQU  *                               8CF15000
02D7 0 C02B         LD   DZC08      INCREMENT PASS      8CF15010
02D8 0 4700 0876    BSI  L3 PS010-BASE COUNTER.          8CF15020
02DA 0 C025         LD   DZC02      LOAD PATTERN AND 8CF15030
02DB 0 406E         BSI  EY010      RUN EXERCISE.    8CF15040
*                   8CF15050
* PATTERN TEST DONE, STORAGE PROTECT BITS AND 8CF15060
* SWITCH RESET, TRY TO STORE ZEROS.          8CF15070
*                   8CF15080
*                   8CF15090
02DC 0 4700 08E3    BSI  L3 SA100-BASE SET ADDRESS LIMITS, UP. 8CF15100
02DE 0 D022         STO  DZC04      SAVE END ADDRESS.    8CF15110
02DF 0 1810         SRA  16          SAVE PATTERN FOR 8CF15110
02E0 0 D700 0492    STO  L3 IXC12-BASE INTERRUPT SUBROUTINE. 8CF15120
02E2 0              EQU  *                               8CF15130
02E2 0 1810         SRA  16          THE PATTERN IS ZERO. 8CF15140
02E3 0 D100         STO  1 ZERO      WRITE/READ/WRITE ZERO IN 8CF15150
02E4 0 C100         LD   1 ZERO      EACH POSITION.    8CF15160
02E5 0 4F18 0287    BZ   L3 DZ040-BASE TEST FOR ZERO. 8CF15170
02E7 0 4700 059D    BSI  L3 JA010-BASE BRANCH ON ERROR.    8CF15180
02E9 0              EQU  *                               8CF15190
02E9 0 6918         STX  1 DZC06      TEST FOR LAST 8CF15200
02EA 0 C017         LD   DZC06      POSITION.          8CF15210
02EB 0 F015         EOR  DZC04      8CF15220
02EC 0 4818         SKP  +-         SKIP NOT DONE.    8CF15230
02ED 0 7002         B   DZ050      BRANCH TEST DONE. 8CF15240
02EE 0 7101         MDX  1 ONE      INCREMENT ADDRESS POINTER 8CF15250
02EF 0 70F2         B   DZ030      AND LOOP.        8CF15260
*                   8CF15270
* PATTERN TEST COMPLETE.                    8CF15280
*                   8CF15290
02F0 0              EQU  *                               8CF15300
02F0 0 4700 0059    BSI  L3 AC010-BASE SET STATUS FLAG WORD. 8CF15310
*                   8CF15320
* UPON RETURN THERE IS A VALUE OF 0 - 5 IN THE ACC. 8CF15330
*                   8CF15340
02F2 0 8011         A   DZC10      COMPUTE TABLE ADDRESS AND 8CF15350
02F3 0 D001         STO  DZ080+1 STORE IN LOAD OPERAND. 8CF15360
02F4 0 C700 0000    DZ080 LD  L3 *-*      GET TABLE ENTRY AND BUILD 8CF15370
02F6 0 D001         STO  DZ090+1 BRANCH TO ROUTINE 8CF15380
02F7 0 4F00 0000    DZ090 B   L3 *-*      ENTRY.          8CF15390
*                   8CF15400
* FULL, NORMAL TEST.                        8CF15410
*                   8CF15420
02F9 0              EQU  *                               8CF15430
02F9 0 4700 0790    BSI  L3 NE010-BASE RELOCATE CORE TEST. 8CF15440
02FB 0 0275         DC   DZ020-BASE RE-ENTRY ADDRESS 8CF15450
02FC 0 02B0         DC   DZ520-BASE PARAMETERS.    8CF15460
02FD 0              EQU  *                               8CF15470
02FD 0 4700 07A7    BSI  L3 NE200-BASE OSCILLATE.      8CF15480
02FF 0 0275         DC   DZ020-BASE RE-ENTER AT DZ020. 8CF15490
***** 8CF15500
* 8CF15510
* CONSTANTS AND WORK AREAS                  8CF15520
* 8CF15530
***** 8CF15540
* 8CF15550
0300 0 FFFF         DZC02 DC  /FFFF      PATTERN, ALL ONES.    8CF15560
0301 0 0001         DZC04 BSS 1          STORAGE FOR END ADDRESS. 8CF15570
0302 0 0001         DZC06 BSS 1          WORK AREA.      8CF15580
0303 0 0F24         DZC08 DC  PXX60-BASE LOOP TALLEY TABLE ADDRESS 8CF15590
0304 0 02A3         DZC10 DC  DZC12-BASE FLAG TABLE BASE ADDRESS. 8CF15600
0305 0 0297         DZC12 DC  DZ140-BASE FULL, NORMAL TEST. 8CF15610
0306 0 02A9         DC   DZ300-BASE LOOP ON ROUTINE.    8CF15620
0307 0 02AC         DC   DZ400-BASE EXPLICIT BSM TEST. 8CF15630
0308 0 029B         DC   DZ150-BASE LOOP AND EXPLICIT. 8CF15640
0309 0 02B0         DC   DZ520-BASE EXTERNAL BSM TEST. 8CF15650

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CORE FUNCTION TEST

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030A 0 0275         DC   DZ020-BASE LOOP AND EXTERNAL. 8CF15660
*                   * 8CF15670
***** 8CF15680
* 8CF15690
* LOOP ON PATTERN TEST.                    8CF15700
* 8CF15710
* 8CF15720
030B 0              EQU  *                               8CF15730
030B 0 4700 07AB    BSI  L3 NE300-BASE MOVE ANYWHERE. 8CF15740
030D 0 0275         DC   DZ020-BASE RE-ENTER AT DZ020. 8CF15750
*                   8CF15760
* EXPLICIT BSM TEST.                       8CF15770
* 8CF15780
030E 0              EQU  *                               8CF15790
030E 0 4700 07AF    BSI  L3 NE400-BASE 8CF15790
0310 0 0275         DC   DZ020-BASE RE-ENTRY ADDRESS 8CF15800
0311 0 02B0         DC   DZ520-BASE PARAMETERS.    8CF15810
*                   8CF15820
* TEST FOR EXPLICIT ROUTINE.               8CF15830
* 8CF15840
0312 0              EQU  *                               8CF15850
0312 0 4700 08E4    BSI  L3 UA010-BASE EXPLICIT TEST SUBROUTINE. 8CF15860
0314 0 7068         B   HZ010      BRANCH TO SUMMARY. 8CF15870
***** 8CF15880
* 8CF15890
* EXERCISE SUBROUTINE                      8CF15900
* 8CF15910
***** 8CF15920
* 8CF15930
* THIS SUBROUTINE RUNS A GENERAL EXERCISE OF 8CF15940
* WRITING AND READING A PATTERN.          8CF15950
* 8CF15960
* CALL -                                    8CF15970
* 8CF15980
* BSI  L3 EX010-BASE 8CF15990
* 8CF16000
* THE ACCUMULATOR CONTAINS THE TEST PATTERN. 8CF16010
* 8CF16020
* XR1 MUST BE UNSPECIFIED AND WILL BE USED TO 8CF16030
* ADDRESS CORE FOR THE EXERCISE.          8CF16040
* 8CF16050
* XR2 CONTAINS THE PATTERN ID.            8CF16060
* 8CF16070
* XR3 IS THE PSEUDO BASE REGISTER        8CF16080
* 8CF16090
* 3/26/69 8CF16100
* 8CF16110
***** 8CF16120
* 8CF16130
EX010 DC  *-*      ENTRY. 8CF16140
STO  L3 IXC12-BASE SAVE PATTERN FOR INTRPT. 8CF16150
STO  EXC02      SAVE PATTERN. 8CF16160
LD   EXC04      INITIALIZE PASS 8CF16170
STO  EXC06      COUNTER. 8CF16180
LD   EXC08      INITIALIZE INCREMENT 8CF16190
STO  EX070      INDEX REGISTER INSTR. 8CF16200
* 8CF16210
* SET ADDRESS LIMITS.                     8CF16220
* 8CF16230
EX020 EQU  *                               8CF16240
LD   EXC06      TEST PASS COUNTER. 8CF16250
SKP  E          SKIP IF EVEN. 8CF16260
B   EX030      BRANCH IF ODD. 8CF16270
BSI  L3 SA100-BASE SET ADDRESS LIMITS, UP. 8CF16280
B   EX040      BRANCH TO CONTINUE. 8CF16290
EX030 EQU  *                               8CF16300
BSI  L3 SA200-BASE SET ADDRESS LIMITS, DOWN. 8CF16310
EX040 EQU  *                               8CF16320
STO  EXC10      SAVE END ADDRESS. 8CF16330

```

*
* TEST PASS.
*
0326 0 EQU *
0326 0 C018 LD EXC02 WRITE AND READ PATTERN
0327 0 D100 STO 1 ZERO AND COMPARE.
0328 0 C100 LD 1 ZERO
0329 0 F018 EOR EXC02
032A 0 4820 SKP Z SKIP IF CORRECT.
032B 0 7013 B EX200 BRANCH IF ERROR.
*
EX060 EQU *
032C 0 STX 1 EXC12 TEST FOR
032D 0 C019 LD EXC12 LAST POSITION.
032E 0 F017 EOR EXC10
032F 0 4818 SKP +- SKIP NOT DONE.
0330 0 7002 B EX080 BRANCH IF DONE.
*
* THE FOLLOWING INSTRUCTION IS MODIFIED TO
* INCREMENT OR DECREMENT XR1 ON ALTERNATE TEST
* PASSES.
*
0331 0 7101 MDX 1 ONE INCREMENT OR DECREMENT
0332 0 70F3 B EX050 ADDRESS POINTER AND LOOP.
*
* A PASS IS DONE
*
0333 0 EQU *
0333 0 C010 LD EXC06 DECREMENT AND TEST
0334 0 9013 S EXC14 PASS COUNTER.
0335 0 4808 SKP +
0336 0 7005 B EX090 BRANCH WHEN DONE.
0337 0 D00C STO EXC06 UPDATE COUNTER.
*
* THE FOLLOWING INSTRUCTIONS MODIFY EX070 TO
* INCREMENT OR DECREMENT XR1 ON ALTERNATE PASSES.
*
0338 0 C0F8 LD EX070
0339 0 F00F EOR EXC16
033A 0 D0F6 STO EX070
033B 0 70E1 B EX020 MAKE ANOTHER PASS.
EX090 EQU *
033C 0 LD EXC02 RETURN WITH PATTERN IN ACC
033C 0 C005 LD EXC02
033D 0 4F80 02B3 B I3 EX010-BASE RETURN.
*
* NON-INTERRUPT ERROR DETECTED.
*
EX200 EQU *
033F 0 BSI L3 JA010-BASE LOG ERROR.
033F 0 4700 059D B EX060 RETURN.
0341 0 70EA

* CONSTANTS AND WORK AREAS

* EXCO2 IS THE PATTERN. IT
* IS INITIALIZED BY THE
* CALLING ROUTINE
0342 0 0001 EXC02 BSS 1
0343 0 0004 EXC04 DC 4
0344 0 0001 EXC06 BSS 1
0345 0 7101 EXC08 MDX 1 ONE
0346 0 0001 EXC10 BSS 1
0347 0 0001 EXC12 BSS 1
0348 0 0001 EXC14 DC 1
0349 0 00FE EXC16 DC /00FE

*

8CF16340
8CF16350
8CF16360
8CF16370
8CF16380
8CF16390
8CF16400
8CF16410
8CF16420
8CF16430
8CF16440
8CF16450
8CF16460
8CF16470
8CF16480
8CF16490
8CF16500
8CF16510
8CF16520
8CF16530
8CF16540
8CF16550
8CF16560
8CF16570
8CF16580
8CF16590
8CF16600
8CF16610
8CF16620
8CF16630
8CF16640
8CF16650
8CF16660
8CF16670
8CF16680
8CF16690
8CF16700
8CF16710
8CF16720
8CF16730
8CF16740
8CF16750
8CF16760
8CF16770
8CF16780
8CF16790
8CF16800
8CF16810
8CF16820
8CF16830
8CF16840
8CF16850
8CF16860
8CF16870
8CF16880
8CF16890
8CF16900
8CF16910
8CF16920
8CF16930
8CF16940
8CF16950
8CF16960
8CF16970
8CF16980
8CF16990
8CF17000
8CF17010

034A 0 0000
034B 0 D0F6
034C 0 C0F6
034D 0 D0F6
034E 0 C0F6
034F 0 D017
0350 0 C0F1
0351 0 4700 0BB5

0353 0
0353 0 C0F0
0354 0 4804
0355 0 7003
0356 0 4700 08E3
0358 0 7002
0359 0
0359 0 4700 08EB
035B 0
035B 0 D0EA

035C 0
035C 0 C100
035D 0 F0E4
035E 0 4820
035F 0 7016
0360 0 D100
0361 0
0361 0 7014
0362 0
0362 0 69E4
0363 0 C0E3
0364 0 F0E1
0365 0 4818
0366 0 7002

* EXERCISE SUBROUTINE

* THIS SUBROUTINE RUNS AN EXERCISE OF WRITING AND *
* READING A PATTERN THAT IS STORAGE PROTECTED. *
* CALL - *
* BSI L3 EY010-BASE *
* THE ACCUMULATOR CONTAINS THE TEST PATTERN. *
* XR1 MUST BE UNSPECIFIED AND WILL BE USED TO *
* ADDRESS CORE FOR THE EXERCISE. *
* XR2 CONTAINS THE PATTERN ID. *
* XR3 IS THE PSEUDO BASE REGISTER. *
*
* 3/16/69 *

EY010 DC *-* ENTRY.
STO EXC02 SAVE PATTERN FOR TEST.
LD EXC04 INITIALIZE PASS
STO EXC06 COUNTER.
LD EXC08 INITIALIZE INCREMENT
STO EY080 INDEX REGISTER INSTRUCTION
LD EXC02 INITIALIZE PATTERN.
BSI L3 TA010-BASE
*
* SET ADDRESS LIMITS.
*
EY020 EQU *
LD EXC06 TEST PASS COUNTER AND
SKP E SKIP IF EVEN.
B EY030 BRANCH TO RIPPLE DOWN CORE
BSI L3 SA100-BASE SET ADDRESS LIMITS, UP.
B EY040 BRANCH TO CONTINUE.
EY030 EQU *
BSI L3 SA200-BASE SET ADDRESS LIMITS, DOWN.
EY040 EQU *
STO EXC10 SAVE END ADDRESS.
*
* TEST PASS.
*
EY050 EQU *
LD 1 ZERO READ/WRITE AND CHECK
EOR EXC02 BIT PATTERN.
SKP Z SKIP IF OK.
B EY200 BRANCH IF PATTERN ERROR.
STO 1 ZERO TEST STORAGE PROTECT BIT.
EY060 EQU * INTERRUPT ADDRESS
B EY200 BRANCH NO INTERRUPT, ERROR
EY070 EQU *
STX 1 EXC12 TEST FOR
LD EXC12 LAST POSITION.
EOR EXC10
SKP +- SKIP NOT DONE.
B EY090 BRANCH IF DONE.
*
* THE FOLLOWING INSTRUCTION IS MODIFIED TO
* INCREMENT OR DECREMENT XR1 ON ALTERNATE TEST
* PASSES.
*
8CF17020
8CF17030
8CF17040
8CF17050
8CF17060
8CF17070
8CF17080
8CF17090
8CF17100
8CF17110
8CF17120
8CF17130
8CF17140
8CF17150
8CF17160
8CF17170
8CF17180
8CF17190
8CF17200
8CF17210
8CF17220
8CF17230
8CF17240
8CF17250
8CF17260
8CF17270
8CF17280
8CF17290
8CF17300
8CF17310
8CF17320
8CF17330
8CF17340
8CF17350
8CF17360
8CF17370
8CF17380
8CF17390
8CF17400
8CF17410
8CF17420
8CF17430
8CF17440
8CF17450
8CF17460
8CF17470
8CF17480
8CF17490
8CF17500
8CF17510
8CF17520
8CF17530
8CF17540
8CF17550
8CF17560
8CF17570
8CF17580
8CF17590
8CF17600
8CF17610
8CF17620
8CF17630
8CF17640
8CF17650
8CF17660
8CF17670
8CF17680
8CF17690

CORE FUNCTION TEST

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0367 0 7101      EY080 MDX  1 ONE      INCREMENT OR DECREMENT      8CF17700
0368 0 70F3      B          EY050      ADDRESS POINTER AND LOOP.  8CF17710
*
* A PASS IS DONE.
*
0369 0           EY090 EQU   *
0369 0 CODA      LD          EXC06      DECREMENT AND TEST      8CF17750
036A 0 90DD      S          EXC14      PASS COUNTER.           8CF17760
036B 0 4808      SKP        +          SKIP NOT DONE.           8CF17770
036C 0 7005      B          EY100      BRANCH IF DONE.        8CF17780
036D 0 D0D6      STO        EXC06      UPDATE COUNTER.        8CF17790
*
* THE FOLLOWING INSTRUCTIONS MODIFY EY080 TO
* INCREMENT AND DECREMENT XRI ON ALTERNATE PASSES.
*
036E 0 C0F8      LD          EY080
036F 0 F0D9      EOR        EXC16
0370 0 D0F6      STO        EY080
0371 0 70E1      B          EY020      MAKE ANOTHER PASS.
*
* PATTERN TEST DONE.
*
0372 0           EY100 EQU   *
0372 0 4700 0BD3 BSI L3 TB010-BASE CLEAR BITS, RESET STOR. 8CF17920
0374 0 4F80 02E8 B I3 EY010-BASE PROT. SWITCH AND RETURN. 8CF17930
*
* NON-INTERRUPT ERROR DETECTED.
*
0376 0           EY200 EQU   *
0376 0 4700 059D BSI L3 JA010-BASE RECORD THE ERROR.      8CF17980
0378 0 C0C9      LD          EXC02      RESTORE PATTERN IN      8CF17990
0379 0 D100      STO        1 ZERO     ERROR LOCATION.        8CF18000
037A 0 2D41 0000 STS L1 ZERO,/41
037C 0 70E5      B          EY070      RETURN TO EXERCISE.    8CF18010
*
* UPPER ADDRESS LIMIT OF PATTERN TESTS.
*
037D 0           ETEST EQU   *
037D 0           HZ010 EQU   *
037D 0 0F00 0026 XIO L3 AAC50-BASE TEST LOOP PROGRAM.      8CF18070
037F 0 100B      SLA        11         IF THIS IS A LOOP ON   8CF18080
0380 0 4810      SKP        -         PROGRAM, SEND PASS      8CF18090
0381 0 7008      B          HZ100      COMPLETE MESSAGE.      8CF18100
0382 0 C040      LD          HZK06     MAKE MESSAGE 0008 TO   8CF18110
0383 0 D700 08A7 STO L3 PSC12-BASE INDICATE LOOP ON PROGRAM 8CF18120
0385 0 4700 0691 BSI L3 MA010-BASE PASS.           8CF18130
0387 0 08A6      DC          PSC10-BASE 8CF18140
0388 0 4F00 001C B L3 AA100-BASE LOOP.           8CF18150
*
*
* SUMMARY LOG ROUTINE.
*
038A 0           HZ100 EQU   *
038A 0 620F      LDX        2 /F       XR2 INDICATES ROUTINE ID. 8CF18160
038B 0 C038      LD          HZK08     INITIALIZE LINE BUFFER 8CF18170
038C 0 D700 0B77 STO L3 SUC80-BASE WORD COUNT FOR SUMMARY. 8CF18180
038E 0 C032      LD          HZK02     INITIALIZE BSM ID. COUNTER 8CF18190
038F 0 D030      STO        HZK01     STORAGE.           8CF18200
0390 0           HZ110 EQU   *
0390 0 1008      SLA        EIGHT     LINE.           8CF18210
0391 0 D03C      STO        HZK92
0392 0 403C      BSI        HZ200     TEST FOR NON-ZERO LOOP 8CF18220
0393 0 0F23      DC          PXX60-BASE-1 COUNTER.      8CF18230
0394 0 7014      B          HZ145     BRANCH IF UNTESTED BSM. 8CF18240
0395 0 4700 0691 BSI L3 MA010-BASE WRITE A SPACE.      8CF18250

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CORE FUNCTION TEST

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0397 0 F000      DC          /F000     SPACE FUNCTION.        8CF18380
0398 0 4700 0691 BSI L3 MA010-BASE WRITE HEADING.        8CF18390
039A 0 0363      DC          HZK90-BASE HEADING MESSAGE. 8CF18400
039B 0 4033      BSI        HZ200     TEST FOR NON-ZERO ERROR 8CF18410
039C 0 0EDB      DC          PXX50-BASE-1 COUNTER.      8CF18420
039D 0 7006      B          HZ140     BRANCH IF NO ERRORS. 8CF18430
039E 0 4700 08F4 BSI L3 SB010-BASE WRITE BIT FAIL. SUMMARY. 8CF18440
03A0 0 4700 09CF BSI L3 SE010-BASE WRITE ADDR. LINE SUMMARY. 8CF18450
03A2 0 4700 0AB1 BSI L3 SI010-BASE WRITE S/I SUMMARY.     8CF18460
03A4 0           HZ140 EQU   *
03A4 0 4700 0AF8 BSI L3 SL010-BASE WRITE PATT. FAIL. SUMMARY 8CF18470
03A6 0 4700 0691 BSI L3 MA010-BASE WRITE A SPACE.        8CF18480
03A8 0 F000      DC          /F000     SPACE FUNCTION.        8CF18490
03A9 0           HZ145 EQU   *
03A9 0 C700 FFF8 LD L3 AAC04-BASE TEST FOR LAST BSM      8CF18500
03AB 0 F014      EOR        HZK01     SUMMARIZED.        8CF18510
03AC 0 4818      SKP        +-        SKIP IF NOT.         8CF18520
03AD 0 7004      B          HZ150     BRANCH IF DONE.     8CF18530
03AE 0 C011      LD          HZK01     UPDATE BSM          8CF18540
03AF 0 8011      A          HZK02     ID.                 8CF18550
03B0 0 D00F      STO        HZK01
03B1 0 70DE      B          HZ110     LOOP FOR ANOTHER SUMMARY. 8CF18560
03B2 0           HZ150 EQU   *
03B2 0 4700 0691 BSI L3 MA010-BASE WRITE A SPACE.        8CF18570
03B4 0 F000      DC          /F000     SPACE FUNCTION.        8CF18580
03B5 0 4700 0691 BSI L3 MA010-BASE WRITE END MESSAGE.    8CF18590
03B7 0 0C58      DC          MSG11-BASE MESSAGE.        8CF18600
03B8 0 4700 0691 BSI L3 MA010-BASE WRITE A SPACE.        8CF18610
03BA 0 F000      DC          /F000     SPACE FUNCTION.        8CF18620
03BB 0 3050      DC          /50       END WAIT.           8CF18630
03BC 0 4700 08B2 BSI L3 PT010-BASE ZERO SUMMARY STORAGE. 8CF18640
03BE 0 4F00 FFB3 B L3 AA020-BASE LOOP ON PROGRAM.      8CF18650
*
*****
*
* CONSTANTS AND WORK AREAS
*
*****
*
HZK01 BSS 1 BSM ID. 8CF18700
HZK02 DC 1 ONE. 8CF18710
*
* IF THE NUMBER OF PATTERN TEST ENTRIES CHANGES IN
* THE TABLE PXX50, THE FOLLOWING CONSTANTS MUST
* BE CHANGED.
*
HZK03 EQU 9 NUMBER OF SUMMARIES. 8CF18720
HZK04 DC 9 NUMBER OF SUMMARIES. 8CF18730
HZK06 DC /0A0A 00 8CF18740
*
* RELATIVE BASE ADDRESS OF
* LINE BUFFER WORD COUNT.
* HEADING.
*
HZK08 DC 11 8CF18750
HZK90 DC 9 8CF18760
DC /1214 SU 8CF18770
DC /2424 MM 8CF18780
DC /3129 AR 8CF18790
DC /1800 Y 8CF18800
DC /3626 FO 8CF18810
DC /2900 R 8CF18820
DC /3212 BS 8CF18830
DC /2400 M 8CF18840
HZK92 DC /0000 X 8CF18850
*
*****
*
HZZ00 DC *-* ENTRY. 8CF18860
LD HZK01 IF EACH COUNTER IN THE 8CF18870
S HZK02 INDICATED ARRAY IS ZERO, 8CF18880
M HZK04 RETURN AT CALL+2, 8CF18890
XCH OTHERWISE RETURN AT 8CF18900
A 13 HZ200-BASE CALL+3. 8CF18910

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CORE FUNCTION TEST

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03D6 0 8301          A      3 ONE                8CF19060
03D7 0 D005          STO     HZ210+1             8CF19070
03D8 0 C0F6          LD      HZ200          INCREMENT RETURN ADDRESS 8CF19080
03D9 0 80E7          A      HZK02          PAST ARRAY PARAMETER.   8CF19090
03DA 0 D0F4          STO     HZ200                8CF19100
03DB 0 6109          LDX   1 HZK03          USE XR1 AS A LOOP COUNTER. 8CF19110
03DC 0 C500 0000     HZ210 LD  L1 *-*             8CF19120
03DE 0 4820          SKP   Z              TEST EACH COUNTER IN ARRAY 8CF19130
03DF 0 7003          B      HZ220          FOR ZERO.                8CF19140
03E0 0 71FF          MDX   1 -1           DECREMENT LOOP COUNTER   8CF19150
03E1 0 70FA          B      HZ210          UNTIL TOTAL ARRAY IS DONE. 8CF19160
03E2 0 7003          B      HZ230          RETURN.                  8CF19170
03E3 0              HZ220 EQU *                8CF19180
03E3 0 C0EB          LD      HZ200          INCREMENT RETURN ADDRESS 8CF19190
03E4 0 80DC          A      HZK02          IF A MEMBER OF THE      8CF19200
03E5 0 D0E9          STO     HZ200          ARRAY IS NON-ZERO.     8CF19210
03E6 0              HZ230 EQU *                8CF19220
03E6 0 4F80 036D     B      I3 HZ200-BASE RETURN. 8CF19230
*****
* CONSTANT FOR MEMORY ADD TEST * 8CF19250
* * 8CF19260
* * 8CF19270
*****
* THIS CONSTANT MUST BE NON ZERO AND MUST BE AT * 8CF19280
* /0400. * 8CF19290
* * 8CF19300
* IF THE LENGTH OF THE ROUTINES ABOVE IS CHANGED, * 8CF19310
* THIS CONSTANT MAY HAVE TO BE MOVED IN RELATION * 8CF19320
* TO THE CODING. * 8CF19330
* * 8CF19340
* * 8CF19350
* * 8CF19360
*****
* * 8CF19370
* * 8CF19380
* * 8CF19390
0400          ORG      AA000+/400
0400 0 0001     MAD01 DC 1          ONE, FOR MEMORY ADD TEST. 8CF19400
*****
* * 8CF19410
* * 8CF19420
* * 8CF19430
* * 8CF19440
* COUNTER OVERFLOW ERROR SUBROUTINE * 8CF19450
* * 8CF19460
* * 8CF19470
* * 8CF19480
*****
0401 0          HZ500 EQU *                8CF19490
0401 0 6A08          STX   2 HZX92          CONVERT PATTERN ID. FOR   8CF19500
0402 0 C007          LD      HZX92          ERROR MESSAGE.         8CF19510
0403 0 400E          BSI   IC010          CONVERT CHARACTERS AND PUT 8CF19520
0404 0 D005          STO     HZX92          IN MESSAGE AND          8CF19530
0405 0 4700 0691     BSI   L3 MA010-BASE WRITE IT. 8CF19540
0407 0 03A7          DC      HZX90-BASE MESSAGE. 8CF19550
0408 0 7081          B      HZ100          BRANCH TO SUMMARIZE.   8CF19560
*****
* * 8CF19570
* * 8CF19580
* * 8CF19590
* MESSAGE * 8CF19600
* * 8CF19610
* * 8CF19620
* * 8CF19630
*****
0409 0 0008          HZX90 DC 8          MESSAGE.                8CF19640
040A 0 0000          HZX92 DC /0000      XX PATTERN ID.         8CF19650
040B 0 0A09          DC      /0A09      09 ERROR ID.         8CF19660
040C 0 0033          DC      /0033      C                8CF19670
040D 0 1329          DC      /1329      TR                8CF19680
040E 0 3800          DC      /3800      .                8CF19690
040F 0 2636          DC      /2636      OF                8CF19700
0410 0 2326          DC      /2326      LD                8CF19710
0411 0 1638          DC      /1638      W.                8CF19720
* * 8CF19730

```

CORE FUNCTION TEST

```

*****
***** 8CF19740
***** 8CF19750
* 8CF19760
* PATTERN ID. CONVERSION SUBROUTINE * 8CF19770
* * 8CF19780
***** 8CF19790
* * 8CF19800
* THIS SUBROUTINE CONVERTS THE BINARY PATTERN * 8CF19810
* IN THE ACCUMULATOR TO TWO 1443 CHARACTERS. * 8CF19820
* THERE IS NO MAGNITUDE CHECK. * 8CF19830
* * 8CF19840
* CALL - * 8CF19850
* * 8CF19860
* BSI IC010 * 8CF19870
* * 8CF19880
* THE VALUE TO CONVERT IS IN THE ACCUMULATOR. * 8CF19890
* * 8CF19900
* XR1 AND XR2 ARE NOT USED. * 8CF19910
* * 8CF19920
* XR3 IS THE PSEUDO BASE REGISTER. * 8CF19930
* * 8CF19940
* TWO 1443 CHARACTERS ARE IN THE ACCUMULATOR * 8CF19950
* AT EXIT. * 8CF19960
* * 8CF19970
* * 8CF19980
* * 8CF19990
***** 8CF20000
* * 8CF20010
IC010 DC *-* ENTRY. 8CF20020
SRT 16 PREPARE FOR DIVISION. 8CF20030
D ICC02 DIVIDE BY TEN. 8CF20040
SKP + SKIP NOT ZERO. 8CF20050
LD ICC02 LOAD 1443 CHARACTER 0. 8CF20060
RTE 16 EXCHANGE. 8CF20070
SKP + SKIP NOT ZERO. 8CF20080
LD ICC02 LOAD 1443 CHARACTER ZERO. 8CF20090
SLA EIGHT PUT THE TWO CHARACTERS 8CF20100
RTE EIGHT TOGETHER IN THE ACC. 8CF20110
B I3 IC010-BASE RETURN. 8CF20120
***** 8CF20130
* * 8CF20140
* CONSTANTS * 8CF20150
* * 8CF20160
***** 8CF20170
* * 8CF20180
IC002 DC /000A TEN AND 1443 CHARACTER 0. 8CF20190
* * 8CF20200
***** 8CF20210
* * 8CF20220
* * 8CF20230
* OP CODE CHECK * 8CF20240
* * 8CF20250
***** 8CF20260
* * 8CF20270
IG010 DC *-* ENTRY. 8CF20280
BSI L3 SU010-BASE ZERO LINE BUFFER. 8CF20290
LD I1010 COMPUTE ERROR ADDRESS 8CF20300
S HZK02 AND LOAD INTO 8CF20310
STO IG020+1 MESSAGE. 8CF20320
IG020 LDX L1 *-* 8CF20330
BSI L3 KB010-BASE PUT ADDR. IN LINE BUFFER. 8CF20340
BSI L3 KL010-BASE IS INTERRUPT IN PATTERN 8CF20350
B IG030 TESTS. NO. RETURN 0. 8CF20360
LD I1060+1 YES. RETURN 0. 8CF20370
IG030 EQU * 8CF20380
BSI IC010 CONVERT CHARACTERS AND 8CF20390
STO IGC02 PUT IN ERROR MESSAGE. 8CF20400
LDD IGC02 LOAD ERROR ID. 8CF20410
0412 0 0000
0413 0 1890
0414 0 A809
0415 0 4808
0416 0 C007
0417 0 18D0
0418 0 4808
0419 0 C004
041A 0 1008
041B 0 18C8
041C 0 4F80 03B0
041E 0 000A
041F 0 0000
0420 0 4700 0B66
0422 0 C045
0423 0 9090
0424 0 D001
0425 0 6500 0000
0427 0 4700 0600
0429 0 4700 0644
042B 0 7001
042C 0 C052
042D 0
042E 0 40E4
042F 0 D00B
042F 0 C80A

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CORE FUNCTION TEST

