IDENTIFICATION

PRODUCT CODE: MAINDEC-08-DKVTB-A-D

PRODUCT NAME: VT78 CPU DIAGNOSTIC

PRODUCT DATE: JULY 1977

MAINTAINER: DIAGNOSTIC GROUP

AUTHOR: BARRY S. POLAND

TABLE OF CONTENTS

1.0 ABSTRACT

THIS DIAGNOSTIC WILL TEST ALL THE LOGIC ON THE VT78 PROCESSOR MODULE THAT CAN BE TESTED VIA PROGRAM INSTRUCTION. THE MODULE LOGIC TESTED INCLUDES THE PDP-8 CPU, MEMORY EXTENSION CONTROL, FLOPPY INTERFACE, THREE SERIAL LINE UNITS (SLU) AND THE PARALLEL I/O INTERFACE. THE DIAGNOSTIC IS ORGANIZED WITH A SOFTWARE MODULE FOR EACH OF THESE BASIC HARDWARE COMPONENTS. THE MAIN MEMORY FOR THIS PROCESSOR IS CONTAINED ON A SEPARATE "DAUGHTER" MODULE AND IS TESTED VIA THE VT78 MOS MEMORY DIAGNOSTIC (MAINDEC-08-DKVTA-A).

THE STANDARD PDP-8 CONSOLE PACKAGE WITH SOFTWARE CONTROLLED SWITCH REGISTER HAS BEEN INCORPORATED INTO THIS DIAGNOSTIC TO ALLOW THE PROGRAM TO RUN ON THE VT78 SYSTEM WHICH HAS NO HARDWARE SWITCH REGISTER. THIS PACKAGE PROVIDES AN INTERFACE BETWEEN THE USER AND THE DIAGNOSTIC VIA THE VIDEO DISPLAY/KEYBOARD TERMINAL.

THE VT78 PROCESSOR MODULE CONTAINS A SMALL AMOUNT OF LOGIC WHICH CAN NOT BE TESTED WITHOUT EXTERNAL DEVICES ATTACHED TO THE VT78 PERIPHERAL PORTS. FOR MANUFACTURING PURPOSES, A SPECIAL PERIPHERAL SIMULATOR PACKAGE HAS BEEN DESIGNED TO PLUG INTO THE VT78 PORTS AND PROVIDE DIAGNOSTIC ACCESS TO ALL MODULE LOGIC. THIS DIAGNOSTIC IS COMPATIBLE WITH THE HARDWARE SIMULATOR. ALL OTHER USERS OF THE DIAGNOSTIC WHICH DO NOT HAVE THE HARDWARE SIMULATOR, CAN FULLY TEST THE MODULE BY RUNNING BOTH THIS DIAGNOSTIC AND THE PERIPHERAL DIAGNOSTICS WITH RESPECTIVE PERIPHERALS ATTACHED TO VT78 SYSTEM.

THE PROGRAM IS COMPATIBLE WITH THE PDP-8 APT TEST SYSTEM.

THIS DIAGNOSTIC WILL RUN ONLY ON THE VT78 SYSTEM - IT WILL NOT RUN ON ANY OTHER PDP-8 SYSTEM.

2.0 REQUIREMENTS

2.1 HARDWARE

THE FOLLOWING HARDWARE IS REQUIRED FOR EXECUTION OF THIS PROGRAM:

VT78 VIDEO DATA PROCESSOR (INCLUDES PROCESSOR MODULE, 16K MEMORY MODULE, SIGNAL DISTRIBUTION BOARD, VIDEO DISPLAY AND KEYBOARD)

OPTIONAL EQUIPMEMT INCLUDES THE PERPHERIAL SIMULATOR, THE RX01 DISKETTE SUBSYSTEM, AND THE LQP OR LA180 PRINTER.

NOTE: THE VIDEO DISPLAY AND KEYBOARD ARE NOT REQUIRED FOR TESTING UNDER APT CONTROL.

2.2 SOFTWARE

THE SOFTWARE ENVIRONMENTS IN WHICH THIS PROGRAM WILL EXECUTE INCLUDE:

1) STAND ALONE
2) UNDER OS/8 CONTROL
3) UNDER APT CONTROL

2.3 STORAGE

THE PROGRAM OCCUPIES 8K OF MEMORY(2 FIELDS) AND MUST BE LOADED INTO FIELDS 0 AND 1.

2.4 PREREQUISITE SOFTWARE

THE PANEL HANDLER AND BOOTSTRAP PORTIONS OF THE RESIDENT CONTROL PANEL PROGRAM MUST RUN SUCESSFULLY TO PERMIT LOADING OF THIS DIAGNOSTIC. THE RESIDENT DIAGNOSTIC SHOULD ALSO BE RUN PRIOR TO ATTEMPTING TO EXECUTE ANY VT78 SYSTEM DIAGNOSTICS.

3.0 RELATED DOCUMENTS

VT78 HARDWARE SPECIFICATION
STANDARD APT SYSTEM TO PDP-8 DIAGNOSTIC INTERFACE
MR78BA USER INFORMATION DOCUMENT
MR78BB USER INFORMATION DOCUMENT

4.0 RESTRICTIONS

DURING MUCH OF THE SLU TEST SECTION OF THE DIAGNOSTIC, THE SLU WHICH INTERFACES TO THE VIDEO DISPLAY/KEYBOARD IS LOOPED UPON ITSELF. WHILE LOOPED, ANY ATTEMPT BY THE OPERATOR TO GAIN CONTROL VIA KEYBOARD INTERVENTION IS BLOCKED. THE OPERATOR CAN REGAIN SYSTEM CONTROL AT ANY TIME THROUGH USE OF THE START BUTTON ON THE SIDE OF THE VT78.

5.0 OPERATING INSTRUCTIONS

5.1 LOADING THE PROGRAM

THE DIAGNOSTICS CAN BE LOADED THROUGH ANY ONE OF THE AVAILABLE EXTERNAL PORTS; FLOPPY INTERFACE, PARALLEL I/O INTERFACE, SLU INTERFACE, OR PROGRAM INJECTOR INTERFACE. CURRENTLY LOADING IS SUPPORTED ONLY THROUGH THE FLOPPY INTERFACE AND SLU INTERFACE.

5.1.1 LOADING FROM FLOPPY DISKETTE

THIS DIAGNOSTIC IS PROVIDED ALONG WITH A SYSTEM MONITOR ON FLOPPY DISKETTE AND WILL NORMALLY BE LOADED FROM THIS MEDIUM. TO LOAD THE SYSTEM MONITOR SIMPLY INSERT THE DISKETTE CONTAINING THE DIAGNOSTIC INTO EITHER DRIVE RXA0 OR RXA_1 AND PRESS THE VT78 START BUTTON. THE SYSTEM WILL RESPOND ON THE VIDEO DISPLAY WITH A START MESSAGE FOLLOWED BY A PROMPT CHARACTER. TO CALL AND START THE DIAGNOSTIC TYPE R DKVTBA FOLLOWED BY THE RETURN KEY. THE SYSTEM WILL RESPOND WITH A DISPLAY OF THE PROGRAM NAME, MAINDEC NUMBER, PSEUDO SWITCH REGISTER (PSR), AND HARDWARE CONFIGURATION WORD (HW3) AND WAIT FOR RUN MODE SELECTION BY THE OPERATOR.
RUN MODE IS SELECTED BY SETTING THE PSR AND HW3 AS DESCRIBED IN SECTION 5.2.1.

5.1.2 LOADING FROM SLU INTERFACE

SLU #3 IS USED FOR LOADING THE DIAGNOSTIC WHEN THE VT78 SYSTEM IS RUNNING UNDER APT CONTROL. THIS TYPE OF LOAD REQUIRES USE OF THE MR78BA EXTERNAL PROGRAM INJECTOR MODULE. WITH VT78 POWER OFF ATTACH THE MR78BA TO THE PROGRAM INJECTOR CONNECTOR ON THE BACK OF THE VT78. ALSO ATTACH THE APT TEST LINE TO SLU #3. TURN POWER ON AND ALLOW THE RESIDENT DIAGNOSTIC TO RUN TO COMPLETION. THE VT78 IS NOW READY FOR DIAGNOSTIC PROGRAM LOADING FROM THE APT HOST PROCESSOR. THE VT78 KEYBOARD MUST NOT BE TOUCHED WHILE THE VT78 IS UNDER APT CONTROL. APT PROCEDURES FOR PROGRAM LOADIING SHOULD NOW BE FOLLOWED.

SLU #3 IS ALSO USED FOR LOADING THE DIAGNOSTIC FROM PAPER TAPE BY FIELD SERVICE. THIS TYPE OF LOAD REQUIRES USE OF EITHER THE MR78BA OR MR78BB EXTERNAL PROGRAM INJECTOR MODULE. WITH VT78 POWER OFF, ATTACH THE MR78BA OR MR78BB TO THE PROGRAM INJECTOR CONNECTOR ON THE BACK OF THE VT78. ALSO ATTACH THE PRS01 PAPER TAPE READER TO SLU #3. TURN POWER ON AND ALLOW THE RESIDENT DIAGNOSTIC TO RUN TO COMPLETION. THE VT78 IS NOW IN ODT MODE READY TO ACCEPT ODT COMMANDS FROM THE VT78 KEYBOARD. PROCEDURES DETAILED IN THE RESPECTIVE MR78 DOCUMENT SHOULD BE FOLLOWED TO LOAD DIAGNOSTICS.

5.2 PROGRAM OPTIONS

SEVERAL OPTIONS RELATING TO THE RUN MODE OF THE DIAGNOSTIC ARE AVAILABLE TO THE OPERATOR. THE OPERATOR SELECTS BETWEEN THE VARIOUS OPTIONS BY CHANGING THE PSR AFTER DIAGNOSTIC STARTUP (SECTION 5.2.1).

SEVERAL OPTION SWITCHES RELATING TO THE HARDWARE CONFIGURATION OF THE VT78 SYSTEM UNDER TEST ARE AVAILABLE FOR OPERATOR SELECTION (SECTION 5.2.2).

5.2.1 SWITCH REGISTER SETTINGS

FOR NORMAL DIAGNOSTIC EXECUTION ALL SWITCH REGISTER BITS ARE SET = 0.

BIT 0 = 1	INHIBIT ERROR HALT
BIT 1 = 1	LOOP ON ERROR
BIT 2 = 1	LOOP ON TEST
BIT 3 = 1	HALT ON COMPLETION OF A PROGRAM PASS
BIT 4 = 1	INHIBIT ERROR TYPEOUT
BIT 5 = 1	DON'T RUN CPU TEST
BIT 6 = 1	DON'T RUN MEMORY EXTENSION TEST
BIT 7 = 1	DON'T RUN SLU TEST
BIT 8 = 1	DON'T RUN RX01 INTERFACE TEST
BIT 9 = 1	DON'T RUN PARALLEL I/O INTERFACE TEST
BIT 10 = 1	DON'T RUN REAL TIME CLOCK TEST
BIT 11 = 1	RUN BAUD RATE SWITCH TEST

SWITCH REGISTER BITS 0 THROUGH 4 RELATE TO THE ACTION TAKEN WHEN THE PROGRAM DETECTS AN ERROR.

SWITCH REGISTER BITS 5 THROUGH 10 PERMIT THE OPERATOR TO INHIBIT TESTING PARTS OF THE CPU MODULE. NORMAL TEST SEQUENCING WITH BITS 5-10 ALL ZERO IS: CPU TESTING -- MEMORY EXTENSION TESTING -- REAL TIME CLOCK TESTING -- SLU TESTING -- PARALLEL I/O TESTING -- FLOPPY INTERFACE TESTING.

SWITCH REGISTER BIT 11 PERMITS CHECKOUT OF THE SLU #2 BAUD RATE SWITCH LOCATED ON THE BACK OF THE VT78. THIS TEST REQUIRES MANUAL INTERVENTION AND IS THEREFORE NOT PART OF NORMAL DIAGNOSTIC EXECUTION. WITH BIT 11 OF THE PSR SET THE "BAUD RATE SWITCH TESTING" WILL OCCUR IMMEDIATELY FOLLOWING "REAL TIME CLOCK TESTING." DURING THIS TEST THE BAUD RATE SWITCH SETTING WILL BE DISPLAYED. THE OPERATOR MUST CHANGE THE SWITCH SETTING AND PRESS THE SPACE BAR TO DISPLAY EACH NEW SETTING. BAUD RATE SWITCH TESTING TERMINATES UPON TYPING OF EITHER A NORMAL CONSOLE PACKAGE CONTROL CHARACTER OR A RETURN. RETURN SIMPLY CONTINUES THE NORMAL DIAGNOSTIC SEQUENCE.

5.2.2 HARDWARE CONFIGURATION SETTINGS (HW3)

WARNING--THESE SETTINGS MUST BE SELECTED TO BE CONSISTANT WITH THE PARTICULAR HARDWARE CONFIGURATION UNDER TEST - OTHERWISE FALSE ERROR MESSAGES MAY RESULT.

BIT 0 = 1	FLOPPY DRIVE 0 NOT READY
BIT 1 = 1	NO RX01 CABLED TO VT78 SYSTEM
BIT 2 = 1	NO EXTERNAL DEVICE ATTACHED TO PARALLEL INTERFACE
BIT 3 = 1	PARALLEL DEVICE ATTACHED AND USING DEVICE CODE 50. (LA180=DEVICE CODE 66; LQP=DEVICE CODE 50) WARNING--POWER MUST BE TURNED OFF THE PARALLEL I/O DEVICE BEFORE RUNNING THIS DIAGNOSTIC
BIT 4 = 1	PERIPHERAL SIMULATOR ATTACHED TO VT78
BIT 5 = 1	EXTERNAL WRAPS ATTACHED TO SLU #2 AND SLU #3

HW3 = 0000 FOR A VT78 SYSTEM CONFIGURED WITH AN LA180 PRINTER (POWERED DOWN) AND A RX01 FLOPPY; FLOPPY DRIVE RXA0 CONTAINS A DISKETTE.

HW3 = 7000 FOR A VT78 PROCESSOR WITH NO PERIPHERALS ATTACHED.

HW3 = 1000 FOR A VT78 SYSTEM CONFIGURED WITH A RX01 FLOPPY; FLOPPY DRIVE RXA0 CONTAINS A DISKETTE.

5.3 CONSOLE TERMINAL PACKAGE

THIS SOFTWARE PROVIDES A MEANS FOR THE OPERATOR TO COMMUNICATE WITH THE DIAGNOSTIC.

CONTROL G

THIS IS THE CONTROL CHARACTER TO OPEN THE PSEUDO SWITCH REGISTER WHEN CONTROL G IS TYPED THE PROGRAM IS INTERRUPTED AND SR=XXXX IS TYPED. XXXX IS THE PRESENT CONTENTS OF THE PSEUDO SWITCH REGISTER. THE OPERATOR CAN NOW CHANGE THE SETTING BY ENTERING A NEW SET OF NUMBERS, OR NOT CHANGE IT BY TYPING IN A TERMINATING CHARACTER. WHEN THE PROGRAM RECOGNIZES A CONTROL G IT WILL TYPE A UP ARROW THE A G TO SIGNAL OPERATOR IT IS RESPONDING TO A CONTROL G.

EXAMPLE:

```
TYPE CONTROL G
^G                          /ECHO CONTROL G
SR=XXXX                     /XXXX IS PRESENT SWITCH REGISTER
```

TERMINATING CHARACTERS

CARRIAGE RETURN

THIS WILL RESTORE THE PSEUDO SWITCH REGISTER WITH A NEW VALUE IF ONE WAS ENTERED OR KEEP THE OLD VALUE IF NO NUMBERS WERE TYPED IN. THE PROGRAM WILL THEN RETURN TO THE POINT AT WHICH IT WAS INTERRUPTED AND RESUME OPERATION.

EXAMPLE:

```
CONTROL G TYPED IN
^G                                  /ECHO CONTROL G
SR=1000 (C.RET)                     /DO NOT CHANGE SWITCH REG
                                    /CONTINUE PROGRAM
```

EXAMPLE:

```
CONTROL G TYPED IN
^G                                  /ECHO CONTROL G
SR=1000  2000 (C, RET)              /CHANGE SWITCH REG TO 2000
                                    /CONTINUE PROGRAM
```

LINE FEED

A LINE FEED WILL RESTORE THE PSEUDO SWITCH REGISTER WITH THE NEW VALUE TYPED IN OR IF NO NUMBERS WERE ENTERED RESTORE THE OLD VALUE. THE PROGRAM WILL THEN RETURN TO THE BEGINNING OF THE PROGRAM.

EXAMPLE:

```
    TYPE IN CONTROL G
    ^G                                  /ECHO CONTROL G
    SR=1000 (LINE FEED)                 /KEEP SWITCH REGISTER
                                        /RESTART PROGRAM
```

EXAMPLE:

```
    TYPE IN CONTROL G
    ^G                                  /ECHO CONTROL G
    SR=1000  3000 (LINE FEED)           /CHANGE SWITCH REG
                                        /TO 3000. RESTART PROG
```

ILLEGAL CHARACTERS

ANY CHARACTER THAT IS NOT A C, RET, LINE FEED OR A NUMBER FROM 0 TO 7 IS ILLEGAL. ALL ILLEGAL NUMBERS WILL BE TYPED FOLLOWED BY A "?" QUESTION MARK . THE SWITCH REGISTER WILL BE RETYPED WITH THE ORIGINAL CONTENTS DISPLAYED.

EXAMPLE:

```
    TYPE IN CONTROL G
    ^G                                  /ECHO CONTROL G
    SR=1000 W?                          /W TYPED IN   RETYPE LINE
    SR=1000
```

CONTROL S

THIS IS A CONTROL CHARACTER TO STOP SENDING DATA TO A TERMINAL. THE CONTROL S IS NOT ECHOED.

CONTROL Q

THIS CONTROL CHARACTER IS TO RESUME SENDING DATA TO THE TERMINAL. THIS CONTROL CHARACTER IS NOT ECHOED.

CONTROL C

THIS CONTROL CHARACTER IS USED TO RETURN CONTROL BACK TO A OPERATING SYSTEM KEYBOARD MONITOR. THE OPERATING SYSTEM SELECTED FOR THE PDP-8 IS THE OS-8 SYSTEM WITH ITS BOOTSTRAP IN LOCATION 07600. THIS CONTROL CHARACTER IS ECHOED WHEN IT IS RECOGNIZED AS AS UPARROW AND THEN C.

5.4 EXECUTION TIMES

THE TIME TO RUN ONE COMPLETE PASS IS APPROXIMATELY 15 SECONDS.

6.0 ERROR INFORMATION

THE FOLLOWING MESSAGE FORMATS ARE USED IN THIS DIAGNOSTIC.

A) NORMAL ERROR DISPLAY

```
DKVTB-A FAILED, FIELD X
TN:XXXX  PC:XXXX  AC:XXXX  MQ:XXXX  FL:XXXX
```

```
 X = FIELD WHERE PROGRAM WAS EXECUTING AT TIME OF ERROR
TN = OCTAL TEST NUMBER OF TEST EXECUTING AT TIME OF ERROR
PC = PROGRAM COUNTER AT TIME OF ERROR
AC = ACCUMULATOR AT TIME OF ERROR
MQ = MEMORY QUOTIENT AT TIME OF ERROR
FL = FLAGS AT TIME OF ERROR
```

IN SOME SITUATIONS THE AC AND MQ DISPLAYS ARE LOADED WITH MORE MEANINGFUL DATA THAN WHAT THEY CONTAINED AT TIME OF ERROR. FOR EXAMPLE THE AC MIGHT BE LOADED WITH AN ACTUAL TEST RESULT AND THE MQ WITH THE EXPECTED TEST RESULT. IN THESE SITUATIONS THE PROGRAM LISTING CLEARLY IDENTIFIES WHAT INFORMATION THE VARIOUS REGISTER DISPLAYS CONTAIN.

EACH OF THE FOLLOWING MESSAGES ARE DISPLAYED AS EXECUTION PROCEDES THROUGH THE COMPLETE MODULE DIAGNOSTIC:

```
CPU TESTING
MEMORY EXT. TESTING
REAL TIME CLOCK TESTING
SLU TESTING
PARALLEL I/O INTERFACE TESTING.
FLOPPY INTERFACE TESTING
```

THESE MESSAGES SERVE TO IDENTIFY WHICH PARTICULAR LOGIC FUNCTION OF THE CPU MODULE IS BEING DIAGNOSED AT ANY TIME. THE MESSAGE PRECEDES THE ACTUAL TESTING - I.E. THE SLU TESTING MESSAGE IS PRINTED JUST PRIOR TO THE ACTUAL SLU TEST.

THE TEST NUMBER DISPLAYED UPON ERROR REFERS TO A TEST WITHIN THE LOGIC FUNCTION BEING TESTED AND IS NOT UNIQUE TO THE ENTIRE MODULE DIAGNOSTIC.

THE FLAGS DISPLAY CONTAINS THE FOLLOWING DATA:

```
BIT 0    LINK
BIT 2    INTERRUPT REQUEST (1=ASSERTED)
BIT 4    INTERRUPT ENABLE (1=ENABLED)
BIT 7    ISF1
BIT 8    ISF2
BIT 10   DSF1
BIT 11   DSF2
```

ALL OTHER BITS ALWAYS CONTAIN 0.

B) COMBINED MICROINSTRUCTION SIMULATION ERROR DISPLAY

TEST 15 WITHIN CPU TESTING TESTS COMBINED MICROINSTRUCTIONS BY COMPARING THEIR EXECUTION RESULTS WITH SIMULATED RESULTS. THE NORMAL ERROR DISPLAY FORMAT IS INADEQUATE TO FULLY DESCRIBE THESE TYPE FAILURES. INSTEAD THE FOLLOWING FORMAT IS USED FOR DATA TYPE ERRORS.

```
DKVTB-A FAILED, FIELD 0
TN:XXXX  PC:XXXX  INST:XXXX
  ACTUAL     AC:XXXX  MQ:XXXX  LK:XXXX
  EXPECTED   AC:XXXX  MQ:XXXX  LK:XXXX

INST = OCTAL MICROINSTRUCTION WHICH FAILED
LK   = LINK (BIT 11)
```

THIS FORMAT DISPLAYS BOTH THE ACTUAL CONTENTS OF THE AC,MQ AND LINK IMMEDIATELY AFTER MICROINSTRUCTION EXECUTION AND THE EXPECTED RESULTS.

A SOMEWHAT SIMPLIER DISPLAY FORMAT IS USED WHERE THE ERROR IS A SKIP TYPE FAILURE - I.E. THE MICROINSTRUCTION SKIPPED WHEN IT SHOULD NOT HAVE OR VICE VERSA.

```
DKVTB-A FAILED, FIELD 0
TN:XXXX  PC:XXXX  INST:XXXX
AC:XXXX  MQ:XXXX  LK:XXXX
```

THE AC,MQ AND LINK DISPLAY THE CONTENTS OF THE RESPECTIVE REGISTERS JUST PRIOR TO MICRO INSTRUCTION EXECUTION.

C) SLU ERROR DISPLAY

THE NORMAL ERROR DISPLAY IS INADEQUATE TO FULLY DESCRIBE SLU FAILURES. THE FOLLOWING FORMAT IS USED.

```
DKVTB-A FAILED, FIELD 1
TN:XXXX  PC:XXXX  AC:XXXX  MQ:XXXX  FL:XXXX  SLU:XXXX  BR:XXXX
XMIT DATA:XXXX  REC DATA:XXXX

SLU = FAILING SLU IDENTIFIER (1,2 OR 3)
BR  = BAUD RATE
XMIT DATA  = DATA TRANSMITTED (WITH SLU LOOPED ON ITSELF)
REC DATA  = CORRESPONDING DATA RECEIVED
```

NOTE THAT IN SOME SLU FAILURE SITUATIONS THE XMIT AND RECEIVE DATA IS IRRELEVANT AND THUS OMITTED FROM THE ERROR DISPLAY.

D) UNEXPECTED INTERRUPT

THE FORMAT IS USED TO IDENTIFY THAT AN INTERRUPT OCCURRED WHICH WAS NOT EXPECTED BY THE DIAGNOSTIC AND WAS NOT CAUSED BY A CONSOLE REQUEST.

```
UNEXPECTED INTERRUPT - FIELD X
TN:XXXX  PC:XXXX  AC:XXXX  FL:XXXX
FLAGS SET:  X1  X2  X3  R1  R2  R3  LA  LQ
```

THE PC DISPLAY CONTAINS THE ADDRESS OF THE INSTRUCTION BEING EXECUTED WHEN THE INTERRUPT OCCURRED.

THE FLAGS SET MESSAGE LISTS THOSE DEVICE FLAGS SET AFTER THE INTERRUPT. THE LISTED FLAG MAY OR MAY NOT HAVE CAUSED THE INTERRUPT DEPENDING ON THE STATE OF THE DEVICE INTERRUPT ENABLE. IN THE SAMPLE FORMAT ABOVE THE X REPRESENTS THE XMIT FLAG AND R THE RECEIVE FLAG ASSOCIATED WITH THE NUMBERED SLU. LA AND LQ ARE THE PARALLEL I/O INTERFACE FLAGS. THE FLOPPY FLAG IS NOT SHOWN BECAUSE READING THIS FLAG CLEARS IT.

7.0 SUB-TEST SUMMARIES

7.1.1 CPU TESTS

TN 0001 -- FIRST OPERATE MICROINSTRUCTION TEST
TN 0002 -- FIRST TEST OF MRI
TN 0003 -- TEST ADDER FUNCTION
TN 0004 -- SECOND OPERATE MICROINSTRUCTION TEST
TN 0005 -- MQ MICROINSTRUCTION TEST
TN 0006 -- TEST DCA & ISZ DIRECT ADDRESSING TO PAGE ZERO
TN 0007 -- TEST AND,TAD,ISZ,& DCA DIRECT ADDRESSING TO SAME PAGE
TN 0010 -- TEST AND,TAD,ISZ,& DCA INDIRECT ADDRESSING THRU PAGE ZERO
TN 0011 -- TEST AND,TAD,ISZ,& DCA INDIRECT ADDRESSING THRU SAME PAGE
TN 0012 -- TEST AUTO-INDEX
TN 0013 -- TEST INTERNAL IOT INSTRUCTIONS
TN 0014 -- TEST JMP AND JMS
TN 0015 -- TEST COMBINED OPERATE MICROINST. OF FORM 7XX0,7XX1.

7.1.2 MEMORY EXTENSION TESTS

TN 0001 -- TEST CDF & RDF, USE CDF TO SET DATA FIELD AND
RDF TO READ THE DATA FIELD, DO ALL COMBINATIONS
0 TO 3 & 7
TN 0002 -- TEST SAVE FIELD BITS 9-11 WITH RIB, PROGRAM
INTERRUPT IS ENABLED, RECEIVE FLAG IS USED FOR INT,
DO ALL COMBINATIONS 0-3 & 7.
TN 0003 -- TEST DCA I AND TAD I TO ALL STACKS (1-3 & 7)
TN 0004 -- CIF TEST
TN 0005 -- TEST GTF FOR FLAG & SAVE FIELDS.
TN 0006 -- TEST ION & LINK FROM RTF - TEST INTERRUPT
INHIBIT BEFORE JMP
TN 0007 -- CONFIDENCE CHECK ON FIELDS 0,1,2, & 3
TN 0010 -- TEST DF + IF FROM SAVE FIELD AFTER INTERRUPT
TEST CDI TO CHANGE BOTH DF & IF.
TN 0011 -- TEST PROGRAM INTERRUPT IN ALL EXTENDED FIELDS
TN 0012 -- TEST SF WITH AN RMF IOT
TN 0013 -- TEST THAT RMF & RTF INST. ZERO MOST SIGN. BIT OF DF REG.
TN 0014 -- UNUSED IOT TEST - VERIFIES THAT ALL UNUSED
IOTS HAVE NO EFFECT ON SYSTEM.

7.1.3 REAL TIME CLOCK TESTS

IN 0001 -- TESTS THAT CLOCK FLAG WILL SET AND THAT CAF
WILL CLEAR IT.
TN 0002 -- TESTS THAT CLCL WILL CLEAR CLOCK FLAG
TN 0003 -- TESTS THAT CLLE ENABLES & DISABLES CLOCK INTERRUPTS
TN 0004 -- TESTS THAT CAF WILL CLEAR CLOCK INT. ENABLE
TN 0005 -- TESTS THAT ALL REAL TIME CLOCK IOTS LEAVE AC
UNDISTURBED
TN 0006 -- CLOCK TIMING TEST

7.1.4 SERIAL LINE UNIT TESTS

TN 0001 -- TESTS THAT CAF WILL CLEAR RECEIVE FLAG AND DISABLE TRANSMIT FLAG

TN 0002 -- TEST KIE TO CLEAR SLU INTERRUPT ENABLE
TEST SPF TO SET TRANSMIT FLAG ENABLE
TEST TCF TO CLEAR TRANSMIT FLAG ENABLE

TN 0003 -- TEST THAT CAF CLEARS TRANSMIT FLAG ENABLE

TN 0004 -- TEST THAT CAF SETS SLU INTERRUPT ENABLE
TEST TSK TO SKIP AND NOT TO SKIP

TN 0005 -- TEST KIE TO SET & CLEAR SLU INTERRUPT ENABLE

TN 0006 -- (LOOPAROUND ENABLED) TEST TLS TO CLEAR TRANSMIT FLAG & THEN SET IT WHEN TRANSMISSION OF CHAR IS COMPLETE. ALSO TEST RECEIVE FLAG TO SET. TESTS KSF TO SKIP ON RECEIVE FLAG AND KCF TO CLEAR RECEIVE FLAG.

TN 0007 -- (LOOPAROUND ENABLED) TESTS THAT TPC PRODUCES IDENTICAL RESULTS AS TLS

TN 0010 -- (LOOPAROUND ENABLED) CHECKS THAT THE TLS-TCF SEQUENCE CLEARS TRANSMIT FLAG ENABLE PREVENTING FOLLOWING INT.

TN 0011 -- (LOOPAROUND ENABLED) TESTS THAT KRB WILL CLEAR THE RECEIVE FLAG

TN 0012 -- (LOOPAROUND ENABLED) TEST THAT CAF WILL CLEAR RECEIVE FLAG

TN 0013 -- (LOOPAROUND ENABLED) TESTS THE EFFECT OF SLU IOTS UPON THE AC

TN 0014 -- (LOOPAROUND ENABLED) CHECKS THAT ALL ZEROS CAN BE TRANSMITTED AND READ BACK

TN 0015 -- (LOOPAROUND ENABLED) CHECKS THAT ALL ONES CAN BE TRANSMITTED AND READ BACK

TN 0016 -- (LOOPAROUND ENABLED) CHECKS THAT A COMPLEMENTING PATTERN (252-125) CAN BE TRANSMITTED AND READ BACK

TN 0017 -- (LOOPAROUND ENABLED) CHECKS THAT "ONE THRU A FIELD OF ZEROS" AND "ZERO THRU A FIELD OF ONES" PATTERNS CAN BE TRANSMITTED AND READ BACK.

TN 0020 -- CHECKS SLU TIMING FROM 50 BAUD TO 19200 BAUD

TN 0021 -- (PERIPHERAL SIMULATOR REQUIRED) VERIFIES OPERATION OF EIA DRIVERS ON SIGNAL DISTRIBUTION BOARD

TN 0022 -- VERIFY PROGRAMMABLE MODES OF SLU #2

7.1.5 PARALLEL INTERFACE TESTS

(DEVICE CODE 66)

TN 0001 -- CHECK PCLF TO CLEAR PRINT FLAG & PSSF TO SET PRINT FLAG
TN 0002 -- CHECK THAT PCIE WILL SET & CLEAR INTERRUPT EN.
TN 0003 -- TEST THAT CAF ENABLES PRINTER INT. & CLEARS FLAGS
TN 0004 -- TESTS THAT PSTB LOADS & PRDB READS PRINTER INTERFACE BUFFER. CHECK THAT PSTB LEAVES FLAG ALONE. VERIFIES JAM INTO AC.
TN 0005 -- CHECK THAT PCLP LOADS PRINTER INTERFACE BUFFER AND CLEARS FLAG
TN 0006 -- CHECK THAT PSSF,PSKF,PCLF,PSTB,PCIE, & PCLP LEAVE AC UNDISTURBED. ALSO CHECKS THAT PSSF,PSKF,PCLF, PCIE,AND PRDB LEAVE INTERFACE BUFFER UNCHANGED
TN 0007 -- CHECK PARALLEL I/O INTERFACE BUFFER

(DEVICE CODE 50)

TN 0001 -- TEST THAT LQRE & LQRS CLEAR DONE FLAG AND THAT LQLS SETS DONE FLAG.
TN 0002 -- TEST THAT LQLS WRITES STATUS AND LQRS READS STATUS ALSO VERIFIES INTERRUPT ENABLE FUNCTION.
TN 0003 -- TEST THAT CAF DISABLES LQP INT. & CLEARS LIFT RIBBON
TN 0004 -- TESTS THAT LQMP,LQMC,LQPC & LQRE LOAD INTERFACE BUFFER AND THAT LQRB READS INTERFACE BUFFER
TN 0005 -- TESTS THAT LQMP,LQMC,LQLS, AND LQPC CLEAR AC
TN 0006 -- TESTS THAT LQSK AND LQRE LEAVE AC UNDISTURBED. ALSO CHECKS THAT LQSK,LQRS,LQRB, & LQLS LEAVE INTERFACE BUFFER UNDISTURBED.
TN 0007 -- TESTS PARALLEL INTERFACE BUFFER

(BOTH DEVICE CODE 50 & 66 --PERIPHERAL SIMULATOR REQUIRED)

TN 0010 -- VERIFY IN/OUT AND DATA INTERFACE CONNECTOR
TN 0011 -- TEST PAPER STROBE AND PAPER READY LOGIC
TN 0012 -- TEST CARRIAGE STROBE AND CARRIAGE READY LOGIC
TN 0013 -- TEST CHARACTER STROBE AND CHAPACTER READY LOGIC
TN 0014 -- TEST PRINTER READY LOGIC
TN 0015 -- TEST CHECK LOGIC