```

0430 0 4700 0B9D      BSI L3 SV010-BASE LOG ERROR.          8CF20420
0432 0 C700 0472      LD L3 IIC34-BASE CHECK FOR PARITY ERROR 8CF20430
0434 0 1001           SLA ONE TOO.                          8CF20440
0435 0 4828           SKP +Z SKIP IF NONE.                  8CF20450
0436 0 404D           BSI I1200 LOG PARITY ERROR.           8CF20460
0437 0 30F1          WATF1 WAIT /F1 OP CODE CHECK WAIT.    8CF20470
0438 0 701B          B IH030 EXIT TO SUMMARY LOG.         8CF20480
*****
*
* CONSTANTS
*****
IGCO2 BSS E 1        ERROR CODE FOR OP   8CF20550
DC /0301            CODE CHECK.         8CF20560
*
*****
* STORAGE PROTECT CHECK
*****
IH010 DC *--* ENTRY.                  8CF20650
LD L3 IXC14-BASE CHECK STORAGE PROTECT 8CF20660
SKP Z SWITCH, SKIP IF SET.            8CF20670
B IH020 BRANCH TO ERROR LOG.          8CF20680
LD IHC02 COMPARE INTERRUPT ADDRESS     8CF20690
A 3 ONE TO TABLE OF KNOWN ENTRIES.   8CF20700
EOR IIO10 8CF20710
SKP +- SKIP NOT THIS ENTRY.           8CF20720
B IH040 BRANCH IF KNOWN ENTRY.        8CF20730
LD IHC04 8CF20740
A 3 ONE 8CF20750
EOR IIO10 8CF20760
SKP +- SKIP IF NOT THIS ENTRY.        8CF20770
B IH040 BRANCH IF KNOWN ENTRY.        8CF20780
*
* UNKNOWN STORAGE PROTECT INTERRUPT.
*****
IH020 EQU * 8CF20820
BSI L3 KLO10-BASE IS INTERRUPT IN PAT. TEST 8CF20830
SKP +-Z SKIP IF NOT, ID. = 0.         8CF20840
LD IIO60+1 PUT ID. IN STORAGE PROTECT 8CF20850
BSI ICO10 INTERRUPT MESSAGE.         8CF20860
STO IHC08 8CF20870
0450 0 D00D           BSI L3 MA010-BASE WRITE MESSAGE.     8CF20880
0451 0 4700 0691      DC IHC06-BASE 8CF20890
0454 0              IH030 EQU * 8CF20900
0454 0 C012           LD IHC10 RESET RETURN ADDRESS TO 8CF20910
0455 0 8301           A 3 ONE SUMMARY LOG AND 8CF20920
0456 0 D011           STO IIO10 EXIT. 8CF20930
0457 0 7021           B IIO40 8CF20940
*
* VALID STORAGE PROTECT INTERRUPT.
*****
IH040 EQU * 8CF20950
*
* THE OPERAND OF THE MDX INSTRUCTION IS INITIALIZED 8CF21000
* IN TA010. 8CF21010
* 8CF21020
MDX L0 IIO10,1 INCREMENT RETURN ADDRESS. 8CF21030
B IIO40 8CF21040
*****
*
* CONSTANTS AND WORK AREAS
*****
8CF21050
* 8CF21060
* 8CF21070
* 8CF21080
***** 8CF21090

```

CORE FUNCTION TEST

```

045B 0 02FF
045C 0 05A6
045D 0 0009
045E 0 0000
045F 0 0306
0460 0 0000
0461 0 1213
0462 0 2629
0463 0 3800
0464 0 2729
0465 0 2613
0466 0 3800
0467 0 0328
0468 0 0000
0469 0 D85C
046A 0 6912
046B 0 6A13
046C 0 2813
046D 0 6205
046E 0 C05B
046F 0 8301
0470 0 D004
0471 0 0856
0472 0 D061
0473 0 1240
0474 0 C600 0000
0476 0 D001
0477 0 4700 0000
0479 0
0479 0 084E
047A 0 4820
047B 0 7059
047C 0 6500 0000
047E 0 6600 0000
0480 0 2000
0481 0 C844
0482 0 4FC0 0406
0484 0 0000
0485 0 1810
0486 0 D700 0528
0488 0 903F
0489 0 D700 0527
048B 0 C046
048C 0 8301
048D 0 D400 0008
048F 0 4700 0644
0491 0 702D
0492 0 COEC

```

```

*
IHC02 DC EY060-BASE INTERRUPT ADDRESS. 8CF21100
IHC04 DC JA032-BASE INTERRUPT ADDRESS. 8CF21110
IHC06 DC 9 MESSAGE. 8CF21120
IHC08 DC /0000 XX 8CF21140
DC /0306 36 8CF21150
DC /0000 8CF21160
DC /1213 ST 8CF21170
DC /2629 OR 8CF21180
DC /3800 . 8CF21190
DC /2729 PR 8CF21200
DC /2613 OT 8CF21210
DC /3800 . 8CF21220
IHC10 DC HZ100-BASE SUMMARY LOG ENTRY ADDR. 8CF21230
*
*****
***** 8CF21260
* 8CF21270
* INTERNAL INTERRUPT SUBROUTINE 8CF21280
* 8CF21290
***** 8CF21300
* 8CF21310
* THIS SUBROUTINE HANDLES ALL OF THE INTERNAL 8CF21320
* INTERRUPTS. 8CF21330
* 8CF21340
***** 8CF21350
* 8CF21360
IIO10 DC *--* INTERNAL INTERRUPT ROUTINE 8CF21370
STO IIC02 SAVE A & Q. 8CF21380
STX 1 IIO50+1 SAVE XR1. 8CF21390
STX 2 IIO60+1 SAVE XR2. 8CF21400
STS IIO70 SAVE STATUS. 8CF21410
LDX 2 FIVE XR2 = COUNT 8CF21420
LD IIC06 COMPUTE ABSOLUTE ADDRESS 8CF21430
A 3 ONE OF BASE OF INTERRUPT 8CF21440
STO IIO20+1 SUBROUTINE TABLE. 8CF21450
XIO IIC04 SENSE ILSW. 8CF21460
STO IIC34 SAVE ILSW. 8CF21470
SLCA 2 ZERO CHECK INTERRUPT CAUSE. 8CF21480
LD L2 *--* COMPUTE ABSOLUTE ADDRESS 8CF21490
STO IIO30+1 8CF21500
IIO30 BSI L3 *--* 8CF21510
IIO40 EQU * RESTORE REGISTERS. 8CF21520
XIO IIC04 CHECK FOR MORE INTERNAL 8CF21530
SKP Z INTERRUPTS. 8CF21540
B WATF2 MULTIPLE ERRORS. 8CF21550
IIO50 LDX L1 *--* RESTORE XR1 8CF21560
IIO60 LDX L2 *--* RESTORE XR2. 8CF21570
IIO70 LDS 0 RESTORE STATUS. 8CF21580
LDD IIC02 RESTORE A & Q. 8CF21590
BOSC I3 IIO10-BASE RETURN. 8CF21600
*
* B REGISTER PARITY ERROR. 8CF21610
* 8CF21620
* 8CF21630
IIO20 DC *--* ENTRY. 8CF21640
*
* PREPARE FOR POSSIBLE SEARCH. 8CF21650
* 8CF21660
* 8CF21670
SRA 16 INITIALIZE SEARCH ADDRESS 8CF21680
STO L3 IXC34-BASE SWITCH, INITIALIZE 8CF21690
S IIC04 PARITY COUNTER. 8CF21700
STO L3 IXC32-BASE 8CF21710
LD IIC26 INITIALIZE NEW INTERNAL 8CF21720
A 3 ONE INTERRUPT CELL. 8CF21730
STO L EIGHT 8CF21740
BSI L3 KLO10-BASE IS INTERRUPT IN PATTERN 8CF21750
B IIO30 TESTS. NO, BRANCH. 8CF21760
LD IIO60+1 YES,, LOAD PATTERN ID. AND 8CF21770

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CORE FUNCTION TEST

```

0493 0 D700 04F2      STO L3 IX610+1-BASE PUT IN XR2 LOAD OPERAND 8CF21780
0495 0 4700 0676      BSI L3 KM010-BASE 8CF21790
0497 0 0830           XIO L3 IIC04 MAKE SURE THERE WERENT ANY 8CF21800
0498 0 4820           SKP Z MORE INTERNAL CHECKS. 8CF21810
*                                     8CF21820
0499 0 703B          * B WATF2 MULTIPLE ERRORS. 8CF21830
*                                     8CF21840
049A 0 4878          * BOSC +-Z RESET INTERRUPT 8CF21850
049B 0 1000          * NOP LEVEL. 8CF21860
*                                     8CF21870
* TEST LOCATION ADDRESSED BY XR1 FIRST. 8CF21880
*                                     8CF21890
049C 0 C100          * LD 1 ZERO READ/WRITE LOCATION. 8CF21900
*                                     8CF21910
* IF THERE WAS NO INTERRUPT, THE ERROR LOCATION 8CF21920
* MUST BE SEARCHED OUT. 8CF21930
*                                     8CF21940
049D 0              * II240 EQU * IAR AT INTERRUPT TIME. 8CF21950
049D 0 6500 0000     * II250 LDX L1 *-* USE XR1 TO ADDRESS CORE. 8CF21960
049F 0              * II255 EQU * 8CF21970
049F 0 C100          * LD 1 ZERO READ/WRITE EACH POSITION. 8CF21980
04A0 0              * II260 EQU * IAR AT INTERRUPT TIME. 8CF21990
04A0 0 71FF          * MDX 1 -1 DECREMENT ADDRESS REGISTER 8CF22000
04A1 0 1000          * NOP AND IGNORE SKIPS AT 32K. 8CF22010
04A2 0 7100          * MDX 1 ZERO ADDRESS REGISTER ZERO. 8CF22020
04A3 0 70FB          * B II255 NO, LOOP. 8CF22030
*                                     8CF22040
* SEARCHED ALL POSITIONS. 8CF22050
*                                     8CF22060
04A4 0 C700 0528     * LD L3 IXC34-BASE WAS THERE AN INTERNAL 8CF22070
04A6 0 4820          * SKP Z PARITY ERROR. 8CF22080
*                                     8CF22090
04A7 0 702F          * B WATF3 INTERNAL ERROR. 8CF22100
*                                     8CF22110
04A8 0 C700 0252     * LD L3 DPC28-BASE IN MEMORY ADD PATTERN 8CF22120
04AA 0 4820          * SKP Z TEST. SKIP IF SO. 8CF22130
04AB 0 7008          * B II295 BRANCH NOT IN PATTERN. 8CF22140
04AC 0 C301          * LD 3 ONE IF EXECUTING ADD TO MEMORY 8CF22150
04AD 0 FOBA          * EOR II010 STREAM, RESET RETURN 8CF22160
04AE 0 180C          * SRA 12 ADDRESS TO DP500. 8CF22170
04AF 0 4818          * SKP +- 8CF22180
04B0 0 7003          * B II295 BRANCH NOT TRUE. 8CF22190
04B1 0 C01F          * LD IIC12 RESET ADDRESS. 8CF22200
04B2 0 8301          * A 3 ONE 8CF22210
04B3 0 DOB4          * STO II010 8CF22220
04B4 0              * II295 EQU * 8CF22230
*                                     8CF22240
* CHECK FOR WAIT ON ERROR. 8CF22250
*                                     8CF22260
04B4 0 0F00 0026     * XIO L3 AAC50-BASE CHECK SWITCH 14. 8CF22270
04B6 0 1801          * SRA ONE 8CF22280
04B7 0 4804          * SKP E SKIP IF OFF. 8CF22290
04B8 0 3072          * WAT72 WAIT /72 WAIT ON ERROR, SW. 14 SET. 8CF22300
04B9 0 C019          * LD IIC32 RESTORE INTERRUPT CELL. 8CF22310
04BA 0 8301          * A 3 ONE 8CF22320
04BB 0 D400 0008     * STO L EIGHT 8CF22330
04BD 0 4F80 0422     * B I3 II200-BASE RETURN. 8CF22340
04BF 0              * II300 EQU * 8CF22350
04BF 0 D700 04F2     * STO L3 IX610+1-BASE PUT 0 OR 7 IN XR2 OPER. 8CF22360
04C1 0 0806          * XIO IIC04 MAKE SURE THERE WERE NO 8CF22370
04C2 0 4820          * SKP Z MORE INTERNAL CHECKS. 8CF22380
*                                     8CF22390
04C3 0 7011          * B WATF2 BRANCH TO MULTIPLE ERROR 8CF22400
*                                     8CF22410
04C4 0 4F40 043B     * BOSC L3 II240-BASE IGNORE SRI TEST. 8CF22420
***** 8CF22430
*                                     8CF22440
* CONSTANTS AND WORK AREAS 8CF22450

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CORE FUNCTION TEST

```

04C6 0002          * IIC02 BSS E 2 AREA TO SAVE A & Q. 8CF22460
04C8 0 0001        * IIC04 DC 1 ONE, ALSO, IOCC TO SENSE 8CF22470
04C9 0 0300        * DC /0300 INTERNAL ILSW. 8CF22480
*                                     8CF22490
04CA 0 0469        * IIC06 DC IIC08-BASE OF INTERRUPT TABLE. 8CF22500
04CB 0 058D        * IIC08 DC IY010-BASE FALSE INTERRUPT. 8CF22510
04CC 0 057F        * DC IXXX-BASE AUX CORE ERROR 8CF22520
04CD 0 0562        * DC IX800-BASE CAR CHECK INTERRUPT. 8CF22530
04CE 0 03DA        * DC IH010-BASE STORAGE PROTECT INTERRUPT 8CF22540
04CF 0 0422        * DC II200-BASE B REGISTER PARITY CHECK. 8CF22550
04D0 0 03BD        * DC IG010-BASE OP CODE CHECK. 8CF22560
04D1 0 026E        * IIC12 DC DP500-BASE RELATIVE ADDRESS OF DP500 8CF22570
*                                     8CF22580
04D2 0 0477        * IIC26 DC IX010-BASE SEARCH INTERRUPT SUBR. 8CF22590
*                                     8CF22600
04D3 0 0406        * IIC32 DC II010-BASE OF INTERRUPT ROUTINE. 8CF22610
04D4 0001          * IIC34 BSS 1 STORAGE FOR ILSW. 8CF22620
*                                     8CF22630
*                                     8CF22640
*                                     8CF22650
*                                     8CF22660
*                                     8CF22670
* MULTIPLE INTERNAL INTERRUPTS. 8CF22680
*                                     8CF22690
*                                     8CF22700
04D5 0              * WATF2 EQU * 8CF22710
04D5 0 30F2        * WAIT /F2 ERROR WAIT. 8CF22720
04D6 0 70FE        * B WATF2 UNRECOVERABLE ERROR. 8CF22730
*                                     8CF22740
* INTERNAL PARITY ERROR. 8CF22750
*                                     8CF22760
04D7 0              * WATF3 EQU * 8CF22770
04D7 0 30F3        * WAIT /F3 ERROR WAIT. 8CF22780
04D8 0 70FE        * B WATF3 UNRECOVERABLE ERROR. 8CF22790
***** 8CF22800
* ALTERNATE INTERNAL INTERRUPT SUBROUTINE * 8CF22810
*                                     * 8CF22820
*                                     * 8CF22830
*                                     * 8CF22840
*                                     * 8CF22850
* THIS SUBROUTINE IS USED BY THE INTERNAL INTER- * 8CF22860
* RUPT SUBROUTINE TO FIND THE LOCATION OR * 8CF22870
* LOCATIONS WITH PARITY ERRORS. * 8CF22880
*                                     * 8CF22890
* OP CODE CHECK ERRORS ARE HANDLED BY INTERFACING * 8CF22900
* WITH THE NORMAL SUBROUTINE IG010. * 8CF22910
*                                     * 8CF22920
* PARITY ERRORS ARE HANDLED AND LOGGED INTERNALLY. * 8CF22930
*                                     * 8CF22940
* THERE SHOULD NEVER BE ANY MEMORY PROTECT ERRORS. * 8CF22950
* CAR CHECKS AND FALSE INTERRUPTS ARE HANDLED BY * 8CF22960
* INTERFACING WITH THE NORMAL SUBROUTINES, IX800 * 8CF22970
* AND IY010. * 8CF22980
*                                     * 8CF22990
*                                     * 8CF23000
*                                     * 8CF23010
*                                     * 8CF23020
*                                     * 8CF23030
*                                     * 8CF23040
04D9 0 0000        * IX010 DC *-* ENTRY. 8CF23050
04DA 0 D018        * STO IXC10 SAVE POSSIBLE FAILURE PTRN 8CF23060
04DB 0 4700 0866    * BSI L3 SU010-BASE ZERO LINE BUFFER. 8CF23070
04DD 0 6205        * LDX 2 FIVE XR2 = COUNT 8CF23080
04DE 0 C00B        * LD IXC02 COMPUTE ABSOLUTE ADDRESS 8CF23090
04DF 0 8301        * A 3 ONE FOR INTERRUPT LOOKUP 8CF23100
04E0 0 D003        * STO IX020+1 OPERAND. 8CF23110
04E1 0 0816        * XIO IXC22 DETERMINE CAUSE OF 8CF23120
04E2 0 1240        * SLCA 2 ZERO INTERRUPT. 8CF23130

```


CORE FUNCTION TEST

```

04E3 0 C600 0000 IX020 LD L2 *-* LOAD SUBROUTINE BASE ADDR. 8CF23140
04E5 0 D001 STO IX030+1 INITIALIZE BRANCH OPERAND. 8CF23150
04E6 0 4700 0000 IX030 BSI L3 *-* ENTER INTERRUPT SUBROUTINE 8CF23160
04E8 0 4FC0 0477 BOSC I3 IX010-BASE RESET INTERRUPT AND EXIT. 8CF23170
* 8CF23180
*****
* CONSTANTS AND WORK AREAS * 8CF23210
* 8CF23220
***** 8CF23230
* 8CF23240
* RELATIVE BASE ADDRESS OF 8CF23250
IXC02 DC IXC04-BASE INTERRUPT TABLE. 8CF23260
IXC04 DC IY010-BASE FALSE INTERRUPT. 8CF23270
DC IXXX-BASE AUX CORE ERROR 8CF23280
DC IX800-BASE CAR CHECK INTERRUPT. 8CF23290
DC IH020-BASE STORAGE PROTECT INTERRUPT 8CF23300
DC IX200-BASE B REGISTER PARITY CHECK. 8CF23310
DC IGO10-BASE OP CODE CHECK. 8CF23320
IXC06 DC I1240-BASE INTERRUPT ADDRESS. 8CF23330
IXC08 DC I1260-BASE INTERRUPT ADDRESS. 8CF23340
IXC10 BSS 1 TEMPORARY STORAGE. 8CF23350
IXC12 BSS 1 TEST PATTERN. 8CF23360
IXC14 DC /FFFF STORAGE PROTECT SWITCH. 8CF23370
IXC18 DC /0B00 CHANGE SP BIT TO ONE. 8CF23380
IXC20 DC /000B CHANGE P BIT. 8CF23390
BSS E 0 FORCE EVEN BOUNDARY. 8CF23400
IXC22 DC 1 ONE AND IOCC TO SENSE 8CF23410
DC /0300 ILSW. 8CF23420
* 8CF23430
***** 8CF23440
IX100 DC *-* ENTRY. 8CF23450
* 8CF23460
* THE LOCATION UNDER TEST FAILED. THE BAD PATTERN 8CF23470
* IS AT IIC02. THE KNOW PATTERN IS AT IXC12. 8CF23480
* THE GOOD PATTERN HAS ODD PARITY, THE BAD PATTERN 8CF23490
* HAS EVEN PARITY. 8CF23500
* 8CF23510
04FB 0 4700 05CD BSI L3 JB010-BASE FILL KNOWN PATTERN 8CF23520
04FD 0 C0C8 LD IIC02 FILL FAILURE PATTERN. 8CF23530
04FE 0 4700 05E3 BSI L3 KA010-BASE 8CF23540
* 8CF23550
* CHECK IF STORAGE PROTECT BIT SET IN WORD. 8CF23560
* 8CF23570
* XIO IXC22 CHECK ILSW. 8CF23580
* SKP Z SKIP IF OK. 8CF23590
* B WATF2 BRANCH ON MULTIPLE ERRORS. 8CF23600
* STO 1 ZERO TRY TO STORE ZERO IN 8CF23610
* XIO IXC22 ERROR POSITION AND CHECK 8CF23620
* SLA TWO FOR STOR. PROT. INTERRUPT. 8CF23630
* SKP - SKIP IF INTERRUPT SET. 8CF23640
* B IX130 BRANCH NO INTERRUPT. 8CF23650
* LD IXC14 WAS THERE SUPPOSED TO BE 8CF23660
* SKP Z A STOR. PROT. INTERRUPT. 8CF23670
* B IX120 BRANCH NOT SET. 8CF23680
* STS L1 ZERO,/40 TRY TO RESET STOR. PROT. 8CF23690
0500 0 EQU * 8CF23700
0500 0 C200 LD 2 ZERO SET STORAGE PROTECT BIT 8CF23710
050E 0 F0E7 EOR IXC18 ON, EVEN PARITY. 8CF23720
050F 0 7002 B IX140 8CF23730
0510 0 EQU * 8CF23740
0510 0 C200 LD 2 ZERO CHANGE PARITY BIT TO MAKE 8CF23750
0511 0 F0E5 EOR IXC20 PARITY EVEN. 8CF23760
0512 0 EQU * 8CF23770
0512 0 D200 STO 2 ZERO 8CF23780
0513 0 4700 07BB BSI L3 PQ010-BASE TALLEY FAILURES BY BIT. 8CF23790
0515 0 403C BSI IX600 UPDATE COUNTERS AND LOG. 8CF23800
0516 0 4F80 0498 B I3 IX100-BASE RETURN. 8CF23810

```

CORE FUNCTION TEST

```

* 8CF23820
* B REGISTER PARITY ERROR. 8CF23830
* 8CF23840
* IX200 DC *-* ENTRY. 8CF23850
LD IXC06 BE SURE INTERRUPT ADDRESS 8CF23860
A 3 ONE IS CORRECT. 8CF23870
EOR IX010 8CF23880
SKP Z 8CF23890
B IX300 BRANCH IF IN SEARCH RTN. 8CF23900
BSI IX100 LOG ERROR. 8CF23910
B L3 I1295-BASE BRANCH OUT. 8CF23920
* 8CF23930
* PARITY ERROR SEARCH INTERRUPT. 8CF23940
* 8CF23950
IX300 EQU * 8CF23960
LD IXC08 BE SURE INTERRUPT ADDRESS 8CF23970
A 3 ONE IS CORRECT. 8CF23980
EOR IX010 8CF23990
SKP Z SKIP IF SO. 8CF24000
* 8CF24010
* THE PARITY ERROR IS INTERNAL TO THE SEARCH 8CF24020
* SUBROUTINE, ABEND. 8CF24030
* 8CF24040
* B WATF2 BRANCH TO ERROR WAIT. 8CF24050
* 8CF24060
* THE BAD PATTERN IS SAVED IN IXC10. THE FAILURE 8CF24070
* ADDRESS IS IN XR1. THERE IS NO TEST PATTERN. * 8CF24080
* THE BAD PATTERN HAS EVEN PARITY. 8CF24090
* 8CF24100
LD IX610+1 IF ERROR OCCURRED IN 8CF24110
SKP Z MEMORY ADD INSTRUCTION 8CF24120
B IX700 STREAM, BRANCH TO IX700. 8CF24130
IX305 EQU * 8CF24140
LDD IXC26 PUT FOUR ASTERISKS IN 8CF24150
STD L3 SUC88+6-BASE TEST PATTERN BUFFER. 8CF24160
LD L3 AAC66-BASE PUT ADDRESS OF FAILURE 8CF24170
STO IX310+1 PATTERN BUFFER AREA IN 8CF24180
IX310 LDX L2 *-* XR2, LOAD FAILURE PATTERN 8CF24190
LD IXC10 AND FILL. 8CF24200
BSI L3 KA010-BASE 8CF24210
LD IIC34 CHECK FOR STORAGE PROTECT 8CF24220
SLA TWO INTERRUPT. 8CF24230
SKP +Z SKIP NO SP. INTERRUPT. 8CF24240
B IX320 BRANCH TO CHANGE SP. BIT. 8CF24250
* 8CF24260
* CHECK FOR SP. PICK. 8CF24270
* 8CF24280
XIO IXC22 CHECK FOR INTERRUPTS. 8CF24290
SKP Z SKIP IF NONE. 8CF24300
* 8CF24310
* B WATF2 MULTIPLE ERRORS. 8CF24320
* 8CF24330
* STO 1 ZERO TRY TO STORE IN ERROR 8CF24340
XIO IXC22 POSITION AND CHECK FOR 8CF24350
SLA TWO SP. ERROR. 8CF24360
SKP - SKIP IF SP. INTERRUPT. 8CF24370
B IX330 BRANCH IF NOT. 8CF24380
IX320 EQU * 8CF24390
LD 2 ZERO SET SP. BIT WITHOUT 8CF24400
EOR IXC18 SETTING PARITY. 8CF24410
B IX340 8CF24420
IX330 EQU * 8CF24430
LD 2 ZERO CHANGE PARITY BIT TO SHOW 8CF24440
EOR IXC20 EVEN PARITY. 8CF24450
IX340 EQU * 8CF24460
STO 2 ZERO UPDATE SP, PARITY STORAGE. 8CF24470
LD IXC32 INCREMENT PARITY ERROR 8CF24480
A IXC22 COUNTER. 8CF24490
0518 0 0000 0519 0 C0D7 051A 0 8301 051B 0 F0B0 051C 0 4820 051D 0 7003 051E 0 40DB 051F 0 4F00 0452
0521 0 0521 0 C0D0 0522 0 8301 0523 0 F0B5 0524 0 4820
0525 0 70AF
0526 0 C02D 0527 0 4820 0528 0 7069 0529 0 0529 0 C85C 052A 0 DF00 0B8C 052C 0 C700 003D 052E 0 D001 052F 0 6600 0000 0531 0 C0C1 0532 0 4700 05E3 0534 0 C09F 0535 0 1002 0536 0 4828 0537 0 7008
0538 0 08BF 0539 0 4820
053A 0 709A
053B 0 D100 053C 0 08BB 053D 0 1002 053E 0 4810 053F 0 7003 0540 0 0540 0 C200 0541 0 F0B4 0542 0 7002 0543 0 0543 0 C200 0544 0 F0B2 0545 0 0545 0 D200 0546 0 C042 0547 0 80B0

```

CORE FUNCTION TEST

```

0548 0 D040      STO      IXC32      8CF24500
*
* IF ERROR ADDRESS IN CORE TEST, SET SWITCH.
*
0549 0 693E      STX      1 IXC28      CHECK ERROR ADDRESS FOR
054A 0 C03D      LD        IXC28      INTERNAL RANGE.
054B 0 F301      EOR      3 ONE      8CF24510
054C 0 180C      SRA      12          8CF24520
054D 0 4818      SKP      +-          8CF24530
054E 0 683B      STX      0 IXC34      CHECK ERROR ADDRESS FOR
054F 0 4002      BSI      IX600      INTERNAL RANGE.
0550 0 4F80 04B6 B        I3 IX200-BASE RETURN.
0552 0 0000      IX600 DC  *-        ENTRY.
* XR2 LOAD OPERAND INITIALIZED IN I1200 OR I1300.
IX610 LDX L2 *-
BSI L3 PRO10-BASE TALLEY FAILURES BY LINE.
LD IXC38 TALLEY FAILURES BY
BSI L3 PS010-BASE PATTERN TEST.
LD IX610+1 TEST VALUE IN XR2.
SKP +- SKIP IF INTERRUPT IN TESTS
B IX650 BRANCH NOT IN PATTERN TEST
XCH IX650 SAVE PATTERN ID.
LD IXC12 PUT CORRECT TEST PATTERN
STO L3 IIC02-BASE IN ACCUM. RESTORE WORD.
XCH IX650 SAVE PATTERN, RESTORE ID.
EOR IXC40 INTERRUPT IN WORST CASE
SKP Z PATTERN TEST, SKIP IF SO.
B IX650 BRANCH NOT TEST FOUR.
STS L1 ZERO,40 RESET ANY STOR. PROT. BIT.
XCH RESTORE PATTERN TO ERROR
STO 1 ZERO WORD.
STX 0 IXC14 RESET STOR. PROT. SWITCH.
IX650 EQU *
XIO L3 AAC50-BASE CHECK FOR BYPASSING
SRA TWO IMMEDIATE ERROR LOG.
SKP E SKIP TO LOG.
B IX660 BRANCH NO LOG.
BSI L3 KB010-BASE PUT ADDR. IN LINE BUFFER.
LD IX610+1 CONVERT PATTERN ID TO
BSI L3 IXC010-BASE TWO 1443 ERROR CODES FOR
STO IXC24 LOG.
LDX L2 IXC30 ERROR CODE 32.
LD IXC34 PARITY IN PROGRAM SWITCH.
SKP Z SKIP IF OFF.
MDX 2 ONE UPDATE ERROR CODE.
LD IXC32 MULTIPLE MEMORY SELECTS.
SKP -Z SKIP IF OFF.
MDX 2 TWO UPDATE ERROR CODE.
STX 2 IXC25 STORE PARITY ERROR CODE.
LDD IXC24 LOAD ERROR ID.
BSI L3 SV010-BASE LOG ERROR.
IX660 EQU *
B I3 IX600-BASE RETURN.
*****
*
* CONSTANTS AND WQRK AREAS
*
*****
IXC24 BSS E 1 STORAGE AREA FOR PARITY
IXC25 BSS 1 CODES.
IXC26 DC /2C2C FOUR ASTERISKS.
DC /2C2C
IXC28 BSS 1 WORK AREA.
IXC30 EQU /0302 PARITY ERROR CODE 32.
IXC32 DC -1 PARITY ERROR COUNTER.
IXC34 BSS 1 INTERNAL PARITY SWITCH.
IXC38 DC PXX50-BASE FAILURE TABLE ADDRESS.

```

CORE FUNCTION TEST

```

058C 0 0004      IXC40 DC 4 WORST CASE PATTERN TEST ID
058D 0 0699      IXC42 DC MA020-BASE RE-ENTRY, 1443 SUBROUTINE
058E 0 0217      IXC44 DC DP040-BASE INSTRUCTION IN MEMORY ADD
058F 0 F400      IXC46 DC /F400 AREA.
0590 0 1000      IXC48 DC /1000
0591 0 7400      IXC50 DC /7400
*
*****
* CHECK ADDRESS LIMITS FOR MEMORY ADD TEST.
*
IX700 EQU *
STX 1 IXC28 SAVE ERROR ADDRESS.
BSI L3 SA010-BASE DETERMINE ADDRESS LIMITS.
EOR IXC28 TEST ADDRESS FOR 4K BSM.
SRA 12
SKP Z SKIP IF IN TEST AREA.
B IX710 SKIP TO IX710.
XCH IX710 RESTORE END ADDRESS.
B IX715 BRANCH TO END ADDRESS TEST
IX710 EQU *
XCH IX710 END ADDRESS TO ACC.
EOR IXC28 TEST ADDRESS FOR 4K BSM.
SRT 12 CHECK BITS 0-3.
SKP Z SKIP IF IN TEST AREA.
B IX305 BRANCH NOT IN TEST AREA.
SLT 12 RESTORE END
EOR IXC28 ADDRESS.
IX715 EQU *
CMP IXC28 COMPARE TO ERROR ADDRESS.
B IX720 SKIP IF NOT EQUAL.
B IX720 SKIP IF NOT EQUAL.
LD IXC44 ERROR IN LAST WORD, LOAD
B IX760 BRANCH OPERAND.
IX720 EQU *
A IXC32 DECREMENT ADDRESS AND
CMP IXC28 COMPARE TO ERROR ADDRESS.
B IX730 SKIP IF NOT EQUAL.
B IX730 SKIP IF NOT EQUAL.
LD IXC46 IF SAME LOAD BRANCH OP
B IX760 CODE.
IX730 EQU *
A IXC32 DECREMENT ADDRESS AND
CMP IXC28 COMPARE TO ERROR ADDRESS.
B IX740 SKIP IF NOT EQUAL.
B IX740 SKIP IF NOT EQUAL.
LD IXC48 IF SAME LOAD NOP
B IX760 INSTRUCTION.
IX740 EQU *
A IXC32 DECREMENT ADDRESS AND
CMP IXC28 COMPARE TO ERROR ADDRESS.
B IX750 SKIP IF NOT EQUAL.
B IX750 SKIP IF NOT EQUAL.
LD IXC48 IF SAME LOAD NOP
B IX760 INSTRUCTION.
IX750 EQU *
LD IXC50 LOAD MEMORY ADD INSTRUC.
IX760 EQU *
STO L3 IXC12-BASE PUT WORD IN TEST PATTERN.
LD L3 IXC10-BASE PUT FAILURE WORD IN
STO L3 IIC02-BASE FAILURE PATTERN.
BSI L3 IX100-BASE LOG ERROR.
B I3 IX200-BASE RETURN.
*
* CAR CHECK INTERNAL INTERRUPT.
*
IX800 DC *- ENTRY.
LD L3 MAC01-BASE CHECK 1443 WRITE SWITCH.

```

CORE FUNCTION TEST

```

05C7 0 4818      SKP      +-      SKIP IF 1443 CAR CHECK.      8CF25860
05C8 0 7009      B        IX810    BRANCH IF FALSE CAR CHECK. 8CF25870
*
* THERE IS NO ERROR MESSAGE FOR A LEGITIMATE 1443
* CAR CHECK, BECAUSE IT WOULD DESTROY THE RETURN
* ADDRESS FROM THE 1443 WRITE SUBROUTINE.
*
05C9 0 3074      WAT74 WAIT  /74      CAR CHECK WAIT.      8CF25930
05CA 0 C0C2      LD        IXC42    SET RETURN ADDRESSES TO 8CF25940
05CB 0 8301      A         3 ONE    RETRY WRITE.      8CF25950
05CC 0 D700 0406  STO L3 I1010-BASE 8CF25960
05CE 0 D700 0477  STO L3 IX010-BASE 8CF25970
05D0 0 4F80 0562  B         I3 IX800-BASE RETURN.      8CF25980
*
* FALSE CAR CHECK.
*
05D2 0
05D2 0 0F00 0026 IX810 EQU      *      8CF26020
05D4 0 1802      XIO L3 AAC50-BASE CHECK FOR IMMEDIATE ERROR 8CF26030
05D5 0 4804      SRA      TWO      LOG.      8CF26040
05D6 0 7003      SKP      E        SKIP TO LOG.      8CF26050
05D7 0 4700 0691 B        IX820    BRANCH NO LOG.      8CF26060
05D9 0 0C45      BSI L3 MA010-BASE WRITE ERROR MESSAGE. 8CF26070
05DA 0
05DA 0 0F00 0026 DC        MSG09-BASE MESSAGE.      8CF26080
05DC 0 1801      XIO L3 AAC50-BASE CHECK FOR WAIT ON ERROR. 8CF26100
05DD 0 4804      SRA      ONE      8CF26110
05DE 0 3075      SKP      E        SKIP IF OFF.      8CF26120
05DF 0 4F80 0562 WAT75 WAIT  /75      FALSE CAR CHECK WAIT. 8CF26130
*
* AUX CORE ERROR
*
05E1 0 0000      IXXXX DC      *--*   ENTRY      8CF26140
05E2 0 0B26      XIO 3 AAC50-BASE CK BYPASS ERROR LOG 8CF26150
05E3 0 1802      SRA      TWO      *      8CF26160
05E4 0 4804      SKP      E        SKIP TO LOG      8CF26170
05E5 0 7003      B        IXX20    ELSE BR      8CF26180
05E6 0 4700 0691 BSI L3 MA010-BASE LOG ERR MESSAGE 8CF26190
05E8 0 0C62      DC        MSG12-BASE MESSAGE ADDR 8CF26200
05E9 0
05E9 0 0B26      XIO 3 AAC50-BASE CK WAIT ON ERROR 8CF26210
05EA 0 1801      SRA      ONE      SKIP IF SW 14 OFF 8CF26220
05EB 0 4804      SKP      E        *      8CF26230
05EC 0 3077      WAT77 DC      /3077  ERROR WAIT 8CF26240
05ED 0 4F80 057F B        I3 IXXXX-BASE RETURN      8CF26250
*
* NO INTERRUPT CONDITION
*
05EF 0 0000      IY010 DC      *--*   ENTRY.      8CF26260
05F0 0 0F00 0026 XIO L3 AAC50-BASE CHECK FOR BYPASSING ERROR 8CF26270
05F2 0 1802      SRA      TWO      LOG.      8CF26280
05F3 0 4804      SKP      E        SKIP TO LOG.      8CF26290
05F4 0 7003      B        IY020    BRANCH AROUND LOG. 8CF26300
05F5 0 4700 0691 BSI L3 MA010-BASE LOG ERROR MESSAGE. 8CF26310
05F7 0 0C3B      DC        MSG08-BASE MESSAGE.      8CF26320
05F8 0
05F8 0 0F00 0026 IY020 EQU      *      8CF26330
05FA 0 1801      XIO L3 AAC50-BASE CHECK FOR WAIT ON ERROR. 8CF26340
05FB 0 4804      SRA      ONE      SKIP IF SWITCH 8CF26350
05FC 0 3076      SKP      E        14 IS OFF.      8CF26360
05FD 0 4F80 058D WAT76 WAIT  /76      ERROR WAIT.      8CF26370
*
* LOG NON INTERRUPT ERRORS
*

```

CORE FUNCTION TEST