7,1,6 FLOPPY INTERFACE TESTS

TN 0001 -- CAF PART I / FLAG DETECTION PART I
TN 0002 -- FLAG DETECTION PART II / "C" LINES VERIFICATION PART I
TN 0003 -- DIRECTION OF IOT XDR PART I / IOT DECODING PART I/
"C" LINES VERIFICATION PART II
TN 0004 -- FLAG DETECTION PART III / "C" LINES VERIFICATION PART III
TN 0005 -- TRANSFER REGISTER DIRECTION TEST PART II / "C" LINES
VERIFICATION PART IV
TN 0006 -- IOT DECODING VERIFICATION PART II
TN 0007 -- INTERRUPT TEST PART I / IOT DECODING VERIFICATION
PART III
TN 0010 -- INTERRUPT TEST PART II
TN 0011 -- INTERRUPT TEST PART III
TN 0012 -- INTERRUPT TEST PART IV
TN 0013 -- INIT TEST / INTERRUPT TEST PART V
TN 0014 -- (PERIPHERAL SIMULATOR REQUIRED) VERIFICATION OF
INTERFACE REGISTER AND SHIFT CONTROL OPERATION

```
                        /VT78 CPU DIAGNOSTIC
                        /VT78 CPU DIAGNOSTIC - PART 1 - FIELD 0
                        /PROGRAMMER: B. S. POLAND
                        /*****************************************************************************
                        /*****************************************************************************

            6143        APTHW3=6143             /LOCATION OF HCW3 IN APT LOADER/MONITOR
            7402        HLT=7402                /HALT
            7002        BSW=7002                /BYTE SWAP
            6203        CDI=6203
            7421        MQL=7421                /AC TO MQ, 0 TO AC
            7501        MQA=7501                /MQ + AC TO AC
            7621        CAM=7621                /CLEAR AC AND MQ
            7521        SWP=7521                /SWAP AC AND MQ
            7701        ACL=7701                /MQ TO AC
            6214        RDF=6214                /READ DATA FIELD
            6224        RIF=6224                /READ INSTRUCTION FIELD
            6000        SKON=6000               /SKIP IF INTERRUPT ON, TURN INTERRUPT OFF
            6001        ION=6001                /TURN INTERRUPT ON
            6002        IOF=6002                /TURN INTERRUPT OFF
            6003        SRQ=6003                /SKIP ON INTERRUPT REQUEST
            6004        GTF=6004                /GET FLAGS
            6005        RTF=6005                /RESTORE FLAGS
            6305        KIE1=6305               /LOAD CONTENT OF AC10 INTO STATUS EN FF,,
                                                /LOAD CONTENT OF AC11 INTO INT EN FF, SLU#2
            6325        KIE2=6325               /LOAD CONTENT OF AC11 INTO INT EN FF SLU#3
            6234        RIB=6234                /READ(INCLUSIVE OR) THE ISF & DSF INTO BITS
                                                /7-8 &10-11 OF THE AC RESPECTIVELY.
            6040        SPF=6040                /SET TELEPRINTER FLAG
            6007        CAF=6007                /CLEAR ALL FLAGS, AND CLEAR AC AND LINK
            6301        KSF1=6301               /SLU #2 SKIP ON RECEIVE FLAG
            6321        KSF2=6321               /SLU #3 SKIP ON RECEIVE FLAG
            6311        TSF1=6311               /SLU #2 SKIP ON XMIT FLAG SET & EN
            6331        TSF2=6331               /SLU #3 SKIP ON XMIT FLAG SET & EN
            6661        PSKF=6661               /LA180  SKIP ON FLAG (CHAR READY)
            6500        LQSK=6500               /LQP    SKIP ON DONE FLAG
            6137        CLSK=6137               /SKIP ON REAL TIME CLOCK FLAG
            6136        CLCL=6136               /CLEAR REAL TIME CLOCK FLAG
            6135        CLLE=6135               /LOAD CLOCK INT. ENABLE FROM AC11
                                                /       AC11=1  SET INT. EN
                                                /       AC11=0  CLR INT. EN

                        /*****************************************************************************

            0000        FIELD 0
            0000        *0
    0000    0000                0000            /FIRST EDITION.
```



```
    0001    6244                RMF
    0002    5403                JMP I 3
    0003    6200                SKPCHN
            0004        *4
    0004    0000        ODT1,   0
    0005    0000        ODT2,   0
    0006    0000        ODT3,   0
    0007    0000                0
    0010    0000                0
    0011    0000                0

    0012    0000                0
    0013    0000                0
    0014    0000                0
    0015    0000                0
    0016    0000                0

                        /*****************************************************************************
                        /PDP-8 STANDARDIZED SWITCHES AND HARDWARE DESIGNATOR WORDS

            0020        *20
    0020    0000        PSR,    0000            /PSEUDO SWITCH REGISTER

                                                /*-------------------------------------------------
                                                /       BIT 0=1 INHIBIT ERROR HALT
                                                /       BIT 1=1 LOOP ON ERROR
                                                /       BIT 2=1 LOOP ON TEST
                                                /*-------------------------------------------------
                                                /       BIT 3=1 HALT ON COMPLETION OF A PROGRAM PASS
                                                /       BIT 4=1 INHIBIT ERROR TYPEOUT
                                                /       BIT 5=1 DON'T RUN CPU TEST
                                                /*-------------------------------------------------
                                                /       BIT 6=1 DON'T RUN EXT. MEMORY TEST
                                                /       BIT 7=1 DON'T RUN SLU TEST
                                                /       BIT 8=1 DON'T RUN RX01 INTERFACE TEST
                                                /*-------------------------------------------------
                                                /       BIT 9=1 DON'T RUN PARALLEL INTERFACE TEST
                                                /       BIT 10=1 DON'T RUN REAL TIME CLOCK TEST
                                                /       BIT 11=1 RUN BAUD RATE SWITCH TEST
                                                /*-------------------------------------------------

    0021    0017    HCW1,   0017                /HARDWARE WORD 1
                                                /       BITS 7-11 MEMORY SIZE (16K)
    0022    0000    HCW2,   0000                /HARDWARE WORD 2
                                                /       BIT 0=1 APT CONTROL
    0023    0400    HCW3,   0400                /HARDWARE WORD 3 (RETRIEVED FROM APT LOADER/MONITOR)

                                                /*-------------------------------------------------
                                                /       BIT 0=1 FLOPPY DRIVE 0 NOT READY
                                                /       BIT 1=1 NO RX01 CABLED TO SYSTEM
                                                /       BIT 2=1 NO EXTERNAL DEVICE ATTACHED TO PARALLEL INTERFACE
                                                /*-------------------------------------------------
                                                /       BIT 3=1 PARALLEL INTERFACE DEVICE ATTACHED
                                                /               AND USING DEVICE CODE 50.
                                                /               (LA180=DEVICE CODE 66;LQP=DEVICE CODE 50)
```

```
                                                 /               WARNING--POWER MUST BE TURNED OFF
                                                 /                      PARALLEL I/O DEVICE!!!
                                                 /        BIT 4=1 PERIPHERAL SIMULATOR ATTACHED.
                                                 /        BIT 5=1 USING EXTERNAL SLU WRAPS ON SLU'S #2 & #3.
                                                 /-----------------------------------------------------

                  /**************************************************************************************

          0040    *40
                  /CONSTANTS
    0040  0000    KSFLG,  0
    0041  0001    K1,     0001
    0042  0010    K10,    0010
    0043  0077    K77,    0077
    0044  0100    K100,   0100
    0045  0200    K200,   0200
    0046  2525    K2525,  2525
    0047  4000    K4000,  4000
    0050  5252    K5252,  5252
    0051  5253    K5253,  5253
    0052  7700    K7700,  7700
    0053  7777    K7777,  7777

                  /**************************************************************************************
                  /SCRATCH LOCATIONS

    0054  0000    ACWAS,  0
    0055  0000    MQWAS,  0
    0056  0000    LKWAS,  0
    0057  0000    SKPPED, 0
    0060  0000    SOMSKP, 0
    0061  0000    SAVFLD, 0                      /STORAGE FOR IF AND DF
          0102    BIT6=POINTD
          0007    BIT7=0007
          0072    BIT11=TESLOC
    0062  7777    BIT3,   7777
    0063  0000    BIT4,   0
    0064  0000    BIT5,   0
    0065  0000    BIT8,   0
    0066  7402    KSTOP,  HLT
    0067  0000    ACDATA, 0
    0070  0000    MQDATA, 0
    0071  0000    LKDATA, 0
    0072  0000    TESLOC, 0
    0073  0000    DAT,    0
    0074  0000    NDF,    0
    0075  0000    TSTNO,  0
    0076  0077    POINTR, .+1
    0077  2526            2526
    0100  0101    POINTB, POINTC
    0101  0000    POINTC, 0
    0102  0000    POINTD, 0
    0103  1434    POINTE, JMSLOC-1
    0104  1450    POINTF, JMSLO2-2
    0105  1515    INSTTR, INSTRT
```



```
    0106  4537    XTFLG,  TFLG
    0107  0000    STKS,   0
    0110  4533    XSTKS,  NSTKS
    0111  5512    JMPIR,  JMP I XRET
    0112  4447    XRET,   RET
    0113  0000    RTCIF,  0
    0114  4635    KFLD0,  RTRN
    0115  2023    TEST,   TESTS
          4516            CHKKSF=JMS I .
    0116  7111                      XCHKKSF
          4517            KBCHK=JMS I .
    0117  2237                      CHKKB
          4520            FIXIL=JMS I .
    0120  5217                      FIXLKG
          4521            C8CRLF=JMS I .
    0121  7200                      XC8CRLF
          4522            C8PRNT=JMS I .
    0122  7423                      MESAGX
          4523            C8PRT4=JMS I .
    0123  7464                      XPRNT4
          4524            C8SWIT=JMS I .
    0124  7360                      XC8SW
          4525            LISN=JMS I .
    0125  7225                      XLISN
          4526            PRNT1=JMS I .
    0126  7477                      XPRNT1
          4527            TYPE=JMS I .
    0127  7321                      XTYPE
          4530            PRNT2=JMS I .
    0130  7153                      XPRNT2
          4531            SPACE2=JMS I .
    0131  7217                      SPACX2
          4532            C8APT=JMS I .
    0132  7400                      XC8APT
          4533            C8ERR=  JMS I   .
    0133  6600                      XC8ERR
          4534            C8START=JMS I   .
    0134  6716                      XC8START
          4535            INTST=JMS I .
    0135  2217                      TSTIN
          4536            ENDTST=JMS I .
    0136  2227                      TSTEND
          4537            C8RC=JMS I .
    0137  7012                      XC8RC
          4540            C8H3=JMS I .
    0140  7540                      XC8H3
          4541            CLSKWT=JMS I .
    0141  5427                      WTCLSK

          0177    *177
    0177  7770    DATPAT, 7770
```

```
                0200    *200
                        /*****************************************************************************
                        /CPU TEST
                        /*****************************************************************************




                        /*****************************************************************************
                        /CPU TEST 1 - FIRST OPERATE MICROINSTRUCTION TEST
                        /*****************************************************************************
                        /TEST ALL BASIC SKIPS TO EITHER SKIP OR NOT SKIP WHEN AC=7777.
        0200    4534    START,  C8START         /CONSOLE CALL TO ASK SWITCH REG QUESTION.
        0201    7300    C8REST, CLA CLL
        0202    3075            DCA TSTNO               /CLEAR TEST NUMBER USED FOR ERROR DISPLAY
        0203    6002            IOF
        0204    4520            FIXIL           /FIX UP INTERRUPT LINKAGE
        0205    1020            TAD PSR
        0206    0377            AND (100        /EXECUTE CPU TEST?????
        0207    7640            SZA CLA
        0210    5776'           JMP BEGEXM      /NO
        0211    4775'   PCPUM,  JMS PCPUMS      /YES - PRINT "CPU TESTING" MESSAGE
                                                /IF NOT UNDER APT CONTROL.
        0212    4535    CPUT1,  INTST
        0213    6007            CAF
        0214    7000            NOP
        0215    7000            NOP
        0216    7000            NOP
        0217    7450            SNA
        0220    7430            SZL
        0221    4533            C8ERR           /SNA SKIPS WHEN AC CLEAR, OR SZL DOES NOT SKIP WHEN LINK = 0
        0222    6001            ION             /ENABLE INTERRUPTS FOR CONSOLE PACKAGE
        0223    7040            CMA             /AC TO 7777
        0224    7450            SNA
        0225    4533            C8ERR           /CMA SKIPPED OR DID NOT COMPLEMENT,OR SNA DID NOT SKIP, OR ION SKIPPED
        0226    7440            SZA
        0227    7410            SKP
        0230    4533            C8ERR           /SNA CLEARED AC, OR SZA SKIPPED, OR SKP FAILED
        0231    7500            SMA
        0232    4533            C8ERR           /SZA OR SKP CLEARED AC0, OR SMA FAILED TO SKIP
        0233    7510            SPA
        0234    7410            SKP
        0235    4533            C8ERR           /SMA CLEARED AC0,OR SPA SKIPPED WHEN AC0=1
                        /*****************************************************************************
                        /TEST CLA CLL TO CLEAR AC AND LINK
        0236    7300    TSCACL, CLA CLL
        0237    7450            SNA
        0240    7430            SZL
        0241    4533            C8ERR           /CLA CLL DID NOT CLEAR AC OR LINK,OR SNA SKIPPED
                                                /WHEN AC=0000, OR SZL DID NOT SKIP WHEN LINK=0
        0242    7040            CMA             /AC TO 7777
                        /*****************************************************************************
                        /TEST BASIC SKIPS TO SKIP OR NOT SKIP WHEN AC=0000
        0243    7040    TSBSSK, CMA             /AC TO 0000
```



```
        0244    7440            SZA
        0245    4533            C8ERR           /CMA DID NOT COMPLEMENT AC OR SZA FAILED TO SKIP,OR CMA SKIPPED
        0246    7510            SPA
        0247    4533            C8ERR           /SPA FAILED TO SKIP WHEN AC0=0
        0250    7500            SMA
        0251    7410            SKP
        0252    4533            C8ERR           /SMA SKIPPED WHEN AC0=0
                        /*****************************************************************************
                        /TEST IAC TO INCREMENT AC TO 0000 AND SET LINK
        0253    7100    TSTIAC, CLL             /THIS INSTRUCTION NOT YET TESTED
        0254    7040            CMA             /AC TO 7777
        0255    7001            IAC             /AC TO 0000,LINK TO 1
        0256    7440            SZA
        0257    4533            C8ERR           /SZA FAILED TO SKIP, OR IAC DID NOT INCREMENT AC TO 0000
                        /*****************************************************************************
                        /TEST TO SEE IF LINK COMPLEMENTED TO A 1 ON A CARRY OUT OF ADDER
        0260    7420    TSTLCM, SNL
        0261    4533            C8ERR           /LINK DID NOT COMPLEMENT ON CARRY OUT, OR CLL FAILED
                                                /OR SNL FAILED TO SKIP FOR LINK = 1
        0262    7430            SZL
        0263    7410            SKP
        0264    4533            C8ERR           /SZL SKIPED ON LINK=1,OR SNL CLEARED LINK,OR SKIP FAILS WHEN LINK =1
                        /*****************************************************************************
                        /TEST CLL TO CLEAR LINK
        0265    7100    TSTCLL, CLL
        0266    7420            SNL
        0267    7410            SKP
        0270    4533            C8ERR           /CLL FAILED, OR SNL SKIPPED WHEN LINK=0, OR SKP FAILED WHEN LINK=0
        0271    7430            SZL
        0272    4533            C8ERR           /SZL FAILED TO SKIP,OR SNL OR SKP SET LINK
                        /*****************************************************************************
                        /TEST ABILITY OF CML TO SET LINK
        0273    7020    TSTCML, CML             /LINK TO 1
        0274    7420            SNL
        0275    4533            C8ERR           /CML DID NOT SET LINK
                        /*****************************************************************************
                        /TEST ABILITY OF LINK TO COMPLEMENT FROM A 1 TO A 0 ON A CARRY OUT
        0276    7040            CMA             /AC TO 7777, LINK=1
        0277    7001            IAC             /AC TO 0000, CARRY TO LINK,LINK TO 0
        0300    7430            SZL
        0301    4533            C8ERR           /CARRY OUT DID NOT COMPLEMENT LINK TO A 0
                        /*****************************************************************************
                        /TEST ABILITY OF CML TO COMPLEMENT LINK FROM A 0 TO A 1 AND BACK TO A 0
        0302    7200            CLA
        0303    7020            CML             /LINK TO 1
        0304    7020            CML             /LINK TO 0
        0305    7430            SZL
        0306    4533            C8ERR           /CML DID NOT COMPLEMENT LINK FROM A 1 TO A 0
        0307    7440            SZA
        0310    4533            C8ERR           /CML CHANGED AC
                        /*****************************************************************************
                        /TEST CLA TO CLEAR AC AND NOT CLEAR LINK
        0311    7020            CML             /MAKE LINK A 1
        0312    7040            CMA             /AC TO 7777
        0313    7200            CLA             /AC TO 0000
```

```
  327   0314  7420          SNL
  328   0315  4533          C8ERR           /CLA CLEARED LINK
  329   0316  7440          SZA
  330   0317  4533          C8ERR           /CLA DID NOT CLEAR AC
  331                      /*************************************************************************************
  332                      /TEST NOP TO NOT CHANGE AC OR LINK
  333   0320  7000          NOP             /AC=0000 LINK=1
  334   0321  7420          SNL
  335   0322  4533          C8ERR           /NOP SKIPPED OR CLEARED LINK
  336   0323  7440          SZA
  337   0324  4533          C8ERR           /NOP SET AC BIT
  338   0325  7040          CMA             /AC TO 7777
  339   0326  7020          CML             /LINK TO 0
  340   0327  7000          NOP             /AC=7777,LINK=0
  341   0330  7430          SZL
  342   0331  4533          C8ERR           /NOP SKIPPED OR SET LINK
  343   0332  7450          SNA
  344   0333  4533          C8ERR           /NOP CLEARED AC
  345                      /*************************************************************************************
  346                      /TEST RAL TO NOT PICK UP BITS BY SHIFTING ZEROES
  347   0334  7200          CLA             /AC TO 0000
  348   0335  7004          RAL
  349   0336  7450          SNA
  350   0337  7430          SZL
  351   0340  4533          C8ERR           /RAL OF ZEROES PICKED UP AC BIT OR LINK BIT
  352                      /*************************************************************************************
  353                      /TEST RTL TO NOT PICK UP BITS WHEN SHIFTING ALL ZEROES
  354   0341  7006          RTL
  355   0342  7450          SNA
  356   0343  7430          SZL
  357   0344  4533          C8ERR           /RTL PICKED UP BIT IN AC OR LINK WHEN SHIFTING ZEROES
  358                      /*************************************************************************************
  359                      /TEST RAR TO NOT PICK UP BITS WHEN SHIFTING ALL ZEROES
  360   0345  7010          RAR
  361   0346  7450          SNA
  362   0347  7430          SZL
  363   0350  4533          C8ERR           /RAR PICKED UP BIT IN AC OR LINK WHEN SHIFTING ZEROES
  364                      /*************************************************************************************
  365                      /TEST RTR TO NOT PICK UP BITS WHEN SHIFTING ALL ZEROES
  366   0351  7012          RTR
  367   0352  7450          SNA
  368   0353  7430          SZL
  369   0354  4533          C8ERR           /RTR PICKED UP BIT IN AC OR LINK WHEN SHIFTING ZEROES
  370                      /*************************************************************************************
  371                      /TEST BSW TO NOT PICK UP ANY BITS WHEN SWAPPING ZEROES,AND TO NOT AFFECT LINK
  372   0355  7002          BSW
  373   0356  7450          SNA
  374   0357  7430          SZL
  375   0360  4533          C8ERR           /B&W PICKED UP BIT IN AC WHEN SWAPPING ALL ZEROES,OR SET LINK
  376   0361  4536          ENDTST
  377   0362  5774'         JMP CPUT2
  378   0374  0400
  379   0375  2200
  380   0376  3000
  381   0377  0100
```



```
        0400    PAGE
  382                      /*************************************************************************************
  383                      /CPU TEST 2 - FIRST TEST OF MRI
  384                      /*************************************************************************************
  385                      /TEST TAD TO ADD 7777 TO A CLEAR AC
  386   0400  4535    CPUT2,  INTST
  387   0401  1053            TAD     K7777   /AC TO 7777, LINK=0
  388   0402  7450            SNA
  389   0403  4533            C8ERR           /TAD DID NOT LOAD AC, OR TAD SKIPPED,
  390   0404  7430            SZL
  391   0405  4533            C8ERR           /TAD SET LINK WHEN NO CARRY OUT EXPECTED
  392                      /*************************************************************************************
  393                      /TEST TAD TO ADD 1 TO AC=7777 TO PRODUCE AC=0000 AND LINK=1
  394   0406  1041            TAD     K1      /AC TO 0000,LINK TO 1
  395   0407  7440            SZA
  396   0410  4533            C8ERR           /TAD USED INCORRECT VALUE,OR ADDER CARRY CKT
  397                                          /FAULTY OR TAD SKIPPED
  398   0411  7420            SNL
  399   0412  4533            C8ERR           /CARRY OUT OF ADDER DID NOT COMPLEMENT LINK
  400                      /*************************************************************************************
  401                      /TEST ADDER CARRY STRUCTURE TO GENERATE CARRY THROUGH ALL POSITIONS
  402                      /UNDER OPPOSITE CONDITIONS FROM PREVIOUS TEST
  403   0413  1041            TAD     K1      /AC TO 0001,LINK=1
  404   0414  1053            TAD     K7777   /AC TO 0000,LINK TO 0
  405   0415  7450            SNA
  406   0416  7430            SZL
  407   0417  4533            C8ERR           /CARRY FAILED TO PROPAGATE ALL THROUGH ADDER TO LINK
  408                      /*************************************************************************************
  409                      /TEST ABILITY TO ADD 0000 TO A CLEAR AC TO PRODUCE A CLEAR AC
  410   0420  1377            TAD     (0      /AC=0000,LINK=0
  411   0421  7450            SNA
  412   0422  7430            SZL
  413   0423  4533            C8ERR           /ADDING 0000 TO 0000 PRODUCED NON-ZERO RESULT
  414                                          /OR COMPLEMENTED LINK
  415                      /*************************************************************************************
  416                      /TEST ADDER'S ABILITY TO PROPAGATE CARRY WHEN ACN=1,MDN=1,AND CARRY IN N=1
  417   0424  1053            TAD     K7777   /AC TO 7777,LINK=0
  418   0425  1053            TAD     K7777   /AC TO 7776,LINK TO 1
  419   0426  7420            SNL
  420   0427  4533            C8ERR           /CARRY DID NOT PROPAGATE TO LINK
  421   0430  7001            IAC             /MAKE AC=7777 FOR EASE OF CHECKING RESULT OF PREVIOUS TAD
  422   0431  7040            CMA             /AC TO 0000
  423   0432  7440            SZA
  424   0433  4533            C8ERR           /CARRY DID NOT PROPAGATE CORRECTLY
  425                                          /OR TAD USED INCORRECT OPERAND
  426                      /*************************************************************************************
  427                      /TEST ADDER'S ABILITY TO GENERATE CARRY WHEN ACN=1, MDN=1, AND CARRY IN N=0 IN ODD NUMBERED BIT POSITIONS
  428   0434  1046            TAD     K2525   /AC TO 2525,LINK = 1
  429   0435  1046            TAD     K2525   /AC TO 5252
  430   0436  1046            TAD     K2525   /AC TO 7777,LINK = 1(NO CARRY GENERATED TO LINK)
  431   0437  7040            CMA             /AC TO 0000,LINK = 1
  432   0440  7440            SZA
  433   0441  4533            C8ERR           /CARRY FAILED IN AN ODD BIT POSITION
  434   0442  7420            SNL
  435   0443  4533            C8ERR           /LINK COMPLEMENTED WHEN NO CARRY OUT EXPECTED
```

SEQ 0025

```
                        /*************************************************************************************
                        /TEST ADDER'S ABILITY TO GENERATE CARRY WHEN ACN=1,MDN=1, AND CARRY IN N=0 IN ALL EVEN BIT POSITIONS
0444  1050                TAD     K5252   /AC TO 5252,LINK=1
0445  1050                TAD     K5252   /AC TO 2524,LINK TO 0
0446  1050                TAD     K5252   /AC TO 7776,LINK=0
0447  7001                IAC             /AC TO 7777,LINK=0
0450  7040                CMA             /AC TO 0000,LINK=0
0451  7440                SZA
0452  4533                C8ERR           /CARRY FAILED IN AN EVEN BIT POSITION
0453  7430                SZL
0454  4533                C8ERR           /CARRY OUT FAILED TO COMPLEMENT LINK
                        /*************************************************************************************
                        /TEST AND INSTRUCTION TO NOT SET ANY AC BITS WHEN AC =0000
0455  0053                AND     K7777   /AC=0000,LINK=0
0456  7450                SNA
0457  7430                SZL
0460  4533                C8ERR           /AND SET BIT WHEN AC INITIALLY CLEAR,OR AND SET LINK
                        /*************************************************************************************
                        /TEST AND INSTRUCTION TO CLEAR ALL AC BITS WHEN USING AN OPERAND OF 0000
0461  1053                TAD     K7777   /AC TO 7777,LINK = 0
0462  0377                AND     (0      /AC TO 0000,LINK = 0
0463  7450                SNA
0464  7430                SZL
0465  4533                C8ERR           /AND FAILED TO CLEAR ALL AC BITS, OR SET LINK
                        /*************************************************************************************
                        /TEST AND INSTRUCTION TO NOT CLEAR ANY AC BITS WHEN AC=7777 AND MD=7777
0466  1053                TAD     K7777   /AC TO 7777
0467  0053                AND     K7777   /AC=7777,LINK=0
0470  7040                CMA             /AC TO 0000,LINK =0
0471  7450                SNA
0472  7430                SZL
0473  4533                C8ERR           /AND OF 7777 CLEARED AC BIT OR SET LINK
                        /*************************************************************************************
                        /TEST FOR ADJACENT PIN SHORTS IN "AND" CIRCUITRY
0474  1046                TAD     K2525   /AC TO 2525
0475  0050                AND     K5252   /AC TO 0000
0476  7440                SZA
0477  4533                C8ERR           /"AND" DID NOT CLEAR AC,POSSIBLE ADJACENT PIN SHORTS IN AND CIRCUITRY
0500  4536                ENDIST
                        /*************************************************************************************
                        /CPU TEST 3 - TEST ADDER FUNCTION
                        /*************************************************************************************
                        /TEST BIT 11 INPUT TO ADDER=0
0501  4535            CPUT3,  INTST
0502  1041                TAD     K1      /AC TO 0001
0503  7450                SNA
0504  4533                C8ERR           /ADDER=0 OPEN ON BIT 11 INPUT
                        /*************************************************************************************
                        /TEST BIT 10 INPUT TO ADDER=0
0505  7200                CLA             /AC TO 0000
0506  1376                TAD     (2      /AC TO 0002
0507  7450                SNA
0510  4533                C8ERR           /ADDER=0 OPEN ON BIT 10 INPUT
                        /*************************************************************************************
                        /TEST BIT 9 INPUT TO ADDER=0
```