```

***** 8CF26540
* 8CF26550
* THIS SUBROUTINE LOGS DATA ON NON INTERRUPT * 8CF26560
* ERRORS. * 8CF26570
* * 8CF26580
* CALL - * 8CF26590
* * 8CF26600
* BSI L3 JA010-BASE * 8CF26610
* * 8CF26620
* XR1 CONTAINS THE ADDRESS OF THE POSITION * 8CF26630
* WITH THE ERROR. * 8CF26640
* * 8CF26650
* XR2 CONTAINS THE PATTERN ID. * 8CF26660
* * 8CF26670
* XR3 IS THE PSEUDO BASE REGISTER. * 8CF26680
* * 8CF26690
* * 3/26/69 * 8CF26700
* * 8CF26710
***** 8CF26720
* 8CF26730
JA010 DC *--* ENTRY. 8CF26740
STX 2 JA040+1 SAVE XR2. 8CF26750
BSI L3 SU010-BASE ZERO LINE BUFFER. 8CF26760
BSI JB010 FILL KNOWN PATTERN. 8CF26770
LD 1 ZERO LOAD AND FILL 8CF26780
BSI KA010 FAILURE PATTERN. 8CF26790
* 8CF26800
* CHECK STORAGE PROTECT BIT IN ERROR WORD. 8CF26810
* * 8CF26820
SRA 16 TRY STORING ZERO ON ERROR 8CF26830
STO 1 ZERO WORD. 8CF26840
JA032 EQU * INTERRUPT ADDRESS. 8CF26850
B JA040 BRANCH NO INTERRUPT. 8CF26860
LD 2 ZERO SET STORAGE PROTECT BIT 8CF26870
EOR JAC06 AND CHANGE PARITY BIT TO 8CF26880
STO 2 ZERO MAINTAIN ODD PARITY. 8CF26890
STS L1 ZERO,/40 RESET STORAGE PROTECT BIT. 8CF26900
JA040 LDX L2 *--* RESTORE PATTERN ID. 8CF26910
BSI L3 PQ010-BASE TALLEY FAILURES BY BIT. 8CF26920
BSI L3 PR010-BASE TALLEY FAILURES BY LINE. 8CF26930
LD JAC02 UPDATE TEST FAILURE 8CF26940
BSI L3 PS010-BASE STORAGE. 8CF26950
XIO L3 AAC50-BASE CHECK FOR BYPASSING 8CF26960
SRA TWO IMMEDIATE ERROR LOG. 8CF26970
SKP E SKIP TO LOG. 8CF26980
B JA050 BRANCH NO LOG. 8CF26990
BSI KB010 PUT ADDR. IN LINE BUFFER. 8CF27000
LD JA040+1 CONVERT PATTERN ID. TO 8CF27010
BSI L3 IC010-BASE TWO 1443 CHARACTERS AND 8CF27020
STO JAC04 PUT IN ERROR CODE. 8CF27030
LDD JAC04 8CF27040
BSI L3 SV010-BASE LOG ERROR. 8CF27050
JA050 EQU * 8CF27060
XIO L3 AAC50-BASE CHECK FOR HALT ON ERROR. 8CF27070
SRA ONE 8CF27080
SKP E 8CF27090
* 8CF27100
* WAT78 WAIT /78 HALT ON ERROR WAIT. 8CF27110
* * 8CF27120
B I3 JA010-BASE RETURN. 8CF27130
***** 8CF27140
* 8CF27150
* CONSTANTS AND WORK AREAS * 8CF27160
* * 8CF27170
***** 8CF27180
* 8CF27190
* JAC02 DC PJK50-BASE FAILURE TABLE ADDRESS. 8CF27200
* JAC04 BSS E 1 ERROR CODE 21. 8CF27210

```

CORE FUNCTION TEST

```

062D 0 0201          DC      /0201          8CF27220
062E 0 0B0B        JAC06 DC  /0B0B          MASK TO SET STOR. PROT. 8CF27230
*                   *                   8CF27240
*                   *                   8CF27250
*****
*****
*****
*****
* FILL KNOWN PATTERN 8CF27260
*                   *                   8CF27270
*                   *                   8CF27280
*                   *                   8CF27290
*                   *                   8CF27300
*****
*****
*                   *                   8CF27310
*                   *                   8CF27320
*                   *                   8CF27330
062F 0 0000        JB010 DC  *-*          ENTRY.          8CF27340
0630 0 C700 003C   LD      L3 AAC64-BASE PUT ADDRESS OF TEST 8CF27350
0632 0 D001        STO      JBO20+1    PATTERN BUFFER AREA IN 8CF27360
0633 0 6600 0000   JBO20 LDX L2 *-*          XR2, LOAD TEST PATTERN 8CF27370
0635 0 C700 0492   LD      L3 IXC12-BASE AND FILL.          8CF27380
0637 0 400D        BSI      KA010          8CF27390
0638 0 C700 0493   LD      L3 IXC14-BASE TEST STORAGE PROTECT SW. 8CF27400
063A 0 4820        SKP      Z          SKIP IF SET.          8CF27410
063B 0 7003        B        JB030          SKIP NOT ON.          8CF27420
063C 0 C200        LD      2 ZERO          LOG STORAGE PROTECT BIT 8CF27430
063D 0 F0F0        EOR      JAC06          AND UPDATE PARITY BIT. 8CF27440
063E 0 D200        STO      2 ZERO          8CF27450
063F 0             EQU      *          8CF27460
0640 0 D001        LD      3 AAC66-BASE PUT ADDR OF FAILURE 8CF27470
0641 0 6600 0000   STO      JBO40+1    PATTERN BUFFER AREA IN 8CF27480
0643 0 4F80 05CD   JBO40 LDX L2 *-*          XR2.          8CF27490
*                   *                   8CF27500
*                   *                   8CF27510
* FILL SUBROUTINE   *                   8CF27520
*                   *                   8CF27530
*****
*****
* THIS SUBROUTINE FILLS THE LINE BUFFER AREA 8CF27540
* DESIGNATED BY XR2 WITH THE PATTERN IN THE 8CF27550
* ACCUMULATOR.    *                   8CF27560
*                   *                   8CF27570
*                   *                   8CF27580
*                   *                   8CF27590
* CALL -          *                   8CF27600
*                   *                   8CF27610
*                   *                   8CF27620
*                   *                   8CF27630
*                   *                   8CF27640
*                   *                   8CF27650
*                   *                   8CF27660
*                   *                   8CF27670
*                   *                   8CF27680
*                   *                   8CF27690
*                   *                   8CF27700
*                   *                   8CF27710
*                   *                   8CF27720
* UPON EXIT XR2 CONTAINS THE ADDRESS OF THE PARITY* 8CF27730
* AND SP BITS.    *                   8CF27740
*                   *                   8CF27750
*                   *                   8CF27760
*****
*****
*                   *                   8CF27770
*                   *                   8CF27780
*                   *                   8CF27790
0645 0 0000        KA010 DC  *-*          ENTRY.          8CF27800
0646 0 D014        STO      KAC02          SAVE PATTERN.        8CF27810
0647 0 6908        STX     1 KA050+1    SAVE XR1.          8CF27820
0648 0 6188        LDX     1 -120        XR1 POINTS TO LEFT BYTE. 8CF27830
0649 0 C012        LD      KAC04          INITIALIZE LOOP      8CF27840
064A 0 D031        STO      KCC02          AND DIGIT COUNTERS. 8CF27850
064B 0 D031        STO      KCC04          8CF27860
064C 0 C00E        LD      KAC02          LOAD PATTERN INTO    8CF27870
064D 0 18D0        RTE     16           Q AND POSITION FIRST BIT. 8CF27880
064E 0 4033        BSI     KC010          LOAD CHARACTERS INTO LINE. 8CF27890
064F 0 6500 0000   KA050 LDX L1 *-*          RESTORE XR1.        8CF27900

```

CORE FUNCTION TEST

```

0651 0 7201          MDX     2 ONE          INCREMENT WORD POINTER. 8CF27900
0652 0 C00A        LD      KAC06          TEST BIT COUNTER FOR 8CF27910
0653 0 4804        SKP     E          EVEN.          8CF27920
0654 0 7002        B        KA070          BRANCH TO LOAD 00.    8CF27930
0655 0 C00B        LD      KAC14          LOAD 01, EVEN PARITY. 8CF27940
0656 0 7001        B        KA080          SKIP.          8CF27950
0657 0             EQU      *          8CF27960
0657 0 C008        LD      KAC12          LOAD 00, ODD PARITY. 8CF27970
0658 0             EQU      *          8CF27980
0658 0 D200        STO     2 ZERO          LOAD SP AND PARITY BITS. 8CF27990
0659 0 4F80 05E3   B        I3 KA010-BASE RETURN.          8CF28000
*****
*****
* CONSTANTS AND WORK AREAS * 8CF28010
*                   *                   8CF28020
*                   *                   8CF28030
*                   *                   8CF28040
*****
*****
*                   *                   8CF28050
*                   *                   8CF28060
065B 0 0001        KAC02 BSS 1          PATTERN STORAGE.    8CF28070
065C 0 0004        KAC04 DC  4          LOOP COUNT.        8CF28080
065D 0 0001        KAC06 BSS 1          BIT COUNTER.      8CF28090
*                   *                   8CF28100
*                   *                   8CF28110
065E 0 087B        KAC08 DC  SUC86-BASE SUC86-BASE LINE BUFFER FILL AREA. 8CF28110
065F 0 0003        KAC10 DC  3          THREE.          8CF28120
0660 0 0A0A        KAC12 DC  /0A0A      1443 CHARACTERS 00. 8CF28130
0661 0 0A01        KAC14 DC  /0A01      1443 CHARACTERS 01. 8CF28140
*                   *                   8CF28150
*****
*****
* LOAD ADDRESS IN LINE BUFFER SUBROUTINE * 8CF28160
*                   *                   8CF28170
*                   *                   8CF28180
*                   *                   8CF28190
*                   *                   8CF28200
*****
*****
* THIS SUBROUTINE CONVERTS THE ADDRESS IN XR1 8CF28210
* TO A STRING OF 1443 CHARACTERS AND FILLS THEM * 8CF28220
* INTO THE LINE BUFFER AT SUC86.          * 8CF28230
*                   *                   8CF28240
*                   *                   8CF28250
*                   *                   8CF28260
* CALL -          *                   8CF28270
*                   *                   8CF28280
*                   *                   8CF28290
*                   *                   8CF28300
*                   *                   8CF28310
*                   *                   8CF28320
*                   *                   8CF28330
*                   *                   8CF28340
*                   *                   8CF28350
*                   *                   8CF28360
*                   *                   8CF28370
*                   *                   8CF28380
*                   *                   8CF28390
*                   *                   8CF28400
*****
*****
0662 0 0000        KB010 DC  *-*          ENTRY.          8CF28410
0663 0 6A15        STX     2 KB050+1    SAVE XR1 AND ADDRESS. 8CF28420
0664 0 C0F9        LD      KAC08          COMPUTE ABSOLUTE BASE 8CF28430
0665 0 8301        A        3 ONE          ADDRESS OF ADDRESS AREA 8CF28440
0666 0 D001        STO     KB020+1    IN LINE BUFFER AND 8CF28450
0667 0 6600 0000   JBO20 LDX L2 *-*          INITIALIZE XR2.    8CF28460
0669 0 690D        STX     1 KB040+1    SAVE XR1.          8CF28470
066A 0 6188        LDX     1 -120        XR1 POINTS TO LEFT BYTE. 8CF28480
066B 0 C0F0        LD      KAC04          INITIALIZE LOOP      8CF28490
066C 0 D00F        STO     KCC02          COUNTER.          8CF28500
066D 0 C0F1        LD      KAC10          INITIALIZE DIGIT     8CF28510
066E 0 D00E        STO     KCC04          COUNTER VALUE.     8CF28520
066F 0 C007        LD      KB040+1    MOVE ADDRESS TO CONVERT 8CF28530
0670 0 18D0        RTE     16           INTO Q.          8CF28540
0671 0 4010        BSI     KC010          CONVERT AND LOAD CHARS. 8CF28550
0672 0 7201        MDX     2 ONE          UPDATE WORD POINTER. 8CF28560
0673 0 C0E8        LD      KAC04          INITIALIZE DIGIT COUNTER 8CF28570

```

CORE FUNCTION TEST

```

0674 0 D008      STO      KCC04  FOR LAST FOUR DIGITS.  8CF28580
0675 0 400C      BSI      KC010  CONVERT AND FILL CHARS.  8CF28590
*
* CONVERSION DONE.  8CF28600
*                   8CF28610
*                   8CF28620
KB040 LDX L1 --*   RESTORE XR1, ADDRESS.  8CF28630
0676 0 6500 0000  KB050 LDX L2 --*   RESTORE XR2.  8CF28640
0678 0 6600 0000  B      I3 KB010-BASE RETURN.  8CF28650
067A 0 4F80 0600  *****
*                   * 8CF28660
*                   * 8CF28670
* LOAD SUBROUTINE * 8CF28680
*                   * 8CF28690
*****
*                   * 8CF28700
*                   * 8CF28710
* THIS SUBROUTINE IS COMMON TO THE FILL AND LOAD * 8CF28720
* ADDRESS SUBROUTINES. * 8CF28730
*                   * 8CF28740
* CALL - * 8CF28750
*                   * 8CF28760
* BSI      KC010 * 8CF28770
*                   * 8CF28780
* XR1 POINTS TO THE INITIAL BYTE TO FILL. * 8CF28790
*                   * 8CF28800
* XR2 CONTAINS THE ADDRESS OF THE BUFFER AREA. * 8CF28810
*                   * 8CF28820
* XR3 IS THE PSEUDO BASE REGISTER. * 8CF28830
*                   * 8CF28840
* THE WORD TO CONVERT AND FILL IS IN THE Q. * 8CF28850
*                   * 8CF28860
* THE LOOP COUNTER, KCC02, IS ALREADY * 8CF28870
* INITIALIZED. * 8CF28880
*                   * 8CF28890
*                   * 8CF28900
*                   * 8CF28910
*                   * 8CF28920
*                   * 8CF28930
*****
*                   * 8CF28940
*                   * 8CF28950
* CONSTANTS AND WORK AREAS * 8CF28960
*                   * 8CF28970
*****
*                   * 8CF28980
*                   * 8CF28990
*                   * 8CF29000
067C 0001      KCC02 BSS 1      LOOP COUNTER.  8CF29010
067D 0001      KCC04 BSS 1      VALUE TO PUT IN DIGIT CTR. 8CF29020
067E 0001      KCC06 BSS 1      DIGIT COUNTER.  8CF29030
067F 0001      KCC08 BSS 1      STORAGE AREA FOR BIT.  8CF29040
0680 0 000A      KCC10 DC /000A 1443 CHARACTER 0.  8CF29050
0681 0 0001      KCC12 DC 1      ONE.  8CF29060
*****
*                   * 8CF29070
*                   * 8CF29080
*                   * 8CF29090
KC010 DC --*     ENTRY.  8CF29100
0682 0 0000      SRA 16     ZERO BIT COUNTER.  8CF29110
0683 0 1810      STO KAC06  8CF29120
0684 0 D008      KC020 EQU * 8CF29130
0685 0          LD KCC04  INITIALIZE THE  8CF29140
0686 0 C0F7      STO KCC06  DIGIT COUNTER. 3 OR 4. 8CF29150
0687 0          KC030 EQU * 8CF29160
0688 0 1804      SRA FOUR  CLEAR ACCUMULATOR. 8CF29170
0689 0 1081      SLT ONE    GET NEXT BIT TO CONVERT. 8CF29180
068A 0 D0F5      STO KCC08  SAVE FOR COUNTING. 8CF29190
068B 0 4808      SKP +      SKIP IF ONE. 8CF29200
068C 0 C0F4      LD KCC10  LOAD CHARACTER ZERO. 8CF29210
068D 0 1100      SLA 1 ZERO  LOAD CHARACTER INTO 8CF29220
068E 0 EA00      OR 2 ZERO  PROPER WORD AND BYTE 8CF29230
068F 0 D200      STO 2 ZERO  POSITION IN BUFFER AREA. 8CF29240
0690 0 C0CD      LD KAC06  UPDATE THE BIT 8CF29250
0690 0 80EE      A KCC08  COUNTER. 8CF29250

```

CORE FUNCTION TEST

```

0691 0 D0CB      STO      KAC06  8CF29260
0692 0 C0EB      LD      KCC06  8CF29270
0693 0 90ED      S      KCC12  DECREMENT DIGIT COUNTER 8CF29280
0694 0 4808      SKP      +      AND TEST FOR MORE DIGITS 8CF29290
0695 0 7007      B      KC040  TO CONVERT. 8CF29300
0696 0 D0E7      STO      KCC06  BRANCH NO MORE DIGITS. 8CF29310
0697 0 7100      MDX 1 ZERO  UPDATE DIGIT COUNTER. 8CF29320
0698 0 7178      MDX 1 120   SKIP IF RIGHT BYTE. 8CF29330
0699 0 7188      MDX 1 -120  MAKE RIGHT BYTE, SKIP. 8CF29340
069A 0 7001      MDX ++1    MAKE LEFT BYTE, SKIP. 8CF29350
069B 0 7201      MDX 2 ONE  SKIP. 8CF29360
069C 0 70EA      B      KC030  INCREMENT WORD POINTER. 8CF29370
*                   LOOP TO CONVERT. 8CF29380
*                   8CF29390
* DIGIT COUNTER ZERO. 8CF29400
*                   8CF29410
KC040 EQU *      8CF29420
LD KCC02        DECREMENT THE 8CF29430
S KCC12        LOOP COUNTER. 8CF29440
SKP +         TEST IF DONE. 8CF29450
B KC050       BRANCH IF DONE. 8CF29460
STO KCC02    UPDATE THE LOOP COUNTER. 8CF29470
MDX 2 ONE   INCREMENT WORD POINTER. 8CF29480
B KC020     CONVERT MORE DIGITS. 8CF29490
*                   8CF29500
* CONVERSION DONE. 8CF29510
*                   8CF29520
KC050 EQU *      8CF29530
B I3 KC010-BASE RETURN. 8CF29540
*****
*                   * 8CF29550
* INTERRUPT ADDRESS IN PATTERN TEST * 8CF29560
*                   * 8CF29570
*****
*                   * 8CF29580
*                   * 8CF29590
*                   * 8CF29600
* CALL - * 8CF29610
*                   * 8CF29620
* BSI L3 KL010-BASE * 8CF29630
* XXXX NO, EXIT. 0 OR 7 * 8CF29640
* XXXX YES, EXIT. 0 * 8CF29650
*                   * 8CF29660
*                   * 8CF29670
*                   * 8CF29680
*                   * 8CF29690
*                   * 8CF29700
*                   * 8CF29710
KL010 DC --*     ENTRY. 8CF29720
LD L3 I1010-BASE SAVE INTERRUPT 8CF29730
STO KLC08      SAVE ADDRESS. 8CF29740
SRT 12        ADDRESS BITS 4 - 15. 8CF29750
SLA 12        RESTORE BITS 0 - 4. 8CF29760
EOR 3 ONE     COMPARE MEMORY SELECT BITS 8CF29770
SRA 12        0-3 AND SKIP IF INTERRUPT 8CF29780
SKP Z        IS IN PROGRAM. 8CF29790
B KL050      BRANCH IF NOT. 8CF29800
SLT 12       COMPARE ADDRESS BITS 8CF29810
CMP KLC02    TO PTEST. 8CF29820
B KL020     I1010 GT PTEST. 8CF29830
B KL030     I1010 LT PTEST. 8CF29840
*                   8CF29850
KL020 EQU *      CMPRE ADDR. BITS TO ETEST. 8CF29860
CMP KLC04    I1010 GT ETEST. 8CF29870
B KL030     I1010 LT ETEST. 8CF29880
NOP          INCREMENT RETURN 8CF29890
LD KL010    ADDRESS. 8CF29900
A KLC06     8CF29910
STO KL010   8CF29920
*                   8CF29930
KL030 EQU *      RETURN WITH ACC. = 0.
SRA 16
*
KL040 EQU *
B I3 KL010-BASE RETURN.
06A6 0 0000
06A7 0 C700 0406
06A9 0 D016
06AA 0 188C
06AB 0 100C
06AC 0 F301
06AD 0 180C
06AE 0 4820
06AF 0 7016
06B0 0 108C
06B1 0 B00B
06B2 0 7001
06B3 0 7006
06B4 0
06B4 0 B009
06B5 0 7004
06B6 0 1000
06B7 0 C0EE
06B8 0 8006
06B9 0 D0EC
06BA 0
06BA 0 1810
06BB 0
06BB 0 4F80 0644

```


CORE FUNCTION TEST

```

***** 8CF29940
* 8CF29950
* CONSTANTS AND WORK AREAS 8CF29960
* 8CF29970
***** 8CF29980
* 8CF29990
06BD 0 00A5 KLC02 DC PTEST-AA000 8CF30000
06BE 0 037D KLC04 DC ETEST-AA000 8CF30010
06BF 0 0001 KLC06 DC 1 ONE. 8CF30020
06C0 0001 KLC08 BSS 1 STORAGE AREA. 8CF30030
06C1 0001 KLC10 BSS 1. SAVE AREA. 8CF30040
06C2 0 0007 KLC12 DC 7 SEVEN. 8CF30050
06C3 0 0004 KLC14 DC 4 FOUR. 8CF30060
06C4 0 FFFF KLC16 DC /FFFF PATTERN, ALL ONES. 8CF30070
06C5 0 01BA KLC18 DC DC068-AA000 ADDRESS OF DC068 8CF30080
* 8CF30090
***** 8CF30100
KL050 EQU * 8CF30110
BSI L3 SA100-BASE GET ADDR. LIMITS OF TEST. 8CF30120
EOR KLC08 COMPARE MEMORY SELECT 8CF30130
SRA 12 BITS. 8CF30140
SKP +- SKIP NOT IN THIS 4K. 8CF30150
B KL060 BRANCH IF IN THIS 4K. 8CF30160
STX 1 KLC10 GET OTHER ADDRESS LIMIT. 8CF30170
LD KLC10 COMPARE MEMORY SELECT 8CF30180
EOR KLC08 BITS. 8CF30190
SRA 12 8CF30200
SKP Z SKIP IF IN THIS 4K. 8CF30210
B KL030 BRANCH INTRPT. NOT IN TEST 8CF30220
KL060 EQU * 8CF30230
LD L3 DPC28-BASE TEST IF PATTERN 7. 8CF30240
SKP Z SKIP IF SO. 8CF30250
B KL030 8CF30260
LD KLC12 8CF30270
B KL040 EXIT WITH 7. 8CF30280
***** 8CF30290
* 8CF30300
* WORST CASE PATTERN DETERMINATION 8CF30310
* 8CF30320
***** 8CF30330
* 8CF30340
* THE INTERNAL INTERRUPT IS IN THE PATTERN TESTS. 8CF30350
* IF IT IS IN THE WORST CASE PATTERN, THE ACTUAL 8CF30360
* BIT PATTERN MUST BE DETERMINED FROM THE ADDRESS. 8CF30370
* 8CF30380
* CALL - 8CF30390
* 8CF30400
* BSI L3 KM010-BASE 8CF30410
* 8CF30420
* XR1 CONTAINS THE ADDRESS OF THE TEST 8CF30430
* LOCATION. 8CF30440
* 8CF30450
* XR2 IS NOT USED. 8CF30460
* 8CF30470
* XR3 IS THE PSEUDO BASE REGISTER. 8CF30480
* 8CF30490
* 4/22/69 8CF30500
* 8CF30510
***** 8CF30520
* 8CF30530
KM010 DC *-* ENTRY. 8CF30540
EOR KLC14 IF WORST CASE PATTERN TEST 8CF30550
SKP Z SKIP TO DETERMINE PATTERN. 8CF30560
B KM050 BRANCH NOT PATTERN TEST 4. 8CF30570
STX 1 KLC10 DETERMINE PATTERN, /0000 8CF30580
LD KLC10 OR /FFFF. 8CF30590
SRA SIX 8CF30600
STO KLC10 8CF30610

```

```

06D8 0 0000
06D9 0 FOE9
06DA 0 4820
06DB 0 7015
06DC 0 69E4
06DD 0 COE3
06DE 0 1806
06DF 0 DOE1

```

CORE FUNCTION TEST

```

06E0 0 1802 SRA TWO 8CF30620
06E1 0 F0DF EOR KLC10 8CF30630
06E2 0 4804 SKP E SKIP IF PATTERN IS /FFFF. 8CF30640
06E3 0 7002 B KM020 BRANCH IF /0000. 8CF30650
06E4 0 C0DF LD KLC16 8CF30660
06E5 0 7001 B KM030 SKIP. 8CF30670
06E6 0 KM020 EQU * 8CF30680
06E6 0 1810 SRA 16 8CF30690
06E7 0 KM030 EQU * 8CF30700
06E7 0 D700 0492 STO L3 IXC12-BASE SAVE PATTERN FOR INTRPT. 8CF30710
06E9 0 C700 0406 LD L3 IIO10-BASE COMPARE INTERRUPT ADDRESS 8CF30720
06EB 0 F0D9 EOR KLC18 TO DC068. 8CF30730
06EC 0 1004 SLA FOUR GET RID OF MEMORY SELECT 8CF30740
06ED 0 4820 SKP Z BITS AND SKIP IF EQUAL. 8CF30750
06EE 0 7002 B KM050 BRANCH NOT AT DC068. 8CF30760
06EF 0 D700 0493 STO L3 IXC14-BASE SET STOR. PROT. SWITCH. 8CF30770
06F1 0 KM050 EQU * 8CF30780
06F1 0 4F80 0676 B I3 KM010-BASE RETURN. 8CF30790
***** 8CF30800
* 8CF30810
* WRITE SUBROUTINE 8CF30820
* 8CF30830
***** 8CF30840
* 8CF30850
* THIS SUBROUTINE WRITES ON THE 1443 IF DATA 8CF30860
* ENTRY SWITCH 9 IS OFF, AND WRITES ON THE 1816/ 8CF30870
* 1053 IF SWITCH 9 IS ON. 8CF30880
* 8CF30890
* THE MESSAGE IS IN 1443 FORMAT. IF NECESSARY IT 8CF30900
* IS CONVERTED TO 1816/1053 CODE. 8CF30910
* 8CF30920
* CALL - 8CF30930
* 8CF30940
* BSI L3 MA010-BASE 8CF30950
* DC MSG-BASE ABSOLUTE DISPLACEMENT OF 8CF30960
* MESSAGE. 8CF30970
* 8CF30980
* XR1 IS SAVED AND RESTORED. 8CF30990
* 8CF31000
* XR2 IS SAVED AND RESTORED. 8CF31010
* 8CF31020
* XR3 IS THE PSEUDO BASE ADDRESS REGISTER. 8CF31030
* 8CF31040
***** 8CF31050
* 8CF31060
MA010 DC *-* ENTRY TO WRITE ROUTINE. 8CF31070
MA015 EQU * 8CF31080
LD I3 MA010-BASE SAVE RELATIVE ADDRESS OF 8CF31090
STO MAC15 MESSAGE IN 1443 IOCC. 8CF31100
XIO MAC05 SENSE DATA SWITCHES. 8CF31110
SRA SIX DETERMINE I/O DEVICE. 8CF31120
SKP E SKIP IF 1443. 8CF31130
B MA100 BRANCH IF 1816/1053. 8CF31140
MA020 EQU * 8CF31150
XIO MAC10 SENSE 1443 DSW. 8CF31160
SKP E SKIP IF 1443 READY. 8CF31170
B MA050 BRANCH TO DISPLAY. 8CF31180
STX 0 MAC01 SET 1443 WRITE SWITCH ON. 8CF31190
LD MAC15 TEST FOR FUNCTION. 8CF31200
SKP - SKIP IF SPACE FUNCTION. 8CF31210
B MA025 BRANCH TO WRITE MESSAGE. 8CF31220
XIO MAC50 EXECUTE SPACE. 8CF31230
B MA030 BRANCH TO CONTINUE. 8CF31240
MA025 EQU * 8CF31250
A 3 ONE COMPUTE ABSOLUTE ADDRESS 8CF31260
STO MAC15 OF MESSAGE. 8CF31270
XIO MAC15 WRITE. 8CF31280
MA030 EQU * 8CF31290

```

```

06F3 0 0000
06F4 0
06F4 0 C780 0691
06F6 0 D027
06F7 0 0822
06F8 0 1806
06F9 0 4804
06FA 0 7031
06FB 0
06FB 0 0820
06FC 0 4804
06FD 0 7019
06FE 0 681A
06FF 0 C01E
0700 0 4810
0701 0 7002
0702 0 0827
0703 0 7003
0704 0
0704 0 8301
0705 0 D018
0706 0 0817
0707 0

```


CORE FUNCTION TEST

```

0707 0 0818      XID  MAC20  SENSE 1443 DSW, NO RESET. 8CF31300
0708 0 1002      SLA  TWD    TEST PRINTER COMPLETE. 8CF31310
0709 0 4810      SKP  -      SKIP WHEN DONE. 8CF31320
070A 0 70FC      B    MA030  LOOP TILL PRINTER DONE. 8CF31330
070B 0 4802      SKP  C      SKIP NO ERROR, CARRY OFF. 8CF31340
070C 0 7007      B    MA040  BRANCH TO ERROR ROUTINE. 8CF31350
070D 0 1810      SRA  16     RESET 1443 WRITE 8CF31360
070E 0 D00A      STO  MAC01  SWITCH. 8CF31370
070F 0           MA036 EQU  *      8CF31380
070F 0 COE3      LD  MA010  INCREMENT RETURN 8CF31390
0710 0 8011      A    MAC25  ADDRESS AND UPDATE 8CF31400
0711 0 D0E1      STO  MA010  IT. 8CF31410
0712 0 4F80 0691 B    13 MA010-BASE RETURN. 8CF31420
0714 0           MA040 EQU  *      ERROR ROUTINE. 8CF31430
0714 0 3030      WAT30 WAIT /30  ERROR WAIT. 8CF31440
0715 0 0806      XID  MAC10  RESET 1443 DSW. 8CF31450
*              B    MA015  START OVER AGAIN, MAY USE 8CF31460
0716 0 70DD      MA050 EQU  *      1816/1053. 8CF31470
0717 0           WAT31 WAIT /31 1443 NOT READY DISPLAY. 8CF31480
0718 0 70DB      B    MA015  NOT READY WAIT. 8CF31490
*              *      MA015  RETURN TO TRY AGAIN. 8CF31500
*****
*              *      8CF31510
*              *      8CF31520
*              *      8CF31530
*              *      8CF31540
*              *      8CF31550
*              *      8CF31560
*              *      8CF31570
0719 0 0000      MAC01 DC  /0000 1443 WRITE SWITCH, OFF. 8CF31580
071A 0001      MAC05 BSS E 1    FORCE EVEN BOUNDARY FOR 8CF31590
071B 0 0740      DC  /0740  IOCC TO SENSE DES. 8CF31600
071C 0 0000      MAC10 DC  /0000 SENSE 1443 DSW AND 8CF31610
071D 0 3701      DC  /3701  RESET. 8CF31620
071E 0 0000      MAC15 DC  *--  IOCC TO WRITE AT 1443. 8CF31630
071F 0 3500      DC  /3500  8CF31640
*              *      8CF31650
*              *      8CF31660
*              *      8CF31670
0720 0001      MAC20 BSS 1     SENSE 1443 DSW WITHOUT 8CF31680
0721 0 3700      DC  /3700  RESET. 8CF31690
*              *      8CF31700
*              *      8CF31710
*              *      8CF31720
0722 0 0001      MAC25 DC  1     SENSE FIRST PRINTER DSW 8CF31730
0723 0 0F03      DC  /0F03  WITH RESET. 8CF31740
*              *      8CF31750
*              *      8CF31760
*              *      8CF31770
0724 0 8100      MAC30 DC  /8100 SENSE FIRST PRINTER DSW 8CF31780
0725 0 0F02      DC  /0F02  WITHOUT RESET. 8CF31790
*              *      8CF31800
*              *      8CF31810
*              *      8CF31820
*              *      8CF31830
*              *      8CF31840
0726 0 0000      MAC35 DC  *--  WRITE IOCC TO FIRST 8CF31850
0727 0 0902      DC  /0902  1816 OR 1053. 8CF31860
0728 0001      MAC40 BSS 1     CHARACTER TO PRINT. 8CF31870
0729 0 06C6      MAC45 DC  MAC40-BASE RELATIVE ADDRESS OF MAC40 8CF31880
072A 0 2100      MAC50 DC  /2100 IOCC TO SPACE 8CF31890
072B 0 3400      DC  /3400  IMMEDIATE. 8CF31900
*              *      8CF31910
*****
*              *      8CF31920
*              *      8CF31930
*              *      8CF31940
*              *      8CF31950
*              *      8CF31960
*              *      8CF31970
072C 0           MA100 EQU  *

```

CORE FUNCTION TEST