SEQ 0026

```
0511  7200                CLA             /AC TO 0000
0512  1375                TAD     (4      /AC TO 0004
0513  7450                SNA
0514  4533                C8ERR           /ADDER=0 OPEN ON BIT 9 INPUT
                        /*************************************************************************************
                        /TEST BIT 8 INPUT TO ADDER=0
0515  7200                CLA             /AC TO 0000
0516  1042                TAD     K10
0517  7450                SNA
0520  4533                C8ERR           /ADDER=0 OPEN ON BIT 8 INPUT
                        /*************************************************************************************
                        /TEST BIT 7 INPUT TO ADDER=0
0521  7200                CLA             /AC TO 0000
0522  1374                TAD     (20     /AC TO 0020
0523  7450                SNA
0524  4533                C8ERR           /ADDER=0 OPEN ON BIT 7 INPUT
                        /*************************************************************************************
                        /TEST BIT 6 INPUT TO ADDER=0
0525  7200                CLA             /AC TO 0000
0526  1373                TAD     (40
0527  7450                SNA
0530  4533                C8ERR           /ADDER=0 OPEN ON BIT 6 INPUT
                        /*************************************************************************************
                        /TEST BIT 5 INPUT TO ADDER=0
0531  7200                CLA             /AC TO 0000
0532  1044                TAD     K100
0533  7450                SNA
0534  4533                C8ERR           /ADDER=0 OPEN ON BIT 5 INPUT
                        /*************************************************************************************
                        /TEST BIT 4 INPUT TO ADDER=0
0535  7200                CLA             /AC TO 0000
0536  1045                TAD     K200    /AC TO 0200
0537  7450                SNA
0540  4533                C8ERR           /ADDER=0 OPEN ON BIT 4 INPUT
                        /*************************************************************************************
                        /TEST BIT 3 INPUT TO ADDER=0
0541  7200                CLA             /AC TO 0000
0542  1372                TAD     (400    /AC TO 0400
0543  7450                SNA
0544  4533                C8ERR           /ADDER=0 OPEN ON BIT 3 INPUT
                        /*************************************************************************************
                        /TEST BIT 2 INPUT TO ADDER=0
0545  7200                CLA             /AC TO 0000
0546  1371                TAD     (1000   /AC TO 1000
0547  7450                SNA
0550  4533                C8ERR           /ADDER=0 OPEN ON BIT 2 INPUT
                        /*************************************************************************************
                        /TEST BIT 1 INPUT TO ADDER=0
0551  7200                CLA             /AC TO 0000
0552  1370                TAD     (2000
0553  7450                SNA
0554  4533                C8ERR           /ADDER=0 OPEN ON BIT 1 INPUT
                        /*************************************************************************************
                        /TEST BIT 0 INPUT TO ADDER=0
0555  7200                CLA             /AC TO 0000
```

```
0556  1047          TAD     K4000   /AC TO 4000
0557  7450          SNA
0560  4533          C8ERR           /ADDER=0 OPEN ON BIT 0 INPUT
0561  4536          ENDTST
0562  5767'         JMP CPUT4
0567  0600
0570  2000
0571  1000
0572  0400
0573  0240
0574  0020
0575  0004
0576  0002
0577  0000
      0600    PAGE
              /*************************************************************************************
              /CPU TEST 4 - SECOND OPERATE MICROINSTRUCTION TEST
              /*************************************************************************************
              /TEST RAR TO ROTATE AND NOT DROP ANY BITS
0600  4535    CPUT4,  INTSTT
0601  1046          TAD     K2525   /AC TO 2525
0602  7100          CLL
0603  7020          CML             /LINK TO 1
0604  7010          RAR             /AC TO 5252,LINK=1
0605  7420          SNL
0606  4533          C8ERR           /RAR DID NOT SHIFT AC11 TO LINK
0607  7040          CMA             /AC TO 2525,LINK=1
0610  0050          AND     K5252   /AC=0000,LINK=1
0611  7440          SZA
0612  4533          C8ERR           /RAR DROPPED BIT OR DID NOT SHIFT
                                    /ANY BIT SET IN AC INDICATES POSITION OF DROPPED BIT
              /*************************************************************************************
              /TEST RAR TO NOT PICK UP ANY BITS
0613  1046          TAD     K2525   /AC TO 2525,LINK=1
0614  7010          RAR             /AC TO 5252,LINK=1
0615  0046          AND     K2525   /AC TO 0000,LINK=1
0616  7450          SNA
0617  7420          SNL
0620  4533          C8ERR           /RAR PICKED UP BIT,POSITION OF BIT PICK UP IS
                                    /INDICATED BY BIT(S) SET IN AC
              /*************************************************************************************
              /TEST RAL TO SHIFT AND NOT DROP ANY BITS
0621  1050          TAD     K5252   /AC TO 5252 LINK=1
0622  7004          RAL             /AC TO 2525 LINK=1
0623  7420          SNL
0624  4533          C8ERR           /RAL DROPPED LINK BIT
0625  7040          CMA             /AC TO 5252 LINK=1
0626  0046          AND     K2525   /AC TO 0000 LINK=1
0627  7440          SZA
0630  4533          C8ERR           /RAL DROPPED BIT OR DID NOT SHIFT
                                    /FAILING BIT POSITIONS ARE SET IN AC
              /*************************************************************************************
              /TEST RAL TO NOT PICK UP ANY BITS
0631  1050          TAD     K5252   /AC TO 5252 LINK=1
0632  7004          RAL             /AC TO 2525 LINK=1
```



```
0633  0050          AND     K5252   /AC TO 0000 LINK=1
0634  7440          SZA
0635  4533          C8ERR           /RAL PICKED UP BIT, BITS SET IN AC INDICATE FAILING POSITIONS
              /*************************************************************************************
              /TEST RTR TO SHIFT TWICE AND NOT DROP ANY BITS
0636  7100          CLL             /CLEAR LINK
0637  1377          TAD     (4444   /AC TO 4444 LINK=0
0640  7012          RTR             /AC TO 1111 LINK=0
0641  7430          SZL
0642  4533          C8ERR           /RTR PICKED UP LINK BIT
0643  7040          CMA             /AC TO 6666
0644  0376          AND     (1111   /AC TO 0000 LINK=0
0645  7440          SZA
0646  4533          C8ERR           /RTR DROPPED BIT OR DID NOT SHIFT TWICE
                                    /BIT SET IN AC INDICATES BIT DROPPED
              /*************************************************************************************
              /TEST RTR TO NOT PICK UP ANY BITS
0647  1377          TAD     (4444   /AC TO 4444
0650  7012          RTR             /AC TO 1111
0651  0375          AND     (6666   /AC TO 0000
0652  7440          SZA
0653  4533          C8ERR           /RTR PICKED UP BIT, BIT SET IN AC INDICATES FAILING POSITION,
              /*************************************************************************************
              /TEST RTL TO SHIFT AND NOT DROP BITS
0654  1376          TAD     (1111
0655  7006          RTL             /AC TO 4444 LINK=0
0656  7430          SZL
0657  4533          C8ERR           /RTL PICKED UP LINK BIT
0660  7040          CMA             /AC TO 3333 LINK=0
0661  0377          AND     (4444   /AC TO 0000 LINK=0
0662  7440          SZA
0663  4533          C8ERR           /RTL DROPPED BIT OR DID NOT SHIFT
                                    /BIT SET IN AC INDICATES BIT DROPPED
              /*************************************************************************************
              /TEST RTL TO NOT PICK UP ANY BITS
0664  1376          TAD     (1111   /AC TO 1111
0665  7006          RTL             /AC TO 4444
0666  0374          AND     (3333   /AC TO 0000
0667  7440          SZA
0670  4533          C8ERR           /RTL PICKED UP BIT, BIT SET IN AC INDICATES FAILING POSITION
              /*************************************************************************************
              /TEST BSW TO SWAP AND NOT DROP BITS OR CHANGE LINK
0671  7100          CLL             /INITIALIZE LINK TO ZERO
0672  1043          TAD     K77     /AC TO 0077 LINK=0
0673  7002          BSW             /AC TO 7700 LINK=0
0674  7430          SZL
0675  4533          C8ERR           /BSW SET LINK
0676  1044          TAD     K100    /AC TO 0000 LINK TO 1
0677  7440          SZA
0700  4533          C8ERR           /BSW DID NOT SWAP OR PICKED UP BIT,
              /*************************************************************************************
              /TEST BSW FOR ADJACENT PIN SHORTS AND DROPPED BITS
0701  1052          TAD     K7700   /AC TO 7700 LINK=1
0702  7002          BSW             /AC TO 0077 LINK=1
0703  7420          SNL
```

```
                        C8ERR           /BSW CLEARED LINK
                        CMA             /AC TO 7700
                        TAD     K100    /AC TO 0000, LINK TO 0
                        SZA
                        C8ERR           /BSW PICKED UP OR DROPPED BIT(S).
                        ENDTST
                /*************************************************************************************
                /CPU TEST 5 - MQ MICROINSTRUCTION TEST
                /*************************************************************************************
                /TEST MQL TO CLEAR AC
CPUT5,          INTST
                        TAD     K7777   /AC TO 7777
                        MQL             /AC TO MQ, 0 TO AC.
                        SZA
                        C8ERR           /MQL DID NOT CLEAR AC
                /*************************************************************************************
                /TEST SWP TO EXCHANGE MQ AND AC,TEST RESULTS OF PREVIOUS MQL.
                        SWP             /AC TO MQ, MQ TO AC, AC=7777 MQ=0000
                        CMA             /AC TO 0000
                        SZA
                        C8ERR           /SWP DID NOT LOAD AC WITH MQ, OR MQL DID NOT LOAD MQ,OR
                                        /SWP OR MQL DROPPED A BIT.
                        CMA             /AC TO 7777 MQ=0000
                /*************************************************************************************
                /TEST MQ REGISTER FOR OUTPUTS STUCK HIGH
                        SWP             /AC TO 0000 MQ TO 7777
                        SZA
                        C8ERR           /SWP PICKED UP BIT IN AC.
                /*************************************************************************************
                /TEST MQ FOR ADJACENT PIN SHORTS BY TESTING FOR DROPPED BITS
                        TAD     K2525   /AC TO 2525 MQ=7777
                        MQL             /AC TO 0000 MQ TO 2525
                        SWP             /AC TO 2525 MQ TO 0000
                        CMA             /AC TO 5252
                        AND     K2525   /AC TO 0000
                        SZA
                        C8ERR           /MQL OR SWP DROPPED BIT,POSSIBLE ADJACENT PIN SHORTS
                                        /IN MQ, BIT SET IN AC INDICATES POSITION OF FAILURE
                /*************************************************************************************
                /TEST FOR ADJACENT PIN SHORTS IN MQ BY TESTING FOR BITS PICKED UP
                        TAD     K2525   /AC TO 2525 MQ=0000
                        MQL             /AC TO 0000 MQ TO 2525
                        SWP             /AC TO 2525 MQ TO 0000
                        AND     K5252   /AC TO 0000
                        SZA
                        C8ERR           /MQL OR SWP PICKED UP BIT,POSSIBLE ADJACENT PIN SHORT IN MQ,
                                        /BIT SET IN AC INDICATES POSITION OF FAILURE.
                        CLL
                        CMA             /AC TO 7777
                /*************************************************************************************
                /TEST MQA TO OR THE MQ WITH THE AC, ENTER WITH AC=7777 MQ=0000 LINK=0
                        MQL             /AC TO 0000 MQ TO 7777
                        MQA             /AC TO 7777 MQ=7777
                        SZL
                        C8ERR           /MQA SET LINK
```



```
                        CMA             /AC TO 0000 MQ=7777
                        SZA
                        C8ERR           /MQA DID NOT OR MQ WITH AC
                        SWP             /AC TO 7777 MQ TO 0000
                        SNA
                        C8ERR           /MQA CLEARED MQ
                        JMP CAMTST
                1000    PAGE
                /*************************************************************************************
                /TEST CAM TO CLEAR AC AND MQ
CAMTST,         SWP             /AC TO 0000 MQ TO 7777
                        CMA             /AC TO 7777 MQ=7777
                        CML             /SET LINK
                        CAM             /CLEAR AC AND MQ
                        SZA
                        C8ERR           /CAM DID NOT CLEAR AC
                        SNL
                        C8ERR           /CAM CLEARED LINK
                        SWP             /AC=0000 MQ=0000
                        SZA
                        C8ERR           /CAM DID NOT CLEAR MQ
                /*************************************************************************************
                /TEST ACL TO LOAD ZEROES FROM MQ TO AC
                        CMA             /AC TO 7777 MQ=0000
                        ACL             /AC TO 0000 MQ=0000
                        SZA
                        C8ERR           /ACL DID NOT LOAD 0000 TO AC
                        SNL
                        C8ERR           /ACL CLEARED LINK
                        CMA             /AC TO 7777
                        SWP             /AC TO 0000 MQ TO 7777
                        SZA
                        C8ERR           /ACL CHANGED MQ
                        ENDTST
                /*************************************************************************************
                /CPU TEST 6 - TEST DCA AND ISZ,DIRECT ADDRESSING TO PAGE ZERO
                //*************************************************************************************
                /TEST DCA TO STORE ALL 1'S,CLEAR AC, AND NOT AFFECT LINK
CPUT6,          INTST
                        CLL             /CLEAR LINK
                        TAD     K7777   /AC TO 7777 LINK=0
                        DCA     TESLOC  /AC TO 0000 LINK=0
                        SZA
                        C8ERR           /DCA DID NOT CLEAR AC, OR DCA SKIPPED
                        SZL
                        C8ERR           /DCA SET LINK
                        TAD     TESLOC  /AC TO 7777
                        CMA
                        SZA
                        C8ERR           /DCA DID NOT STORE,OR DCA STORED TO WRONG ADDRESS
```

SEQ 0031

```
                        /*************************************************************************************
                        /TEST DCA TO STORE ALL ZEROES
1042  3072                      DCA     TESLOC  /0000 TO LOCATION "TESLOC"
1043  1072                      TAD     TESLOC  /0000 TO AC
1044  7440                      SZA
1045  4533                      C8ERR           /DCA DID NOT STORE ALL 0'S, BIT SET IN AC
                                                /INDICATES FAILING BIT POSITION.
                        /*************************************************************************************
                        /TEST ISZ TO INCREMENT WITHOUT SKIPPING
1046  2072                      ISZ     TESLOC  /LOCATION "TESLOC" TO 0001
1047  7440                      SZA
1050  4533                      C8ERR           /ISZ SKIPPED WHEN NO OVERFLOW, OR ISZ SET AC BIT
1051  7430                      SZL
1052  4533                      C8ERR           /ISZ SET LINK
1053  1072                      TAD     TESLOC  /AC TO 0001 LINK=0
1054  1053                      TAD     K7777   /AC TO 0000, LINK TO 1
1055  7440                      SZA
1056  4533                      C8ERR           /ISZ DID NOT INCREMENT BY 1
                        /*************************************************************************************
                        /TEST ISZ TO SKIP ON OVERFLOW
1057  1053                      TAD     K7777   /AC TO 7777 LINK=1
1060  3072                      DCA     TESLOC  /LOCATION "TESLOC" TO 7777, AC TO 0000
1061  2072                      ISZ     TESLOC  /SHOULD SKIP
1062  4533                      C8ERR           /ISZ DID NOT SKIP ON OVERFLOW
1063  7420                      SNL
1064  4533                      C8ERR           /OVERFLOW ON ISZ SET LINK
1065  1072                      TAD     TESLOC  /0000 TO AC
1066  7440                      SZA
1067  4533                      C8ERR           /ISZ DID NOT INCREMENT 7777 TO 0000, OR ISZ
                                                /AFFECTED AC ON OVERFLOW
1070  4536                      ENDTST
                        /*************************************************************************************
                        /CPU TEST 7 - TEST "AND",TAD,ISZ,AND DCA DIRECT ADDRESSING TO SAME PAGE
                        /*************************************************************************************
                        /TEST TAD TO ADDRESS SAME PAGE DIRECT
1071  4535              CPUT7,  INTST
1072  1274                      TAD     .+2     /AC TO 2526 LINK=0
1073  7410                      SKP
1074  2526                      2526            /OPERAND FOR TAD SAME PAGE TEST
1075  1050                      TAD     K5252   /AC TO 0000, LINK TO 1
1076  7440                      SZA
1077  4533                      C8ERR           /TAD TO SAME PAGE DIRECT FAILED
                        /*************************************************************************************
                        /TEST DCA TO SAME PAGE DIRECT
1100  1053                      TAD     K7777   /AC TO 7777
1101  3303                      DCA     .+2     /AC TO 0000
1102  7410                      SKP
1103  0000                      0000            /TEST LOCATION FOR DCA TO SAME PAGE TEST
1104  1303                      TAD     .-1     /AC TO 7777
1105  7040                      CMA             /AC TO 0000
1106  7440                      SZA
1107  4533                      C8ERR           /DCA TO SAME PAGE FAILED
1110  3303                      DCA     .-5     /CLEAR TEST LOCATION FOR POSSIBLE SECOND PASS
                        /*************************************************************************************
                        /TEST ISZ TO SAME PAGE DIRECT TO SKIP
```


SEQ 0032

```
1111  1053                      TAD     K7777   /AC TO 7777
1112  3314                      DCA     .+2     /AC TO 0000
1113  7410                      SKP
1114  0000                      0000            /ISZ TEST LOCATION
1115  2314                      ISZ     .-1     /SHOULD SKIP
1116  4533                      C8ERR           /ISZ DID NOT SKIP
                        /*************************************************************************************
                        /TEST ISZ TO SAME PAGE DIRECT TO NOT SKIP
1117  2314                      ISZ     .-3     /SHOULD NOT SKIP
1120  7410                      SKP
1121  4533                      C8ERR           /ISZ SKIPPED WHEN NO SKIP EXPECTED
                        /*************************************************************************************
                        /TEST "AND" TO SAME PAGE DIRECT TO CLEAR ALL AC BITS
1122  1050                      TAD     K5252   /AC TO 5252
1123  0325                      AND     .+2     /AC TO 0000
1124  7410                      SKP
1125  2525                      2525            /OPERAND FOR AND SAME PAGE TEST
1126  7440                      SZA
1127  4533                      C8ERR           /AND TO SAME PAGE DIRECT FAILED
1130  4536                      ENDTST
```

SEQ 0033

```
                        /*************************************************************************************
                        /CPU TEST 10 - TEST TAD, "AND",DCA AND ISZ INDIRECT THRU PAGE ZERO
                        /*************************************************************************************
                        /TEST OF TAD THRU PAGE ZERO INDIRECT
1131  4535    CPUT10, INTST
1132  1476            TAD I POINTR    /AC TO 2526
1133  1050            TAD     K5252   /AC TO 0000
1134  7440            SZA
1135  4533            C8ERR           /TAD INDIRECT THRU PAGE ZERO FAILED, OR AUTO-INDEXED.
                        /*************************************************************************************
                        /TEST DCA INDIRECT THRU PAGE ZERO
1136  1053            TAD     K7777   /AC TO 7777
1137  3500            DCA I POINTB    /7777 TO LOCATION "POINTC", AC TO 0000
1140  1101            TAD     POINTC  /AC TO 7777
1141  7040            CMA             /AC TO 0000
1142  7440            SZA
1143  4533            C8ERR           /DCA INDIRECT THRU PAGE ZERO FAILED
                        /*************************************************************************************
                        /TEST ISZ INDIRECT THRU PAGE ZERO
1144  2500            ISZ I POINTB    /LOCATION "POINTC" TO 0000, SKIP
1145  4533            C8ERR           /ISZ INDIRECT THRU PAGE ZERO FAILED TO SKIP
                        /*************************************************************************************
                        /TEST "AND" INDIRECT THRU PAGE ZERO
1146  1046            TAD     K2525   /AC TO 2525
1147  3101            DCA     POINTC  /AC TO 0000
1150  1053            TAD     K7777   /AC TO 7777
1151  0500            AND I POINTB    /AC TO 2525
1152  1051            TAD     K5253   /AC TO 0000
1153  7440            SZA
1154  4533            C8ERR           /AND INDIRECT THRU PAGE ZERO FAILED
                        /*************************************************************************************
                        /TEST AUTO-INDEX DECODER FROM BITS 0 THRU 3 BY ADDRESSING ADDRESS 1010
                        /INDIRECTLY AND INSURING THAT AUTO-INDEXING DID NOT TAKE PLACE.
1155  1210            TAD     1010            /GET INITIAL CONTENTS OF 1010
1156  3072            DCA     TESLOC          /SAVE FOR LATER COMPARISION
1157  0610            AND I 1010              /REFERENCE 1010 INDIRECTLY
1160  1210            TAD     1010            /GET CONTENTS OF 1010
1161  7041            CIA                     /NEGATE IT
1162  1072            TAD     TESLOC          /COMPARE TO INITIAL CONTENTS
1163  7440            SZA                     /FINAL=INITIAL?
1164  4533            C8ERR                   /NO, AUTO INDEX OCCURRED FOR LOCATION 1010
1165  4536            ENDTST
1166  5777*           JMP CPUT11
1177  1200
      1200    PAGE
                        /*************************************************************************************
                        /CPU TEST 11 - TEST TAD,DCA,ISZ, & "AND" INDIRECT THRU SAME PAGE
                        /*************************************************************************************
                        /TEST TAD INDIRECT THRU SAME PAGE
1200  4535    CPUT11, INTST
1201  1603            TAD I .+2       /AC TO 2526
1202  7410            SKP
1203  0077            POINTR+1        /POINTER FOR TAD INDIRECT THRU SAME PAGE
1204  1050            TAD K5252       /AC TO 0000
```