```

072C 0 6923      STX  1 MA145+1 SAVE XR1. 8CF31980
072D 0 6A20      STX  2 MA140+1 SAVE XR2. 8CF31990
072E 0 C301      LD  3 ONE  COMPUTE ABSOLUTE ADDRESS 8CF32000
072F 0 80F9      A    MAC45  OF CHARACTER BUFFER AND 8CF32010
0730 0 D0F5      STO  MAC35  STORE IN IOCC. 8CF32020
0731 0 COEC      LD  MAC15  INITIALIZE XR1 8CF32030
0732 0 4808      SKP  +     SKIP IF MESSAGE TO WRITE. 8CF32040
0733 0 7018      B    MA130  BRANCH TO SPACE FUNCTION. 8CF32050
0734 0 8301      A    3 ONE  COMPUTE ABSOLUTE ADDRESS 8CF32060
0735 0 D001      STO  MA105+1 TO POINT TO I/O 8CF32070
0736 0 6500 0000 MA105 LDX L1 *-- BUFFER AREA. 8CF32080
0738 0 C100      LD  1 ZERO  GET WORD COUNT. 8CF32090
0739 0 D0E6      STO  MAC20  AND SAVE. 8CF32100
073A 0 7101      MDX  1 ONE  BUMP XR1 TO FIRST WORD. 8CF32110
073B 0 6288      LDX  2 -120 XR2 POINTS TO LEFT BYTE. 8CF32120
073C 0 4015      BSI  MA150  TEST FOR PRINTER READY. 8CF32130
073D 0           MA110 EQU  *      8CF32140
073D 0 402B      BSI  MM010  CONVERT CHARACTER. 8CF32150
073E 0 D0E9      STO  MAC40  CHARACTER TO I/O BUFFER. 8CF32160
073F 0 08E6      XIO  MAC35  WRITE. 8CF32170
0740 0 4011      BSI  MA150  TEST FOR PRINTER DONE. 8CF32180
0741 0 7200      MDX  2 ZERO  TEST RIGHT BYTE, SKIP YES. 8CF32190
0742 0 7278      MDX  2 120  MAKE RIGHT BYTE, SKIP. 8CF32200
0743 0 7288      MDX  2 -120 MAKE LEFT BYTE, SKIP. 8CF32210
0744 0 70F8      B    MA110  PRINT RIGHT BYTE. 8CF32220
0745 0 CODA      LD  MAC20  DECREMENT WORD COUNTER. 8CF32230
0746 0 90DB      S    MAC25  AND TEST. 8CF32240
0747 0 4808      SKP  +     SKIP NOT ZERO YET. 8CF32250
0748 0 7003      B    MA130  DONE PRINTING LINE. 8CF32260
0749 0 D0D6      STO  MAC20  UPDATE COUNTER. 8CF32270
074A 0 7101      MDX  1 ONE  BUMP WORD POINTER. 8CF32280
074B 0 70F1      B    MA110  PRINT NEXT CHARACTER. 8CF32290
*              *      8CF32300
*              *      8CF32310
*              *      8CF32320
*              *      8CF32330
*              *      8CF32340
074C 0           MA130 EQU  *      RETURN CARRIAGE. 8CF32340
074D 0 4015      BSI  MA200  RESTORE XR2 8CF32350
074E 0 6600 0000 MA140 LDX L2 *-- RESTORE XR1. 8CF32360
074F 0 6500 0000 MA145 LDX L1 *-- RESTORE XR1. 8CF32370
0751 0 70BD      B    MA036  BRANCH TO EXIT ROUTINE. 8CF32380
*              *      8CF32390
*              *      8CF32400
*              *      8CF32410
*              *      8CF32420
*              *      8CF32430
*              *      8CF32440
*              *      8CF32450
*              *      8CF32460
*              *      8CF32470
*              *      8CF32480
*              *      8CF32490
*              *      8CF32500
*              *      8CF32510
*              *      8CF32520
*              *      8CF32530
*              *      8CF32540
*              *      8CF32550
0752 0 0000      MA150 DC  *--  SENSE DSW WITHOUT RESET. 8CF32560
0753 0 08D0      XIO  MAC30  TEST FOR BUSY. 8CF32570
0754 0 1004      SLA  FOUR  SKIP NOT BUSY. 8CF32580
0755 0 4828      SKP  +Z    LOOP IF BUSY. 8CF32590
0756 0 70FC      B    MA150+1 8CF32600
0757 0           MA155 EQU  *      SENSE DSW WITH RESET AND 8CF32610
0757 0 08CA      XIO  MAC25  TEST FOR PARITY ERROR. 8CF32620
0758 0 1806      SRA  SIX   SKIP IF OFF. 8CF32630
0759 0 4804      SKP  E     BRANCH TO WAIT. 8CF32640
075A 0 7005      B    MA180  TEST FOR PRINTER NOT READY 8CF32650
075B 0 1804      SRA  FOUR  SKIP IF READY. 8CF32660
075C 0 4804      SKP  E     BRANCH TO WAIT. 8CF32670
075D 0 7002      B    MA180  BRANCH TO WAIT. 8CF32680
075E 0 4F80 06F0 B    13 MA150-BASE RETURN. 8CF32690
0760 0           MA180 EQU  *      8CF32700
0760 0 3032      WAT32 WAIT /32 NOT READY OR ERROR WAIT. 8CF32710
0761 0 70F5      B    MA155  RETURN TO SENSE READY. 8CF32720
*              *      8CF32730
*              *      8CF32740
*              *      8CF32750
*              *      8CF32760
*              *      8CF32770
*              *      8CF32780
*              *      8CF32790
*              *      8CF32800
*              *      8CF32810
*              *      8CF32820
*              *      8CF32830
*              *      8CF32840
*              *      8CF32850
*              *      8CF32860
*              *      8CF32870
*              *      8CF32880
*              *      8CF32890
*              *      8CF32900
*              *      8CF32910
*              *      8CF32920
*              *      8CF32930
*              *      8CF32940
*              *      8CF32950
*              *      8CF32960
*              *      8CF32970
0762 0 0000      MA200 DC  *--  LOAD CARRIER RETURN 8CF32980
0763 0 C0C0      LD  MAC30  INTO CHARACTER BUFFER. 8CF32990
0764 0 D0C3      STO  MAC40  WRITE. 8CF33000
0765 0 08C0      XIO  MAC35  TEST STATUS. 8CF33010
0766 0 40EB      BSI  MA150

```

CORE FUNCTION TEST

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0767 0 4F80 0700      B      I3 MA200-BASE RETURN.      8CF32660
*****                *****                8CF32670
*                      *                      8CF32680
* 1816/1053 CHARACTER CONVERSION SUBROUTINE * 8CF32690
*                      *                      8CF32700
*****                *****                8CF32710
*                      *                      8CF32720
* THIS SUBROUTINE CONVERTS A CHARACTER IN 1443 * 8CF32730
* CODE TO AN 1816 OR 1053 CHARACTER.          * 8CF32740
*                      *                      8CF32750
* CALL -                                          * 8CF32760
*                      *                      8CF32770
*      BSI      MM010                            * 8CF32780
*                      *                      8CF32790
*      XR1 AND XR2 INDICATE THE CHARACTER TO    * 8CF32800
*      CONVERT.                                * 8CF32810
*                      *                      8CF32820
*      XR3 IS SAVED AND RESTORED.              * 8CF32830
*                      *                      8CF32840
*****                *****                8CF32850
*                      *                      8CF32860
MM010 DC      *-*                                8CF32870
      STX      3 MM050+1  SAVE BASE REGISTER.    8CF32880
      LDX      3 EIGHT   SET SHIFT COUNT TO 8.  8CF32890
      LD       1 ZERO    GET CHARACTER TO PRINT. 8CF32900
      SRA      2 ZERO    IN RIGHT BYTE OF ACC.  8CF32910
      AND      MMC10     8CF32920
*                      *                      8CF32930
*      SKP      E       SKIP IF CHARACTER IS LEFT 8CF32940
*                      *                      8CF32950
*                      *                      8CF32960
      MDX      3 -8     COUNT TO 0, SKIP.       8CF32970
*                      *                      8CF32980
*                      *                      8CF32990
      NOP      SRA      ONE  PLACE 5 HI BITS IN ACC. 8CF33000
*                      *                      8CF33010
* COMPUTE ABSOLUTE ADDRESS OF CONVERTED CHARACTERS. 8CF33020
*                      *                      8CF33030
      A        MM050+1  ADD CONTENTS OF BASE    8CF33040
      A        MMC05   REGISTER AND DISPLACEMENT 8CF33050
      STO      MM030+1 STORE IN LOAD INSTRUCTION 8CF33060
MM030 LD      L *-*   LOAD1816/1053 CHARACTERS 8CF33070
      SLA      3 ZERO  SHIFT TO LEFT BYTE.     8CF33080
*                      *                      8CF33090
* IF THE RIGHT BYTE IS EXTRANEIOUS, IT IS NOT MASKED 8CF33100
*                      *                      8CF33110
MM050 LDX    L3 *-*   RESTORE XR3.              8CF33120
      B        I3 MM010-BASE RETURN.           8CF33130
*****                *****                8CF33140
*                      *                      8CF33150
* CONSTANTS AND WORK AREAS                       * 8CF33160
*****                *****                8CF33170
*                      *                      8CF33180
*                      *                      8CF33190
DISPLACEMENT OF TABLE
MMC05 DC      T1053-BASE T1053.                8CF33200
MMC10 DC      /00FF     MASK OFF LEFT BYTE.    8CF33210
T1053 EQU     *        1816/1053 CHARACTER TABLE 8CF33220
      DC      /FC21    1, SPACE                8CF33230
      DC      /DCD8    32                     8CF33240
      DC      /F4F0    54                     8CF33250
      DC      /D4D0    76                     8CF33260
      DC      /E0E4    98                     8CF33270
      DC      /C2C4    =0                     8CF33280
      DC      /E604    'a                     8CF33290
      DC      /8646    8CF33300
      DC      /BCDA    /+                     8CF33310
      DC      /9E9A    TS                      8CF33320
      DC      /B6B2    VU                      8CF33330

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CORE FUNCTION TEST

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078A 0 9692      DC      /9692      XW      8CF33340
078B 0 A2A6      DC      /A2A6      ZY      8CF33350
078C 0 8006      DC      /8006      ,%      8CF33360
078D 0 BEFE      DC      /BEFE      (      8CF33370
078E 0 E282      DC      /E282      '      8CF33380
078F 0 7E84      DC      /7E84      J-     8CF33390
0790 0 5E5A      DC      /5E5A      LK     8CF33400
0791 0 7672      DC      /7672      NM     8CF33410
0792 0 5652      DC      /5652      PD     8CF33420
0793 0 6266      DC      /6266      RQ     8CF33430
0794 0 40C0      DC      /40C0      $#     8CF33440
0795 0 42D6      DC      /42D6      .*     8CF33450
0796 0 F2D2      DC      /F2D2      .      8CF33460
0797 0 3E44      DC      /3E44      A&     8CF33470
0798 0 1E1A      DC      /1E1A      CB     8CF33480
0799 0 3632      DC      /3632      ED     8CF33490
079A 0 1612      DC      /1612      GF     8CF33500
079B 0 2226      DC      /2226      IH     8CF33510
079C 0 0021      DC      /0021      . , LOZ 8CF33520
079D 0 02F6      DC      /02F6      C)     8CF33530
*                      *                      8CF33540
*****                *****                8CF33550
*****                *****                8CF33560
*                      *                      8CF33570
* EXPLICIT RELOCATION ROUTINE                    * 8CF33580
*                      *                      8CF33590
*****                *****                8CF33600
*                      *                      8CF33610
* THIS SUBROUTINE WILL RELOCATE THE CORE FUNCTION * 8CF33620
* TEST TO THE HI 4K OF AN EXPLICITLY DEFINED BSM. * 8CF33630
*                      *                      8CF33640
* CALL -                                          * 8CF33650
*                      *                      8CF33660
*      BSC      L3 NA010-BASE                    * 8CF33670
*                      *                      8CF33680
* THE ACCUMULATOR CONTAINS THE BSM NUMBER      * 8CF33690
* TO BE RELOCATED TO - 1 TO 8.                 * 8CF33700
*                      *                      8CF33710
*      XR1 AND XR2 ARE NOT USED.                * 8CF33720
*                      *                      8CF33730
*      XR3 IS THE PSEUDO BASE REGISTER.        * 8CF33740
*****                *****                8CF33750
*                      *                      8CF33760
*                      *                      8CF33770
*                      *                      8CF33780
NA010 EQU     *                                8CF33790
      S        NAC02   OF BSM TO MOVE TO.      8CF33800
      SLA      13     MOVE TO HI HALF BYTE.    8CF33810
      OR       NAC04   ADD BIT 3.              8CF33820
      STO      NAC06   SAVE.                  8CF33830
      LD       3 ONE   GET BSM ADDRESS OF      8CF33840
      AND      NAC08   MODULE THAT PROGRAM IS IN. 8CF33850
      EOR      NAC06   COMPARE TO ONE WANTED.  8CF33860
      SKP      +-     SKIP NOT EQUAL.          8CF33870
      B        NA020   BRANCH IF PROGRAM IS HERE. 8CF33880
      LD       NAC06   LOAD BITS 0-3 OF ADDRESS. 8CF33890
      BSI      NA100   EXECUTE MOVE ROUTINE.    8CF33900
NA020 EQU     *                                8CF33910
      LD       NAC06   GENERATE ENTRY ADDRESS.  8CF33920
      A        NAC12   8CF33930
      STO      NA030+1 8CF33940
NA030 BSI    L *-*   BRANCH TO RELOCATED RTN.  8CF33950
      DC      AA100-BASE RE-ENTRY ADDRESS.    8CF33960
*****                *****                8CF33970
*                      *                      8CF33980
* CORE RELOCATE ROUTINE                        * 8CF33990
*****                *****                8CF34000
*                      *                      8CF34010

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CORE FUNCTION TEST

CORE FUNCTION TEST

```

* THIS SUBROUTINE MOVES THE FUNCTION TEST TO THE * 8CF34020
* INDICATED 4K BLOCK. * 8CF34030
* * 8CF34040
* CALL - * 8CF34050
* * 8CF34060
* BSI L3 NA100-BASE * 8CF34070
* * 8CF34080
* THE ACCUMULATOR CONTAINS BITS 0-3 OF THE * 8CF34090
* *TO* ADDRESS. * 8CF34100
* * 8CF34110
* XR1 IS SAVED AND RESTORED. * 8CF34120
* * 8CF34130
* XR2 IS NOT USED. * 8CF34140
* * 8CF34150
* XR3 IS THE PSEUDO BASE REGISTER. * 8CF34160
* * 8CF34170
***** 8CF34180
NA100 DC *-- * 8CF34190
OR NAC10 GENERATE FULL ADDRESS. 8CF34200
STO NA120+1 INITIALIZE STORE INSTR. 8CF34210
STX 1 NA130+1 SAVE XR1. 8CF34220
LDX L1 NAC14 NUMBER OF WORDS TO MOVE. 8CF34230
LD 3 ONE GET BASE AND DETERMINE 8CF34240
AND NAC08 BASE ADDRESS FOR 8CF34250
OR NAC10 MOVE. 8CF34260
STO NA110+1 INITIALIZE STORE INSTR. 8CF34270
NA110 LDD L1 *-- RELOCATE CORE TEST 8CF34280
NA120 STD L1 *-- ROUTINE. 8CF34290
MDX 1 TWO INCREMENT INDEX REGISTER. 8CF34300
B NA110 CONTINUE MOVE. 8CF34310
NA130 LDX L1 *-- RESTORE XR1. 8CF34320
B I3 NA100-BASE RETURN. 8CF34330
* 8CF34340
***** 8CF34350
CONSTANTS AND WORK AREAS * 8CF34360
* 8CF34370
* 8CF34380
* 8CF34390
***** 8CF34400
NAC02 DC 1 INCREMENT. 8CF34410
NAC04 DC /1000 BIT 3, 4K. 8CF34420
NAC06 BSS 1 TEMPORARY STORAGE. 8CF34430
NAC08 DC /F000 MASK TO LEAVE HI 4 BITS. 8CF34440
NAC10 DC /OFFE HI ADDRESS FOR MOVE. 8CF34450
* 8CF34460
DISPLACEMENT FOR 8CF34470
NAC12 DC AA080-AA000 ENTRY ADDRESS OF AA080. 8CF34480
NAC14 EQU -4078 WORD COUNT FOR MOVE RTN. 8CF34490
* 8CF34500
***** 8CF34510
OSCILLATE RELOCATION ROUTINE * 8CF34520
* 8CF34530
* 8CF34540
* 8CF34550
***** 8CF34560
* 8CF34570
* THIS SUBROUTINE RELOCATES THE CORE FUNCTION * 8CF34580
* PROGRAM WITHIN A BSM. IF THE PROGRAM IS IN THE * 8CF34590
* HI 4K, IT IS MOVED TO THE LOW 4K. IF IT IS IN * 8CF34600
* THE LOW 4K, IT IS MOVED TO THE HI 4K. * 8CF34610
* * 8CF34620
* CALL - * 8CF34630
* * 8CF34640
* BSI L3 NB010-BASE * 8CF34650
* * 8CF34660
* XR1 AND XR2 ARE NOT USED. * 8CF34670
* * 8CF34680
* XR3 IS THE PSEUDO BASE REGISTER. * 8CF34690

```

```

07AF 0 0000
07B0 0 E816
07B1 0 D00A
07B2 0 690D
07B3 0 6500 F012
07B5 0 C301
07B6 0 E00F
07B7 0 E80F
07B8 0 D001
07B9 0 CD00 0000
07BB 0 DD00 0000
07BD 0 7102
07BE 0 70FA
07BF 0 6500 0000
07C1 0 4F80 074D
07C3 0 0001
07C4 0 1000
07C5 0001
07C6 0 F000
07C7 0 OFFE
07C8 0 0077
F012 0

```

```

07C9 0 0000
07CA 0 C301
07CB 0 E0FA
07CC 0 F0F7
07CD 0 D0F7
07CE 0 40E0
07CF 0 C0F5
07D0 0 4F80 0767

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```

07D2 0 0000
07D3 0 C301
07D4 0 180D
07D5 0 80ED
07D6 0 100D
07D7 0 E8EC
07D8 0 D0EC
07D9 0 40D5
07DA 0 C0EA
07DB 0 4F80 0770

```

```

* 8CF34700
* UPON EXIT, THE ACCUMULATOR HAS BITS 0-3 OF * 8CF34710
* THE NEW PROGRAM ADDRESS. * 8CF34720
* * 8CF34730
***** 8CF34740
NB010 DC *-- ENTRY. 8CF34750
LD 3 ONE CHANGE ADDRESS 8CF34760
AND NAC08 BIT 3. 8CF34770
EOR NAC04 FOR REGULAR BSM. 8CF34780
STO NAC06 SAVE 8CF34790
BSI NA100 EXECUTE MOVE ROUTINE. 8CF34800
LD NAC06 RETURN WITH BITS 0-3 OF 8CF34810
B I3 NB010-BASE NEW ADDRESS IN ACC. 8CF34820
***** 8CF34830
MOVE TO NEXT BSM RELOCATION ROUTINE * 8CF34840
* 8CF34850
* 8CF34860
* 8CF34870
***** 8CF34880
THIS SUBROUTINE RELOCATES THE CORE FUNCTION * 8CF34890
PROGRAM TO THE HIGH 4K OF THE NEXT BSM. * 8CF34900
* 8CF34910
* 8CF34920
* CALL - * 8CF34930
* * 8CF34940
* BSI L3 NC010-BASE * 8CF34950
* * 8CF34960
* XR1 AND XR2 ARE NOT USED. * 8CF34970
* * 8CF34980
* XR3 IS THE PSEUDO BASE REGISTER. * 8CF34990
* * 8CF35000
* UPON EXIT, THE ACCUMULATOR HAS BITS 0-3 OF * 8CF35010
* THE NEW PROGRAM ADDRESS. * 8CF35020
* * 8CF35030
***** 8CF35040
NC010 DC *-- ENTRY. 8CF35050
LD 3 ONE GET BASE ADDRESS OF CFT. 8CF35060
SRA 13 ADDRESS BITS 0-2 ONLY IN 8CF35070
A NAC02 ACCUMULATOR. INCREMENT 8CF35080
SLA 13 RESTORE TO 0-2. 8CF35090
OR NAC04 ADD BIT 3. 8CF35100
STO NAC06 SAVE 8CF35110
BSI NA100 EXECUTE MOVE. 8CF35120
LD NAC06 RETURN WITH BITS 0-4 OF 8CF35130
B I3 NC010-BASE NEW ADDRESS IN ACC. 8CF35140
***** 8CF35150
MOVE ANYWHERE RELOCATION ROUTINE * 8CF35160
* 8CF35170
* 8CF35180
* 8CF35190
***** 8CF35200
THIS SUBROUTINE RELOCATES THE CORE FUNCTION * 8CF35210
PROGRAM DEPENDING ON SEVERAL FACTORS. IF THE * 8CF35220
PROGRAM IS IN THE HI 4K OF A BSM, IT WILL BE * 8CF35230
RELOCATED TO THE LOW 4K. IF IT IS ALREADY IN * 8CF35240
THE LOW 4K, IT WILL BE RELOCATED TO ANOTHER BSM. * 8CF35250
* 8CF35260
* 8CF35270
* CALL - * 8CF35280
* * 8CF35290
* BSI L3 ND010-BASE * 8CF35300
* * 8CF35310
* XR1 AND XR2 ARE NOT USED. * 8CF35320
* * 8CF35330
* XR3 IS THE PSEUDO BASE REGISTER. * 8CF35340
* * 8CF35350
* UPON EXIT THE ACCUMULATOR HAS BITS 0-3 OF * 8CF35360
* THE NEW PROGRAM ADDRESS. * 8CF35370

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CORE FUNCTION TEST

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* 8CF35380
***** 8CF35390
* 8CF35400
ND010 DC *-* ENTRY. 8CF35410
LD 3 ONE IS PROGRAM IN HIGH 4K. 8CF35420
SLA THREE TEST BIT 3. 8CF35430
SKP - SKIP IF IN HIGH 4K. 8CF35440
B ND020 BRANCH TO RELOCATE. 8CF35450
BSI NB010 OSCILLATE. 8CF35460
ND015 EQU * 8CF35470
B 13 ND010-BASE RETURN. 8CF35480
ND020 EQU * MUST MOVE TO ANOTHER BSM. 8CF35490
LD 3 ONE TEST IF IN LAST BSM. 8CF35500
SRA 13 DETERMINE RESIDENT BSM. 8CF35510
A NAC02 INCREMENT. 8CF35520
S 3 AAC04-BASE COMPARE TO HIGHEST BSM 8CF35530
SKP - SKIP IF NOT IN LAST BSM. 8CF35540
B ND030 BRANCH, MOVE TO FIRST BSM. 8CF35550
BSI NC010 MOVE TO NEXT BSM. 8CF35560
B ND015 RETURN. 8CF35570
ND030 EQU * 8CF35580
LD NAC04 LOAD BASE ADDRESS FOR 8K. 8CF35590
STO NAC06 SAVE. 8CF35600
BSI NA100 EXECUTE MOVE ROUTINE. 8CF35610
LD NAC06 RETURN WITH BITS 0-4 OF 8CF35620
B ND015 NEW ADDRESS IN ACC. 8CF35630
***** 8CF35640
* 8CF35650
* THIS SUBROUTINE DETERMINES WHERE TO RELOCATE 8CF35660
* THE CORE FUNCTION TEST. 8CF35670
* 8CF35680
* CALL - 8CF35690
* 8CF35700
* BSI L3 NE010-BASE 8CF35710
* DC XXXXX-BASE OSCILLATE RE-ENTRY 8CF35720
* ADDRESS PARAMETER. 8CF35730
* DC XXXXX-BASE TEST COMPLETE RE-ENTRY 8CF35740
* ADDRESS PARAMETER. 8CF35750
* 8CF35760
* XR1 AND XR2 ARE NOT USED. 8CF35770
* 8CF35780
* XR3 IS THE PSEUDO BASE REGISTER. 8CF35790
* 8CF35800
* 4/9/69 8CF35810
* 8CF35820
***** 8CF35830
* 8CF35840
NE010 DC *-* ENTRY. 8CF35850
SLT TWO RESTORE HIGH/LOW FLAGS. 8CF35860
SKP E SKIP IF IN LOW HALF OF BSM 8CF35870
B NE020 OSCILLATE IF IN HIGH HALF. 8CF35880
SRA ONE TEST IF IN LAST BSM TOO. 8CF35890
SKP E SKIP IF NOT LAST. 8CF35900
B NE100 BRANCH LOW, LAST. 8CF35910
8CF35920
* 8CF35930
* FULL, NORMAL TEST. 8CF35940
* MOVE CORE TEST TO NEXT BSM. 8CF35950
* 8CF35960
BSI NC010 MOVE TO NEXT BSM. 8CF35970
B NE030 GO TO RE-ENTER ROUTINE. 8CF35980
8CF35990
* OSCILLATE INTERFACE. 8CF36000
* 8CF36010
NE020 EQU * 8CF36020
BSI NB010 OSCILLATE. 8CF36030
NE030 EQU * 8CF36040
A NEC02 COMPUTE RE-ENTRY ADDRESS 8CF36050
STO NE040+1 AND PUT IN BRANCH OPERAND.
07DD 0 0000
07DE 0 C301
07DF 0 1003
07E0 0 4810
07E1 0 7003
07E2 0 40E6
07E3 0
07E3 0 4F80 077B
07E5 0
07E5 0 C301
07E6 0 180D
07E7 0 80DB
07E8 0 93F8
07E9 0 4810
07EA 0 7002
07EB 0 40E6
07EC 0 70F6
07ED 0
07ED 0 COD6
07EE 0 D0D6
07EF 0 40BF
07F0 0 COD4
07F1 0 70F1
07F2 0 0000
07F3 0 1082
07F4 0 4804
07F5 0 7005
07F6 0 1801
07F7 0 4804
07F8 0 700B
07F9 0 40D8
07FA 0 7001
07FB 0
07FB 0 40CD
07FC 0
07FC 0 801E
07FD 0 D004

```

CORE FUNCTION TEST

```

07FE 0 C780 0790 LD 13 NE010-BASE GET RE-ENTRY ADDRESS AND 8CF36060
0800 0 D002 STO NE050 STORE IN CALL. 8CF36070
0801 0 4400 0000 NE040 BSI L *-* BRANCH TO RE-ENTRY ADDRESS 8CF36080
0803 0 0000 NE050 DC *-* 8CF36090
* 8CF36100
* PATTERN TEST COMPLETE. 8CF36110
* 8CF36120
NE100 EQU * 8CF36130
LD NE010 GET SECOND PARAMETER AS 8CF36140
A NEC04 RETURN ADDRESS. 8CF36150
STO NE010 8CF36160
NE110 EQU * 8CF36170
BSI ND010 MOVE TO LOWEST BSM. 8CF36180
B NE030 BRANCH TO RE-ENTER. 8CF36190
8CF36200
* OSCILLATE ONLY. 8CF36210
* 8CF36220
NE200 DC *-* 8CF36230
LD NE200 MAKE IT APPEAR AS NORMAL 8CF36240
STO NE010 ENTRY. 8CF36250
B NE020 OSCILLATE. 8CF36260
8CF36270
* LOOP ON PATTERN TEST ENTRY. 8CF36280
* 8CF36290
NE300 DC *-* 8CF36300
LD NE300 MAKE IT APPEAR AS NORMAL 8CF36310
STO NE010 ENTRY. 8CF36320
B NE110 MOVE ANYWHERE. 8CF36330
8CF36340
* EXPLICIT BSM TEST ENTRY. 8CF36350
* 8CF36360
NE400 DC *-* 8CF36370
LD NE400 MAKE IT APPEAR AS 8CF36380
STO NE010 NORMAL ENTRY. 8CF36390
SLT TWO RESTORE HIGH/LOW FLAGS. 8CF36400
SKP E SKIP IF IN LOW HALF. 8CF36410
B NE020 OSCILLATE. 8CF36420
LD NE010 GET SECOND PARAMETER 8CF36430
A NEC04 AS RETURN ADDRESS. 8CF36440
STO NE010 8CF36450
B NE020 OSCILLATE. 8CF36460
***** 8CF36470
* 8CF36480
* CONSTANTS AND WORK AREAS 8CF36490
* 8CF36500
***** 8CF36510
* 8CF36520
NE020 DC AA080-AA000 ENTRY ADDRESS OF AA080. 8CF36530
NE040 DC 1 ONE, INCREMENT. 8CF36540
* 8CF36550
***** 8CF36560
***** 8CF36570
* 8CF36580
* BIT FAILURE TALLEY SUBROUTINE 8CF36590
* 8CF36600
***** 8CF36610
* 8CF36620
* CALL - 8CF36630
* 8CF36640
* BSI L3 PQ010-BASE 8CF36650
* 8CF36660
* THE KNOWN TEST PATTERN IS AT SUC88 IN THE 8CF36670
* LINE BUFFER. THE FAILURE PATTERN IS IN 8CF36680
* SUC90 IN THE LINE BUFFER. 8CF36690
* 8CF36700
* XR1 IS SAVED AND RESTORED. 8CF36710
* 8CF36720
* XR2 IS SAVED AND RESTORED. 8CF36730
0804 0
0804 0 C0ED
0805 0 8016
0806 0 D0EB
0807 0
0807 0 40D5
0808 0 70F3
0809 0 0000
080A 0 C0FE
080B 0 D0E6
080C 0 70EE
080D 0 0000
080E 0 C0FE
080F 0 D0E2
0810 0 70F6
0811 0 0000
0812 0 C0FE
0813 0 D0DE
0814 0 1082
0815 0 4804
0816 0 70E4
0817 0 CODA
0818 0 8003
0819 0 D0D8
081A 0 70E0
081B 0 0077
081C 0 0001

```

CORE FUNCTION TEST

CORE FUNCTION TEST

```

*
* XR3 IS THE PSEUDO BASE REGISTER.
*
*
* 3/11/69
*
*****
081D 0 0000
PQ010 DC *-* ENTRY.
* DETERMINE BASE ADDRESS OF TABLE TO UPDATE.
*
081E 0 0F00 0026 X10 L3 AAC50-BASE CHECK FOR EXTERNAL BSM.
0820 0 1807 SRA SEVEN
0821 0 4804 SKP E SKIP IF INTERNAL.
0822 0 7003 B PQ020 BRANCH IF EXTERNAL.
0823 0 C301 LD 3 ONE
0824 0 180D SRA 13
0825 0 7002 B PQ030
0826 0
PQ020 EQU *
0826 0 C3F9 LD 3 AAC10-BASE USE EXTERNAL BSM ID.
0827 0 9052 S PQC02
0828 0
PQ030 EQU *
0828 0 A052 M PQC04 COMPUTE ADDRESS OF FIRST
0829 0 18D0 RTE 16 WORD OF STORAGE TABLE
082A 0 8051 A PQC06 AND SAVE AS INDIRECT
082B 0 8301 A 3 ONE ADDRESS.
082C 0 D050 STO PQC08
*
* INDIRECT ADDRESS IS POINTING TO DROP BIT 0.
*
082D 0 C050 LD PQC10 COMPUTE ABSOLUTE ADDRESS
082E 0 8301 A 3 ONE OF TEST PATTERN AND
082F 0 D010 STO PQ070+1 INITIALIZE OPERAND.
0830 0 C04E LD PQC12 COMPUTE ABSOLUTE ADDRESS
0831 0 8301 A 3 ONE OF FAILURE PATTERN AND
0832 0 D008 STO PQ060+1 INITIALIZE OPERAND.
0833 0 6938 STX 1 PQ120+1 SAVE XR1.
0834 0 6A3C STX 2 PQ130+1 SAVE XR2.
0835 0 61F5 LDX 1 -11 USE XR1 AS A COUNTER.
0836 0 6288 LDX 2 -120 XR2 POINTS TO LEFT BYTE.
0837 0 2000 LDS 0 SET OVERFLOW STATUS OFF.
0838 0
PQ050 EQU *
0838 0 C049 LD PQC18 INITIALIZE
0839 0 D047 STO PQC16 COUNTER.
083A 0 C500 0000 PQ060 L1 *-* LOAD BIT EQUIVALENT
083C 0 1A00 SRA 2 ZERO OF FAILURE PATTERN.
083D 0 E045 AND PQC20 MASK POSSIBLE LEFT BYTE.
083E 0 D045 STO PQC22 SAVE.
083F 0 C500 0000 PQ070 LD L1 *-* LOAD BIT EQUIVALENT
0841 0 1A00 SRA 2 ZERO OF TEST PATTERN.
0842 0 E040 AND PQC20 MASK POSSIBLE LEFT BYTE.
0843 0 9040 S PQC22 COMPARE.
0844 0 4818 SKP +- SKIP IF PICK OR DROP.
0845 0 7017 B PQ090 BRANCH NO PROBLEM.
0846 0 4808 SKP + SKIP IF PICK.
0847 0 700E B PQ080 BRANCH DROP.
0848 0 C034 LD PQC08 INCREMENT INDIRECT ADDRESS
0849 0 8030 A PQC02 TO PICK STORAGE.
084A 0 D032 STO PQC08
084B 0 C780 081B LD 13 PQC08-BASE INCREMENT PICK COUNTER.
084D 0 802C A PQC02
084E 0 4801 SKP 0 SKIP NO OVERFLOW.
084F 0 7024 B PQ140 BRANCH ON OVERFLOW.
0850 0 D780 081B STO 13 PQC08-BASE UPDATE COUNTER.
0852 0 C02A LD PQC08 INCREMENT INDIRECT
0853 0 8026 A PQC02 ADDRESS TO NEXT ENTRY.
0854 0 D028 STO PQC08
0855 0 700A B PQ100 BRANCH TO CONTINUE.

```

```

0856 0
0856 0 C780 081B
0858 0 8021
0859 0 4801
085A 0 7019
085B 0 D780 081B
085D 0
085D 0 C01F
085E 0 8021
085F 0 D01D
0860 0
0860 0 C020
0861 0 9018
0862 0 4808
0863 0 7008
0864 0 D01C
0865 0 7200
0866 0 7278
0867 0 7288
0868 0 7001
0869 0 7101
086A 0 70CF
086B 0 7002
086C 0
086C 0 7101
086D 0 70CA
086E 0 6500 0000
0870 0 6600 0000
0872 0 4F80 07BB
0874 0
0874 0 C0FC
0875 0 D001
0876 0 6600 0000
0878 0 4F00 039F
087A 0 0001
087B 0 0024
087C 0 0C6C
087D 0001
087E 0 0B91
087F 0 0B9D
0880 0 0002
0881 0001
0882 0 0004
0883 0 00FF
0884 0001

```

```

PQ080 EQU * DROP.
LD 13 PQC08-BASE INCREMENT DROP COUNTER.
A PQC02
SKP 0 SKIP NO OVERFLOW.
B PQ140 BRANCH ON OVERFLOW.
STO 13 PQC08-BASE UPDATE COUNTER.
PQ090 EQU *
LD PQC08 INCREMENT INDIRECT ADDRESS
A PQC14 BY TWO.
STO PQC08
*
* DONE UPDATING AN ENTRY.
*
PQ100 EQU *
LD PQC16 DECREMENT LOOP COUNTER.
S PQC02
SKP + SKIP NOT ZERO TO CONTINUE.
B PQ110 BRANCH IF ZERO.
STO PQC16 UPDATE COUNTER.
MDX 2 ZERO IF RIGHT BYTE SKIP.
MDX 2 120 MAKE RIGHT BYTE AND SKIP.
MDX 2 -120 MAKE LEFT BYTE AND SKIP.
MDX +-1 SKIP.
MDX 1 ONE UPDATE WORD POINTER.
B PQ060 LOOP.
B PQ120 BRANCH OUT WHEN DONE.
*
* LOOP COUNTER ZERO.
*
PQ110 EQU *
MDX 1 ONE DECREMENT WORD POINTER.
B PQ050 BRANCH NOT DONE.
*
* SUBROUTINE DONE.
*
PQ120 LDX L1 *-* RESTORE XR1.
PQ130 LDX L2 *-* RESTORE XR2.
B 13 PQ010-BASE RETURN.
PQ140 EQU *
LD PQ130+1 RESTORE XR2.
STO PQ150+1
PQ150 LDX L2 *-*
B L3 HZ500-BASE OVERFLOW EXIT.
*****
*
* CONSTANTS AND WORK AREAS
*
*****
PQC02 DC 1 ONE.
PQC04 DC 36 NO. WORDS IN EACH TABLE.
*
PQC06 DC PXC20-BASE BIT FAIL. STORAGE TABLE.
PQC08 BSS 1 INDIRECT ADDRESS.
*
PQC10 DC SUC88+11-BASE TEST PATTERN.
*
PQC12 DC SUC90+11-BASE FAILURE PATTERN.
PQC14 DC 2 TWO.
PQC16 BSS 1 COUNTER.
PQC18 DC 4 FOUR.
PQC20 DC /O0FF MASK TO LEAVE RIGHT BYTE.
PQC22 BSS 1 STORAGE AREA.
*
*****
*
* FAILURES BY ADDRESS LINE TALLEY SUBROUTINE
*

```


CORE FUNCTION TEST

CORE FUNCTION TEST

```

*
*****
* THIS SUBROUTINE TALLEYS THE FAILURES BY ADDRESS *
* LINE. TOTALS ARE KEPT IN MATRIX PKX30. IT ALSO *
* TALLEYS FAILURES BY SENSE/INHIBIT BLOCK IN *
* MATRIX PKX40.
*
* CALL -
*   BSI L3 PRO10-BASE
*
*   XR1 CONTAINS THE FAILURE ADDRESS.
*
*   XR2 IS NOT USED.
*
*   XR3 IS THE PSEUDO BASE REGISTER.
*****
*
PR010 DC *--* ENTRY.
STX 1 PR040+1 SAVE XR1 AND ADDRESS.
XIO L3 AAC50-BASE CHECK FOR EXTERNAL BSM.
SRA SEVEN
SKP E SKIP IF INTERNAL TEST.
B PR014 BRANCH EXTERNAL.
LD 3 ONE LOAD INTERNAL ID.
SRA 13
B PR016
PR014 EQU *
LD 3 AAC10-BASE USE EXTERNAL BSM ID.
S PRC06
PR016 EQU *
STO PRC18 SAVE FOR S/I UPDATE.
M PRC08 LINE FAILURE STORAGE
RTE 16 TABLE AND SAVE AS
A PRC10 BASIC INDIRECT ADDRESS.
A 3 ONE
STO PRC04
LDS 0 RESET OVERFLOW STATUS.
LDX 1 THREE USE XR1 AS A COUNTER.
LD PR040+1 LOAD ADDRESS PATTERN AND
SRT 13 PUT BITS 3-15 IN Q.
PR020 EQU *
SRA 16 CLEAR ACC. FOR ADDR. GEN.
SLT THREE COMPUTE ADDRESS AND
A PRC04 STORE IN INDIRECT
STO PRC12 ADDRESS PRC12.
LD 13 PRC12-BASE INCREMENT HI X, LO X AND
A PRC06 HI Y STORAGE.
SKP 0 SKIP NO OVERFLOW.
B PR060 BRANCH IF COUNTER FULL.
STO 13 PRC12-BASE
LD PRC04 UPDATE BASE
A PRC14 INDIRECT
STO PRC04 ADDRESS.
MDX 1 -1 DECREMENT COUNTER.
B PR020 LOOP.
SRA 16
SLT FOUR
A PRC04
STO PRC12
LD 13 PRC12-BASE
A PRC06
SKP 0 SKIP NO OVERFLOW.
B PR060 BRANCH IF COUNTER FULL.
STO 13 PRC12-BASE
*
* UPDATE SENSE/INHIBIT FAILURE STORAGE.

```

```

0885 0 0000
0886 0 6940
0887 0 0F00 0026
0889 0 1807
088A 0 4804
088B 0 7003
088C 0 C301
088D 0 180D
088E 0 7002
088F 0
088F 0 C3F9
0890 0 9040
0891 0
0891 0 D045
0892 0 A03F
0893 0 18D0
0894 0 803E
0895 0 8301
0896 0 D039
0897 0 2000
0898 0 6103
0899 0 C02D
089A 0 188D
089B 0
089B 0 1810
089C 0 1083
089D 0 8032
089E 0 D035
089F 0 C780 0872
08A1 0 802F
08A2 0 4801
08A3 0 702A
08A4 0 D780 0872
08A6 0 C029
08A7 0 802D
08A8 0 D027
08A9 0 71FF
08AA 0 70F0
08AB 0 1810
08AC 0 1084
08AD 0 8022
08AE 0 D025
08AF 0 C780 0872
08B1 0 801F
08B2 0 4801
08B3 0 701A
08B4 0 D780 0872

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```

08B6 0 C020
08B7 0 1001
08B8 0 801D
08B9 0 8301
08BA 0 D015
08BB 0 C00B
08BC 0 180C
08BD 0 4804
08BE 0 700B
08BF 0
08BF 0 C780 086E
08C1 0 800F
08C2 0 4801
08C3 0 700A
08C4 0 D780 086E
08C6 0 6500 0000
08C8 0 4F80 0823
08CA 0
08CA 0 C005
08CB 0 8005
08CC 0 D003
08CD 0 70F1
08CE 0
08CE 0 4F00 039F

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```

08D0 0001
08D1 0 0001
08D2 0 0028
08D3 0 0D8C
08D4 0001
08D5 0 0008
08D6 0 0ECC
08D7 0001

```

08D8 0 0000

```

*
LD PRC18 LOAD STORAGE AREA ID.
SLA ONE FAILURE STORAGE FOR THIS
A PRC16 PATTERN TEST.
A 3 ONE
STO PRC04
LD PR040+1 TEST FAILURE ADDRESS FOR
SRA 12 HI OR LO 4K.
SKP E SKIP IF LOW 4K.
B PR050 BRANCH IF HIGH 4K.
PR030 EQU *
LD 13 PRC04-BASE INCREMENT ENTRY
A PRC06 IN TABLE.
SKP 0 SKIP NO OVERFLOW.
B PR060 BRANCH IF COUNTER FULL.
STO 13 PRC04-BASE
PR040 LDX L1 *-* RESTORE XR1
B 13 PR010-BASE AND RETURN.
PR050 EQU *
LD PRC04 INCREMENT INDIRECT
A PRC06 ADDRESS.
STO PRC04
B PR030 BRANCH TO CONTINUE UPDATE.
PR060 EQU *
B L3 HZ500-BASE BRANCH TO OVERFLOW SUBR.
*****
* CONSTANTS AND WORK AREAS
*****
PRC04 BSS 1 WORK AREA.
PRC06 DC 1 ONE.
PRC08 DC 40 FORTY.
*
PRC10 DC PKX30-BASE RELATIVE ADDRESS OF
STORAGE TABLE.
PRC12 BSS 1 INDIRECT ADDRESS.
PRC14 DC 8 EIGHT
*
PRC16 DC PKX40-BASE RELATIVE ADDRESS OF
STORAGE TABLE PKX40.
PRC18 BSS 1 TEMPORARY STORAGE.
*
*****
*****
* LOOP AND TEST FAILURE COUNTER UPDATE SUBROUTINE *
*
* THIS SUBROUTINE TALLEYS LOOPS OF A ROUTINE OR *
* FAILURES BY ROUTINE.
*
* CALL -
*
*   BSI L3 PS010-BASE
*
*   THE ACCUMULATOR CONTAINS THE RELATIVE BASE *
*   ADDRESS OF THE AREA TO UPDATE MINUS ONE.
*
*   XR1 IS NOT USED.
*
*   XR2 CONTAINS THE TEST PATTERN NUMBER.
*
*   XR3 IS THE PSEUDO BASE REGISTER.
*****
PS010 DC *-* ENTRY.

```

```

8CF38780
8CF38790
8CF38800
8CF38810
8CF38820
8CF38830
8CF38840
8CF38850
8CF38860
8CF38870
8CF38880
8CF38890
8CF38900
8CF38910
8CF38920
8CF38930
8CF38940
8CF38950
8CF38960
8CF38970
8CF38980
8CF38990
8CF39000
8CF39010
8CF39020
8CF39030
8CF39040
8CF39050
8CF39060
8CF39070
8CF39080
8CF39090
8CF39100
8CF39110
8CF39120
8CF39130
8CF39140
8CF39150
8CF39160
8CF39170
8CF39180
8CF39190
8CF39200
8CF39210
8CF39220
8CF39230
8CF39240
8CF39250
8CF39260
8CF39270
8CF39280
8CF39290
8CF39300
8CF39310
8CF39320
8CF39330
8CF39340
8CF39350
8CF39360
8CF39370
8CF39380
8CF39390
8CF39400
8CF39410
8CF39420
8CF39430
8CF39440
8CF39450

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CORE FUNCTION TEST

```

08D9 0 D0FD      STO      PRC18      SAVE TABLE BASE ADDRESS.  8CF39460
08DA 0 2000      LDS      0          RESET OVERFLOW STATUS.    8CF39470
08DB 0 0F00 0026 XIO     L3 AAC50-BASE CHECK FOR EXTERNAL TEST. 8CF39480
08DD 0 1807      SRA      SEVEN      8CF39490
08DE 0 4804      SKP      E          SKIP IF OFF.          8CF39500
08DF 0 7003      B        PS014     BRANCH IF ON.            8CF39510
08E0 0 C301      LD       3 ONE     TALLEY FOR THIS BSM.    8CF39520
08E1 0 180D      SRA      13       8CF39530
08E2 0 7002      B        PS016     BRANCH TO CONTINUE. 8CF39540
08E3 0          PS014 EQU *          8CF39550
08E3 0 C3F9      LD       3 AAC10-BASE TALLEY FOR EXTERNAL 8CF39560
08E4 0 90EC      S        PRC06     BSM.                    8CF39570
08E5 0          PS016 EQU *          8CF39580
08E5 0 A020      M        PSC06     COMPUTE ABSOLUTE BASE 8CF39590
08E6 0 18D0      RTE      16       ADDRESS OF TABLE TO 8CF39600
08E7 0 80EF      A        PRC18     UPDATE.                 8CF39610
08E8 0 8301      A        3 ONE     8CF39620
08E9 0 D002      STO     PS020+1   STORE IN INSTRUCTION 8CF39630
08EA 0 D006      STO     PS030+1   OPERANDS.              8CF39640
08EB 0 C600 0000 PS020 LD  L2 *-*   INCREMENT TABLE     8CF39650
08ED 0 80E3      A        PRC06     ENTRY.                    8CF39660
08EE 0 4801      SKP      0        SKIP NO OVERFLOW.     8CF39670
08EF 0 700C      B        PS050     BRANCH IF COUNTER FULL. 8CF39680
08F0 0 D600 0000 PS030 STO L2 *-*   8CF39690
08F2 0 C0E4      LD       PRC18     IF THIS IS A LOOP     8CF39700
08F3 0 F01F      EOR     PSC14     COUNTER UPDATE, CHECK 8CF39710
08F4 0 4820      SKP     Z         FOR PASS COMPLETE   8CF39720
08F5 0 7004      B        PS040     MESSAGE.              8CF39730
08F6 0 0B26      XIO     3 AAC50-BASE SEND PASS COMPLETE 8CF39740
08F7 0 1805      SRA     FIVE     MESSAGE IF LOOP ON    8CF39750
08F8 0 4804      SKP     E        ROUTINE SWITCH IS    8CF39760
08F9 0 7004      B        PS060     ON.                    8CF39770
08FA 0          PS040 EQU *          8CF39780
08FA 0 4F80 0876 B       I3 PS010-BASE RETURN.          8CF39790
08FC 0          PS050 EQU *          8CF39800
08FC 0 4F00 039F B       L3 HZ500-BASE BRANCH TO OVERFLOW SUBR. 8CF39810
08FE 0          PS060 EQU *          8CF39820
08FE 0 6A0A      STX     2 PSC12     PUT ROUTINE ID. IN PASS 8CF39830
08FF 0 C009      LD       PSC12     COMPLETE MESSAGE.    8CF39840
0900 0 E806      OR      PSC08     8CF39850
0901 0 D007      STO     PSC12     8CF39860
0902 0 4700 0691 BSI    L3 MA010-BASE WRITE MESSAGE.    8CF39870
0904 0 08A6      DC      PSC10-BASE 8CF39880
0905 0 70F4      B        PS040     EXIT.                8CF39890
*          *          8CF39900
***** 8CF39910
*          *          8CF39920
*          *          8CF39930
* CONSTANTS AND WORK AREAS *          8CF39940
***** 8CF39950
*          *          8CF39960
*          *          8CF39970
*          *          8CF39980
*          *          8CF39990
* THE FOLLOWING CONSTANT REFLECTS THE NUMBER OF 8CF40000
* WORDS IN EACH TABLE OF PKX50 AND PKX60 AND WILL 8CF40010
* HAVE TO BE CHANGED IF THE SIZE OF THE TABLES ARE 8CF40020
* CHANGED. 8CF40030
0906 0 0009      PSC06 DC 9        NO. WORDS IN EACH TABLE. 8CF40040
0907 0 0A00      PSC08 DC /0A00    MASK FOR ERROR MESSAGE. 8CF40050
0908 0 000A      PSC10 DC 10       WORD COUNT.           8CF40060
0909 0 0000      PSC12 DC /0000    OX                    8CF40070
090A 0 0A08      DC      /0A08     08                    8CF40080
090B 0 0000      DC      /0000     8CF40090
090C 0 2731      DC      /2731     PA                    8CF40100
090D 0 1212      DC      /1212     SS                    8CF40110
090E 0 0033      DC      /0033     C                     8CF40120
090F 0 2624      DC      /2624     OM                    8CF40130
0910 0 2723      DC      /2723     PL

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CORE FUNCTION TEST

```

0911 0 3513      DC      /3513     ET          8CF40140
0912 0 3500      DC      /3500     E          8CF40150
0913 0 0F24      PSC14 DC PKK60-BASE LOOP COUNTER. 8CF40160
*          *          8CF40170
***** 8CF40180
***** 8CF40190
*          *          8CF40200
*          *          8CF40210
*          *          8CF40220
*          *          8CF40230
*          *          8CF40240
*          *          8CF40250
*          *          8CF40260
*          *          8CF40270
*          *          8CF40280
*          *          8CF40290
*          *          8CF40300
*          *          8CF40310
*          *          8CF40320
*          *          8CF40330
*          *          8CF40340
*          *          8CF40350
*          *          8CF40360
*          *          8CF40370
***** 8CF40380
*          *          8CF40390
PT010 DC *-*     ENTRY.          8CF40400
LD     L3 PKK04-BASE COMPUTE NUMBER OF 8CF40410
SLA    THREE     WORDS TO ZERO AND 8CF40420
STO    PT020+1   REGISTER TWO.    8CF40430
PT020 LDX L2 *-* 8CF40440
LD     L3 PKK06-BASE COMPUTE ABSOLUTE BASE 8CF40450
A      3 ONE     ADDRESS AND STORE IN 8CF40460
STO    PT030+1   INSTRUCTION OPERAND. 8CF40470
SLT    34        ZERO ACCUMULATOR AND Q. 8CF40480
PT030 STD L2 *-*  ZERO EACH WORD.    8CF40490
MDX    2 -2      DECREMENT COUNTER. 8CF40500
B      PT030     LOOP.             8CF40510
STO    L3 SVC02-BASE RESET HEADING SWITCH. 8CF40520
B      I3 PT010-BASE RETURN.       8CF40530
***** 8CF40540
*          *          8CF40550
*          *          8CF40560
*          *          8CF40570
***** 8CF40580
*          *          8CF40590
SA010 DC *-*     ENTRY.          8CF40600
XIO    3 AAC50-BASE SENSE DATA ENTRY SWS 8CF40610
SLA    EIGHT     TEST SWITCH 8, EXTERNAL. 8CF40620
SKP    +Z        SKIP NOT ON.      8CF40630
B      SA040     BRANCH IF EXTERNAL TEST. 8CF40640
LD     3 ONE     GET BASE ADDRESS. 8CF40650
AND    SAC02     MASK OFF BITS 4-15. 8CF40660
EOR    SAC04     CHANGE BIT 3.     8CF40670
STO    SAC06     SAVE.             8CF40680
A      SAC10     COMPUTE HIGHEST ADDRESS. 8CF40690
SA020 EQU *          8CF40700
SRT    EXCHA     SAVE IN Q.        8CF40710
LD     SAC06     TEST LOWEST ADDRESS FOR 0. 8CF40720
SKP    +-        SKIP NOT 0.      8CF40730
*          *          8CF40740
*          *          8CF40750
*          *          8CF40760
*          *          8CF40770
*          *          8CF40780
*          *          8CF40790
*          *          8CF40800
*          *          8CF40810
0914 0 0000      LD     0C6A     8CF40820
0915 0 C700      SLA    0C6A     8CF40830
0917 0 1003      STO    0C6A     8CF40840
0918 0 D001      LD     0C6A     8CF40850
0919 0 6600 0000 PT020 LDX L2 *-* 8CF40860
091B 0 C700 0C6B LD     L3 PKK06-BASE COMPUTE ABSOLUTE BASE 8CF40870
091D 0 8301      A      3 ONE     ADDRESS AND STORE IN 8CF40880
091E 0 D002      STO    PT030+1 INSTRUCTION OPERAND. 8CF40890
091F 0 10A2      SLT    34        ZERO ACCUMULATOR AND Q. 8CF40900
0920 0 DE00 0000 PT030 STD L2 *-*  ZERO EACH WORD.    8CF40910
0922 0 72FE      MDX    2 -2      DECREMENT COUNTER. 8CF40920
0923 0 70FC      B      PT030     LOOP.             8CF40930
0924 0 D700 08B3 STO    L3 SVC02-BASE RESET HEADING SWITCH. 8CF40940
0926 0 4F80 08B2 B      I3 PT010-BASE RETURN.       8CF40950
***** 8CF40960
*          *          8CF40970
*          *          8CF40980
*          *          8CF40990
0928 0 0000      LD     0C6A     8CF41000
0929 0 0B26      SLA    0C6A     8CF41010
092A 0 1008      STO    0C6A     8CF41020
092B 0 4828      LD     0C6A     8CF41030
092C 0 700B      SKP    +Z        SKIP NOT ON.      8CF41040
092D 0 C301      B      SA040     BRANCH IF EXTERNAL TEST. 8CF41050
092E 0 E00F      LD     3 ONE     GET BASE ADDRESS. 8CF41060
092F 0 F00F      AND    SAC02     MASK OFF BITS 4-15. 8CF41070
0930 0 D00F      EOR    SAC04     CHANGE BIT 3.     8CF41080
0931 0 8010      STO    SAC06     SAVE.             8CF41090
0932 0          A      SAC10     COMPUTE HIGHEST ADDRESS. 8CF41100
0933 0 1890      SA020 EQU *          8CF41110
0934 0 4818      SRT    EXCHA     SAVE IN Q.        8CF41120
0935 0 800E      LD     SAC06     TEST LOWEST ADDRESS FOR 0. 8CF41130
0936 0 4F80 08C6 SKP    +-        SKIP NOT 0.      8CF41140
0938 0          *          8CF41150

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```

*          *          8CF41160
*          *          8CF41170
*          *          8CF41180
*          *          8CF41190
*          *          8CF41200
*          *          8CF41210
*          *          8CF41220
*          *          8CF41230
*          *          8CF41240
*          *          8CF41250
*          *          8CF41260
*          *          8CF41270
*          *          8CF41280
*          *          8CF41290
*          *          8CF41300
*          *          8CF41310
*          *          8CF41320
*          *          8CF41330
*          *          8CF41340
*          *          8CF41350
*          *          8CF41360
*          *          8CF41370
***** 8CF41380
*          *          8CF41390
PT010 DC *-*     ENTRY.          8CF41400
LD     L3 PKK04-BASE COMPUTE NUMBER OF 8CF41410
SLA    THREE     WORDS TO ZERO AND 8CF41420
STO    PT020+1   REGISTER TWO.    8CF41430
PT020 LDX L2 *-* 8CF41440
LD     L3 PKK06-BASE COMPUTE ABSOLUTE BASE 8CF41450
A      3 ONE     ADDRESS AND STORE IN 8CF41460
STO    PT030+1   INSTRUCTION OPERAND. 8CF41470
SLT    34        ZERO ACCUMULATOR AND Q. 8CF41480
PT030 STD L2 *-*  ZERO EACH WORD.    8CF41490
MDX    2 -2      DECREMENT COUNTER. 8CF41500
B      PT030     LOOP.             8CF41510
STO    L3 SVC02-BASE RESET HEADING SWITCH. 8CF41520
B      I3 PT010-BASE RETURN.       8CF41530
***** 8CF41540
*          *          8CF41550
*          *          8CF41560
*          *          8CF41570
***** 8CF41580
*          *          8CF41590
SA010 DC *-*     ENTRY.          8CF41600
XIO    3 AAC50-BASE SENSE DATA ENTRY SWS 8CF41610
SLA    EIGHT     TEST SWITCH 8, EXTERNAL. 8CF41620
SKP    +Z        SKIP NOT ON.      8CF41630
B      SA040     BRANCH IF EXTERNAL TEST. 8CF41640
LD     3 ONE     GET BASE ADDRESS. 8CF41650
AND    SAC02     MASK OFF BITS 4-15. 8CF41660
EOR    SAC04     CHANGE BIT 3.     8CF41670
STO    SAC06     SAVE.             8CF41680
A      SAC10     COMPUTE HIGHEST ADDRESS. 8CF41690
SA020 EQU *          8CF41700
SRT    EXCHA     SAVE IN Q.        8CF41710
LD     SAC06     TEST LOWEST ADDRESS FOR 0. 8CF41720
SKP    +-        SKIP NOT 0.      8CF41730
*          *          8CF41740
*          *          8CF41750
*          *          8CF41760
*          *          8CF41770
*          *          8CF41780
*          *          8CF41790
*          *          8CF41800
*          *          8CF41810
0935 0 800E      LD     0C6A     8CF41820
0936 0 4F80 08C6 SKP    +-        SKIP NOT 0.      8CF41830
0938 0          *          8CF41840

```



CORE FUNCTION TEST

CORE FUNCTION TEST

```

*
* EXTERNAL BSM TO TEST.
*
0938 0 C3F9      LD      3 AAC10-BASE  CALCULATE STARTING
0939 0 9007      S        SAC08      ADDRESS FROM EXPLICIT BSM
093A 0 100D      SLA      13        SETTING.
093B 0 D004      STO      SAC06      SAVE.
093C 0 8006      A        SAC14      COMPUTE HIGHEST ADDRESS.
093D 0 70F4      B        SA020      BRANCH TO CONTINUE.
*****
*
* CONSTANTS AND WORK AREAS
*
093E 0 F000      SAC02 DC   /F000      MASK BITS 4-15.
093F 0 1000      SAC04 DC   /1000     BIT 3.
0940 0 0001      SAC06 BSS  1          TEMPORARY STORAGE.
0941 0 0001      SAC08 DC   1          ONE.
0942 0 0FFF      SAC10 DC  /0FFF     4K.
0943 0 1FFF      SAC14 DC  /1FFF     8K.
0944 0 000A      SAC16 DC  10         TEN.
*****
*
* SET ADDRESS TEST LIMITS, RIPPLE UP CORE
*
* THIS SUBROUTINE SETS THE STARTING ADDRESS FOR
* A PATTERN TEST IN XR1. THE OTHER ADDRESS LIMIT
* IS IN THE ACCUMULATOR AT EXIT.
*
* CALL -
*   BSI L3 SA100-BASE
*
* XR1 HAS THE STARTING ADDRESS UPON EXIT.
*
* XR2 IS NOT USED.
*
* XR3 IS THE PSEUDO BASE REGISTER.
*
* THE ACCUMULATOR CONTAINS THE LAST ADDRESS TO
* TEST UPON EXIT.
*****
0945 0 0000      SA100 DC  *-*        ENTRY.
0946 0 40E1      BSI     SA010      DETERMINE LIMITS.
0947 0 D001      STO     SA110+1    INITIALIZE XR2 WITH
0948 0 6500 0000 SA110 LDX L1 *-*    STARTING ADDRESS.
094A 0 1090      SLT     EXCHA     END ADDRESS IN ACCUMULATOR
094B 0 4F80 08E3 B        I3 SA100-BASE RETURN.
*****
*
* SET ADDRESS LIMITS, RIPPLE DOWN CORE
*
* THIS SUBROUTINE SETS THE STARTING ADDRESS FOR
* A PATTERN TEST IN XR1. THE OTHER ADDRESS LIMIT
* IS IN THE ACCUMULATOR AT EXIT.
*
* CALL -
*   BSI L3 SA200-BASE

```

```

094D 0 0000
094E 0 40D9
094F 0 18D0
0950 0 D001
0951 0 6500 0000
0953 0 1090
0954 0 4F80 08EB
*****
0956 0 0000
0957 0 4700 0691
0959 0 F000
095A 0 4700 0691
095C 0 093D
095D 0 4700 0691
095F 0 F000
0960 0 4700 0691
0962 0 0944
0963 0 4700 0691
0965 0 F000
0966 0 4700 0B66
0968 0 6929
0969 0 6A2A
096A 0 61EE
096B 0 C02B
096C 0 8301
096D 0 D001
096E 0 6600 0000
0970 0 C027
0971 0 8301
0972 0 D009
0973 0 C700 035E
0975 0 9023
0976 0 A023
0977 0 18D0
0978 0 8022

```

```

* XR1 HAS THE STARTING ADDRESS UPON EXIT.
*
* XR2 IS NOT USED.
*
* XR3 IS THE PSEUDO BASE REGISTER.
*
* THE ACCUMULATOR CONTAINS THE LAST ADDRESS
* TO TEST UPON EXIT.
*****
SA200 DC  *-*        ENTRY.
        BSI     SA010      DETERMINE LIMITS.
        RTE     EXCHA     INITIALIZE XR2
        STO     SA210+1    WITH STARTING
SA210 LDX L1 *-*    ADDRESS.
        SLT     EXCHA     END ADDRESS IN ACCUMULATOR
        B        I3 SA200-BASE RETURN.
*****
*
* BIT FAILURE SUMMARY PRINT SUBROUTINE
*
* THIS ROUTINE PRINTS THE BIT FAILURE SUMMARY FOR
* THE STORAGE MODULE INDICATED IN HZK01.
*
* CALL -
*   BSI L3 SB010-BASE
*
* XR1 IS SAVED AND RESTORED
*
* XR2 INDICATES THE SUMMARY ROUTINE.
*
* XR3 IS THE PSEUDO BASE REGISTER.
*
* THE BSM ID. IS IN HZK01.
*****
SB010 DC  *-*        ENTRY.
        BSI L3 MA010-BASE WRITE A SPACE.
        DC     /F000      SPACE FUNCTION.
        BSI L3 MA010-BASE WRITE HEADING.
        DC     SBC70-BASE MESSAGE HEADING.
        BSI L3 MA010-BASE WRITE A SPACE.
        DC     /F000      SPACE FUNCTION.
        BSI L3 MA010-BASE WRITE HEADING.
        DC     SBC80-BASE MESSAGE HEADING.
        BSI L3 MA010-BASE WRITE A SPACE.
        DC     /F000      SPACE FUNCTION.
        BSI L3 SU010-BASE ZERO LINE BUFFER.
        STX 1 SB050+1    SAVE XR1.
        STX 2 SB060+1    SAVE XR2.
        LDX 1 -18       XR1 IS A POINTER, COUNTER.
        LD     SBC02     USE XR2 AS A POINTER
        A      3 ONE     TO BUFFER AREA.
        STO     SB020+1
        SB020 LDX L2 *-*    LOAD POINTER INTO XR2.
        LD     SBC04     BUILD OPERAND FOR
        A      3 ONE     BIT STRING.
        STO     SB030+1
        LD     L3 HZK01-BASE COMPUTE ABSOLUTE ADDRESS
        S        SBC06     OF BASE OF BIT FAILURE
        M        SBC08     STORAGE TABLE ENTRY TO
        RTE     16        CONVERT.
        A        SBC10

```

CORE FUNCTION TEST

```

0979 0 8301          A      3 ONE
097A 0 D021          STO    SBC12  SAVE AS INDIRECT ADDRESS. 8CF42180
097B 0 C500 0000    SB030 LD   L1 *-#  GET BIT ID. 8CF42190
097D 0 D200          STO    2 ZERO  PUT IN BUFFER AND 8CF42200
097E 0 7202          MDX   2 TWO   INCREMENT POINTER 8CF42210
097F 0 CF80 093A    LDD   13 SBC12-BASE LOAD DROP AND PICK 8CF42220
0981 0 4041          BSI    SC010  COUNTERS AND CONVERT 8CF42230
0982 0 C01B          LD     SBC16  PUT CONVERTED CHARACTERS 8CF42240
0983 0 4700 09BE    BSI   L3 SD010-BASE IN BUFFER LINE. 8CF42250
0985 0 4700 0691    BSI   L3 MA010-BASE WRITE LINE. 8CF42260
0987 0 0B77          DC     SUC80-BASE MESSAGE. 8CF42270
0988 0 72FA          MDX   2 -6   RESTORE XR2 8CF42280
0989 0 C012          LD     SBC12  UPDATE INDIRECT 8CF42290
098A 0 8012          A      SBC14  ADDRESS TO BIT 8CF42300
098B 0 D010          STO    SBC12  FAILURE STORAGE. 8CF42310
098C 0 7101          MDX   1 ONE   INCREMENT COUNTER. 8CF42320
098D 0 70ED          B      SB030  LOOP. 8CF42330
*
* SUMMARY COMPLETE.
*
098E 0 4700 0691    BSI   L3 MA010-BASE WRITE A SPACE. 8CF42340
0990 0 F000          DC     /F000  SPACE FUNCTION 8CF42350
0991 0 6500 0000    SB050 LDX L1 *-#  RESTORE XR1. 8CF42360
0993 0 6600 0000    SB060 LDX L2 *-#  RESTORE XR2. 8CF42370
0995 0 4F80 0BF4    B      13 SB010-BASE RETURN. 8CF42380
*****
*
* CONSTANTS AND WORK AREAS
*
*****
*
* RELATIVE ADDRESS OF LINE
*
0997 0 0B79          SBC02 DC   SUC84-BASE BUFFER. 8CF42430
*
0998 0 0961          SBC04 DC   SBC92-BASE OF BIT STORAGE IDNTS. 8CF42440
0999 0 0001          SBC06 DC   1 ONE. 8CF42450
099A 0 0024          SBC08 DC   36 THIRTY SIX. 8CF42460
*
* RELATIVE ADDRESS OF BASE
*
099B 0 0C6C          SBC10 DC   PXK20-BASE OF STORAGE TABLE. 8CF42470
099C 0001          SBC12 BSS  1 INDIRECT ADDRESS. 8CF42480
099D 0 0002          SBC14 DC   2 TWO. 8CF42490
099E 0 7204          SBC16 MDX  2 FOUR INSTRUCTION FOR FILL RTN. 8CF42500
099F 0 0006          SBC70 DC   6 SUMMARY HEADING. 8CF42510
09A0 0 3239          DC     /3239 BI 8CF42520
09A1 0 1300          DC     /1300 T 8CF42530
09A2 0 3631          DC     /3631 FA 8CF42540
09A3 0 3923          DC     /3923 IL 8CF42550
09A4 0 1429          DC     /1429 UR 8CF42560
09A5 0 3512          DC     /3512 ES 8CF42570
09A6 0 000A          SBC80 DC   10 HEADING. 8CF42580
09A7 0 0000          DC     /0000 BI 8CF42590
09A8 0 3239          DC     /3239 T 8CF42600
09A9 0 1300          DC     /1300 T 8CF42610
09AA 0 0000          DC     /0000 T 8CF42620
09AB 0 3429          DC     /3429 DR 8CF42630
09AC 0 2627          DC     /2627 OP 8CF42640
09AD 0 0000          DC     /0000 OP 8CF42650
09AE 0 0000          DC     /0000 PI 8CF42660
09AF 0 2739          DC     /2739 PI 8CF42670
09B0 0 3322          DC     /3322 CK 8CF42680
*
*
09B1 0 000A          DC     /000A 0 8CF42690
09B2 0 0001          DC     /0001 1 8CF42700
09B3 0 0002          DC     /0002 2 8CF42710
09B4 0 0003          DC     /0003 3 8CF42720
09B5 0 0004          DC     /0004 4 8CF42730
09B6 0 0005          DC     /0005 5 8CF42740
09B7 0 0006          DC     /0006 6 8CF42750