SEQ 0034

```
1205  7440            SZA
1206  4533            C8ERR           /TAD INDIRECT THRU SAME PAGE FAILED
                        /*************************************************************************************
                        /TEST DCA INDIRECT THRU SAME PAGE
1207  1053            TAD     K7777   /AC TO 7777
1210  3612            DCA I .+2       /AC TO 0000
1211  7410            SKP
1212  0101            POINTC          /POINTER FOR DCA INDIRECT THRU SAME PAGE
1213  1101            TAD     POINTC  /AC TO 7777
1214  7040            CMA
1215  7440            SZA
1216  4533            C8ERR           /DCA INDIRECT THRU SAME PAGE FAILED
                        /*************************************************************************************
                        /TEST ISZ INDIRECT THRU SAME PAGE
1217  2622            ISZ I .+3       /LOCATION "POINTC" TO 0000, SKIP
1220  4533            C8ERR           /ISZ INDIRECT THRU SAME PAGE FAILED TO SKIP
1221  7410            SKP
1222  0101            POINTC
                        /*************************************************************************************
                        /TEST "AND" INDIRECT THRU SAME PAGE
1223  1046            TAD     K2525   /AC TO 2525
1224  3101            DCA     POINTC  /
1225  1053            TAD     K7777   /AC TO 7777
1226  0630            AND I .+2       /AC TO 2525
1227  7410            SKP
1230  0101            POINTC          /POINTER FOR "AND" INDIRECT THRU SAME PAGE
1231  1051            TAD     K5253   /AC TO 0000
1232  7440            SZA
1233  4533            C8ERR           /"AND" INDIRECT THRU SAME PAGE FAILED
1234  4536            ENDTST
                        /*************************************************************************************
                        /CPU TEST 12 - TEST AUTO-INDEX
                        /*************************************************************************************
                        /TEST AUTO-INDEX TO NOT INCREMENT WHEN NOT INDIRECTLY ADDRESSED.
1235  4535    CPUT12, INTST
1236  1046            TAD     K2525   /AC TO 2525
1237  3010            DCA     10      /ADDRESS 10 TO 2525
1240  1010            TAD     10      /AC TO 2525
1241  1051            TAD     K5253   /AC TO 0000
1242  7440            SZA
1243  4533            C8ERR           /AUTO-INDEX INCREMENTED WHEN NOT INDIRECTLY ADDRESSED
                        /*************************************************************************************
                        /TEST AUTO-INDEX TO INCREMENT WHEN INDIRECTLY ADDRESSED
1244  3101            DCA     POINTC  /CLEAR LOCATION "POINTC"
1245  1046            TAD     K2525   /AC TO 2525
1246  3102            DCA     POINTD  /LOCATION "POINTD" TO 2525
1247  1100            TAD     POINTB
1250  3010            DCA     10      /SET LOCATION 10 TO THE ADDRESS OF "POINTC"
1251  1410            TAD I 10        /LOCATION "POINTD"'S CONTENTS TO AC, AC TO 2525
1252  1051            TAD     K5253   /AC TO 0000
1253  7440            SZA
1254  4533            C8ERR           /AUTO-INDEX FAILED TO INCREMENT
                                        /AUTO-INDEX DECODER OPEN ON INPUT FROM BITS 0-3
                        /*************************************************************************************
                        /TEST BIT 8 INPUT OF AUTO-INDEX DECODER BY ADDRESSING LOCATION 0007
```

```
                        /INDIRECTLY AND CHECKING THAT AUTO-INDEXING DID NOT OCCUR
1255  3007              DCA     7       /CLEAR LOCATION 0007
1256  1407              TAD I 7         /REFERENCE LOCATION 0007 INDIRECTLY
1257  7200              CLA             /CLEAR AC
1260  1007              TAD     7       /GET CONTENTS OF LOCATION 0007
1261  7440              SZA             /DOES IT STILL CONTAIN 0000?
1262  4533              C8ERR           /NO, LOCATION 0007 AUTO-INDEXED
                        /*****************************************************************************
                        /TEST AUTO-INDEX DECODER INPUT FROM BITS 4 THRU 7, BY REFERENCING
                        /ADDRESS 0030 INDIRECTLY AND CHECKING THAT AUTO-INDEXING DID NOT OCCUR
1263  1030              TAD     30      /GET INITIAL CONTENTS OF LOC 0030
1264  3072              DCA     TESLOC  /SAVE IT FOR COMPARISON
1265  0430              AND I 30        /REFERENCE 30 INDIRECTLY
1266  1030              TAD     30      /GET FINAL CONTENTS OF LOC 30
1267  7040              CMA
1270  7001              IAC             /COMPLEMENT IT FOR COMPARE
1271  1072              TAD     TESLOC  /COMPARE TO INITIAL CONTENTS
1272  7440              SZA             /WAS LOC 30 AUTO-INDEXED?
1273  4533              C8ERR           /YES, LOC 30 AUTO-INDEXED
1274  4536              ENDTST
                        /*****************************************************************************
                        /CPU TEST 13 - TEST INTERNAL IOT INSTRUCTIONS
                        /*****************************************************************************
                        /TEST GTF TO SAVE LINK
1275  4535              CPUTI3, INTST
1276  7100              CLL             /CLEAR LINK
1277  7020              CML             /LINK TO 1
1300  6004              GTF
1301  7500              SMA
1302  4533              C8ERR           /GTF DID NOT SAVE A 1 FOR LINK
1303  7300              CLA CLL
1304  6214              RDF             /GET DATA FIELD
1305  7012              RTR
1306  7010              RAR             /MOVE DF TO AC 9-11
1307  6224              RIF             /GET INSTRUCTION FIELD
1310  3061              DCA     SAVFLD
                        /*****************************************************************************
                        /TEST RTF TO RESTORE LINK
1311  1047              TAD     K4000   /AC TO 4000
1312  1061              TAD     SAVFLD  /GET CORRECT IF AND DF INFORMATION
1313  6005              RTF             /RESTORE LINK TO 1
1314  5315              JMP     .+1     /ENABLE INTERRUPT FOR CONSOLE INTERACTION.
1315  7420              SNL
1316  4533              C8ERR           /RTF DID NOT RESTORE LINK TO A 1
                        /*****************************************************************************
                        /TEST GTF TO SAVE A LINK OF 0, AND INT REQUEST AND INT ENABLE OF 0
1317  6002              IOF
1320  7300              CLA CLL         /CLEAR AC AND LINK
1321  6004              GTF             /GET FLAGS, LINK TO AC0
1322  0777*             AND     K7600   /ELIMINATE SAVE FIELD REGISTER AND USER BIT
1323  7440              SZA             /LINK,INT REQUEST, AND INT ENABLE ALL ZERO?
1324  4533              C8ERR           /NO, GTF DID NOT SAVE CORRECTLY.
                                        /IF BIT0=1 LINK WAS SAVED AS 1 INSTEAD OF 0
                                        /IF BIT2=1 INT REQUEST WAS SAVED AS 1 INSTEAD OF 0
                                        /IF BIT4=1 INT ENABLE WAS SAVED AS 1 INSTEAD OF 0
```



```
                        /*****************************************************************************
                        /TEST CAF TO CLEAR AC AND LINK
1325  6001              ION
1326  7040              CMA             /AC TO 7777
1327  7020              CML             /AC=7777 LINK TO 1
1330  6007              CAF             /CLEAR ALL FLAGS, CLEARS AC AND LINK, AND INT ENABLE
1331  6305              KIE1            /DISABLE SLU#2
1332  6325              KIE2            /DISABLE SLU#3
1333  7450              SNA
1334  7430              SZL
1335  4533              C8ERR           /CAF FAILED TO CLEAR AC OR LINK
                        /*****************************************************************************
                        /TEST SKON TO NOT SKIP WHEN INTERRUPT ENABLE IS CLEAR
1336  6000              SKON            /SHOULD NOT SKIP
1337  7410              SKP
1340  4533              C8ERR           /SKON SKIPPED WHEN INT ENABLE CLEAR, OR CAF FAILED
                                        /TO CLEAR INT ENABLE
                        /*****************************************************************************
                        /TEST SKON TO SKIP ON INTERRUPT ON AND TURN INTERRUPT OFF
1341  6001              ION             /INTERRUPT ON,
1342  6000              SKON            /SKIP IF INTERRUPT ON,TURN INTERRUPT OFF
1343  4533              C8ERR           /ION DID NOT ENABLE INTERRUPT, OR SKON FAILED TO SKIP
                        /*****************************************************************************
                        /TEST THAT SKON TURNED OFF INTERRUPT
1344  6000              SKON            /SHOULD NOT SKIP
1345  7410              SKP
1346  4533              C8ERR           /SKON DID NOT TURN OFF INT, OR SKON SKIPS WHEN INT OFF
                        /*****************************************************************************
                        /TEST IOF TO DISABLE INTERRUPTS
1347  6001              ION             /ENABLE INTERUPTS
1350  7000              NOP             /ALLOWS TIME FOR INTERRUPT DELAY TO SET
1351  6002              IOF             /TURN OFF INTERRUPT
1352  6000              SKON
1353  7410              SKP
1354  4533              C8ERR           /IOF DID NOT DISABLE INTERRUPT
1355  5776*             JMP INTEN1
1376  1400
1377  1511
      1400              PAGE
                        /*****************************************************************************
                        /TEST PROPER OPERATION OF INT ENABLE.
1400  6001              INTEN1, ION     /INTERRUPT ON
1401  6004              GTF             /SHOULD GET A 1 FOR INT ENABLE
1402  0045              AND     K200    /MASK OUT INT ENABLE BIT
1403  7450              SNA             /SKIP IF INT ENABLE BIT SET
1404  4533              C8ERR           /ION DID NOT SET INT ENABLE OR GTF DID NOT GET A 1 FOR INT ENABLE
                        /*****************************************************************************
                        /TEST RTF TO SET INT ENABLE AND TO CLEAR LINK
1405  6002              IOF             /CLEAR INT ENABLE
1406  7300              CLA CLL
1407  7020              CML             /SET LINK
1410  1061              TAD     SAVFLD  /GET IF AND DF INFORMATION
1411  6005              RTF             /RESTORE FLAGS, LINK TO 0, SET INTERRUPT ENABLE
1412  5213              JMP     .+1     /ENABLE INTERRUPT FOR CONSOLE INTERACTION.
1413  7430              SZL
```

```
1058    1414  4533          C8ERR           /RTF DID NOT CLEAR LINK
1059    1415  6000          SKON            /SKIP IF INTERRUPT ON
1060    1416  4533          C8ERR           /RTF FAILED TO ENABLE INTERRUPTS
1061                  /*************************************************************************
1062                  /TEST SRQ TO NOT SKIP WHEN NO INTERRUPT REQUEST
1063    1417  6001          ION             /INTERRUPT ON
1064    1420  7300          CLA CLL         /GIVE POWER FAIL A CHANCE TO INTERRUPT
1065    1421  6003          SRQ             /SKIP ON INTERRUPT REQUEST
1066    1422  7410          SKP
1067    1423  4533          C8ERR           /SRQ SKIPPED WHEN NO INTERRUPT, OR ILLEGAL INTERRUPT
1068                                        /CAME UP DURING SRQ INSTRUCTION.
1069    1424  4536          ENDTST
1070                  /*************************************************************************
1071                  /CPU TEST 14 - TEST JUMPS AND JMS'S
1072                  /*************************************************************************
1073                  /TEST JUMP DIRECT
1074    1425  4535  CPUT14, INTST
1075    1426  7300          CLA CLL         /CLEAR AC AND LINK
1076    1427  1066          TAD     KSTOP
1077    1430  3000          DCA     0       /PUT C8ERR IN LOC 0 IN CASE JUMP FAILS TO GATE MD TO PC
1078    1431  5233          JMP     .+2     /FIRST JUMP TESTED
1079    1432  4533          C8ERR           /JMP FAILED TO JUMP DIRECT
1080                  /*************************************************************************
1081                  /TEST JMS DIRECT
1082    1433  4235          JMS     .+2
1083    1434  4533          C8ERR           /JMS FAILED TO JUMP
1084    1435  0000  JMSLOC, 0               /JMS ENTRY POINT, PC STORAGE.
1085    1436  1235          TAD     .-1     /GET STORED PC
1086    1437  7040          CMA
1087    1440  7001          IAC             /COMPLEMENT IT
1088    1441  1103          TAD     POINTE
1089    1442  7440          SZA
1090    1443  4533          C8ERR           /JMS DID NOT STORE PROPER PC
1091                  /*************************************************************************
1092                  /TEST JUMP INDIRECT TO JUMP CORRECTLY
1093    1444  5646          JMP I   .+2
1094    1445  4533          C8ERR           /JMP INDIRECT FAILED TO JUMP
1095    1446  1447          .+1             /POINTER FOR JMP INDIRECT ABOVE
1096                  /*************************************************************************
1097                  /TEST JMS INDIRECT TO JUMP AND STORE PC
1098    1447  4651          JMS I   .+2
1099    1450  4533          C8ERR           /JMS INDIRECT FAILED TO JUMP
1100    1451  1452          .+1
1101    1452  0000  JMSLO2, 0               /JMS INDIRECT PC STORAGE
1102    1453  1252          TAD     .-1
1103    1454  7040          CMA
1104    1455  7001          IAC             /COMPLEMENT STORED PC
1105    1456  1124          TAD     POINTF  /COMPARE IT TO EXPECTED VALUE
1106    1457  7440          SZA             /WAS IT EQUAL?
1107    1460  4533          C8ERR           /NO, JMS INDIRECT STORED INCORRECT PC.
1108    1461  4536          ENDTST
1109                  /*************************************************************************
1110                  /CPU TEST 15 - TEST COMBINED OPERATE MICROINSTRUCTIONS OF FORM 7XX0,7XX1
1111                  /*************************************************************************
1112                  /ALL INSTRUCTIONS IN RANGE 7XX0,7XX1 ARE TESTED.
```



```
1113                  /FOR EACH OF THE INSTRUCTIONS
1114                  /EXECUTED, A TOTAL OF 8 PATTERNS OF AC, MQ, AND LINK CONTENTS ARE USED,
1115                  /TO TEST FOR ERRORS IN THE EXECUTED INSTRUCTION A SIMULATION OF THE
1116                  /INSTRUCTION IS ALSO PERFORMED, AND THE RESULTS OF THE INSTRUCTION ARE
1117                  /COMPARED TO THE SIMULATION.
1118                  /*************************************************************************
1119                  /CREATE THE INSTRUCTION TO BE USED, INSTRUCTION RANGE IS 7XX0, 7XX1.
1120    1462  4535  CPUT15, INTST
1121    1463  3101          DCA     POINTC          /INITIALIZE INSTRUCTION MAKER
1122    1464  7410          SKP
1123    1465  7300  NXTONE, CLA CLL
1124    1466  2101          ISZ     POINTC
1125    1467  7020          CML
1126    1470  1101          TAD     POINTC
1127    1471  1052          TAD     K7700
1128    1472  7700          SMA CLA                 /ALL COMBINATIONS TRIED?
1129    1473  5777'         JMP CPUDN                       /YES,CPU TEST OVER
1130    1474  7300          CLA CLL
1131    1475  1101          TAD     POINTC
1132    1476  7006          RTL
1133    1477  7004          RAL
1134    1500  1376          TAD     (7000           /MAKE NEXT INSTRUCTION
1135    1501  3315          DCA     INSTRT          /SAVE IT.
1136    1502  1375  TESAGN, TAD     (7770
1137    1503  3177          DCA     DATPAT
1138                  /*************************************************************************
1139                  /SET UP AC, MQ, AND LINK FOR EXECUTION OF TEST INSTRUCTION
1140    1504  7621  NXTPAT, CAM
1141    1505  3057          DCA     SKPPED
1142    1506  3060          DCA     SOMSKP
1143    1507  1071          TAD     LKDATA
1144    1510  7010          RAR                     /LOAD LINK
1145    1511  7600  K7600,  7600/CLA
1146    1512  1070          TAD     MQDATA
1147    1513  7521          SWP                     /LOAD MQ
1148    1514  1067          TAD     ACDATA          /LOAD AC
1149                  /*************************************************************************
1150                  /EXECUTE TEST INSTRUCTION
1151    1515  0000  INSTRT, 0                       /EXECUTE INSTRUCTION
1152    1516  2057          ISZ     SKPPED          /DIDN'T SKIP
1153                  /*************************************************************************
1154                  /SAVE RESULTS OF TEST INSTRUCTION
1155    1517  3054          DCA     ACWAS
1156    1520  7040          CMA
1157    1521  7420          SNL
1158    1522  7200          CLA
1159    1523  3056          DCA     LKWAS
1160    1524  7521          SWP
1161    1525  3055          DCA     MQWAS
1162    1526  5774'         JMP GRFSIM
1163    1574  1600
1164    1575  7770
1165    1576  7000
1166    1577  2134
              1600  PAGE
```

```
1167                    /*************************************************************************************
1168                    /SET UP FOR SIMULATED EXECUTION TO TEST RESULT
1169    1600  7040  GRFSIM, CMA
1170    1601  3072          DCA     BIT11
1171    1602  7040          CMA
1172    1603  3065          DCA     BIT8
1173    1604  7040          CMA
1174    1605  3067          DCA     BIT7
1175    1606  7040          CMA
1176    1607  3102          DCA     BIT6
1177    1610  7040          CMA
1178    1611  3064          DCA     BIT5
1179    1612  7040          CMA
1180    1613  3063          DCA     BIT4
1181    1614  7040          CMA
1182    1615  3062          DCA     BIT3
1183    1616  1505  SETSIM, TAD I INSTTR                  /GET INSTRUCTION
1184    1617  7006          RTL
1185    1620  7006          RTL
1186    1621  7430          SZL                           /WAS BIT 3 SET?
1187    1622  2062          ISZ     BIT3                  /YES, CLEAR POINTER
1188    1623  7000          NOP
1189    1624  7004          RAL
1190    1625  7430          SZL                           /BIT 4 SET?
1191    1626  2063          ISZ     BIT4                  /YES, CLEAR POINTER
1192    1627  7000          NOP
1193    1630  7004          RAL
1194    1631  7430          SZL                           /BIT 5 SET?
1195    1632  2064          ISZ     BIT5                  /YES, CLEAR POINTER
1196    1633  7000          NOP
1197    1634  7004          RAL
1198    1635  7430          SZL                           /BIT 6 SET?
1199    1636  2102          ISZ     BIT6                  /YES, CLEAR POINTER
1200    1637  7000          NOP
1201    1640  7004          RAL
1202    1641  7430          SZL                           /BIT 7 SET?
1203    1642  2067          ISZ     BIT7                  /YES, CLEAR POINTER
1204    1643  7000          NOP
1205    1644  7004          RAL
1206    1645  7430          SZL                           /BIT 8 SET ?
1207    1646  2065          ISZ     BIT8                  /YES, CLEAR POINTER
1208    1647  7000          NOP
1209    1650  7006          RTL
1210    1651  7004          RAL
1211    1652  7430          SZL                           /WAS BIT 11 SET?
1212    1653  2072          ISZ     BIT11                 /YES, CLEAR POINTER
1213    1654  7004          NOP
1214    1655  7200          CLA
1215                    /*************************************************************************************
1216                    /SET UP AC, MQ, AND LINK FOR SIMULATED EXECUTION
1217    1656  1071  DOSIMU, TAD     LKDATA
1218    1657  7010          RAR
1219    1660  7200          CLA
1220    1661  1070          TAD     MQDATA