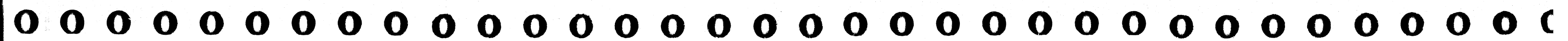
```

CORE FUNCTION TEST

```

09B8 0 0007          DC     /0007 7 8CF42860
09B9 0 0008          DC     /0008 8 8CF42870
09BA 0 0009          DC     /0009 9 8CF42880
09BB 0 010A          DC     /010A 10 8CF42890
09BC 0 0101          DC     /0101 11 8CF42900
09BD 0 0102          DC     /0102 12 8CF42910
09BE 0 0103          DC     /0103 13 8CF42920
09BF 0 0104          DC     /0104 14 8CF42930
09C0 0 0105          DC     /0105 15 8CF42940
09C1 0 0012          DC     /0012 S 8CF42950
09C2 0 0027          DC     /0027 P 8CF42960
09C3 0                DC     /0027 BITS. 8CF42970
SBC92 EQU *
*
*****
* BINARY TO 1443 DECIMAL CODE CONVERSION
*
*****
* THIS SUBROUTINE CONVERTS A ONE WORD BINARY
* INTEGER TO FIVE 1443 PRINTER CHARACTERS IN
* THREE WORDS.
*
* CALL -
*
* BSI L3 SC010-BASE
*
* THE ACCUMULATOR AND Q CONTAIN BINARY WORDS
* TO BE CONVERTED.
*
* XR1 AND XR2 ARE SAVED AND RESTORED.
*
* XR3 IS THE PSEUDO BASE REGISTER.
*
* THE RESULTS ARE STORED IN TWO FIXED AREAS
* OF THREE WORDS EACH.
*
*****
*
* ENTRY.
*
SC010 DC *-# ENTRY. 8CF43260
STD SCC02 STORE WORDS TO CONVERT. 8CF43270
STX 1 SC120+1 SAVE INDEX 8CF43280
STX 2 SC130+1 REGISTER. 8CF43290
STX 3 SC140+1 8CF43300
*
* AT THIS POINT XR3 IS INTACT AS THE BASE REGISTER.
*
*
* LDX 1 -1 USE XR1 AS OVERALL COUNTER 8CF43310
* LD SCC08 COMPUTE ADDRESS OF STORAGE 8CF43320
* A 3 ONE AREA AND PUT IN INDEX 8CF43330
* STO SC020+1 OPERAND. 8CF43340
*
* XR2 POINTS TO RESULT AREA. 8CF43350
* LD SCC10 COMPUTE ADDRESS OF SECOND 8CF43360
* A 3 ONE STORAGE AREA AND 8CF43370
*
* INITIALIZE INDEX OPERAND. 8CF43380
* STO SC060+1 LOAD FIRST WORD TO CONVERT 8CF43390
* LD SCC02 AND SKIP IF NON ZERO. 8CF43400
* SKP +- BRANCH TO LOAD DASHES. 8CF43410
* B SC070 8CF43420
*
* USE XR3 AS COUNTER. 8CF43430
* EQU * PREPARE FOR DIVISION. 8CF43440
*
* LD 16 8CF43450
*
* DIVIDE BY 10. 8CF43460
* EQU * 8CF43470
* LD SCC04 8CF43480
* SKP +- SKIP IF MORE TO CONVERT. 8CF43490
* B SC080 BRANCH TO ADD LEFT BLANKS. 8CF43500
* RTE 16 EXCHANGE QUOTIENT AND 8CF43510
* SKP +- REMAINDER, SKIP NOT 0. 8CF43520

```



CORE FUNCTION TEST

```

09DB 0 C038      LD      SCC04    LOAD 1443 CHARACTER 0.      8CF43540
09DC 0 D200      STO     2 ZERO    STORE AS RIGHT BYTE.     8CF43550
09DD 0 1804      SRA     FOUR     CLEAR ACCUMULATOR.     8CF43560
09DE 0 A835      D       SCC04    DIVIDE BY 10.           8CF43570
09DF 0 4818      SKP     +-       SKIP IF MORE TO CONVERT. 8CF43580
09E0 0 701D      B       SC090    BRANCH TO ADD LEFT BLANKS. 8CF43590
09E1 0 18D0      RTE     16      EXCHANGE QUOTIENT AND   8CF43600
09E2 0 4818      SKP     +-       REMAINDER, SKIP NOT ZERO. 8CF43610
09E3 0 C030      LD      SCC04    LOAD 1443 CHARACTER 0.   8CF43620
09E4 0 1008      SLA     EIGHT    SHIFT TO LEFT BYTE.     8CF43630
09E5 0 EA00      OR      2 ZERO   UPDATE CHARACTER.       8CF43640
09E6 0 D200      STO     2 ZERO   8CF43650
09E7 0 1810      SRA     16      CLEAR ACCUMULATOR.     8CF43660
09E8 0 72FF      MDX     2 -1     DECREMENT WORD POINTER. 8CF43670
09E9 0 73FF      MDX     3 -1     DECREMENT COUNTER.     8CF43680
09EA 0 70EB      B       SC040    LOOP.                   8CF43690
                                8CF43700
                                8CF43710
                                8CF43720
* FIFTH CHARACTER LEFT.
09EB 0 18D0      RTE     16      MOVE LAST CHARACTER TO   8CF43730
09EC 0 D200      STO     2 ZERO   STORAGE.                 8CF43740
09ED 0          SC050 EQU *
09ED 0 7101      MDX     1 ONE    INCREMENT COUNTER.     8CF43750
09EE 0 701B      B       SC120    BRANCH IF DONE.       8CF43760
                                8CF43770
                                8CF43780
* INITIALIZE FOR SECOND CONVERSION.
09EF 0 6600 0000 SC060 LDX L2 *-*   POINTER TO STORAGE AREA. 8CF43790
09F1 0 C021      LD      SCC03    LOAD SECOND WORD TO     8CF43800
09F2 0 4820      SKP     Z        CONVERT AND SKIP IF ZERO. 8CF43810
09F3 0 70E0      B       SC030    BRANCH TO CONVERSION.  8CF43820
                                8CF43830
                                8CF43840
                                8CF43850
* WORD TO CONVERT IS ZERO.
                                8CF43860
                                8CF43870
09F4 0          SC070 EQU *
09F4 0 C022      LD      SCC12    MOVE FIVE 1443 CHARACTERS 8CF43880
09F5 0 D200      STO     2 ZERO   TO CONVERSION STORAGE.  8CF43890
09F6 0 C020      LD      SCC12    8CF43900
09F7 0 D2FF      STO     2 -1     8CF43910
09F8 0 C023      LD      SCC92    8CF43920
09F9 0 D2FE      STO     2 -2     8CF43930
09FA 0 70F2      B       SC050    RETURN AND CONTINUE.  8CF43940
                                8CF43950
                                8CF43960
* NO MORE CHARACTERS, INSERT LEFT BLANKS.
                                8CF43970
                                8CF43980
09FB 0          SC080 EQU *
09FB 0 18D0      RTE     16      RIGHT BYTE LAST CHARACTER. 8CF43990
09FC 0 D200      STO     2 ZERO   GET LAST CHARACTER.     8CF44000
09FD 0 7003      B       SC100    STORE.                   8CF44010
09FE 0          SC090 EQU *
09FE 0 1098      SLT     24      BRANCH TO CONTINUE.     8CF44020
09FF 0 EA00      OR      2 ZERO   8CF44030
                                8CF44040
                                8CF44050
0A00 0 D200      STO     2 ZERO   UPDATE.                   8CF44060
0A01 0          SC100 EQU *
0A01 0 1810      SRA     16      CLEAR THE ACCUMULATOR.  8CF44070
0A02 0 72FF      MDX     2 -1     DECREMENT STORAGE POINTER. 8CF44080
                                8CF44090
                                8CF44100
                                8CF44110
*
                                8CF44120
                                8CF44130
                                8CF44140
0A03 0 73FF      MDX     3 -1     DECREMENT COUNTER AND   8CF44150
0A04 0 7001      B       SC110    SKIP IF ONE MORE WORD.  8CF44160
0A05 0 7002      B       SC115    BRANCH IF ONE MORE WORD. 8CF44170
0A06 0          SC110 EQU *
0A06 0 D200      STO     2 ZERO   BLANK SECOND WORD OF    8CF44180
0A07 0 72FF      MDX     2 -1     STORAGE.                 8CF44190
0A08 0          SC115 EQU *
0A08 0 D200      STO     2 ZERO   BLANK FIRST WORD OF    8CF44200
0A09 0 70E3      B       SC050    STORAGE AND RETURN.     8CF44210
                                8CF44220
* ROUTINE DONE.

```

CORE FUNCTION TEST

```

OAOA 0          *
OAOA 0 6500 0000 SC120 EQU *
OAOA 0 6600 0000 SC130 LDX L1 *-*   RESTORE INDEX
OAOE 0 6700 0000 SC140 LDX L2 *-*   REGISTERS.
OAO1 0 4F80 0961 B       I3 SC010-BASE RETURN. 8CF44220
                                8CF44230
                                8CF44240
                                8CF44250
                                8CF44260
                                8CF44270
                                8CF44280
                                8CF44290
*
*
* CONSTANTS AND WORK AREAS
*
*****
*
OAI2 0001      SCC02 BSS E 1    STORAGE FOR A AND Q, TWO 8CF44350
OAI3 0001      SCC03 BSS 1    BINARY NUMBERS TO CONVERT. 8CF44360
OAI4 0 000A     SCC04 DC 10   DIVISOR, 1443 CHARACTER 0. 8CF44370
OAI5 0 09B9     SCC08 DC SCC90+2-BASE 8CF44380
OAI6 0 09BD     SCC10 DC SCC93+2-BASE 8CF44390
OAI7 0 2020     SCC12 DC /2020 1443 CHARACTERS --. 8CF44400
OAI8 0001      BSS E 1    SCC90 & SCC93 MUST BE ODD. 8CF44410
OAI9 0001      SCC90 BSS 1    FIVE CHARACTERS AS 8CF44420
OAI1A 0002     SCC91 BSS 2    RESULTS OF CONVERSION. 8CF44430
OAI1C 0 0020   SCC92 DC /0020 1443 CHARACTER -. 8CF44440
OAI1D 0001     SCC93 BSS 1    8CF44450
OAI1E 0002     SCC94 BSS 2    8CF44460
*
*
*****
* CHARACTER FILL SUBROUTINE
*
*****
* THIS SUBROUTINE MOVES CONVERTED CHARACTERS FROM * 8CF44500
* THE BUFFERS IN THE CONVERSION ROUTINE TO THE * 8CF44510
* I/O AREA INDICATED IN XR2. * 8CF44520
*
* CALL - * 8CF44530
*
* BSI L3 SD010-BASE * 8CF44540
*
* THE ACCUMULATOR CONTAINS AN MDX INSTRUCTION * 8CF44550
* TO MODIFY XR2. * 8CF44560
*
* XR1 IS NOT USED. * 8CF44570
*
* XR2 CONTAINS THE ADDRESS OF THE I/O AREA TO * 8CF44580
* FILL. * 8CF44590
*
* XR3 IS THE PSEUDO BASE REGISTER. * 8CF44600
*
*****
*
SD010 DC *-*   ENTRY. * 8CF44610
* STORE POINTER MODIFICATION * 8CF44620
*
OAI21 0 D006   LD      SD020  INSTRUCTION. * 8CF44630
OAI22 0 C0F6   LD      SCC90  PICK UP CHARACTERS * 8CF44640
OAI23 0 D200   STO     2 ZERO  FROM CONVERSION * 8CF44650
OAI24 0 C8F5   LDD     SCC91  BUFFERS AND STORE IN * 8CF44660
OAI25 0 D201   STO     2 ONE   I/O LINE. * 8CF44670
OAI26 0 18D0   RTE     16      * 8CF44680
OAI27 0 D202   STO     2 TWO  * 8CF44690
OAI28 0 7200   SD020 MDX 2 ZERO  THIS INSTRUCTION SUPPLIED * 8CF44700
OAI29 0 C0F3   LD      SCC93  BY CALL ROUTINE. * 8CF44710
OAI2A 0 D200   STO     2 ZERO  * 8CF44720
OAI2B 0 C8F2   LDD     SCC94  * 8CF44730
OAI2C 0 D201   STO     2 ONE   * 8CF44740
OAI2D 0 18D0   RTE     16      * 8CF44750
                                * 8CF44760
                                * 8CF44770
                                * 8CF44780
                                * 8CF44790
                                * 8CF44800
                                * 8CF44810
                                * 8CF44820
                                * 8CF44830
                                * 8CF44840
                                * 8CF44850
                                * 8CF44860
                                * 8CF44870
                                * 8CF44880
                                * 8CF44890

```

CORE FUNCTION TEST

0A2E 0 D202
0A2F 0 4F80 09BE

```

      STO 2 TWO
      B I3 SD010-BASE RETURN.
*****
* ADDRESS LINE FAILURE SUMMARY SUBROUTINE
*****
* THIS SUBROUTINE PRINTS THE ADDRESS LINE SUMMARY
* MATRIX FOR THE STORAGE MODULE INDICATED IN
* HZK01.
* CALL -
*   BSI L3 SE010-BASE
*   XR1 AND XR2 ARE SAVED AND RESTORED.
*   XR3 IS THE PSEUDO BASE REGISTER.
*   THE BSM ID. IS IN HZK01.
*****
SE010 DC *-* ENTRY.
      BSI L3 MA010-BASE WRITE A SPACE.
      DC /F000 SPACE FUNCTION.
      BSI L3 MA010-BASE WRITE SUMMARY HEADING.
      DC SEC70-BASE HEADING MESSAGE.
      BSI L3 MA010-BASE WRITE A SPACE.
      DC /F000 SPACE FUNCTION.
      BSI L3 MA010-BASE WRITE FAILURE SUMMARY
      DC SEC80-BASE HEADING WHICH IS
      BSI L3 MA010-BASE TWO LINES.
      DC SEC90-BASE
      BSI L3 MA010-BASE WRITE A SPACE.
      DC /F000 SPACE FUNCTION.
      BSI L3 SU010-BASE ZERO LINE BUFFER.
      STX 1 SE090+1 SAVE XR1.
      STX 2 SE092+1 SAVE XR2.
* FIND SCALE FACTOR.
*
      LD L3 HZK01-BASE COMPUTE BASE ADDRESS
      S SEC02 OF LINE ADDRESS
      M SEC04 FAILURE STORAGE TABLE
      RTE 16 FOR THIS BSM.
      A SEC06
      A 3 ONE
      STO SEC08 SAVE.
      S SEC02 DECREMENT ADDRESS.
      STO SE020+1 STORE IN OPERAND.
      SRA 16 CLEAR WORK
      STO SEC10 AREA.
      LDX 1 40 USE XR1 AS A COUNTER.
SE020 LD L1 *-* FIND LARGEST VALUE
      S SEC10 IN TABLE FOR SCALING.
      SKP +
      B SE030
      A SEC10 RESTORE VALUE AND
      STO SEC10 SAVE.
SE030 EQU *
      MDX 1 -1 DECREMENT COUNTER.
      B SE020 LOOP.
      LD SEC10 COMPUTE
      SRT 16 SCALE FACTOR.
      D SEC12
      A SEC02

```

```

0A31 0 0000
0A32 0 4700 0691
0A34 0 F000
0A35 0 4700 0691
0A37 0 0A8E
0A38 0 4700 0691
0A3A 0 F000
0A3B 0 4700 0691
0A3D 0 0A99
0A3E 0 4700 0691
0A40 0 0AA5
0A41 0 4700 0691
0A43 0 F000
0A44 0 4700 0B66
0A46 0 696D
0A47 0 6A6E

```

```

0A48 0 C700 035E
0A4A 0 907B
0A4B 0 A07B
0A4C 0 18D0
0A4D 0 807A
0A4E 0 8301
0A4F 0 D079
0A50 0 9075
0A51 0 D004
0A52 0 1810
0A53 0 D076
0A54 0 6128
0A55 0 C500 0000
0A57 0 9072
0A58 0 4808
0A59 0 7002
0A5A 0 806F
0A5B 0 D06E
0A5C 0
0A5D 0 71FF
0A5E 0 70F7
0A5F 0 C06B
0A60 0 1890
0A61 0 8064

```

CORE FUNCTION TEST

0A62 0 D067

```

0A63 0 C068
0A64 0 8301
0A65 0 D001
0A66 0 6600 0000
0A68 0 C069
0A69 0 8301
0A6A 0 D003
0A6B 0 D02B
0A6C 0 61F0
0A6D 0 CD00 0000
0A6F 0 DA00
0A70 0 4048
0A71 0 D203
0A72 0 C056
0A73 0 8059
0A74 0 D054
0A75 0 4043
0A76 0 D205
0A77 0 C051
0A78 0 8054
0A79 0 D04F
0A7A 0 403E
0A7B 0 D208
0A7C 0 C04C
0A7D 0 804F
0A7E 0 D04A
0A7F 0 4039
0A80 0 D20A

```

```

0A81 0 4700 0691
0A83 0 0B77
0A84 0 7102
0A85 0 7001
0A86 0 7004
0A87 0
0A87 0 C041
0A88 0 9045
0A89 0 D03F
0A8A 0 70E2

```

```

0A8B 0
0A8B 0 4700 0691
0A8D 0 F000
0A8E 0 61F0
0A8F 0 C03F
0A90 0 D203
0A91 0 D205
0A92 0 D208
0A93 0
0A93 0 C035
0A94 0 8031
0A95 0 D033
0A96 0 CD00 0000
0A98 0 E837
0A99 0 DA00
0A9A 0 401E
0A9B 0 D20A
0A9C 0 4700 0691
0A9E 0 0B77
0A9F 0 7102

```

```

      STO SEC10
* XR2 POINTS TO LINE BUFFER.
*
      LD SEC14 COMPUTE ABSOLUTE ADDRESS
      A 3 ONE OF LINE BUFFER AND
      STO SE040+1 INITIALIZE XR2.
SE040 LDX L2 *-*
      LD SEC26 INITIALIZE OPERAND
      A 3 ONE THAT POINTS TO LINE
      STO SE050+1 ID.
      STO SE080+1
      LDX 1 -16 USE XR1 AS A COUNTER.
SE050 LDD L1 *-* MOVE ADDRESS LINE TO
      STD 2 ZERO I/O BUFFER.
      BSI SE200 SCALE AND CONVERT.
      STO 2 THREE INCREMENT INDIRECT
      LD SEC08 ADDRESS AND UPDATE.
      A SEC16
      STO SEC08 SCALE AND CONVERT.
      BSI SE200
      STO 2 FIVE INCREMENT INDIRECT
      LD SEC08 ADDRESS AND UPDATE.
      A SEC16
      STO SEC08 SCALE AND CONVERT.
      BSI SE200 STORE IN LINE BUFFER.
      STO 2 TEN STORE IN LINE BUFFER.
* LINE FULL.
*
      BSI L3 MA010-BASE WRITE LINE.
      DC SUC80-BASE MESSAGE.
      MDX 1 TWO
      B SE060 SKIP TO LOOP.
      B SE070 BRANCH IF DONE.
SE060 EQU *
      LD SEC08 READJUST INDIRECT
      S SEC18 ADDRESS.
      STO SEC08
      B SE050 LOOP.
* DONE WITH FIRST HALF OF MATRIX PRINTOUT.
*
SE070 EQU *
      BSI L3 MA010-BASE WRITE SPACE.
      DC /F000 SPACE FUNCTION.
      LDX 1 -16 USE XR1 AS A COUNTER.
      LD SEC20 PUT ASTERISK IN UNUSED
      STO 2 THREE POSITIONS.
      STO 2 FIVE
      STO 2 EIGHT
SE075 EQU *
      LD SEC08 INCREMENT INDIRECT
      A SEC02 ADDRESS AND UPDATE.
      STO SEC08
      OR SEC22 MOVE ADDR. LINE TO
      STD 2 ZERO I/O BUFFER.
      BSI SE200 SCALE AND CONVERT.
      STO 2 TEN STORE IN LINE BUFFER.
SE080 LDD L1 *-* WRITE LINE.
      OR SUC80-BASE MESSAGE.
      STD 2 ZERO DECREMENT COUNTER.
      BSI 1 TWO

```

```

8CF45580
8CF45590
8CF45600
8CF45610
8CF45620
8CF45630
8CF45640
8CF45650
8CF45660
8CF45670
8CF45680
8CF45690
8CF45700
8CF45710
8CF45720
8CF45730
8CF45740
8CF45750
8CF45760
8CF45770
8CF45780
8CF45790
8CF45800
8CF45810
8CF45820
8CF45830
8CF45840
8CF45850
8CF45860
8CF45870
8CF45880
8CF45890
8CF45900
8CF45910
8CF45920
8CF45930
8CF45940
8CF45950
8CF45960
8CF45970
8CF45980
8CF45990
8CF46000
8CF46010
8CF46020
8CF46030
8CF46040
8CF46050
8CF46060
8CF46070
8CF46080
8CF46090
8CF46100
8CF46110
8CF46120
8CF46130
8CF46140
8CF46150
8CF46160
8CF46170
8CF46180
8CF46190
8CF46200
8CF46210
8CF46220
8CF46230
8CF46240
8CF46250

```


CORE FUNCTION TEST

```

0AA0 0 70F2          B      SE075  LOOP.          8CF46260
* SUMMARY DONE.          8CF46270
*                          8CF46280
*                          8CF46290
0AA1 0 4700 0691    BSI L3 MA010-BASE WRITE A SPACE. 8CF46300
0AA3 0 F000          DC /F000 SPACE FUNCTION. 8CF46310
0AA4 0 C025          LD SEC10 CONVERT SCALE FACTOR 8CF46320
0AA5 0 4700 0961    BSI L3 SC010-BASE AND FILL. 8CF46330
0AA7 0 C700 0987    LD L3 SCC90-BASE 8CF46340
0AA9 0 D033          STO SEC46 8CF46350
0AAA 0 CF00 09B8    LDD L3 SCC91-BASE 8CF46360
0AAC 0 D831          STD SEC46+1 8CF46370
0AAD 0 4700 0691    BSI L3 MA010-BASE WRITE LINE. 8CF46380
0AAF 0 0A72          DC SEC40-BASE MESSAGE. 8CF46390
0AB0 0 4700 0691    BSI L3 MA010-BASE WRITE A SPACE. 8CF46400
0AB2 0 F000          DC /F000 SPACE FUNCTION. 8CF46410
0AB3 0 6500 0000    SE090 LDX L1 *- RESTORE XR1. 8CF46420
0AB5 0 6600 0000    SE092 LDX L2 *- RESTORE XR2. 8CF46430
0AB7 0 4F80 09CF    B I3 SE010-BASE RETURN. 8CF46440
* SCALE AND CONVERT CHARACTER. 8CF46450
*                          8CF46460
*                          8CF46470
0AB9 0 0000          SE200 DC *- ENTRY. 8CF46480
0ABA 0 C780 0A67    LD I3 SEC08-BASE GET VALUE TO SCALE. 8CF46490
0ABC 0 4808          SKP + SKIP IF VALUE TO SCALE. 8CF46500
0ABD 0 7006          B SE220 NO ERRORS, LOAD -. 8CF46510
0ABE 0 1890          SRT 16 SCALE VALUE. 8CF46520
0ABF 0 A80A          D SEC10 8CF46530
0AC0 0 4808          SKP + SKIP IF NOT ZERO. 8CF46540
0AC1 0 C004          LD SEC02 THERE WAS AT LEAST 1 ERROR 8CF46550
0AC2 0              SE210 EQU * 8CF46560
0AC2 0 4F80 0A57    B I3 SE200-BASE RETURN. 8CF46570
* PUT DASH IN OUTPUT, NO TALLEY. 8CF46580
*                          8CF46590
*                          8CF46600
0AC4 0              SE220 EQU * 8CF46610
0AC4 0 C00C          LD SEC24 LOAD DASH. 8CF46620
0AC5 0 70FC          B SE210 BRANCH TO EXIT. 8CF46630
***** 8CF46640
* CONSTANTS AND WORK AREAS * 8CF46650
*                          * 8CF46660
*                          * 8CF46670
*                          * 8CF46680
*                          * 8CF46690
0AC6 0 0001          SEC02 DC 1 ONE. 8CF46700
0AC7 0 0028          SEC04 DC 40 NO. OF OWRDS IN EACH TABLE 8CF46710
0AC8 0 0D8C          SEC06 DC PXX30-BASE BASE OF TABLE. 8CF46720
0AC9 0 0001          SEC08 BSS 1 INDIRECT ADDRESS TO TABLE. 8CF46730
0ACA 0 0001          SEC10 BSS 1 SCALE FACTOR. 8CF46740
0ACB 0 000A          SEC12 DC 10 SCALING VALUE. 8CF46750
0ACC 0 0B78          SEC14 DC SUC82-BASE RELATIVE ADDRESS. 8CF46760
0ACD 0 0008          SEC16 DC 8 EIGHT. 8CF46770
0ACE 0 0017          SEC18 DC 23 TWENTY THREE. 8CF46780
0ACF 0 002C          SEC20 DC /002C 1443 CHARACTER, *. 8CF46790
0AD0 0 0100          SEC22 DC /0100 1443 CHARACTER 1, LEFT. 8CF46800
0AD1 0 0020          SEC24 DC /0020 1443 CHARACTER, -. 8CF46810
0AD2 0 0A8E          SEC26 DC SEC56-BASE RELATIVE ADDRESS. 8CF46820
0AD4 0 0000          BSS E 0 FORCE EVEN BOUNDARY. 8CF46830
0AD4 0 000B          SEC40 DC 11 8CF46840
0AD5 0 0000          DC /0000 8CF46850
0AD6 0 1233          DC /1233 SC 8CF46860
0AD7 0 3123          DC /3123 AL 8CF46870
0AD8 0 3500          DC /3500 E 8CF46880
0AD9 0 3631          DC /3631 FA 8CF46890
0ADA 0 3313          DC /3313 CT 8CF46900
0ADB 0 2629          DC /2629 OR 8CF46910
0ADC 0 000B          DC /000B = 8CF46920
0ADD 0 0000          SEC46 DC /0000 X 8CF46930

```

CORE FUNCTION TEST

```

0ADE 0 0000          DC /0000 XX MUST BE EVEN ADDRESS. 8CF46940
0ADF 0 0000          DC /0000 XX 8CF46950
0AE0 0 000A          SEC54 DC /000A 0, 1443 CHARACTER 0. 8CF46960
0AE1 0 0A0A          DC /0A0A 00 8CF46970
0AE2 0 000A          DC /000A 0 8CF46980
0AE3 0 0A01          DC /0A01 01 8CF46990
0AE4 0 000A          DC /000A 0 8CF47000
0AE5 0 010A          DC /010A 10 8CF47010
0AE6 0 000A          DC /000A 0 8CF47020
0AE7 0 0101          DC /0101 11 8CF47030
0AE8 0 0001          DC /0001 1 8CF47040
0AE9 0 0A0A          DC /0A0A 00 8CF47050
0AEA 0 0001          DC /0001 1 8CF47060
0AEB 0 0A01          DC /0A01 01 8CF47070
0AEC 0 0001          DC /0001 1 8CF47080
0AED 0 010A          DC /010A 10 8CF47090
0AEE 0 0001          DC /0001 1 8CF47100
0AEF 0 0101          DC /0101 11 8CF47110
0AF0 0              SEC56 EQU * 8CF47120
0AF0 0 000A          SEC70 DC 10 SUMMARY HEADING. 8CF47130
0AF1 0 3631          DC /3631 FA 8CF47140
0AF2 0 3923          DC /3923 IL 8CF47150
0AF3 0 3800          DC /3800 . 8CF47160
0AF4 0 3218          DC /3218 BY 8CF47170
0AF5 0 0031          DC /0031 A 8CF47180
0AF6 0 3434          DC /3434 DD 8CF47190
0AF7 0 2938          DC /2938 R. 8CF47200
0AF8 0 0023          DC /0023 L 8CF47210
0AF9 0 3925          DC /3925 IN 8CF47220
0AFA 0 3500          DC /3500 E 8CF47230
0AFB 0 000B          SEC80 DC 11 HEADING MESSAGE. 8CF47240
0AFC 0 0000          DC /0000 8CF47250
0AFD 0 0000          DC /0000 8CF47260
0AFE 0 0000          DC /0000 8CF47270
0AFF 0 3839          DC /3839 HI 8CF47280
0B00 0 0000          DC /0000 8CF47290
0B01 0 2326          DC /2326 LO 8CF47300
0B02 0 0000          DC /0000 8CF47310
0B03 0 0000          DC /0000 8CF47320
0B04 0 3839          DC /3839 HI 8CF47330
0B05 0 0000          DC /0000 8CF47340
0B06 0 2326          DC /2326 LO 8CF47350
0B07 0 000B          SEC90 DC 11 HEADING MESSAGE. 8CF47360
0B08 0 0000          DC /0000 8CF47370
0B09 0 0000          DC /0000 8CF47380
0B0A 0 0000          DC /0000 8CF47390
0B0B 0 0017          DC /0017 X 8CF47400
0B0C 0 0000          DC /0000 8CF47410
0B0D 0 0017          DC /0017 X 8CF47420
0B0E 0 0000          DC /0000 8CF47430
0B0F 0 0000          DC /0000 8CF47440
0B10 0 0018          DC /0018 Y 8CF47450
0B11 0 0000          DC /0000 8CF47460
0B12 0 0018          DC /0018 Y 8CF47470
* 8CF47480
***** 8CF47490
***** 8CF47500
* 8CF47510
* SENSE/INHIBIT SUMMARY PRINT SUBROUTINE * 8CF47520
* * 8CF47530
***** 8CF47540
* 8CF47550
* THIS SUBROUTINE PRINTS ONE LINE FOR EACH BSM * 8CF47560
* LOG SUMMARIZING FAILURES BY SENSE/INHIBIT BLOCK.* 8CF47570
* * 8CF47580
* CALL - * 8CF47590
* * 8CF47600
* BSI L3 SI010-BASE * 8CF47610

```


CORE FUNCTION TEST

CORE FUNCTION TEST

```

*
* XR1 IS NOT USED.
*
* XR2 IS SAVED AND RESTORED.
*
* XR3 IS THE PSEUDO BASE REGISTER.
*
* THE BSM ID. IS IN HZK01.
*
*****
OB13 0 0000
OB14 0 4700 0691
OB16 0 F000
OB17 0 4700 0691
OB19 0 0ADB
OB1A 0 4700 0691
OB1C 0 F000
OB1D 0 6A19
OB1E 0 C01B
OB1F 0 8301
OB20 0 D001
OB21 0 6600 0000
OB23 0 C700 035E
OB25 0 90A0
OB26 0 1001
OB27 0 8013
OB28 0 D001
OB29 0 CF00 0000
OB2B 0 4700 0961
OB2D 0 C00E
OB2E 0 4700 09BE

* LINE IS COMPLETE
*
OB30 0 4700 0691
OB32 0 0AE7
OB33 0 4700 0691
OB35 0 F000
OB36 0 6600 0000
OB38 0 4F80 0AB1

OB3A 0 0AED
OB3B 0 0ECC
OB3C 0 7208
OB3D 0 000B
OB3E 0 3631
OB3F 0 3923
OB40 0 1429
OB41 0 3500
OB42 0 3218
OB43 0 0004
OB44 0 2200
OB45 0 1235
OB46 0 3724
OB47 0 3525
OB48 0 1300
OB49 0 0010
OB4A 0 0000
OB4B 0 0023
OB4C 0 2600
OB4D 0 0422