1221    1662  7521          SWP                           /LOAD LINK
```



```
1222    1663  1067          TAD     ACDATA                /LOAD AC
1223                    /*************************************************************************************
1224                    /SIMULATED EXECUTION BEGINS
1225                    /*************************************************************************************
1226                    /GROUP 1 SIMULATION
1227    1664  2062  GR1SIM, ISZ     BIT3                  /WAS BIT 3 SET IN THE INSTRUCTION?
1228    1665  5304          JMP     GR2GR3                /YES, IT IS A GROUP 2 OR 3.
1229    1666  2063          ISZ     BIT4                  /WAS BIT 4 SET?(GROUP 1)
1230    1667  7200          CLA                           /YES, SO CLEAR THE AC
1231    1670  2064          ISZ     BIT5                  /WAS IT CLL?
1232    1671  7100          CLL                           /YES,
1233    1672  2102          ISZ     BIT6                  /WAS IT CMA?
1234    1673  7040          CMA                           /YES
1235    1674  2067          ISZ     BIT7                  /WAS IT CML?
1236    1675  7020          CML                           /YES
1237    1676  2072          ISZ     BIT11                 /WAS IT IAC?
1238    1677  1041          TAD     K1                    /YES, ADD 1
1239    1700  2065          ISZ     BIT8                  /WAS IT RAR?
1240    1701  7010          RAR                           /YES
1241    1702  2057          ISZ     SKPPED                /INDICATE NO SKIP
1242    1703  5515          JMP I TEST                    /GO CHECK RESULTS
1243
1244                    /*************************************************************************************
1245                    /GROUP 2 SIMULATION
1246    1704  2072  GR2GR3, ISZ     BIT11                 /GROUP 2?
1247    1705  5777* GROUP3, JMP     GROUP3                /NO,GROUP 3.
1248    1706  2065  GROUP2, ISZ     BIT8                  /REVERSE SENSE SKIPS?
1249    1707  5335          JMP     REVSEN                /YES, GO DO REVERSE
1250    1710  2064          ISZ     BIT5                  /IS IT SMA?
1251    1711  7500          SMA                           /YES
1252    1712  7410          SKP
1253    1713  2060          ISZ     SOMSKP                /SMA SKIPPED,
1254    1714  2102          ISZ     BIT6                  /IS IT SZA?
1255    1715  7440          SZA                           /YES
1256    1716  7410          SKP
1257    1717  2060          ISZ     SOMSKP                /SZA SKIPPED
1258    1720  2067          ISZ     BIT7                  /IS IT SNL?
1259    1721  7420          SNL                           /YES
1260    1722  7410          SKP
1261    1723  2060          ISZ     SOMSKP
1262    1724  3067  OUT,    DCA     BIT7                  /SAVE AC
1263    1725  1060          TAD     SOMSKP
1264    1726  7450          SNA                           /ANY SKIP?
1265    1727  2057          ISZ     SKPPED                /NO
1266    1730  7200          CLA
1267    1731  1067          TAD     BIT7                  /REPLACE AC
1268    1732  2063          ISZ     BIT4                  /WAS IT CLA?
1269    1733  7200          CLA                           /YES
1270    1734  5515          JMP I TEST
1271                    /*************************************************************************************
1272                    /REVERSE SENSE SKIPPING FOR GROUP 2
1273    1735  2064  REVSEN, ISZ     BIT5                  /WAS IT SPA?
1274    1736  7500          SMA                           /YES,
1275    1737  7410          SKP                           /SPA WOULD HAVE SKIPPED,
1276    1740  5324          JMP     OUT                   /SPA WOULD NOT HAVE SKIPPED
```

```
1277  1741  2102          ISZ     BIT6            /WAS IT SNA?
1278  1742  7440          SZA                     /YES.
1279  1743  7410          SKP                     /SNA WOULD HAVE SKIPPED
1280  1744  5324          JMP     OUT             /SNA WOULD NOT HAVE SKIPPED
1281  1745  2007          ISZ     BIT7            /SZL?
1282  1746  7420          SNL                     /YES
1283  1747  5323          JMP     OUT-1           /QUALIFIED SKIP
1284  1750  5324          JMP     OUT             /SZL WOULD NOT HAVE SKIPPED.
1285  1777  2000
              2000  PAGE
                    /*************************************************************************************
1286                /GROUP 3 OPERATE SIMULATION
1287  2000  2057    GROUP3, ISZ     SKPPED          /INDICATE NO SKIP
1288  2001  2063            ISZ     BIT4            /CLA?
1289  2002  7200            CLA                     /YES
1290  2003  2064            ISZ     BIT5            /IS IT MQA?
1291  2004  5210            JMP     .+4             /YES
1292  2005  2007            ISZ     BIT7            /IS IT MQL?
1293  2006  7421            MQL                     /YES
1294  2007  5515            JMP I TEST              /COMPARE RESULTS
1295  2010  2007            ISZ     BIT7            /IT IS MQA. IS IT ALSO MQL? (SWP)
1296  2011  5214            JMP     DOSWAP          /YES. DO A SWP.
1297  2012  7501            MQA                     /NO, JUST DO MQA.
1298  2013  5515            JMP I TEST              /COMPARE RESULTS
1299  2014  3062    DOSWAP, DCA     BIT3            /MQ TO AC
1300  2015  7501            MQA
1301  2016  3063            DCA     BIT4            /SAVE PREVIOUS MQ
1302  2017  1062            TAD     BIT3            /GET PREVIOS AC
1303  2020  7421            MQL                     /PUT IN MQ
1304  2021  1063            TAD     BIT4            /PUT PREVIOUS MQ IN AC.
1305  2022  5515            JMP I TEST              /TEST RESULTS
1306                /*************************************************************************************
1307                /COMPARE RESULTS OF SIMULATION TO ACTUAL RESULTS
1308                /*************************************************************************************
1309                /TEST LINKS
1310  2023  3072    TESTS,  DCA     BIT11           /SAVE SIMULATED AC
1311  2024  7004            RAL                     /LINK TO AC 11
1312  2025  3007            DCA     BIT7            /SAVE SIMULATED LINK
1313  2026  1007            TAD     BIT7            /GET EXPECTED LINK
1314  2027  1056            TAD     LKWAS           /ADD IN LINK OBTAINED
1315  2030  3062            DCA     BIT3            /SET ERROR INDICATOR IF LINKS DIFFERENT
1316                                                /CLEAR ERROR INDICATOR IF LINKS SAME
1317
1318                /*************************************************************************************
1319                /LINKS AGREE. TEST THE AC CONTENTS
1320  2031  1072            TAD     BIT11           /GET EXPECTED AC CONTENTS
1321  2032  7040            CMA
1322  2033  7001            IAC                     /COMPLEMENT IT
1323  2034  1054            TAD     ACWAS           /GET ACTUAL RESULTS
1324  2035  7440            SZA                     /SAME?
1325  2036  3062            DCA     BIT3            /NO, SET ERROR INDICATOR
1326                /*************************************************************************************
1327                /AC CONTENTS OK. TEST MQ CONTENTS
1328  2037  7521            SWP                     /MQ TO AC
1329  2040  3065            DCA     BIT8            /SAVE MQ
1330
```



```
1331  2041  1065            TAD     BIT8
1332  2042  7040            CMA
1333  2043  7001            IAC                     /COMPLEMENT IT
1334  2044  1055            TAD     MQWAS           /COMPARE TO ACTUAL RESULTS
1335  2045  7440            SZA                     /SAME?
1336  2046  3062            DCA     BIT3            /NO, SET ERROR INDICATOR
1337                /*************************************************************************************
1338                /CHECK FOR SIMULATED INSTRUCTION AND ACTUAL INSTRUCTION TO BOTH HAVE
1339                /SKIPPED OR BOTH TO HAVE NOT SKIPPED
1340  2047  1057    SKPCHK, TAD     SKPPED          /GET SKIP INDICATOR
1341  2050  7010            RAR                     /AC 11 TO LINK
1342  2051  7200            CLA
1343  2052  7420            SNL                     /BOTH SKIP OR BOTH NOT SKIP?
1344  2053  5255            JMP     SIMERR          /YES, BOTH SKIPPED OR BOTH DIDN'T
1345
1346  2054  4533    SPE1,   CSERR   /THE INSTRUCTION SKIPPED WHEN EXECUTED, AND A
1347                        /SIMULATION OF THE SAME INSTRUCTION DID NOT, OR VICE VERSA.
1348                /*************************************************************************************
1349                /TEST FOR ANY SIMULATION DATA ERRORS
1350  2055  1062    SIMERR, TAD     BIT3            /GET ERROR INDICATOR
1351  2056  7450            SNA                     /ANY SIMULATION ERRORS?
1352  2057  5261            JMP     TESTPT          /NO
1353
1354  2060  4533    SPE2,   CSERR                   /OPERATE INSTRUCTION FAILED.
1355
1356                /*************************************************************************************
1357                /SIMULATION AGREES WITH ACTUAL. SEE IF ALL DATA PATTERNS HAVE
1358                /BEEN TRIED WITH THIS INSTRUCTION.
1359  2061  2177    TESTPT, ISZ     DATPAT          /ALL PATTERNS TRIED?
1360  2062  5303            JMP     TRNXPT          /NO, TRY NEXT PATTERN
1361  2063  3067            DCA     ACDATA
1362  2064  3070            DCA     MQDATA
1363  2065  3071            DCA     LKDATA
1364  2066  1505            TAD I INSTTR            /GET INSTRUCTION
1365  2067  7010            RAR                     /BIT11 TO LINK
1366  2070  7430            SZL                     /HAS INSTRUCTION BEEN TRIED WITH BIT11=1?
1367  2071  5732            JMP I NXTONN            /YES, DO NEXT INSTRUCTION (JMP TO NXTONE)
1368  2072  2505            ISZ I INSTTR            /UPDATE INSTRUCTION
1369  2073  0045            AND     K200            /MASK OUT MQ TYPE BIT
1370  2074  7450            SNA                     /MQ TYPE?
1371  2075  5733            JMP I TESAGG            /NO, GO DO IT
1372  2076  7200            CLA
1373  2077  1505            TAD I INSTTR
1374  2100  0377            AND     (7721           /MASK OUT BITS NOT ALLOWED(EAE)
1375  2101  3505            DCA I INSTTR
1376  2102  5733            JMP I TESAGG            /JMP TO TESAGN
1377                /*************************************************************************************
1378                /CREATE NEXT DATA SET UP
1379  2103  7000    TRNXPT, NOP/JMS POINT
1380  2104  1177            TAD     DATPAT
1381  2105  7010            RAR                     /AC BIT TO LINK
1382  2106  7200            CLA
1383  2107  1046            TAD     K2525
1384  2110  7420            SNL                     /AC TO BE SET?
1385  2111  7200            CLA                     /NO
```

```
1386    2112  3067          DCA     ACDATA
1387    2113  1177          TAD     DATPAT
1388    2114  7012          RTR
1389    2115  7006          CLA
1390    2116  1535          TAD I INSTTP
1391    2117  7420          SNL                     /MQ TO BE SET?
1392    2120  7200          CLA                     /NO
1393    2121  3070          DCA     MQDATA
1394    2122  1177          TAD     DATPAT
1395    2123  7012          RTR
1396    2124  7010          RAR
1397    2125  7420          SNL                     /LINK TO BE SET?
1398    2126  7200          CLA                     /NO
1399    2127  3071          DCA     LKDATA
1400    2130  5731          JMP I NXTPIT              /JMP TO NXTPAT
1401    2131  1504    NXTPTT, NXTPAT
1402    2132  1465    NXTONN, NXTONE
1403    2133  1502    TESAGG, TESAGN
1404    2134  4536    CPUDN,  ENDTST
1405    2135  3075          DCA TSTNC               /CLEAR TEST NUMBER
1406    2136  5776          JMP BEGEXM
1407
1408
1409    2176  3000
1410    2177  7721
              2200    PAGE
1411                  /ROUTINE TO PRINT "CPU TESTING" MESSAGE
1412
1413    2200  0000    PCPUMS, 0
1414    2201  4521          C8CRLF
1415    2202  4522          C8PRNT
1416    2203  2210          CPUMES
1417    2204  4522          C8PRNT
1418    2205  2213          TESTMS
1419    2206  4521          C8CRLF
1420    2207  5600          JMP I PCPUMS
1421    2210  0320    CPUMES, TEXT "CPU "
        2211  2540
        2212  0000
1422    2213  2405    TESTMS, TEXT    "TESTING"
        2214  2324
        2215  1116
        2216  0700
1423
1424                  /ROUTINE TO INITIALIZE FOR TEST
1425
1426    2217  0000    TSTIN,  0
1427    2220  7300          CLA CLL
1428    2221  2075          ISZ TSTNO               /INCREMENT TEST NUMBER
1429    2222  7000          NOP
1430    2223  1217          TAD TSTIN       /GET TEST LOOP ADDRESS
1431    2224  3226          DCA TSLOP       /SAVE TEST LOOP ADDRESS
1432    2225  5617          JMP I TSTIN
1433    2226  0000    TSLOP,  0
1434
```



```
1435                  /ROUTINE TO HANDLE SCOOP LOOPING AT END OF TEST IF ERROR OCCURRED
1436
1437    2227  0000    TSTEND, 0
1438    2230  7300          CLA CLL
1439    2231  4517          KRCHK           /CHECK FOR CONSOLE REQUEST
1440    2232  1020          TAD PSR         /CHECK PSEUDO SWITCH REGISTER
1441    2233  7006          RTL             /FOR BIT 2=1 TEST LOOP
1442    2234  7700          SMA CLA         /SKIP IF SET
1443    2235  5627          JMP I TSTEND    /CONTINUE TO NEXT TEST
1444    2236  5626          JMP I TSLOP     /LOOP ON CURRENT TEST
1445
1446                  /ROUTINE TO CHECK FOR KEYBOARD INTERVENTION
1447
1448    2237  0000    CHKKB,  0
1449    2240  7300          CLA CLL
1450    2241  6035          KIE             /DISABLE KEYBOARD INTERRUPTS
1451    2242  4516          CHKKSF          /CHECK FOR KEYBOARD FLAG
1452    2243  7000          NOP
1453    2244  7201          CLA IAC
1454    2245  6035          KIE             /ENABLE KEYBOARD INTERRUPTS
1455    2246  7300          CLA CLL
1456    2247  5637          JMP I CHKKB
1457
```

```
                        *3000
                        /*************************************************************************************
                        /MEMORY EXIENSION TEST
                        /*************************************************************************************
                        /*************************************************************************************
                        /MEMORY EXTENSION TEST 1
                        /TEST CDF AND RDF, USE CDF TO SET THE DATA
                        /FIELD AND RDF TO READ THE DATA FIELD.
                        /DO ALL COMBINATIONS 0 TO 3 & 7.
                        /
                        /
3000  7300  BEGEXM,     CLA CLL
3001  6002              IOF
3002  1020              TAD PSR           /EXECUTE MEMORY EXTENSION TEST???????
3003  0377              AND (0040
3004  7640              SZA CLA
3005  5776'             JMP BEGRTC        /NO
3006  4520              FIXIL             /FIXUP INTERRUPT LINKAGE
3007  4775'  MEOW,      JMS PMEMES        /PRINT MEMORY EXTENSION TESTING MESSAGE
                                          /IF NOT UNDER APT CONTROL.
3010  4535  EXMT1,     INTST
3011  6007              CAF
3012  6001              ION
                        /
3013  6201  DF0,        CDF 00            /DF 0
3014  6214              RDF
3015  7440              SZA
3016  4533              C8ERR             /ERROR, CDF OR RDF FAILED.
                        /
3017  6271  DF7,        CDF 70            /DF 7
3020  6214              RDF
3021  1374              TAD (7747
3022  7040              CMA               /AC  = 0
3023  7440              SZA
3024  4533              C8ERR             /ERROR, CDF OR RDF FAILED.
                        /
3025  6211  DF1,        CDF 10            /DF 10
3026  6214              RDF
3027  1373              TAD (7767
3030  7040              CMA               /AC=0
3031  7440              SZA
3032  4533              C8ERR
                        /
3033  6221  DF2,        CDF 20            /DF2
3034  6214              RDF
3035  1372              TAD (7757
3036  7040              CMA               /AC=0
3037  7440              SZA
3040  4533              C8ERR             /CDF2 OR RDF FAILED
```



```
                        /
3041  6231  DF3,        CDF 30            /DF 3
3042  6214              RDF
3043  1374              TAD (7747
3044  7040              CMA               /AC=0
3045  7440              SZA
3046  4533              C8ERR             /CDF 3 OR RDF FAILED.
                        /
3047  6201  DF4,        CDF 00
3050  6214              RDF
3051  7440              SZA
3052  4533              C8ERR             /CDF 0 OR RDF FAILED.
3053  6000              SKON              /SKP IF ION, DISABLE INT SYSTEM.
3054  4533              C8ERR
3055  4536              ENDTST
                        /*************************************************************************************
                        /CONSOLE PACKAGE REQUESTS ARE INHIBITED FROM HERE TO END OF EXT, MEMORY TESTS.
                        /*************************************************************************************
                        /MEMORY EXTENSION TEST 2
                        /NOW TEST SAVE FIELD BITS 9-11 WITH
                        /RIB, PI IS ENABLED, TELEPRINTER FLAG IS
                        /USED FOR INTERRUPT, DO ALL COMBINATIONS 0 TO 3 & 7.
                        /
                        /THIS TEST OVERWRITES LOCATIONS 0 & 1 IN FIELD 0.
                        /
3056  4535  EXMT2,      INTST
3057  6201              CDF 00            /DF0
3060  1376              TAD (JMP I 0
3061  3001              DCA 1             /C(1)=JMP I 0
3062  6041              TSF               /TEST TTY FLAG
3063  4506              JMS I XTFLG       /SET FLAG
                        /
3064  6001  IB0,        ION               /ENABLE PI
3065  7200              CLA               /AN INTERRUPT SHOULD OCCUR AFTER THIS INST IS EXECUTED.
3066  6234              RIB               /READ SF
3067  7440              SZA
3070  4533              C8ERR             /RIB FAILED.
                        /
3071  6211  IB1,        CDF 10            /DF 1
3072  6001              ION
3073  7200              CLA               /INTERRUPT HERE
3074  6214              RDF               /DF SHOULD BE 0 AFTER A PI
3075  7440              SZA
3076  4533              C8ERR             /DF NOT CLEARED, OR NO PI.
                        /
3077  6234              RIB               /READ SF
3100  1371              TAD (7776
3101  7040              CMA               /AC=0
3102  7440              SZA
3103  4533              C8ERR             /RIB OR SF FAILED.
                        /
3104  6221  IB2,        CDF 20            /DF 2
3105  6001              ION
3106  7200              CLA               /INTERRUPT HERE
3107  6214              RDF               /SHOULD BE 0 AFTER PI
```

```
1568    3110  7440          SZA
1569    3111  4533          C8ERR           /DF NOT CLEARED, OR NO PI.
1570                  /
1571    3112  1370          TAD (7775
1572    3113  6234          RIB             /AC=7777
1573    3114  7040          CMA             /=0
1574    3115  7440          SZA
1575    3116  4533          C8ERR           /RIB OR SF FAILED.
1576                  /
1577    3117  6231  IB3,    CDF 30          /DF3
1578    3120  6001          ION
1579    3121  7200          CLA             /INTERRUPT HERE
1580    3122  6214          RDF             /DF SHOULD BE CLEARED
1581    3123  7440          SZA
1582    3124  4533          C8ERR           /DF NOT CLEARED.
1583                  /
1584    3125  6234          RIB             /AC=7777
1585    3126  1367          TAD (7774
1586    3127  7040          CMA             /AC=0
1587    3130  7440          SZA
1588    3131  4533          C8ERR           /RIB OR SF FAILED.
1589                  /
1590    3132  6201  IIB0,   CDF 00          /DF0
1591    3133  6001          ION
1592    3134  7200          CLA             /INTERRUPT HERE
1593    3135  6214          RDF             /DF MUST=0 AFTER PI
1594    3136  7440          SZA
1595    3137  4533          C8ERR           /DF NOT 0 AFTER PI.
1596    3140  6234          RIB
1597    3141  7440          SZA
1598    3142  4533          C8ERR           /RIB OR SF FAILED.
1599                  /
1600    3143  6271  IB7,    CDF 70          /DF 7
1601    3144  6001          ION
1602    3145  7200          CLA             /INTERRUPT HERE
1603    3146  6214          RDF             /DF MUST = 0 AFTER PI
1604    3147  7440          SZA
1605    3150  4533          C8ERR           /DF NOT 0.
1606                  /
1607    3151  6234          RIB
1608    3152  1367          TAD (7774
1609    3153  7040          CMA
1610    3154  7440          SZA
1611    3155  4533          C8ERR           /RIB OR SF FAILED.
1612                  /
1613    3156  4536          ENDTST
1614    3157  5760          JMP I .+1       /INTERRUPTS ARE NOW DISABLED DUE TO PREVIOUS INTERRUPT.
1615    3160  3200          EXMT3           /TTY OUTPUT FLAG IS SET (& ENABLED).
1616    3161  7774
1617    3162  7775
1618    3163  7776
1619    3164  7757
1620    3165  7767
1621    3166  7747
1622    3167  5200
```



```
1623    3170  5430
1624    3171  0040
                    3200  PAGE
1625                  /
1626                  /*****************************************************************************
1627                  /MEMORY EXTENSION TEST 3
1628                  /NOW TEST DCA I AND TAD I TO ALL STACKS(1-3 & 7), EACH STACK WILL
1629                  /CONTAIN ITS DF# IN LOCATION 0007.
1630                  /
1631                  /THIS TEST OVERWRITES LOCATION 7 IN DF'S 1,2,3, & 7.
1632                  /
1633    3200  4535    EXMT3,  INTST
1634    3201  4510            JMS I XSTKS     /INITIALIZE STKS.
1635    3202  7001            IAC
1636    3203  3074            DCA NDF         /DF NUMBER = 1 TO START
1637    3204  1300            TAD CCDF        /6201
1638    3205  1042            TAD K10
1639    3206  3207            DCA .+1         /DF 001 TO START WITH
1640    3207  6201    DFLD,   CDF 00          /WILL BE INCREMENTED
1641    3210  1074            TAD NDF         /DF#
1642    3211  3777            DCA I (0007     /PUT IN 0007 OF STACK
1643    3212  2107            ISZ STKS        /ALL STACKS WHEN 0
1644    3213  7410            SKP
1645    3214  5233            JMP TADI        /TEST TAD I
1646    3215  1107            TAD STKS        /IF STKS=-1 DO FIELD 7 (CPRAM).
1647    3216  7040            CMA
1648    3217  7640            SZA CLA
1649    3220  5226            JMP DNF7        /NOT READY FOR FIELD 7 YET.
1650    3221  1376            TAD (CDF 70     /DO FIELD 7.
1651    3222  3207            DCA DFLD
1652    3223  1377            TAD (0007
1653    3224  3074            DCA NDF
1654    3225  5207            JMP DFLD
1655    3226  1042    DNF7,   TAD K10
1656    3227  1207            TAD DFLD        /INCR, CDF IOT
1657    3230  3207            DCA DFLD
1658    3231  2074            ISZ NDF
1659    3232  5207            JMP DFLD
1660                  /
1661    3233  4510    TADI,   JMS I XSTKS     /RESET UP STKS.
1662    3234  7001            IAC
1663    3235  3074            DCA NDF         /DF#=1 AGAIN
1664    3236  1300            TAD CCDF        /6201
1665    3237  1042            TAD K10
1666    3240  3241            DCA .+1
1667    3241  6201    TFLD,   CDF 00
1668    3242  1777            TAD I (0007     /AC=DF CONTENTS NOW
1669    3243  3073            DCA DAT         /SAVE TEMP
1670    3244  1073            TAD DAT
1671    3245  7041            CIA             /2'S COMP
1672    3246  1074            TAD NDF         /BETTER BE EQUAL
1673    3247  7650            SNA CLA
1674    3250  5255            JMP UPSTK       /EQUAL
1675    3251  1074            TAD NDF
1676    3252  7421            MQL
```

```
1677  3253  1073          TAD DAT
1678  3254  4533          C8ERR           /AC,MQ=ACTUAL DATA READ FROM EXT. FIELD,EXPECTED DATA
1679  3255  2107  UPSTK,  ISZ STKS        /ALL WHEN 0
1680  3256  7410          SKP
1681  3257  5276          JMP IBSF        /NEXT TEST
1682  3260  1107          TAD STKS        /IF STKS=-1 CHECK FIELD 7.
1683  3261  7040          CMA
1684  3262  7640          SZA CLA
1685  3263  5271          JMP TNF7        /NOT READY FOR FIELD 7 YET.
1686  3264  1376          TAD (CDF 70     /CHECK FIELD 7.
1687  3265  3241          DCA TFLD
1688  3266  1377          TAD (0007
1689  3267  3074          DCA NDF
1690  3270  5241          JMP TFLD
1691  3271  1042  TNF7,   TAD K10
1692  3272  1241          TAD TFLD        /CDF IOT + 10
1693  3273  3241          DCA TFLD
1694  3274  2074          ISZ NDF
1695  3275  5241          JMP TFLD
1696  3276  4536  IBSF,   ENDTST
1697                      /
1698                      /*************************************************************************************
1699                      /MEMORY EXTENSION TEST 4
1700                      /CIF TEST. CHECKS THE ABILITY OF A CIF-ION-NOP-JMP OR
1701                          /CIF-ION-NOP-JMS SEQUENCE TO DO THE FOLLOWING:
1702                                  /1.  CIF ENABLE MAR TO IB TRANSFER.
1703                                  /2.  INHIBIT INTERRUPT TILL JMP OR JMS EXECUTED.
1704                                  /3.  INTERRUPT AFTER JMP OR JMS EXECUTED.
1705                                  /4.  JMP OR JMS ENABLES IB TO IF TRANSFER.
1706                                  /5.  INTERRUPT ENABLES IF TO SF TRANSFER.
1707                      /
1708                      /THIS TEST OVERWRITES LOCATIONS 0,1,2, & 3 IN FIELD 0;
1709                      /       ALSO LOCATIONS 1,3347, 3422 & 3425 IN FIELDS 1,2, & 3.
1710                      /
1711                      /SET UP FOR CIF-ION-NOP-JMP CHECK.
1712
1713  3277  4535  EXMT4,  INTST
1714  3300  6201  CCDF,   CDF     00              /SET LOCS 1-2 TO ISZ 0.
1715  3301  1375          TAD     (ISZ 0          /JMP I 0 RESPECTIVELY.
1716  3302  3001          DCA     1
1717  3303  1350          TAD     KNOP
1718  3304  3002          DCA     2
1719  3305  1374          TAD     (JMP I 0
1720  3306  3003          DCA     3
1721                      /
1722                      /NOW STORE HALTS IN LOC1, CIFJMP+1,
1723                      /AND CIFJMS+1 OF ALL EXTENDED FIELDS.
1724                      /
1725                      /NOTE:  IF THE HALT IS EXECUTED, THE SYSTEM WILL TRAP TO CONTROL
1726                      /       PANEL MEMORY AND PRINT OUT THE FACT THAT A HALT OCCURED,
1727                      /       THE FIELD AND LOCATION WHERE THE HALT WAS ENCOUNTERED WILL
1728                      /       ALSO BE IDENTIFIED, THE SYSTEM MUST BE RE-BOOTED TO
1729                      /       RESTART THE DIAGNOSTIC. SORRY ABOUT THAT....
1730                      /
1731  3307  4510          JMS I   XSTKS
```



```
1732  3310  2107          ISZ STKS                /FIELD 0 NOT TESTED.
1733  3311  1330          TAD     LCDF
1734  3312  1042          TAD     K10
1735  3313  3314          DCA     .+1
1736  3314  6211  HLTS,   CDF     10
1737  3315  1373          TAD     (HLT
1738  3316  3441          DCA I   K1
1739  3317  1373          TAD     (HLT
1740  3320  3766          DCA I   CAB
1741  3321  1373          TAD     (HLT
1742  3322  3767          DCA I   CAC
1743  3323  2107          ISZ     STKS
1744  3324  7410          SKP
1745  3325  5330          JMP     .+3
1746  3326  1314          TAD     HLTS
1747  3327  5312          JMP     HLTS-2
1748  3330  6201  LCDF,   CDF     00
1749  3331  6041          TSF                     /ENSURE TTO FLAG SET.
1750  3332  4506          JMS I   XTFLG
1751  3333  1372  AGAIN1, TAD     (CIF            /INITIALIZE TO CIF 00.
1752  3334  3346          DCA     CIFJMP
1753  3335  3365          DCA     CIFCK           /INITIALIZE I,F, CHECK TO 0.
1754  3336  4510          JMS I   XSTKS           /INITIALIZE STKS TO -4.
1755  3337  2107          ISZ     STKS            /FIELD 0 NOT TESTED.
1756  3340  1346  CIFJPL, TAD     CIFJMP
1757  3341  1042          TAD     K10
1758  3342  3346          DCA     CIFJMP
1759  3343  1365          TAD     CIFCK
1760  3344  1042          TAD     K10
1761  3345  3365          DCA     CIFCK
1762  3346  6202  CIFJMP, CIF     00              /MODIFIED TO CURRENT FIELD
1763                                                /UNDER TEST.
1764  3347  6001          ION
1765  3350  7000  KNOP,   NOP
1766  3351  5352          JMP     .+1             /INTERRUPT SHOULD OCCUR AFTER THIS JMP.
1767  3352  4533          C8ERR                   /ERROR,  NO PI OR INHIBIT PI,
1768  3353  6234          RIB
1769  3354  7041          CIA
1770  3355  1365          TAD     CIFCK
1771  3356  7650          SNA CLA
1772  3357  5771'         JMP CIFOK
1773  3360  1365          TAD     CIFCK
1774  3361  7421          MQL                     /LOAD MQ
1775  3362  6234          RIB
1776  3363  4533  CAD,    C8ERR                   /ERROR,  I,B, TO I,F, TRANSFER
                                                  /FAILED AFTER CIF-JMP, BAD
                                                  /I,F, IN AC, GOOD I,F, IN MQ.
1777
1778
1779  3364  5771'         JMP CIFOK
1780  3365  0000  CIFCK,  0
1781  3366  3347  CAB,    CIFJMP+1
1782  3367  3422  CAC,    CIFJMS+1
1783
1784  3371  3400
1785  3372  6202
1786  3373  7402
```

```
1787  3374  5430
1788  3375  2000
1789  3376  6271
1790  3377  0007
            3400    PAGE
1791  3400  2107  CIFOK,  ISZ STKS              /DONE?
1792  3401  5777'         JMP CIFJPL            /NO, DO NEXT FIELD
1793  3402  7200  IBSF1,  CLA                   /TEST CIF-JMS
1794  3403  6201          CDF     00
1795  3404  6041          TSF                   /ENSURE TTO FLAG SET.
1796  3405  4506          JMS I   XTFLG
1797  3406  1376  AGAIN2, TAD     (CIF          /INIT. TO CIF 00.
1798  3407  3221          DCA     CIFJMS
1799  3410  3244          DCA     CIFCK1        /INIT. I.F. CHECK TO 0.
1800  3411  4510          JMS I   XSTKS         /INITIALIZE STKS.
1801  3412  2107          ISZ     STKS          /FIELD 0 NOT TESTED.
1802  3413  1221  CIFJSL, TAD     CIFJMS
1803  3414  1042          TAD     K10
1804  3415  3221          DCA     CIFJMS
1805  3416  1244          TAD     CIFCK1
1806  3417  1042          TAD     K10
1807  3420  3244          DCA     CIFCK1
1808  3421  6202  CIFJMS, CIF     00            /MODIFIED TO CURRENT FIELD
1809                                            /UNDER TEST.
1810  3422  6001          ION
1811  3423  7000          NOP
1812  3424  4225          JMS     .+1           /INTERRUPT SHOULD OCCUR AFTER THIS JMS.
1813  3425  0000          0
1814  3426  4533          CAERR                 /ERROR.  NO PI OR INHIBIT PI.
1815  3427  6234          RIB
1816  3430  7041          CIA
1817  3431  1244          TAD     CIFCK1
1818  3432  7650          SNA CLA
1819  3433  5240          JMP     CIFOK1
1820  3434  1244          TAD     CIFCK1
1821  3435  7421          MQL
1822  3436  6234          RIB
1823  3437  4533  CAE,    CAERR                 /ERROR.  I.B. TO I.F. TRANSFER
1824                                            /FAILED AFTER CIF-JMS, BAD
1825                                            /I.F. IN AC, GOOD I.F. IN MQ.
1826  3440  2107  CIFOK1, ISZ     STKS          /DONE?
1827  3441  5213          JMP     CIFJSL        /NO.  DO NEXT FIELD.
1828  3442  4536          ENDTST
1829  3443  5245          JMP EXMT5             /YES.  GO ON TO NEXT TEST
1830  3444  0000  CIFCK1,0
1831                      /
1832                      /*****************************************************************************
1833                      /MEMORY EXTENSION TEST 5
1834                      /TEST GTF FOR FLAG AND SAVE FIELDS
1835                      /GET SAVE FIELDS  AFTER INTERRUPT
1836                      /CHECK  INTERRUPT INHIBIT, DO ALL
1837                      /COMBINATIONS 0 TO 3.
1838                      /
1839  3445  4535  EXMT5,  INTST
1840  3446  4510          JMS I XSTKS
```



```
1841  3447  1375          TAD (JMP I 0          /SET FOR RETURN
1842  3450  3001          DCA 1
1843  3451  1374          TAD (CDF
1844  3452  3261          DCA XSDF
1845  3453  1761  MGTF,   TAD XSDF              /GET FIRST FIELD
1846  3454  0373          AND (0070
1847  3455  7120          STL                   /INT REQUEST FLAG.
1848  3456  7010          RAR
1849  3457  7012          RTR
1850  3460  3310          DCA XSAV
1851  3461  6201  XSDF,   CDF 00
1852  3462  6041          TSF                   /ENSURE TTY FLAG SET.
1853  3463  4506          JMS I XTFLG
1854  3464  6001          ION
1855  3465  7340          CLA CLL CMA           /INTERRUPT HERE;CHECK FOR JAM ON GTF
1856  3466  6004          GTF                   /GET THE FLAGS
1857  3467  3311          DCA FSAV
1858  3470  1311          TAD FSAV
1859  3471  7041          CIA
1860  3472  1310          TAD XSAV              /TTY + CURRENT FIELD
1861  3473  7650          SNA CLA
1862  3474  5301          JMP CKMF
1863  3475  1310          TAD XSAV
1864  3476  7421          MQL
1865  3477  1311          TAD FSAV
1866  3500  4533          CAERR                 /AC,MQ=ACTUAL FLAGS,EXPECTED FLAGS
1867  3501  1042  CKMF,   TAD K10
1868  3502  1261          TAD XSDF
1869  3503  3261          DCA XSDF
1870  3504  2107          ISZ STKS              /MORE FIELDS TO CHECK
1871  3505  5253          JMP MGTF
1872  3506  4536          ENDTST
1873  3507  5772'         JMP EXMT6             /YES.  GO TO NEXT TEST
1874  3510  0000  XSAV,   0
1875  3511  0000  FSAV,   0
1876                      /
1877  3572  3600
1878  3573  0070
1879  3574  6201
1880  3575  5400
1881  3576  6202
1882  3577  3340
            3600    PAGE
1883                      /*****************************************************************************
1884                      /MEMORY EXTENSION TEST 6
1885                      /TEST ION AND LINK FROM RTF
1886                      /TEST INTERRUPT INHIBIT BEFORE JMP
1887                      /GET THE FLAGS WITH GTF.
1888                      /
1889                      /THIS TEST OVERWRITES LOCATIONS 1 & 2 IN FIELD 0.
1890  3600  4535  EXMT6,  INTST                 /TTY FLAG SET BEFORE ENTRY TO TEST.
1891  3601  1377          TAD (ISZ 0
1892  3602  3001          DCA 1
1893  3603  1376          TAD (JMP I 0
1894  3604  3002          DCA 2
```

```
1895  3605  6005          RTF                     /LOADS IB & DF,EN INT.,SETS INT INH.
1896  3606  5207          JMP .+1                 /INTERRUPT HERE;JMP LOADS IF FROM IB,CLRS INT INH.
1897  3607  4533          C8ERR                   /INTERRUPT WAS INHIBITED.
1898  3610  6004          GTF
1899  3611  3264          DCA SFLGS
1900  3612  1264          TAD SFLGS
1901  3613  7041          CIA
1902  3614  1375          TAD (1000               /CHECK FOR LINK=0,INT REQ=1,INT EN=0
1903  3615  7650          SNA CLA
1904  3616  5223          JMP L61                 /CHECK OK
1905  3617  1375          TAD (1000
1906  3620  7421          MQL
1907  3621  1264          TAD SFLGS
1908  3622  4533          C8ERR                   /AC,MQ=ACTUAL FLAGS,EXPECTED FLAGS
1909  3623  1374  L61,    TAD (5200
1910  3624  6005          RTF
1911  3625  7240          CLA CMA                 /CHECK FOR JAM ON GTF
1912  3626  6004          GTF                     /EXPECTED BITS ARE LINK=1,INT EN=1
1913  3627  3264          DCA SFLGS
1914  3630  1264          TAD SFLGS
1915  3631  7041          CIA                     /  (NO INT REQ - TTY FLAG BECAUSE
1916  3632  1373          TAD (4200               /  INT INH=1 TILL NEXT JMS OR JMP).
1917  3633  7640          SZA CLA
1918  3634  5253          JMP L62
1919  3635  6005          RTF                     /REPLACE ION,INT INH
1920  3636  7300          CLA CLL
1921  3637  6004          GTF
1922  3640  3264          DCA SFLGS
1923  3641  1264          TAD SFLGS
1924  3642  7041          CIA
1925  3643  1372          TAD (0200               /EXPECTED BITS ARE LINK=0,INT REQ=0 BECAUSE INT INH=1
1926  3644  7640          SZA CLA
1927  3645  5257          JMP RPERR               /SOMETHING WRONG WITH FLAGS
1928  3646  5247          JMP .+1                 /INTERRUPT HERE
1929  3647  4533          C8ERR                   /INTERRUPT WAS INHIBITED.
1930  3650  7300  RTFRP,  CLA CLL
1931  3651  4536          ENDTST
1932  3652  5771'         JMP EXMT7
1933
1934  3653  1373  L62,    TAD (4200
1935  3654  7421          MQL
1936  3655  1264          TAD SFLGS
1937  3656  4533          C8ERR                   /AC,MQ=ACTUAL FLAGS,EXPECTED FLAGS
1938  3657  1372  RPERR,  TAD (0200
1939  3660  7421          MQL
1940  3661  1264          TAD SFLGS
1941  3662  4533          C8ERR                   /AC,MQ=ACTUAL FLAGS,EXPECTED FLAGS
1942  3663  5250          JMP RTFRP
1943  3664  0000  SFLGS,  0
1944  3771  4000
1945  3772  0200
1946  3773  4200
1947  3774  5200
1948  3775  1000
1949  3776  5400
```



```
1950  3777  2000
            4000  PAGE
1951                /
1952                /*****************************************************************************
1953                /MEMORY EXTENSION TEST 7
1954                /CONFIDENCE CHECK ON ALL EXISTENT FIELDS.
1955                /MAKE SURE DCA I AND TAD I ARE TO CORRECT STACK.
1956                /MAKE SURE JUMP IS TO CORRECT STACK.
1957                /CHECK ALL COMBINATIONS.
1958                /FIELDS WILL CONTAIN THEIR DF NUMBER IN LOC.0
1959                /
1960                /
1961                /THIS TEST OVERWRITES LOCATIONS 0,1,2,3, & 7 OF FIELDS 0,1,2, & 3.
1962                /
1963  4000  4535  EXMT7,  INTST
1964  4001  6002          IOF
1965  4002  3270          DCA NUMX
1966  4003  4510          JMS I XSTKS
1967  4004  1377          TAD (CDF
1968  4005  3206          DCA .+1
1969  4006  6201  FDWRD,  CDF                 /MODIFIED UNDER TEST
1970  4007  4252          JMS FILCOR
1971  4010  2107          ISZ STKS            /ARE ALL STACKS DONE
1972  4011  7410          SKP
1973  4012  5220          JMP CONCHK          /CHECK RESULTS
1974  4013  1042          TAD K10
1975  4014  1206          TAD FDWRD
1976  4015  3206          DCA FDWRD           /UPDATE FIELD CHANGE
1977  4016  2273          ISZ NUMX
1978  4017  5206          JMP FDWRD
1979                /
1980  4020  7300  CONCHK, CLA CLL
1981  4021  6201          CDF 00
1982  4022  3270          DCA NUMX
1983  4023  4510          JMS I XSTKS
1984  4024  1376          TAD (CIF
1985  4025  3226          DCA .+1             /START WITH FIELD 0
1986  4026  6202  CONCH,  CIF                 /MODIFIED UNDER TEST
1987  4027  5775          JMP I (0001
1988  4030  3271  RETADD, DCA SNUMX
1989  4031  1271          TAD SNUMX
1990  4032  7041          CIA                 /RETURN HERE FROM FIELDS
1991  4033  1270          TAD NUMX
1992  4034  7650          SNA CLA
1993  4035  5242          JMP X1              /GOOD FIELD
1994  4036  1270          TAD NUMX
1995  4037  7421          MQL
1996  4040  1271          TAD SNUMX
1997  4041  4533          C8ERR               /AC,MQ=ACTUAL DATA , EXPECTED DATA
1998  4042  2107  X1,     ISZ STKS
1999  4043  7410          SKP                 /CHECK ALL AVAILABLE STACKS.
2000  4044  5266          JMP XRTF1
2001  4045  1226          TAD CONCH
2002  4046  1042          TAD K10