SIC02 DC SIC90+6-BASE OUTPUT AREA TO FILL.
SIC04 DC PXX40-BASE RELATIVE ADDRESS OF STOR.
SIC08 MDX 2 EIGHT INSTRUCTION FOR FILL RTN.
SIC80 DC 11 HEADING.
DC /3631 FA
DC /3923 IL
DC /1429 UR
DC /3500 E
DC /3218 BY
DC /0004 4
DC /2200 K
DC /1235 SE
DC /3724 GM
DC /3525 EN
DC /1300 T
SIC90 DC 16 MESSAGE.
DC /0000
DC /0023 L
DC /2600 0
DC /0422 4K

```

```

OB4E 0 000B DC /000B =
OB4F 0 0000 DC /0000 X
OB50 0 0000 DC /0000 XX
OB51 0 0000 DC /0000 XX
OB52 0 0000 DC /0000
OB53 0 0038 DC /0038 H
OB54 0 3900 DC /3900 I
OB55 0 0422 DC /0422 4K
OB56 0 000B DC /000B =
OB57 0 0000 DC /0000 Y
OB58 0 0000 DC /0000 YY
OB59 0 0000 DC /0000 YY

```

```

8CF48300
8CF48310
8CF48320
8CF48330
8CF48340
8CF48350
8CF48360
8CF48370
8CF48380
8CF48390
8CF48400
8CF48410
* 8CF48420
***** 8CF48430
***** 8CF48440
* 8CF48450
* PATTERN FAILURE AND LOOP SUMMARY SUBROUTINE * 8CF48460
* 8CF48470
***** 8CF48480
* 8CF48490
* THIS SUBROUTINE PRINTS A LOG OF LOOPS AND * 8CF48500
* FAILURES BY PATTERN TEST FOR EACH BSM. * 8CF48510
* 8CF48520
* CALL - * 8CF48530
* 8CF48540
* BSI L3 SLO10-BASE * 8CF48550
* 8CF48560
* XR1 AND XR2 ARE SAVED AND RESTORED. * 8CF48570
* 8CF48580
* XR3 IS THE PSEUDO BASE REGISTER. * 8CF48590
* 8CF48600
* THE BSM ID. IS IN HZK01. * 8CF48610
* 8CF48620
***** 8CF48630
* 8CF48640
* 8CF48650
SLO10 DC *-* ENTRY.
BSI L3 MA010-BASE WRITE A SPACE.
DC /F000 SPACE FUNCTION.
BSI L3 MA010-BASE WRITE SUMMARY HEADING.
DC SLC70-BASE HEADING.
BSI L3 MA010-BASE WRITE A SPACE.
DC /F000 SPACE FUNCTION.
BSI L3 MA010-BASE WRITE HEADING.
DC SLC80-BASE HEADING.
BSI L3 MA010-BASE WRITE A SPACE.
DC /F000 SPACE FUNCTION.
DC SLC00-BASE HEADING.
BSI L3 MA010-BASE WRITE A SPACE.
DC /F000 SPACE FUNCTION.
BSI L3 SU010-BASE ZERO LINE BUFFER.
STX 1 SLO50+1 SAVE XR1.
STX 2 SLO60+1 SAVE XR2.
LDX 1 SLC04 XR1 IS COUNTER.
LD SLC02 COMPUTE ADDRESS OF
A 3 ONE LINE BUFFER FILL
STO SLO20+1 AREA.
SLO20 LDX L2 *-*
LD L3 HZK01-BASE COMPUTE BASE ADDRESSES
S SLC12 OF LOOP AND FAILURE
M SLC14 COUNTER TABLES.
RTE 16
A 3 ONE
STO SLC18 SAVE TEMPORARILY.
A SLC08 BUILD ADDRESSES AND
STO SLC16 SAVE FOR INDIRECT
LD SLC18 ADDRESSING.
A SLC10
STO SLC18
* BUILD A LINE.
*
8CF48970

```

CORE FUNCTION TEST

```

OB80 0          SLO30 EQU *          8CF48980
OB80 0 6928     STX  1 SLC20        COMPUTE TEST ID.  8CF48990
OB81 0 C023     LD   SLC06          NUMBER, CONVERT IT AND 8CF49000
OB82 0 9029     S   SLC20          STORE IN LINE BUFFER. 8CF49010
OB83 0 4700 03B0 BSI  L3 IC010-BASE   CONVERT TO ONE 1443 8CF49020
OB85 0 E028     AND  SLC24          CHARACTER.          8CF49030
OB86 0 D200     STO  2 ZERO         8CF49040
OB87 0 7203     MDX  2 THREE        INCREMENT I/O AREA PTR. 8CF49050
OB88 0 C780 0B48 LD  I3 SLC16-BASE   LOAD LOOP COUNTER. 8CF49060
OB8A 0 18D0     RTE  16            MOVE TO Q.         8CF49070
OB8B 0 C780 0B49 LD  I3 SLC18-BASE   LOAD FAILURE COUNTER. 8CF49080
OB8D 0 4700 0961 BSI  L3 SC010-BASE   CONVERT TO 1443 CODE. 8CF49090
OB8F 0 C01D     LD   SLC22          PUT CHARACTERS IN 8CF49100
OB90 0 4700 09BE BSI  L3 SD010-BASE   I/O BUFFER.      8CF49110
*
* LINE COMPLETE, WRITE IT.
*
OB92 0 4700 0691 BSI  L3 MA010-BASE   WRITE LINE.      8CF49120
OB94 0 0B77     DC   SUC80-BASE    MESSAGE.          8CF49130
OB95 0 C014     LD   SLC16          INCREMENT AND UPDATE 8CF49140
OB96 0 8011     A   SLC12          INDIRECT ADDRESSES. 8CF49150
OB97 0 D012     STO  SLC16          8CF49160
OB98 0 C012     LD   SLC18          8CF49170
OB99 0 800E     A   SLC12          8CF49180
OB9A 0 D010     STO  SLC18          8CF49190
OB9B 0 72F9     MDX  2 -7          RESTORE BUFFER POINTER. 8CF49200
OB9C 0 71FF     MDX  1 -1          DECREMENT COUNTER. 8CF49210
OB9D 0 70E2     B   SLO30          LOOP.           8CF49220
OB9E 0 6500 0000 SLO50 LDX L1 *-#      RESTORE XR1.     8CF49230
OBA0 0 6600 0000 SLO60 LDX L2 *-#      RESTORE XR2.     8CF49240
OBA2 0 4F80 0AF8 B   I3 SLO10-BASE   RETURN.      8CF49250
*****
* CONSTANTS AND WORK AREAS
*****
OBA4 0 0B79     SLC02 DC          SUC84-BASE          8CF49260
*
* PATTERN TEST COUNT. IF THE NUMBER OF PATTERN
* TESTS CHANGE, SLC04 SHOULD BE CHANGED.
O009 0          SLC04 EQU          9                8CF49270
OBA5 0 0009     SLC06 DC          9                8CF49280
*
* RELATIVE ADDRESS OF BASE OF LOOP COUNTER TABLE.
OBA6 0 0F24     SLC08 DC          PXK60-BASE          8CF49290
*
* RELATIVE ADDRESS OF BASE OF FAILURE COUNTER TABLE.
OBA7 0 0EDC     SLC10 DC          PXK50-BASE          8CF49300
OBA8 0 0001     SLC12 DC          1                8CF49310
OBA9 0 0009     SLC14 DC          9                8CF49320
OBA0 0001     SLC16 BSS          1                8CF49330
OBA1 0001     SLC18 BSS          1                8CF49340
OBA2 0001     SLC20 BSS          1                8CF49350
OBA3 0 7204     SLC22 MDX          2 FOUR          INSTRUCTION FOR FILL RTN. 8CF49360
OBA4 0 00FF     SLC24 DC          /00FF          MASK TO LEAVE RIGHT BYTE. 8CF49370
OBA5 0 000C     SLC70 DC          12            SUMMARY HEADING. 8CF49380
*
* FA
OBB0 0 3631     DC   /3631          8CF49390
*
* IL
OBB1 0 3923     DC   /3923          8CF49400
*
* UR
OBB2 0 1429     DC   /1429          8CF49410
*
* ES
OBB3 0 3512     DC   /3512          8CF49420
*
* B
OBB4 0 0032     DC   /0032          8CF49430
*
* Y
OBB5 0 1800     DC   /1800          8CF49440
*
* PA
OBB6 0 2731     DC   /2731          8CF49450
*
* TT
OBB7 0 1313     DC   /1313          8CF49460
*
* ER
OBB8 0 3529     DC   /3529          8CF49470
*
* N
OBB9 0 2500     DC   /2500          8CF49480
*
* TE
OBB0 0 1335     DC   /1335          8CF49490
*
* ST
OBB1 0 1213     DC   /1213          8CF49500
*
* HEADING
OBB2 0 0008     SLC80 DC          11            8CF49510

```

CORE FUNCTION TEST

```

OBBD 0 0029     DC   /0029          R              8CF49660
OBBE 0 1325     DC   /1325          TN              8CF49670
OBBF 0 3800     DC   /3800          .              8CF49680
OBBC 0 0036     DC   /0036          F              8CF49690
OBC1 0 3139     DC   /3139          AI              8CF49700
OBC2 0 2314     DC   /2314          LU              8CF49710
OBC3 0 2935     DC   /2935          RE              8CF49720
OBC4 0 1200     DC   /1200          S              8CF49730
OBC5 0 0023     DC   /0023          L              8CF49740
OBC6 0 2626     DC   /2626          OD             8CF49750
OBC7 0 2712     DC   /2712          PS              8CF49760
*
*****
* ZERO LINE BUFFER SUBROUTINE
*
* THIS SUBROUTINE ZEROS THE LINE BUFFER THAT IS
* COMMON TO ALL SUMMARY SUBROUTINES.
*
* CALL -
*
* BSI L3 SU010-BASE
*
* XR1 IS NOT USED.
*
* XR2 IS SAVED AND RESTORED.
*
* XR3 IS THE PSEUDO BASE REGISTER.
*
*****
SU010 DC *-# ENTRY.
STX 2 SU050+1 SAVE XR2.
LDX 2 SUC02 XR2 IS USED AS A COUNTER.
LD SUC04 COMPUTE ABSOLUTE BASE
A 3 ONE ADDRESS OF LINE BUFFER
STO SU020+1 FOR OPERAND.
SRA 16 ZERO ACCUMULATOR.
SU020 STO L2 *-# STORE A ZERO INTO EACH
MDX 2 -1 POSITION.
B SU020
SU050 LDX L2 *-# RESTORE XR2.
B I3 SU010-BASE RETURN.
*****
* CONSTANTS, WORK AREAS AND LINE BUFFER
*
SUC02 EQU 37 NO. OF WORDS IN BUFFER.
BSS E 0 FORCE EVEN BOUNDARY.
*
SUC04 DC SUC80-BASE RELATIVE BASE ADDRESS OF
*
SUC80 DC 37 LINE BUFFER FOR ZEROING.
SUC82 BSS 1 XX XX THIS ADDRESS MUST BE ODD.
SUC84 BSS 1 YY X XX XX WORD COUNT FOR BUFFER.
BSS 1
SUC86 BSS 1 AA - W
BSS 1 A -- Y
BSS 1 BB -- X YY
BSS 1 B YY
BSS 1 CC -
BSS 1 C -- Y Z
BSS 1 DD -- ZZ

```

CORE FUNCTION TEST

```

OBE4 0001      BSS 1 D Z ZZ 8CF50340
OBE5 0001      BSS 1 EE 8CF50350
OBE6 0001      BSS 1 EE 8CF50360
OBE7 0001      BSS 1 8CF50370
OBE8 0001      SUC88 BSS 1 TT 8CF50380
OBE9 0001      BSS 1 TT 8CF50390
OBEA 0001      BSS 1 T 8CF50400
OBEB 0001      BSS 1 TT 8CF50410
OBEC 0001      BSS 1 T 8CF50420
OBED 0001      BSS 1 TT 8CF50430
OBEE 0001      BSS 1 TT 8CF50440
OBEF 0001      BSS 1 T 8CF50450
OBF0 0001      BSS 1 TT 8CF50460
OBF1 0001      BSS 1 T 8CF50470
OBF2 0001      BSS 1 SP 8CF50480
OBF3 0001      BSS 1 8CF50490
OBF4 0001      SUC90 BSS 1 FF 8CF50500
OBF5 0001      BSS 1 FF 8CF50510
OBF6 0001      BSS 1 F 8CF50520
OBF7 0001      BSS 1 FF 8CF50530
OBF8 0001      BSS 1 F 8CF50540
OBF9 0001      BSS 1 FF 8CF50550
OBFA 0001      BSS 1 FF 8CF50560
OBFB 0001      BSS 1 F 8CF50570
OBFC 0001      BSS 1 FF 8CF50580
OBFD 0001      BSS 1 F 8CF50590
OBFE 0001      BSS 1 SP 8CF50600
* 8CF50610
***** 8CF50620
***** 8CF50630
***** 8CF50640
* IMMEDIATE ERROR LOG SUBROUTINE 8CF50650
* 8CF50660
***** 8CF50670
* 8CF50680
* THIS SUBROUTINE PRINTS THE IMMEDIATE ERROR LOG. * 8CF50690
* IT PRINTS A HEADING IF IT HAS NOT BEEN PRINTED. * 8CF50700
* 8CF50710
* CALL - 8CF50720
* 8CF50730
* BSI L3 SV010-BASE 8CF50740
* 8CF50750
* XR1 AND XR2 ARE NOT USED. 8CF50760
* 8CF50770
* XR3 IS THE PSEUDO BASE REGISTER 8CF50780
* 8CF50790
* 3/14/69 8CF50800
* 8CF50810
***** 8CF50820
* 8CF50830
SV010 DC *-- ENTRY 8CF50840
STD SUC82 FILL IN ERROR CODE. 8CF50850
LD SVC02 TEST HEADING SWITCH 8CF50860
SKP Z SKIP NOT SET, WRITE HDNG. 8CF50870
B SV020 BRANCH TO CONTINUE. 8CF50880
STX 0 SVCQ2 TURN SWITCH ON. 8CF50890
BSI L3 MA010-BASE SPACE ONE LINE. 8CF50900
DC /F000 SPACE FUNCTION. 8CF50910
BSI L3 MA010-BASE WRITE HEADING. 8CF50920
DC MSG07-BASE MESSAGE. 8CF50930
BSI L3 MA010-BASE SPACE ONE LINE. 8CF50940
DC /F000 SPACE FUNCTION. 8CF50950
SV020 EQU * 8CF50960
LD SVC04 PUT WORD COUNT IN 8CF50970
STO SUC80 LINE BUFFER. 8CF50980
BSI L3 MA010-BASE WRITE IMMEDIATE 8CF50990
DC SUC80-BASE ERROR LOG. 8CF51000
B 13 SV010-BASE RETURN. 8CF51010

```

CORE FUNCTION TEST

```

OC15 0001
OC16 0 0025

```

```

OC17 0 0000
OC18 0 D018
OC19 0 D700 0492
OC1B 0 4700 08E3
OC1D 0 D014
OC1E 0
OC1F 0 C012
OC20 0 D100
OC22 0 2D41 0000
OC23 0 C00F
OC24 0 F00D
OC25 0 4818
OC26 0 7002
OC27 0 7101
OC28 0 70F5
OC29 0
OC29 0 D700 0493
OC2B 0 C008
OC2C 0 8301
OC2D 0 D700 03F7
OC2F 0 4F80 08B5

```

```

OC31 0001
OC32 0001
OC33 0001
OC34 0 0406

```

```

***** 8CF51020
* 8CF51030
* CONSTANTS AND WORK AREAS 8CF51040
* 8CF51050
***** 8CF51060
* 8CF51070
SVC02 BSS 1 HEADING SWITCH. 8CF51080
SVC04 DC 37 WORD COUNT. 8CF51090
* 8CF51100
***** 8CF51110
***** 8CF51120
***** 8CF51130
* INITIALIZE PATTERN AND SET STORAGE PROTECT BIT 8CF51140
* 8CF51150
***** 8CF51160
* 8CF51170
* THIS SUBROUTINE SETS THE PATTERN INTO EACH 8CF51180
* POSITION AND TURNS THE STORAGE PROTECT BIT ON. 8CF51190
* 8CF51200
* BSI L3 TA010-BASE 8CF51210
* 8CF51220
* THE PATTERN TO LOAD IS IN THE ACCUMULATOR. 8CF51230
* 8CF51240
* XR1 IS UNSPECIFIED AT INPUT. 8CF51250
* 8CF51260
* XR2 IS NOT USED. 8CF51270
* 8CF51280
* XR3 IS THE PSEUDO BASE REGISTER. 8CF51290
* 8CF51300
* 4/8/69 8CF51310
* 8CF51320
***** 8CF51330
* 8CF51340
* 8CF51350
TA010 DC *-- ENTRY. 8CF51360
STO TAC02 SAVE PATTERN. 8CF51370
L3 IXC12-BASE TEST PATTERN TO INTR. RTN 8CF51380
BSI L3 SA100-BASE SET ADDRESS LIMITS. 8CF51390
STO TAC04 SAVE END ADDRESS. 8CF51400
TA020 EQU * 8CF51410
LD TAC02 PUT PATTERN IN EACH 8CF51420
STO 1 ZERO POSITION AND TURN 8CF51430
STS L1 ZERO,/41 STORAGE PROTECT BIT ON. 8CF51440
STX 1 TAC06 TEST FOR LAST 8CF51450
LD TAC06 POSITION. 8CF51460
EOR TAC04 8CF51470
SKP +- SKIP NOT LAST POSITION. 8CF51480
B TA030 BRANCH TO EXIT. 8CF51490
MDX 1 ONE INCREMENT ADDRESS. 8CF51500
B TA020 LOOP. 8CF51510
TA030 EQU * 8CF51510
STO L3 IXC14-BASE SET STOR. PROT. SWITCH, 0 8CF51520
DC TAC08 INITIALIZE INCREMENT INSTR 8CF51530
LD TAC08 8CF51540
A 3 ONE UCTION OPERAND IN STORAGE 8CF51550
STO L3 IH040+1-BASE PROTECT INTERRUPT RTN. 8CF51560
B I3 TA010-BASE RETURN. 8CF51570
***** 8CF51580
* 8CF51590
* CONSTANTS AND WORK AREAS 8CF51600
* 8CF51610
***** 8CF51620
* 8CF51630
TAC02 BSS 1 PATTERN STORAGE. 8CF51630
TAC04 BSS 1 END ADDRESS. 8CF51640
TAC06 BSS 1 WORK AREA. 8CF51650
TAC08 DC I1010-BASE ADDRESS OF INTRPT. RETURN 8CF51660
* 8CF51670
***** 8CF51680
***** 8CF51690

```

CORE FUNCTION TEST

CORE FUNCTION TEST

```

*
* CLEAR STORAGE PROTECT BITS
*****
* THIS SUBROUTINE CLEARS THE STORAGE PROTECT BIT
* ON A BLOCK OF STORAGE.
* CALL -
*   BSI L3 TB010-BASE
*   THE PATTERN TO LOAD IS IN THE ACCUMULATOR.
*   XR1 IS UNSPECIFIED AT INPUT.
*   XR2 IS NOT USED.
*   XR3 IS THE PSEUDO BASE REGISTER.
*
*                               4/8/69
*****
*   XR1 SHOULD BE UNSPECIFIED.
*   XR2 IS NOT USED.
*   XR3 IS THE PSEUDO BASE REGISTER.
*
*                               4/9/69
*****
*
* TB010 DC *-* ENTRY.
*   BSI L3 SA100-BASE SET ADDRESS LIMITS.
*   STD TAC04 SAVE END ADDRESS.
*   STO L3 IXC14-BASE RESET STOR. PROT. SWITCH.
* TB020 EQU *
*   STS L1 ZERO,/40 CLEAR STORAGE PROTECT BIT.
*   STX 1 TAC06 TEST FOR LAST
*   LD TAC06 POSITION.
*   EOR TAC04
*   SKP +- SKIP NOT LAST
*   B TB030 POSITION.
*   MDX 1 ONE INCREMENT ADDRESS.
*   B TB020 LOOP.
* TB030 EQU *
*   B 13 TB010-BASE RETURN.
*****
* EXPLICIT ROUTINE TEST
*****
*
* UA010 DC *-* ENTRY.
*   LD L3 AAC52-BASE LOAD EXPLICIT ID.
*   RZ 13 UA010-BASE RETURN IF FULL TEST.
*   B L3 HZ010-BASE SUMMARIZE IF EXPLICIT.
*****
*
* MESSAGES
*****
*
* MSG01 DC 10 HEADING.
* DC /0A0A 00

```

```

OC35 0 0000
OC36 0 4700 08E3
OC38 0 D0F9
OC39 0 D700 0493
OC3B 0
OC3B 0 2D40 0000
OC3D 0 69F5
OC3E 0 C0F4
OC3F 0 F0F2
OC40 0 4818
OC41 0 7002
OC42 0 7101
OC43 0 70F7
OC44 0
OC44 0 4F80 0BD3

```

```

OC46 0 0000
OC47 0 C700 0028
OC49 0 4F98 0BE4
OC4B 0 4F00 031B

```

```

OC4D 0 000A
OC4E 0 0A0A

```

```

OC4F 0 0A0A DC /0A0A 00
OC50 0 0000 DC /0000
OC51 0 0A08 DC /0A08 08
OC52 0 3336 DC /3336 CF
OC53 0 0033 DC /0033 C
OC54 0 2629 DC /2629 OR
OC55 0 3500 DC /3500 E
OC56 0 1335 DC /1335 TE
OC57 0 1213 DC /1213 ST
OC58 0 0007 MSG02 DC 7 MESSAGE
OC59 0 0A0A DC /0A0A 00
OC5A 0 0A01 DC /0A01 01
OC5B 0 0000 DC /0000
OC5C 0 1235 DC /1235 SE
OC5D 0 1300 DC /1300 T
OC5E 0 3435 DC /3435 DE
OC5F 0 1200 DC /1200 S
OC60 0 0006 MSG03 DC 6 MESSAGE
OC61 0 0A0A DC /0A0A 00
OC62 0 010A DC /010A 10
OC63 0 0000 DC /0000
OC64 0 3435 DC /3435 DE
OC65 0 1200 DC /1200 S
OC66 0 0800 DC /0800 8
OC67 0 0007 MSG04 DC 7 MESSAGE
OC68 0 0A0A DC /0A0A 00
OC69 0 0102 DC /0102 12
OC6A 0 0000 DC /0000
OC6B 0 2625 DC /2625 ON
OC6C 0 3500 DC /3500 E
OC6D 0 3212 DC /3212 BS
OC6E 0 2400 DC /2400 M
OC6F 0 0007 MSG06 DC 7 MESSAGE
OC70 0 0A0A DC /0A0A 00
OC71 0 0101 DC /0101 11
OC72 0 0000 DC /0000
OC73 0 3435 DC /3435 DE
OC74 0 1200 DC /1200 S
OC75 0 0420 DC /0420 4-
OC76 0 073B DC /073B 7.
OC77 0 0025 MSG07 DC 37 MESSAGE
OC78 0 3326 DC /3326 CO
OC79 0 3435 DC /3435 DE
OC7A 0 0000 DC /0000
OC7B 0 0000 DC /0000
OC7C 0 0000 DC /0000
OC7D 0 0000 DC /0000
OC7E 0 3134 DC /3134 AD
OC7F 0 3429 DC /3429 DR
OC80 0 3512 DC /3512 ES
OC81 0 1200 DC /1200 S
OC82 0 0000 DC /0000
OC83 0 0000 DC /0000
OC84 0 0000 DC /0000
OC85 0 0000 DC /0000
OC86 0 0000 DC /0000
OC87 0 0000 DC /0000
OC88 0 0013 DC /0013 T
OC89 0 3512 DC /3512 ES
OC8A 0 1300 DC /1300 T
OC8B 0 2731 DC /2731 PA
OC8C 0 1313 DC /1313 TT
OC8D 0 3529 DC /3529 ER
OC8E 0 2500 DC /2500 N
OC8F 0 0000 DC /0000
OC90 0 1227 DC /1227 SP
OC91 0 0000 DC /0000
OC92 0 0000 DC /0000

```

```

8CF52380
8CF52390
8CF52400
8CF52410
8CF52420
8CF52430
8CF52440
8CF52450
8CF52460
8CF52470
8CF52480
8CF52490
8CF52500
8CF52510
8CF52520
8CF52530
8CF52540
8CF52550
8CF52560
8CF52570
8CF52580
8CF52590
8CF52600
8CF52610
8CF52620
8CF52630
8CF52640
8CF52650
8CF52660
8CF52670
8CF52680
8CF52690
8CF52700
8CF52710
8CF52720
8CF52730
8CF52740
8CF52750
8CF52760
8CF52770
8CF52780
8CF52790
8CF52800
8CF52810
8CF52820
8CF52830
8CF52840
8CF52850
8CF52860
8CF52870
8CF52880
8CF52890
8CF52900
8CF52910
8CF52920
8CF52930
8CF52940
8CF52950
8CF52960
8CF52970
8CF52980
8CF52990
8CF53000
8CF53010
8CF53020
8CF53030
8CF53040
8CF53050

```

CORE FUNCTION TEST

```

OC93 0 0000      DC      /0000
OC94 0 3631      DC      /3631      FA
OC95 0 3923      DC      /3923      IL
OC96 0 3800      DC      /3800      .
OC97 0 2731      DC      /2731      PA
OC98 0 1313      DC      /1313      TT
OC99 0 3529      DC      /3529      ER
OC9A 0 2500      DC      /2500      N
OC9B 0 0000      DC      /0000
OC9C 0 1227      DC      /1227      SP
OC9D 0 0009      MSG08 DC      9          MESSAGE
OC9E 0 0106      DC      /0106      16
OC9F 0 0308      DC      /0308      38
OCA0 0 0000      DC      /0000
OCA1 0 3631      DC      /3631      FA
OCA2 0 2312      DC      /2312      LS
OCA3 0 3500      DC      /3500      E
OCA4 0 3925      DC      /3925      IN
OCA5 0 1329      DC      /1329      TR
OCA6 0 2713      DC      /2713      PT
OCA7 0 000A      MSG09 DC      10         MESSAGE.
OCA8 0 0106      DC      /0106      16
OCA9 0 0307      DC      /0307      37
OCAA 0 0000      DC      /0000
OCAB 0 3631      DC      /3631      FA
OCAC 0 2312      DC      /2312      LS
OCAD 0 3500      DC      /3500      E
OCAE 0 3331      DC      /3331      CA
OCAF 0 2900      DC      /2900      R
OCB0 0 3338      DC      /3338      CH
OCB1 0 2238      DC      /2238      K.
OCB2 0 0007      MSG10 DC      7          MESSAGE.
OCB3 0 0A0A      DC      /0A0A      00
OCB4 0 0104      DC      /0104      14
OCB5 0 0000      DC      /0000
OCB6 0 3435      DC      /3435      DE
OCB7 0 1200      DC      /1200      S
OCB8 0 0A20      DC      /0A20      0-
OCB9 0 0338      DC      /0338      3.
OCBA 0 0009      MSG11 DC      9          END MESSAGE.
OCBB 0 0105      DC      /0105      15
OCBC 0 0A09      DC      /0A09      09
OCBD 0 0035      DC      /0035      E
OCBE 0 2534      DC      /2534      ND
OCBF 0 0033      DC      /0033      C
OCC0 0 2629      DC      /2629      OR
OCC1 0 3500      DC      /3500      E
OCC2 0 1335      DC      /1335      TE
OCC3 0 1213      DC      /1213      ST
OCC4 0 0007      MSG12 DC      7          MESSAGE
OCC5 0 0106      DC      /0106      16
OCC6 0 0309      DC      /0309      39
OCC7 0 0000      DC      /0000
OCC8 0 3114      DC      /3114      AU
OCC9 0 1700      DC      /1700      X
OCCA 0 3529      DC      /3529      ER
OCCB 0 2938      DC      /2938      R.

```

```

*****
*
* SUMMARY STORAGE AREA
*
*****
* THE SUMMARY STORAGE AREA HAS THE LOCATIONS
* RESERVED FOR ALL THE ERROR COUNTERS FOR THE
* PATTERN TESTS.
*
* ANY CHANGE IN THIS STORAGE AREA SHOULD BE

```

```

8CF53060
8CF53070
8CF53080
8CF53090
8CF53100
8CF53110
8CF53120
8CF53130
8CF53140
8CF53150
8CF53160
8CF53170
8CF53180
8CF53190
8CF53200
8CF53210
8CF53220
8CF53230
8CF53240
8CF53250
8CF53260
8CF53270
8CF53280
8CF53290
8CF53300
8CF53310
8CF53320
8CF53330
8CF53340
8CF53350
8CF53360
8CF53370
8CF53380
8CF53390
8CF53400
8CF53410
8CF53420
8CF53430
8CF53440
8CF53450
8CF53460
8CF53470
8CF53480
8CF53490
8CF53500
8CF53510
8CF53520
8CF53530
8CF53540
8CF53550
8CF53560
8CF53570
8CF53580
8CF53590
8CF53600
8CF53610
8CF53620
8CF53630
8CF53640
8CF53650
8CF53660
8CF53670
8CF53680
8CF53690
8CF53700
8CF53710
8CF53720
8CF53730

```

CORE FUNCTION TEST

```

OCCC 0 0060
OCCD 0 0C6A
OCCE 0001
OCCF 0001
OCD0 001E
OCEE 0001
OCEF 0001
OCF0 0001
OCF1 0001
OCF2 0024
OD16 0024
OD3A 0024
OD5E 0024
OD82 0024
ODA6 0024
ODCA 0024
ODEE 0
ODEE 0008
ODF6 0008
ODFE 0008
OE06 0010
OE16 0028
OE3E 0028
OE66 0028
OE8E 0028
OEB6 0028
OEDE 0028
OF06 0028
OF2E 0
OF2E 0001
OF2F 0001
OF30 0002
OF32 0002
OF34 0002
OF36 0002
OF38 0002
OF3A 0002
OF3C 0002
OF3E 0
OF3E 0048
OF86 0
OF86 0048
OFCE 0000

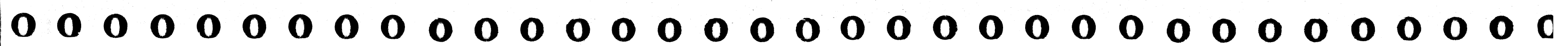
```

```

* REFLECTED IN PXX04 OR STRANGE THINGS WILL * 8CF53740
* HAPPEN. * 8CF53750
* * 8CF53760
***** * 8CF53770
* * 8CF53780
* * 8CF53790
* * 8CF53800
* * 8CF53810
* * 8CF53820
* * 8CF53830
* * 8CF53840
* * 8CF53850
* * 8CF53860
* * 8CF53870
* * 8CF53880
* * 8CF53890
* * 8CF53900
* * 8CF53910
* * 8CF53920
* * 8CF53930
* * 8CF53940
* * 8CF53950
* * 8CF53960
* * 8CF53970
* * 8CF53980
* * 8CF53990
* * 8CF54000
* * 8CF54010
* * 8CF54020
* * 8CF54030
* * 8CF54040
* * 8CF54050
* * 8CF54060
* * 8CF54070
* * 8CF54080
* * 8CF54090
* * 8CF54100
* * 8CF54110
* * 8CF54120
* * 8CF54130
* * 8CF54140
* * 8CF54150
* * 8CF54160
* * 8CF54170
* * 8CF54180
* * 8CF54190
* * 8CF54200
* * 8CF54210
* * 8CF54220
* * 8CF54230
* * 8CF54240
* * 8CF54250

```

NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY



CORE FUNCTION TEST

AAC02 0059 0011 0037 0041 0048 004D 004E
AAC04 005A 000B 000D 0012 002F 0036 00CD 03A9 07E8
AAC10 005B 0024 002E 0043 0051 00C3 0826 088F 08E3 0938
AAC20 005C 0065
AAC22 005D 0067
AAC24 005E 006A
AAC26 005F 006D
AAC50 0088 001F 0025 0032 007E 00A6 00BC 026E 037D 04B4 056A 05D2 05DA 05E2
05E9 05F0 05F8 0617 0624 081E 0887 08DB 08F6 0929
AAC52 008A 0080 0C47
AAC56 008B 0081
AAC58 008C 008B
AAC60 009C 006F
AAC62 009D 0072
AAC64 009E 0071 0630
AAC66 009F 0074 052C 063F
AA000 0000 06BD 06BE 06C5 07C8 081B 0FCE
AA001 0004 000A
AA020 0015 005E 03BE
AA022 001F 002D 003E 0058
AA030 002E 0023
AA034 003F 0039
AA036 004E 004A
AA038 0051 0035
AA040 0054 0031
AA050 0060 000C 0075 0078
AA080 0077 0079 07C8 081B
AA085 007C 007B
AA100 007E 0028 0045 0388 07AE
AA130 0083 0082
AA140 0086 0085
AA200 00A0 0095 0096 0097 0098 0099 009A
ABC90 00B5 00B1
ABC92 00B6 00AA 00AB 00AE
AB010 00A5 00B3 00DC 0130 0161 0190 0211 023A 0263 02D5
AB015 00AA 00A8
AB020 00B3 00A9
ACC05 00D7 00BD
ACC10 00D8 00BF 00C6 00C8 00D0 00D3
ACC15 00D9 00C7
ACC20 00DA 00CC 00D1
AC010 00BB 00D5 0105 013F 016D 01E9 0218 0241 0291 02F0
AC020 00C9 00C2 00C5
AC040 00D3 00CF
AC050 00D4 00D2
BAC02 0114 00EC 00F7
BAC04 0115 00ED 00EE 00F3 00F6
BAC06 0116 00DD
BAC08 0117 00DE 00E4 00FC 0100
BAC12 0118 00FD
BAC16 0119 00DF
BAC18 011A 0102
BAC20 011B 0106
BAC22 011C 011B
BAC24 0122 00E1
BASE 0062 000E 0013 0015 0018 001A 001B 001D 0029 002B 003A 003C 004F 0052
0054 0056 005E 005F 0061 0075 0079 008B 008C 008D 008E 008F 0090
0091 0092 0093 0094 0095 0096 0097 0098 0099 009A 009B 009C 009D
00A0 00A2 00A6 00AC 00AF 00B1 00B3 00BC 00C3 00CD 00D5 00DC 00E2
00E7 00EA 00EF 0105 010D 010F 0110 0111 0113 011B 011C 011D 011E
011F 0120 0121 0122 0123 0126 0128 0129 012B 012C 012D 0130 0132
0135 013F 0147 0149 014A 014B 014D 014F 0150 0151 0152 0153 0154
0155 0156 0157 0159 015A 015C 015D 015E 0161 0163 0166 016D 0175
0177 0178 0179 017B 017E 017F 0180 0181 0182 0183 0184 0185 0186
0188 0189 018B 018C 018D 0190 0196 0198 01B1 01B4 01CD 01DB 01DE
01E0 01E9 01F1 01F3 01F4 01F5 01F7 01FF 0200 0201 0202 0203 0204
0205 0206 0207 0209 020A 020C 020D 020E 0211 0213 0216 0218 0220
0222 0223 0224 0226 0228 0229 022A 022B 022C 022D 022E 022F 0230

CORE FUNCTION TEST

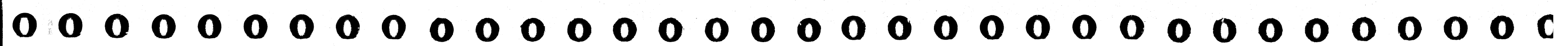
0232 0233 0235 0236 0237 023A 023C 023F 0241 0249 024B 024C 024D
024F 0251 0252 0253 0254 0255 0256 0257 0258 0259 025B 025C 025E
025F 0260 0263 0265 0267 026E 0291 0299 029B 029C 029D 029F 02A8
02AC 02AD 02AE 02AF 02B0 02B1 02B2 02B3 02B7 02B9 02BB 02C7 02C9
02CB 02CC 02CE 02CF 02D2 02D5 02D8 02DC 02E0 02E5 02E7 02F0 02F9
02FB 02FC 02FD 02FF 0303 0304 0305 0306 0307 0308 0309 030A 030B
030D 030E 0310 0311 0312 0316 0320 0323 0330 033F 0351 0356 0359
0372 0374 0376 037D 0383 0385 0387 0388 038C 0393 0395 0398 039A
039C 039E 03A0 03A2 03A4 03A6 03A9 03B2 03B5 03B7 03B8 03BC 03BE
03D4 03E6 0405 0407 041C 0420 0427 0429 0430 0432 043D 0448 0451
0453 045B 045C 0467 0482 0486 0489 048F 0493 0495 04A4 04A8 04B4
04BD 04BF 04C4 04CA 04CB 04CC 04CD 04CE 04CF 04D0 04D1 04D2 04D3
04DB 04E8 04EA 04EB 04EC 04ED 04EE 04EF 04F0 04F1 04F2 04FB 04FE
0513 0516 051F 052A 052C 0532 0550 0555 0558 055F 056A 056F 0572
057F 0581 058B 058D 058E 0593 05BA 05BC 05BE 05C0 05C2 05C5 05CC
05CE 05D0 05D2 05D7 05D9 05DA 05DF 05E2 05E6 05E8 05E9 05ED 05F0
05F5 05F7 05F8 05FD 0601 0610 0612 0615 0617 061E 0622 0624 0629
062B 0630 0635 0638 063F 0643 0659 065E 067A 06A4 06A7 06BB 06C6
06D2 06E7 06E9 06EF 06F1 06F4 0712 0729 075E 0767 077B 077D 07AE
07C1 07D0 07DB 07E3 07E8 07FE 081E 0826 084B 0850 0856 085B 0872
0878 087C 087E 087F 0887 088F 089F 08A4 08AF 08B4 08BF 08C4 08C8
08CE 08D3 08D6 08DB 08E3 08F6 08FA 08FC 0902 0904 0913 0915 091B
0924 0926 0929 0936 0938 094B 0954 0957 095A 095C 095D 0960 0962
0963 0966 0973 097F 0983 0985 0987 098E 0995 0997 0998 099B 0A10
0A15 0A16 0A2F 0A32 0A35 0A37 0A38 0A3B 0A3D 0A3E 0A40 0A41 0A44
0A48 0A81 0A83 0A8B 0A9C 0A9E 0AA1 0AA5 0AA7 0AAA 0AAD 0AAF 0AB0
0AB7 0ABA 0AC2 0AC8 0ACC 0AD2 0B14 0B17 0B19 0B1A 0B23 0B2B 0B2E
0B30 0B32 0B33 0B38 0B3A 0B3B 0B5B 0B5E 0B60 0B61 0B64 0B66 0B67
0B6A 0B74 0B83 0B88 0B8B 0B8D 0B90 0B92 0B94 0BA2 0BA4 0BA6 0BA7
0BD5 0BD8 0C05 0C08 0C0A 0C0B 0C10 0C12 0C13 0C19 0C1B 0C29 0C2D
0C2F 0C34 0C36 0C39 0C44 0C47 0C49 0C4B 0CCD
BA010 00DB 008C 008D
BA020 00DD 010F 0113 0121 0128 012B
BA040 00E4 0104
BA050 00EA 00E6
BA060 00EC 00E9
BA070 00ED 00FB
BA075 00F6 0125
BA080 00FA 00E0 0101 0103
BA085 00FC 00F9
BA090 0105 00FF
BA100 0108 0107
BA110 010B 010A
BA120 010D 011C
BA150 0111 011F
BA200 0123 00F5
BA300 0126 011D
BA400 0129 011E
BA520 012D 0110 0120 012C
CAC02 014E 013D
CAC18 014F 0140
CAC20 0150 014F
CAC24 0156 0131
CA010 012F 008E
CA020 0131 0149 014D 0155 0159 015C
CA030 0135 013A 013E
CA100 013B 0138
CA110 013F 013C
CA120 0142 0141
CA125 0145 0144
CA130 0147 0150
CA140 0148 0153
CA300 0157 0151
CA400 015A 0152
CA520 015E 014A 0154 015D
DAC02 017C 0165
DAC16 017D 016B
DAC20 017E 016E

CORE FUNCTION TEST

DAC22 017F 017E
 DAC26 0185 0162
 DA010 0160 008F
 DA020 0162 0177 017B 0184 0188 018B
 DA030 0166 016C
 DA110 016D 0169
 DA120 0170 016F
 DA130 0173 0172
 DA140 0175 017F
 DA150 0179 0182
 DA300 0186 0180
 DA400 0189 0181
 DA520 018D 0178 0183 018C
 DCC02 01F8 0191
 DCC04 01F9 0192 01AE 01C4 01C8
 DCC06 01FA 0193
 DCC08 01FB 019A 01A9 01B6 01BF 01CF 01E4
 DCC10 01FC 019B 019C 019E 01A0 01A7 01A8 01B0 01BE 01D0 01D1 01D3 01D5 01E2
 01E3
 DCC12 01FD 01A3 01C5 01D8
 DCC14 01FE 01CA
 DCC16 01FF 0195
 DCC18 0200 01EA
 DCC20 0201 0200
 DC010 018F 0090
 DC020 0191 01F3 01F7 0206 0209 020C
 DC030 019B 01AD
 DC040 01A5 01A2
 DC050 01A6 01A4
 DC060 01AE 01AB 01CC
 DC062 01B4 01B0
 DC064 01B6 01B3
 DC066 01B7 01C3
 DC068 01BA 06C5
 DC070 01C2 0194 01C9 01CB
 DC080 01C4 01C1
 DC090 01CD 01C7
 DC100 01D0 01E8
 DC110 01DA 01D7
 DC112 01DB 01D9
 DC120 01E2 01DE
 DC122 01E9 01E6
 DC125 01EC 01EB
 DC130 01EF 01EE
 DC140 01F1 0201
 DC150 01F5 0204
 DC300 0207 0202
 DC400 020A 0203
 DC520 020E 01F4 0205 0200
 DFC02 0227 0215
 DFC04 0228 0219
 DFC06 0229 0228
 DFC10 022F 0212
 DF010 0210 0091
 DF020 0212 0222 0226 022E 0232 0235
 DF120 021B 021A
 DF130 021E 021D
 DF140 0220 0229
 DF150 0224 022C
 DF300 0230 022A
 DF400 0233 022B
 DF520 0237 0223 022D 0236
 DKC08 0250 023E
 DKC18 0251 023B
 DKC20 0252 0242
 DKC22 0253 0252
 DK010 0239 0092
 DK020 023B 024B 024F 0258 025B 025E

CORE FUNCTION TEST

DK120 0244 0243
 DK130 0247 0246
 DK140 0249 0253
 DK150 024D 0256
 DK300 0259 0254
 DK400 025C 0255
 DK520 0260 024C 0257 025F
 DPC02 02A0 02B6
 DPC08 02A1 026C 0274
 DPC10 02A2 0273 0280 0284
 DPC12 02A3 0276 0279 027D
 DPC14 02A4 027A 0281
 DPC16 02A5 0286
 DPC18 02A6 028D
 DPC20 02A8 02C0
 DPC21 02AA 02C3
 DPC22 02AC 0264
 DPC24 02AD 0292
 DPC26 02AE 02AD
 DPC28 02B4 0290 02C6 04A8 06D2
 DP010 0262 0093
 DP020 0264 029B 029F 02B3 02CB 02CE
 DP025 026C 028F
 DP030 0274 0288
 DP036 0277 0285 0287 0289 028E 02BD
 DP040 0279 02A8 02D1 058E
 DP046 027E 028C 02BE
 DP050 0280 027C
 DP060 0289 0283
 DP070 0290 028B
 DP120 0294 0293
 DP130 0297 0296
 DP140 0299 02AE
 DP150 029D 02B1
 DP200 02B5 026B 02C7 02D0
 DP300 02C9 02AF
 DP400 02CC 02B0
 DP500 02D0 04D1
 DP520 02D2 029C 02B2 02CF
 DZC02 0300 02DA
 DZC04 0301 02DE 02EB
 DZC06 0302 02E9 02EA
 DZC08 0303 02D7
 DZC10 0304 02F2
 DZC12 0305 0304
 DZ010 02D4 0094
 DZ020 02D7 02FB 02FF 030A 030D 0310
 DZ030 02E2 02EF
 DZ040 02E9 02E5
 DZ050 02F0 02ED
 DZ080 02F4 02F3
 DZ090 02F7 02F6
 DZ140 02F9 0305
 DZ150 02FD 0308
 DZ300 030B 0306
 DZ400 030E 0307
 DZ520 0312 02FC 0309 0311
 EIGHT 0008 0026 0033 006E 02D4 0390 041A 041B 048D 048B 076B 092A 09E4 0A7B
 0A92 0B3C
 ETEST 037D 06BE
 EXCHA 0010 026D 0932 094A 094F 0953
 EXC02 0342 0318 0326 0329 033C 034B 0350 035D 0378
 EXC04 0343 0319 034C
 EXC06 0344 031A 031D 0333 0337 034D 0353 0369 036D
 EXC08 0345 031B 034E
 EXC10 0346 0325 032E 035B 0364
 EXC12 0347 032C 032D 0362 0363
 EXC14 0348 0334 036A



CORE FUNCTION TEST

EXC16 0349 0339 036F
EX010 0315 0135 0166 0216 033D
EX020 0310 033B
EX030 0323 031F
EX040 0325 0322
EX050 0326 0332
EX060 032C 0341
EX070 0331 031C 0338 033A
EX080 0333 0330
EX090 033C 0336
EX200 033F 032B
EY010 034A 023F 02DB 0374
EY020 0353 0371
EY030 0359 0355
EY040 035B 0358
EY050 035C 0368
EY060 0361 045B
EY070 0362 037C
EY080 0367 034F 036E 0370
EY090 0369 0366
EY100 0372 036C
EY200 0376 035F 0361
FIVE 0005 006B 0210 046D 04DD 08F7 0A76 0A91
FOUR 0004 0020 0068 00BE 00CA 018F 0687 06EC 0754 075B 08AC 099E 09DD 0BAD
HZK01 03C0 038F 03AB 03AE 03B0 03D0 0973 0A48 0B23 0B74
HZK02 03C1 038E 03AF 03D1 03D9 03E4 0423
HZK03 0009 03DB
HZK04 03C2 03D2
HZK06 03C3 0382
HZK08 03C4 038B
HZK90 03C5 039A
HZK92 03CE 0391
HZX90 0409 0407
HZX92 040A 0401 0402 0404
HZ010 037D 0314 0C4B
HZ100 038A 009B 0381 0408 0467
HZ110 0390 03B1
HZ140 03A4 039D
HZ145 03A9 0394
HZ150 03B2 03AD
HZ200 03CF 0392 039B 03D4 03D8 03DA 03E3 03E5 03E6
HZ210 03DC 03D7 03E1
HZ220 03E3 03DF
HZ230 03E6 03E2
HZ500 0401 0878 08CE 08FC
ICC02 041E 0414 0416 0419
IC010 0412 00AC 0403 041C 042D 044F 0572 061E 0B83
IGC02 043A 042E 042F
IG010 041F 04D0 04F0
IG020 0425 0424
IG030 042D 042B
IHC02 045B 0441
IHC04 045C 0446
IHC06 045D 0453
IHC08 045E 0450
IHC10 0467 0454
IH010 043C 04CE
IH020 044B 0440 04EE
IH030 0454 0438
IH040 0458 0445 044A 0C2D
IIC02 04C6 0469 0481 04FD 055F 05BE
IIC04 04C8 0471 0479 0488 0497 04C1
IIC06 04CA 046E
IIC08 04CB 04CA
IIC12 04D1 04B1
IIC26 04D2 048B
IIC32 04D3 04B9
IIC34 04D4 0432 0472 0534

CORE FUNCTION TEST

II010 0468 005F 0422 0443 0448 0456 0458 0482 04AD 04B3 04D3 05CC 06A7 06E9
OC34
II020 0474 0470
II030 0477 0476
II040 0479 0457 045A
II050 047C 046A
II060 047E 042C 044E 046B 0492
II070 0480 046C
II200 0484 0436 04BD 04CF
II240 049D 04C4 04F1
II250 049D 000E
II255 049F 04A3
II260 04A0 04F2
II295 04B4 04AB 04B0 051F
II300 04BF 0491
IXC02 04EA 04DE
IXC04 04EB 04EA
IXC06 04F1 0519
IXC08 04F2 0521
IXC10 04F3 04DA 0531 058C
IXC12 04F4 00EF 01DB 02E0 0316 055E 05BA 0635 06E7 0C19
IXC14 04F5 043D 0508 0569 0638 06EF 0C29 0C39
IXC18 04F6 050E 0541
IXC20 04F7 0511 0544
IXC22 04F8 04E1 0500 0504 0538 053C 0547
IXC24 0584 0574 057E
IXC25 0585 057D
IXC26 0586 0529
IXC28 0588 0549 054A 0592 0595 059C 05A1 05A2 05A8 05AE 05B4
IXC30 0302 0575
IXC32 0589 0489 0546 0548 057A 05A7 05AD 05B3
IXC34 058A 0486 04A4 054E 0577
IXC38 058B 0557
IXC40 058C 0562
IXC42 058D 05CA
IXC44 058E 05A5
IXC46 058F 05AB
IXC48 0590 05B1 05B7
IXC50 0591 05B9
IXXXX 05E1 04CC 04EC 05ED
IXX20 05E9 05E5
IX010 04D9 04D2 04E8 051B 0523 05CE
IX020 04E3 04E0
IX030 04E6 04E5
IX100 04FA 0516 051E 05C0
IX120 050D 050A
IX130 0510 0507
IX140 0512 050F
IX200 0518 04EF 0550 05C2
IX300 0521 051D
IX305 0529 059F
IX310 052F 052E
IX320 0540 0537
IX330 0543 053F
IX340 0545 0542
IX600 0552 0515 054F 0581
IX610 0553 0493 04BF 0526 055A 0571
IX650 056A 055C 0564
IX660 0581 056E
IX700 0592 0528
IX710 059B 0598
IX715 05A2 059A
IX720 05A7 05A3 05A4
IX730 05AD 05A9 05AA
IX740 05B3 05AF 05B0
IX750 05B9 05B5 05B6
IX760 05BA 05A6 05AC 05B2 05B8
IX800 05C4 04CD 04ED 05D0 05DF

CORE FUNCTION TEST

IX810 05D2 05C8
 IX820 05DA 05D6
 IY010 05EF 04CB 04EB 05FD
 IY020 05F8 05F4
 JAC02 062B 0614
 JAC04 062C 0620 0621
 JAC06 062E 060A 063D
 JA010 05FF 0123 01E0 02E7 033F 0376 0629
 JA032 0608 045C
 JA040 060E 0600 0608 061D
 JA050 0624 061B
 JB010 062F 04FB 0603 0643
 JB020 0633 0632
 JB030 063F 063B
 JB040 0641 0640
 KAC02 065B 0646 064C
 KAC04 065C 0649 066B 0673
 KAC06 065D 0652 0684 068F 0691
 KAC08 065E 0664
 KAC10 065F 066D
 KAC12 0660 0657
 KAC14 0661 0655
 KA010 0645 04FE 0532 0605 0637 0659
 KA050 064F 0647
 KA070 0657 0654
 KA080 0658 0656
 KB010 0662 0427 056F 061C 067A
 KB020 0667 0666
 KB040 0676 0669 066F
 KB050 0678 0663
 KCC02 067C 064A 066C 069D 06A1
 KCC04 067D 064B 066E 0674 0685
 KCC06 067E 0686 0692 0696
 KCC08 067F 0689 0690
 KCC10 0680 068B
 KCC12 0681 0693 069E
 KC010 0682 064E 0671 0675 06A4
 KC020 0685 06A3
 KC030 0687 069C
 KC040 069D 0695
 KC050 06A4 06A0
 KLC02 068D 06B1
 KLC04 068E 06B4
 KLC06 068F 06B8
 KLC08 06C0 06A9 06C8 06CE
 KLC10 06C1 06CC 06CD 06DC 06DD 06DF 06E1
 KLC12 06C2 06D6
 KLC14 06C3 06D9
 KLC16 06C4 06E4
 KLC18 06C5 06EB
 KL010 06A6 0429 044B 048F 06B7 06B9 06BB
 KL020 06B4 06B2
 KL030 06BA 06B3 06B5 06D1 06D5
 KL040 06BB 06D7
 KL050 06C6 06AF
 KL060 06D2 06CB
 KM010 06D8 0495 06F1
 KM020 06E6 06E3
 KM030 06E7 06E5
 KM050 06F1 06DB 06EE
 MAC01 0719 05C5 06FE 070E
 MAC05 071A 06F7
 MAC10 071C 06FB 0715
 MAC15 071E 06F6 06FF 0705 0706 0731
 MAC20 0720 0707 0739 0745 0749
 MAC25 0722 0710 0746 0757
 MAC30 0724 0753 0763
 MAC35 0726 0730 073F 0765

CORE FUNCTION TEST

MAC40 0728 0729 073E 0764
 MAC45 0729 072F
 MAC50 072A 0702
 MAD01 0400 0267
 MA010 06F3 0015 0018 001B 0029 003A 0054 00A0 00AF 0385 0395 0398 03A6 03B2
 03B5 03B8 0405 0451 05D7 05E6 05F5 06F4 070F 0711 0712 0902 0957
 095A 095D 0960 0963 0985 098E 0A32 0A35 0A38 0A3B 0A3E 0A41 0A81
 0A8B 0A9C 0AA1 0AAD 0AB0 0B14 0B17 0B1A 0B30 0B33 0B5B 0B5E 0B61
 0B64 0B67 0B92 0C05 0C08 0C0B 0C10
 MA015 06F4 0716 0718
 MA020 06FB 058D
 MA025 0704 0701
 MA030 0707 0703 070A
 MA036 070F 0751
 MA040 0714 070C
 MA050 0717 06FD
 MA100 072C 06FA
 MA105 0736 0735
 MA110 073D 0744 074B
 MA130 074C 0733 0748
 MA140 074D 072D
 MA145 074F 072C
 MA150 0752 073C 0740 0756 075E 0766
 MA155 0757 0761
 MA180 0760 075A 075D
 MA200 0762 074C 0767
 MMC05 077D 0774
 MMC10 077E 076E
 MM010 0769 073D 077B
 MM030 0776 0775
 MM050 0779 076A 0773
 MSG01 0C4D 001A
 MSG02 0C58 001D
 MSG03 0C60 002B
 MSG04 0C67 003C
 MSG06 0C6F 0056
 MSG07 0C77 0C0A
 MSG08 0C9D 05F7
 MSG09 0CA7 05D9
 MSG10 0CB2 00A2
 MSG11 0CBA 03B7
 MSG12 0CC4 05E8
 NAC02 07C3 079E 07D5 07E7
 NAC04 07C4 07A0 07CC 07D7 07ED
 NAC06 07C5 07A1 07A4 07A7 07A9 07CD 07CF 07D8 07DA 07EE 07F0
 NAC08 07C6 07A3 07B6 07CB
 NAC10 07C7 07B0 07B7
 NAC12 07C8 07AA
 NAC14 07D2 07B3
 NA010 079E 004F 0052
 NA020 07A9 07A6
 NA030 07AC 07AB
 NA100 07AF 07A8 07C1 07CE 07D9 07EF
 NA110 07B9 07B8 07BE
 NA120 07BB 07B1
 NA130 07BF 07B2
 NB010 07C9 07D0 07E2 07FB
 NC010 07D2 07D8 07EB 07F9
 ND010 07DD 07E3 0807
 ND015 07E3 07EC 07F1
 ND020 07E5 07E1
 ND030 07ED 07EA
 NEC02 081B 07FC
 NEC04 081C 0805 0818
 NE010 07F2 010D 0147 0175 01F1 0220 0249 0299 02F9 07FE 0804 0806 080B 080F
 0813 0817 0819
 NE020 07FB 07F5 080C 0816 081A
 NE030 07FC 07FA 0808

CORE FUNCTION TEST

NE040 0801 07FD
 NE050 0803 0800
 NE100 0804 07F8
 NE110 0807 0810
 NE200 0809 0111 0148 0179 01F5 0224 024D 029D 02FD 080A
 NE300 080D 0126 0157 0186 0207 0230 0259 02C9 030B 080E
 NE400 0811 0129 015A 0189 020A 0233 025C 02CC 030E 0812
 NINE 0009 00C8
 ONE 0001 003F 0042 0046 004B 0069 006C 0070 0073 00C9 00D4 00DB 00FA 0119
 0139 016A 01AC 01C2 01E7 01FA 0271 0275 02EE 0331 0345 0367 03D6
 0434 0442 0447 0455 046F 048C 04AC 04B2 04B6 04BA 04DF 051A 0522
 054B 0579 05CB 05DC 05EA 05FA 0626 0651 0665 0672 0688 069B 06A2
 06AC 0704 072E 0734 073A 074A 0772 07A2 07B5 07CA 07D3 07DE 07E5
 07F6 0823 082B 082E 0831 0869 086C 088C 0895 08B7 08B9 08E0 08E8
 091D 092D 096C 0971 0979 098C 09CA 09CF 09ED 0A25 0A2C 0A4E 0A64
 0A69 0B1F 0B26 0B70 0B79 0BCC 0C27 0C2C 0C42
 PQC02 087A 0827 0849 084D 0853 0858 0861
 PQC04 087B 0828
 PQC06 087C 082A
 PQC08 087D 082C 0848 084A 084B 0850 0852 0854 0856 085B 085D 085F
 PQC10 087E 082D
 PQC12 087F 0830
 PQC14 0880 085E
 PQC16 0881 0839 0860 0864
 PQC18 0882 0838
 PQC20 0883 083D 0842
 PQC22 0884 083E 0843
 PQ010 081D 0513 0610 0872
 PQ020 0826 0822
 PQ030 0828 0825
 PQ050 0838 086D
 PQ060 083A 0832 086A
 PQ070 083F 082F
 PQ080 0856 0847
 PQ090 085D 0845
 PQ100 0860 0855
 PQ110 086C 0863
 PQ120 086E 0833 086B
 PQ130 0870 0834 0874
 PQ140 0874 084F 085A
 PQ150 0876 0875
 PRC04 08D0 0896 089D 08A6 08A8 08AD 08BA 08BF 08C4 08CA 08CC
 PRC06 08D1 0890 08A1 08B1 08C1 08CB 08E4 08ED
 PRC08 08D2 0892
 PRC10 08D3 0894
 PRC12 08D4 089E 089F 08A4 08AE 08AF 08B4
 PRC14 08D5 08A7
 PRC16 08D6 08B8
 PRC18 08D7 0891 08B6 08D9 08E7 08F2
 PRO10 0885 0555 0612 08C8
 PRO14 088F 088B
 PRO16 0891 088E
 PRO20 089B 08AA
 PRO30 08BF 08CD
 PRO40 08C6 0886 0899 08BB
 PRO50 08CA 08BE
 PRO60 08CE 08A3 08B3 08C3
 PSC06 0906 08E5
 PSC08 0907 0900
 PSC10 0908 0387 0904
 PSC12 0909 0383 08FE 08FF 0901
 PSC14 0913 08F3
 PS010 08D8 00E2 0132 0163 0196 0213 023C 0265 02D8 0558 0615 08FA
 PS014 08E3 08DF
 PS016 08E5 08E2
 PS020 08EB 08E9
 PS030 08F0 08EA
 PS040 08FA 08F5 0905

CORE FUNCTION TEST

PS050 08FC 08EF
 PS060 08FE 08F9
 PTEST 00A5 06BD
 PT010 0914 0013 03BC 0926
 PT020 0919 0918
 PT030 0920 091E 0923
 PXX04 0CCC 0915
 PXX06 0CCD 091B
 PXX20 0CCE 087C 099B 0CCD
 PXX30 0DEE 08D3 0AC8
 PXX40 0F2E 08D6 0B3B
 PXX50 0F3E 039C 058B 062B 0BA7
 PXX60 0F86 0122 0156 0185 01FF 022F 0251 02AC 0303 0393 0913 0BA6
 SAC02 093E 092E
 SAC04 093F 092F
 SAC06 0940 0930 0933 093B
 SAC08 0941 0939
 SAC10 0942 0931
 SAC14 0943 093C
 SAC16 0944 0935
 SA010 0928 0593 0936 0946 094E
 SA020 0932 093D
 SA040 0938 092C
 SA100 0945 00E7 0198 01B1 01CD 02DC 0320 0356 06C6 094B 0C1B 0C36
 SA110 0948 0947
 SA200 094D 00EA 01B4 02BB 0323 0359 0954
 SA210 0951 0950
 SBC02 0997 096B
 SBC04 0998 0970
 SBC06 0999 0975
 SBC08 099A 0976
 SBC10 099B 0978
 SBC12 099C 097A 097F 0989 098B
 SBC14 099D 098A
 SBC16 099E 0982
 SBC70 099F 095C
 SBC80 09A6 0962
 SBC92 09C3 0998
 SB010 0956 039E 0995
 SB020 096E 096D
 SB030 097B 0972 098D
 SB050 0991 0968
 SB060 0993 0969
 SCC02 0A12 09C4 09D1
 SCC03 0A13 09F1
 SCC04 0A14 09D6 09DB 09DE 09E3
 SCC08 0A15 09C9
 SCC10 0A16 09CE
 SCC12 0A17 09F4 09F6
 SCC90 0A19 0A15 0A22 0AA7
 SCC91 0A1A 0A24 0AAA
 SCC92 0A1C 09F8
 SCC93 0A1D 0A16 0A29
 SCC94 0A1E 0A2B
 SC010 09C3 0981 0A10 0AA5 0B2B 0B8D
 SC020 09CC 09CB
 SC030 09D4 09F3
 SC040 09D6 09EA
 SC050 09ED 09FA 0A09
 SC060 09EF 09D0
 SC070 09F4 09D3
 SC080 09FB 09D8
 SC090 09FE 09E0
 SC100 0A01 09FD
 SC110 0A06 0A04
 SC115 0A08 0A05
 SC120 0A0A 09C5 09EE
 SC130 0A0C 09C6

CORE FUNCTION TEST

SC140 0A0E 09C7
SD010 0A20 0983 0A2F 0B2E 0B90
SD020 0A28 0A21
SEC02 0AC6 0A4A 0A50 0A61 0A94 0AC1 0B25
SEC04 0AC7 0A4B
SEC06 0AC8 0A4D
SEC08 0AC9 0A4F 0A72 0A74 0A77 0A79 0A7C 0A7E 0A87 0A89 0A93 0A95 0ABA
SEC10 0ACA 0A53 0A57 0A5A 0A5B 0A5E 0A62 0AA4 0ABF
SEC12 0ACB 0A60
SEC14 0ACC 0A63
SEC16 0ACD 0A73 0A78 0A7D
SEC18 0ACE 0A88
SEC20 0ACF 0A8F
SEC22 0AD0 0A98
SEC24 0AD1 0AC4
SEC26 0AD2 0A68
SEC40 0AD4 0AAF
SEC46 0ADD 0AA9 0AAC
SEC54 0AEO
SEC56 0AF0 0AD2
SEC70 0AF0 0A37
SEC80 0AFB 0A3D
SEC90 0B07 0A40
SEVEN 0007 026F 0820 0889 08DD
SE010 0A31 03A0 0AB7
SE020 0A55 0A51 0A5D
SE030 0A5C 0A59
SE040 0A66 0A65
SE050 0A6D 0A6A 0A8A
SE060 0A87 0A85
SE070 0A8B 0A86
SE075 0A93 0AA0
SE080 0A96 0A68
SE090 0A83 0A46
SE092 0AB5 0A47
SE200 0AB9 0A70 0A75 0A7A 0A7F 0A9A 0AC2
SE210 0AC2 0AC5
SE220 0AC4 0ABD
SIC02 0B3A 0B1E
SIC04 0B3B 0B27
SIC08 0B3C 0B2D
SIC80 0B3D 0B19
SIC90 0B49 0B32 0B3A
SIX 0006 019D 01D2 0239 06DE 06F8 0758
SI010 0B13 03A2 0B38
SI020 0B21 0B20
SI030 0B29 0B28
SI040 0B36 0B1D
SLC02 0BA4 0B6F
SLC04 0009 0B6E
SLC06 0BA5 0B81
SLC08 0BA6 0B7B
SLC10 0BA7 0B7E
SLC12 0BA8 0B76 0B96 0B99
SLC14 0BA9 0B77
SLC16 0BAA 0B7C 0B88 0B95 0B97
SLC18 0BAB 0B7A 0B7D 0B7F 0B88 0B98 0B9A
SLC20 0BAC 0B80 0B82
SLC22 0BAD 0B8F
SLC24 0BAE 0B85
SLC70 0BAF 0B60
SLC80 0BBC 0B66
SL010 0B5A 03A4 0BA2
SL020 0B72 0B71
SL030 0B80 0B9D
SL050 0B9E 0B6C
SL060 0BA0 0B6D
SUC02 0025 0BCA

CORE FUNCTION TEST

SUC04 0BD8 0BCB
SUC80 0BD9 038C 0987 0A83 0A9E 0B94 0BD8 0C0F 0C12
SUC82 0BDA 0ACC 0C00
SUC84 0BDB 0997 0BA4
SUC86 0BDD 065E
SUC88 0BE8 009C 052A 0B7E
SUC90 0BF4 009D 0B7F
SU010 0BC8 0420 04DB 0601 0966 0A44 0B6A 0BD5
SU020 0BCF 0BCD 0BD2
SU050 0BD3 0BC9
SVC02 0C15 0924 0C01 0C04
SVC04 0C16 0C0E
SV010 0BFF 0430 057F 0622 0C13
SV020 0C0E 0C03
TAC02 0C31 0C18 0C1E
TAC04 0C32 0C1D 0C24 0C38 0C3F
TAC06 0C33 0C22 0C23 0C3D 0C3E
TAC08 0C34 0C2B
TA010 0C17 02B7 0351 0C2F
TA020 0C1E 0C28
TA030 0C29 0C26
TB010 0C35 02B9 0372 0C44
TB020 0C3B 0C43
TB030 0C44 0C41
TEN 000A 0A80 0A9B
THREE 0003 005C 00C0 0160 07DF 0898 089C 0917 0A71 0A90 0B87
TWO 0002 012F 019F 01D4 0505 0535 053D 056C 057C 05D4 05E3 05F2 0619 06E0
0708 07BD 07F3 0814 097E 09D4 0A27 0A2E 0A84 0A9F
T1053 077F 077D
UA010 0C46 012D 015E 018D 020E 0237 0260 02D2 0312 0C49
WATF1 0437 30F1
WATF2 04D5 047B 0499 04C3 04D6 0502 0525 053A 30F2
WATF3 04D7 04A7 04D8 30F3
WAT0A 0057 00A4 300A
WAT0B 00A3 300B
WAT0C 00B2 300C
WAT02 001E 3002
WAT04 002C 3004
WAT06 003D 3006
WAT30 0714 3030
WAT31 0717 3031
WAT32 0760 3032
WAT50 03BB 3050
WAT72 0488 3072
WAT74 05C9 3074
WAT75 05DE 3075
WAT76 05FC 3076
WAT77 05EC 3077
WAT78 0628 3078
ZERO 0000 0007 0064 0066 00F1 00F2 01A6 01B7 01B8 01BA 01BC 01DD 02C1 02C4
02C5 02E3 02E4 0327 0328 035C 0360 0379 037A 0473 049C 049F 04A2
04E2 0503 050B 050D 0510 0512 053B 0540 0543 0545 0565 0568 0604
0607 0609 060B 060C 063C 063E 0658 068C 068D 068E 0697 0738 0741
076C 076D 0778 083C 0841 0865 097D 09DC 09E5 09E6 09EC 09F5 09FC
09FF 0A00 0A06 0A08 0A23 0A28 0A2A 0A6F 0A99 0B86 0C1F 0C20 0C3B

END OF ASSEMBLY

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