2003  4047  3226          DCA CONCH           /UPDATE FIELD CHANGE
```

```
2004  4050  2276          ISZ NUMX
2005  4051  5226          JMP CONCH
2006                      /
2007  4052  0000  FILCOR, 0000            /INSTRUCTIONS FOR FIELDS
2008  4053  1270          TAD NUMX        /MODIFIED TO DF#
2009  4054  3774          DCA I (0000
2010  4055  1373          TAD (1000
2011  4056  3775          DCA I (0001
2012  4057  1376          TAD (CIF
2013  4060  3772          DCA I (0002
2014  4061  1273          TAD JMPRET
2015  4062  3771          DCA I (0003
2016  4063  1272          TAD XRETAD
2017  4064  3770          DCA I (0007
2018  4065  5652          JMP I FILCOR
2019                      /
2020  4066  4536  XRTF1,  ENDTST
2021  4067  5767'         JMP EXMT10
2022  4070  0000  NUMX,   0000
2023  4071  0000  SNUMX,  0
2024  4072  4030  XRETAD, RETADD
2025  4073  5407  JMPRET, JMP I 7
2026                      /
2027  4167  4200
2028  4170  0007
2029  4171  0003
2030  4172  0002
2031  4173  1000
2032  4174  0000
2033  4175  0001
2034  4176  6202
2035  4177  6201
            4230          PAGE
2036                      /*****************************************************************************
2037                      /MEMORY EXTENSION TEST 10
2038                      /TEST DF + IF FROM SAVE FIELD AFTER PI
2039                      /USE RTF TO SET IB & DF REG AND GTF TO GET THE FLAGS
2040                      /DO FIELD COMBINATIONS 00,11,22, &33.
2041                      /TEST CDI TO CHANGE DATA & INST FIELDS
2042                      /
2043                      /THIS TEST OVERWRITES LOCATIONS 0,1, & 2 IN FIELD 0.
2044                      /
2045                      /
2046  4200  4535  EXMT10, INTST
2047  4201  4510          JMS I XSTKS
2048  4202  4506          JMS I XTFLG     /SET TTY FLAG
2049  4203  1377          TAD (ISZ 0
2050  4204  3001          DCA 1
2051  4205  1376          TAD (JMP I 0
2052  4206  3002          DCA 2
2053  4207  3275          DCA XTOR
2054  4210  1275  XSRTF,  TAD XTOR
2055  4211  6005          RTF             /MAKE DF XX + IF XX
2056  4212  5213          JMP .+1         /INTERRUPT HERE
2057  4213  4533          CAERR           /INTERRUPT WAS INHIBITED.
```



```
2058  4214  7300          CLA CLL
2059  4215  6004          GTF             /GET THE FLAGS
2060  4216  0375          AND (0077
2061  4217  3276          DCA SFLDS
2062  4220  1276          TAD SFLDS
2063  4221  7041          CIA
2064  4222  1275          TAD XTOR        /EXPECTED BITS
2065  4223  7650          SNA CLA
2066  4224  5231          JMP L101
2067  4225  1275          TAD XTOR
2068  4226  7421          MQL
2069  4227  1276          TAD SFLDS
2070  4230  4533          CAERR           /AC,MQ=ACTUAL DF & IF,EXPECTED DF & IF.
2071  4231  1275  L101,   TAD XTOR
2072  4232  1374          TAD (0011
2073  4233  3275          DCA XTOR
2074  4234  2107          ISZ STKS
2075  4235  5210          JMP XSRTF       /DO THE REST OF XX + IF XX
2076  4236  4510          JMS I XSTKS
2077  4237  3275          DCA XTOR        /CDI TEST
2078  4240  1275  XCDIL,  TAD XTOR
2079  4241  0373          AND (0070
2080  4242  1372          TAD (CDI
2081  4243  3244          DCA .+1
2082  4244  0000  ICDI,   0000            /CHANGE DATA AND INST FIELD TO XX
2083  4245  6001          ION
2084  4246  7000          NOP
2085  4247  5250          JMP .+1         /INTERRUPT HERE
2086  4250  4533          CAERR           /INTERRUPT WAS INHIBITED
2087  4251  7300          CLA CLL
2088  4252  6004          GTF             /GET THE FLAGS
2089  4253  0375          AND (0077
2090  4254  3276          DCA SFLDS
2091  4255  1276          TAD SFLDS
2092  4256  7041          CIA
2093  4257  1275          TAD XTOR        /EXPECTED BITS
2094  4260  7650          SNA CLA
2095  4261  5266          JMP L102
2096  4262  1275          TAD XTOR
2097  4263  7421          MQL
2098  4264  1276          TAD SFLDS
2099  4265  4533          CAERR           /CDI FAILED TO SET DF &IF PROPERLY
2100                                      /AC,MQ=ACTUAL DF & IF,EXPECTED DF & IF
2101  4266  1275  L102,   TAD XTOR
2102  4267  1374          TAD (0011
2103  4270  3275          DCA XTOR
2104  4271  2107          ISZ STKS
2105  4272  5240          JMP XCDIL       /DO CDI TEST TO REMAINING FIELDS
2106  4273  4536          ENDTST
2107  4274  5771'         JMP EXMT11
2108  4275  0000  XTOR,   0
2109  4276  0000  SFLDS,  0
2110  4371  4400
2111  4372  6203
2112  4373  0070
```

```
2113    4374  0011
2114    4375  0077
2115    4376  5400
2116    4377  2000
              4400      PAGE
2117                    /
2118                    /*************************************************************************************
2119                    /MEMORY EXTENSION TEST 11
2120                    /TEST PROGRAM INTERRUPT IN ALL EXTENDED FIELDS
2121                    /USE RTF, GTF, RDF AND RIF FOR CHECK
2122                    /CHECK PC, AC, SF AND FLAGS AFTER PI
2123                    /
2124                    /THIS TEST OVERWRITES LOCATIONS 0 & 1 IN FIELD 0; ALSO
2125                    /       LOCATIONS 0 - 10 IN FIELDS 1,2, & 3.
2126                    /
2127    4400  4535      EXMT11, INTST
2128    4401  4510              JMS I XSTKS
2129    4402  2107              ISZ     STKS            /FIELD 0 NOT TESTED
2130    4403  1377              TAD (0011
2131    4404  3211              DCA IFDF
2132    4405  7001              IAC
2133    4406  3324              DCA XDATA
2134    4407  1376              TAD (7777
2135    4410  3010              DCA 0010
2136    4411  0000      IFDF,   0000            /SET TO CURRENT FIELD UNDER TEST
2137    4412  7300              CLA CLL
2138    4413  1211              TAD IFDF
2139    4414  6005              RTF             /SET FIELDS AND TURN ION
2140    4415  6002              IOF
2141    4416  7300              CLA CLL
2142    4417  1324              TAD XDATA
2143    4420  3410              DCA I 0010
2144    4421  1375              TAD (ISZ 10
2145    4422  3410              DCA I 0010
2146    4423  1374              TAD (JMP 5
2147    4424  3410              DCA I 0010
2148    4425  1373              TAD (ION
2149    4426  3410              DCA I 0010      /ION FOR THAT FIELD
2150    4427  1372              TAD (1000
2151    4430  3410              DCA I 0010      /TAD FOR THAT FIELD
2152    4431  1371              TAD (CDF 00
2153    4432  3410              DCA I 0010
2154    4433  1370              TAD (CIF 00
2155    4434  3410              DCA I 0010
2156    4435  1367              TAD (JMP I 10
2157    4436  3410              DCA I 0010
2158    4437  1366              TAD (FRET-1     /REMEMBER AUTO INDEX
2159    4440  3410              DCA I 0010
2160    4441  1365              TAD (0003
2161    4442  3246              DCA ADRS
2162    4443  1111              TAD JMPIR
2163    4444  3001              DCA 0001        /SET LOC 1 FOR RETURN AFTER PI
2164    4445  5646              JMP I .+1       /GO TO THAT FIELD
2165    4446  0000      ADRS,   0000
2166    4447  3325      RET,    DCA SDATA
```



```
2167    4450  1325              TAD SDATA
2168    4451  7041              CIA
2169    4452  1324              TAD XDATA
2170    4453  7650              SNA CLA
2171    4454  5261              JMP L111
2172    4455  1324              TAD XDATA
2173    4456  7421              MQL
2174    4457  1325              TAD SDATA
2175    4460  4533              C8ERR           /AC DATA FAILED DURING PI
2176                            /AC,MQ=ACTUAL AC DATA,EXPECTED AC DATA
2177    4461  1000      L111,   TAD 0000
2178    4462  7041              CIA
2179    4463  1364              TAD (0005
2180    4464  7650              SNA CLA
2181    4465  5272              JMP L112
2182    4466  1364              TAD (0005
2183    4467  7421              MQL
2184    4470  1000              TAD 0000
2185    4471  4533              C8ERR           /PC FAILED DURING PI
2186                            /AC,MQ=ACTUAL PC,EXPECTED PC
2187    4472  6214      L112,   RDF
2188    4473  6224              RIF
2189    4474  7440              SZA
2190    4475  4533              C8ERR           /I,F, SHOULD BE 0 AFTER A PI
2191                            /AC=ACTUAL I,F.
2192    4476  6004              GTF
2193    4477  0363              AND (0077
2194    4500  3325              DCA SDATA
2195    4501  1325              TAD SDATA
2196    4502  7041              CIA
2197    4503  1211              TAD IFDF
2198    4504  7650              SNA CLA
2199    4505  5312              JMP CONTDG
2200    4506  1211              TAD IFDF
2201    4507  7421              MQL
2202    4510  1325              TAD SDATA
2203    4511  4533              C8ERR           /GTF,RTF, OR SF FAILED
2204                            /AC,MQ=ACTUAL FIELDS,EXPECTED FIELDS
2205    4512  2107      CONTDG, ISZ STKS
2206    4513  7410              SKP
2207    4514  5322              JMP XSFIB
2208    4515  7300              CLA CLL
2209    4516  1377              TAD (0011
2210    4517  1211              TAD IFDF
2211    4520  3211              DCA IFDF        /SET FOR NEXT FIELD
2212    4521  5207              JMP IFDF-2
2213    4522  4536      XSFIB,  ENDTST
2214    4523  5762'             JMP EXMT12
2215    4524  0000      XDATA,  0
2216    4525  0000      SDATA,  0
2217    4526  5331      FRET,   JMP NOPI        /ERROR RETURN FROM EXTENDED FIELD,
2218    4527  4533              C8ERR           /GOT PI BUT DIDN'T CHANGE FIELDS,
2219    4530  7410              SKP
2220    4531  4533      NOPI,   C8ERR           /NO PI
2221    4532  5312              JMP CONTDG
```

```
                        /
4533  0000  NSTKS,     0
4534  1361              TAD (-4
4535  3107              DCA STKS
4536  5733              JMP I NSTKS
                        /
                        /SET TTY FLAG
                        /
4537  0000  TFLG,      0
4540  7200              CLA             /SET OUTPUT FLAG ENABLE
4541  6046              SPF
4542  6041              TSF
4543  5342              JMP .-1
4544  7200              CLA
4545  5737              JMP I TFLG      /EXIT
4561  7774
4562  4600
4563  0077
4564  0005
4565  0003
4566  4525
4567  5410
4570  6202
4571  6201
4572  1000
4573  6001
4574  5005
4575  2010
4576  7777
4577  0011
      4600        PAGE
                        /
                        /*************************************************************************************
                        /MEMORY EXTENSION TEST 12
                        /TEST SF WITH AN RMF IOT, AN INTERRUPT IN FIELD 0 IS CREATED, AFTER
                        /WHICH, THE DF AND IB REGISTERS ARE SET TO FIELD 1.
                        /THE SF SHOULD CONTAIN FIELD 0, THE TEST
                        /THEN MAKES SURE THE IB IS RESET TO 0 BY ISSUING AN RMF,
                        /FOLLOWED BY A JMP I (0003, IF THE IB IS RESET TO 0 THE JMP GOES TO 0003 IN FIELD 0,
                        /IF THE IB FAILS TO BE RESET TO  0, THE JMP GOES TO 0003 IN FIELD 1.
                        /
                        /THIS TEST OVERWRITES LOCATIONS 0,1,2, & 3 IN FIELD 0; ALSO
                        /       LOCATIONS 3,4,5, & 6 IN FIELD 1.
                        /
4600  4535  EXMT12,  INTST
4601  6041              TSF             /SEE IF FLAG IS SET.
4602  4506              JMS I XTFLG     /SET IT
4603  6211              CDF 10          /DF=FIELD 1
4604  1377              TAD (CDF 00     /SETUP RETURN FROM FIELD 1
4605  3776              DCA I (0003     /IN CASE INST FAILS.
4606  1375              TAD (CIF 00
4607  3774              DCA I (0004
4610  1373              TAD (JMP I 6
4611  3772              DCA I (0005
4612  1371              TAD (KKRTN
```



```
4613  3770              DCA I (0006
4614  6201              CDF 00          /DF=0
4615  1367              TAD (JMP I KFLD0
4616  3776              DCA I (0003
4617  1366              TAD (JMP I 2
4620  3001              DCA 1
4621  1365              TAD (KRTN
4622  3002              DCA 2
                        /
                        /BEGIN TEST
                        /
4623  6001              ION             /ENABLE PI
4624  7000              NOP
4625  4533  CAG,       C8ERR           /ERROR NO PI
4626  5235              JMP RTRN
                        /
                        /RETURN HERE AFTER PI
                        /
4627  7200  KRTN,      CLA
4630  6211              CDF 10          /DF=FIELD1
4631  6212              CIF 10          /IB=FIELD1
4632  6244              RMF             /IB SHOULD=FIELD0
4633  5776              JMP I (0003     /IF SHOULD=FIELD0
                        /
4634  4533  KKRTN,     C8ERR           /JMP WENT TO FIELD 1.
4635  4536  RTRN,      ENDTST


                        /*************************************************************************************
                        /MEMORY EXTENSION TEST 13
                        /CHECK THAT RMF AND RTF INSTRUCTIONS ZERO MOST SIGNIFICANT BIT
                        /OF DATA FIELD REGISTER.
                        /
4636  4535  EXMT13,  INTST
4637  6042              TCF             /CLEAR TTY OUTPUT FLAG ENABLE.
4640  6241              CDF 40
4641  6244              RMF
4642  1660              TAD I KTEST     /IF MOST SIGN BIT OF DF REG IS NOT ZERO
                                        /THEN THE INDIRECT WILL NOT OCCUR
4643  6201              CDF 00
4644  7440              SZA
4645  4533              C8ERR           /RMF FAILED TO ZERO MOST SIGN. BIT OF DF REG.
4646  6241              CDF 40
4647  7300              CLA CLL
4650  6005              RTF
4651  6002              IOF
4652  1660              TAD I KTEST
4653  6201              CDF 00
4654  7440              SZA
4655  4533              C8ERR           /RTF FAILED TO ZERO MOST SIGN. BIT OF DF REG
4656  4536              ENDTST
4657  5764'             JMP EXMT14
4660  4661  KTEST,     KTEST1
4661  0000  KTEST1,    0
```

```
2331
2332    4764  5000
2333    4765  4627
2334    4766  5402
2335    4767  5514
2336    4770  0006
2337    4771  4634
2338    4772  0005
2339    4773  5406
2340    4774  0004
2341    4775  6202
2342    4776  0003
2343    4777  6201
              5000    PAGE
2344                  /*****************************************************************************
2345                  /MEMORY EXTENSION TEST 14   (UNUSED IOT TEST)
2346                  /VERIFY THAT ALL UNUSED IOTS HAVE NO EFFECT ON SYSTEM
2347                  /
2348    5000  4520    EXMT14, FIXIL           /FIXUP INTERRUPT LINKAGE
2349    5001  4535            INTST
2350    5002  6007            CAF
2351    5003  6001            ION             /UNUSED IOT'S SHOULD NOT CAUSE INTERRUPTS
2352    5004  1317            TAD KIOT
2353    5005  3234            DCA TSTIOT      /INITIALIZE TEST IOT
2354    5006  1377            TAD (USEDIOT
2355    5007  3321            DCA CUIPTR      /INITIALIZE POINTER INTO USED IOT TABLE
2356    5010  1230    IOTLP,  TAD TSTIOT
2357    5011  0376            AND (0770
2358    5012  7041            CIA
2359    5013  1721            TAD I CUIPTR    /IS TEST IOT DEVICE CODE A SYSTEM DEVICE CODE ?
2360    5014  7640            SZA CLA
2361    5015  5227            JMP EXIOT       /NO=EXECUTE IT
2362    5016  2321            ISZ CUIPTR      /YES=SKIP THIS DEVICE CODE
2363    5017  1230            TAD TSTIOT
2364    5020  1375            TAD (0010
2365    5021  3230            DCA TSTIOT      /UPDATE TO NEXT TEST IOT
2366    5022  1230            TAD TSTIOT
2367    5023  0374            AND (1000
2368    5024  7650            SNA CLA
2369    5025  5210            JMP IOTLP
2370    5026  5261            JMP EXIOTL      /ALL UNUSED IOTS TESTED
2371    5027  1373    EXIOT,  TAD (5252       /LOAD AC WITH ARBITRARY DATA WORD
2372    5030  0000    TSTIOT, 0000            /EXECUTE UNUSED IOT
2373    5031  7410            SKP
2374    5032  5246            JMP SKPERR      /IOT CAUSED A SKIP
2375    5033  3320            DCA ACAIOT
2376    5034  1320            TAD ACAIOT
2377    5035  1372            TAD (-5252
2378    5036  7640            SZA CLA
2379    5037  5254            JMP ACCERR      /IOT DESTROYED AC CONTENTS
2380    5040  2230    NXTIOT, ISZ TSTIOT      /UPDATE TO NEXT IOT WITHIN SAME DEVICE CODE
2381    5041  1230            TAD TSTIOT
2382    5042  0371            AND (0007
2383    5043  7640            SZA CLA
2384    5044  5227            JMP EXIOT
```



```
2385    5045  5210            JMP IOTLP       /DEVICE CODE FINISHED
2386    5046  7300    SKPERR, CLA CLL
2387    5047  1320            TAD ACAIOT
2388    5050  7421            MQL
2389    5051  1230            TAD TSTIOT
2390    5052  4533            C8ERR           /IOT CAUSED INST SKIP
                              /AC,MQ=BAD IOT,AC DATA
2391
2392    5053  5240            JMP NXTIOT
2393    5054  1320    ACCERR, TAD ACAIOT
2394    5055  7421            MQL
2395    5056  1230            TAD TSTIOT
2396    5057  4533            C8ERR           /AC,MQ=BAD IOT, AC DATA AFTER IOT EXECUTION,
2397                          /(AC DATA BEFORE EXECUTION=5252)
2398    5060  5240            JMP NXTIOT
2399    5061  4536    EXIOTL, ENDTST
2400    5062  3075            DCA TSTNO               /CLEAR TEST NUMBER
2401    5063  5770'           JMP BEGRTC
2402
2403
2404    5064  0010    USEDIOT,0010            /ORDERED LIST OF USED DEVICE CODES
2405    5065  0030            0030
2406    5066  0040            0040
2407    5067  0070            0070
2408    5070  0130            0130
2409    5071  0200            0200
2410    5072  0210            0210
2411    5073  0220            0220
2412    5074  0230            0230
2413    5075  0240            0240
2414    5076  0250            0250
2415    5077  0260            0260
2416    5100  0270            0270
2417    5101  0300            0300
2418    5102  0310            0310
2419    5103  0320            0320
2420    5104  0330            0330
2421    5105  0500            0500
2422    5106  0660            0660
2423    5107  0750            0750
2424    5110  0000            0000
2425    5111  0000            0000
2426    5112  0000            0000
2427    5113  0000            0000
2428    5114  0000            0000
2429    5115  0000            0000
2430    5116  0000            0000
2431
2432    5117  6010    KIOT,   6010
2433    5120  0000    ACAIOT, 0
2434    5121  0000    CUIPTR, 0000
2435
2436
2437    5170  5400
2438    5171  0007
2439    5172  2526
```

```
2440    5173  5252
2441    5174  1000
2442    5175  0010
2443    5176  0770
2444    5177  5064
              5200      PAGE
2445                    /ROUTINE TO PRINT "MEMORY EXTENSION TESTING" MESSAGE
2446
2447    5200  0000      PMEMES, 0
2448    5201  4521              CRCRLF
2449    5202  4522              CRPRNT
2450    5203  5210              MEMES
2451    5204  4522              CRPRNT
2452    5205  2213              TESTMS
2453    5206  4521              CRCRLF
2454    5207  5600              JMP I PMEMES
2455
2456    5210  1505      MEMES,  TEXT    "MEMORY EXT, "
        5211  1517
        5212  2231
        5213  4005
        5214  3024
        5215  5640
        5216  0000
2457
2458                    /ROUTINE TO RESTORE INTERRUPT LINKAGE TO NORMAL
2459
2460    5217  0000      FIXLKG, 0
2461    5220  1377              TAD (RMF
2462    5221  3001              DCA 1
2463    5222  1227              TAD KJMP3
2464    5223  3002              DCA 2
2465    5224  1376              TAD (SKPCHN
2466    5225  3003              DCA 3
2467    5226  5617              JMP I FIXLKG
2468    5227  5403      KJMP3,  JMP I 3
2469
2470    5230  0413      ERRMES, TEXT    "DKVTB-A FAILED, FIELD 0  "
        5231  2624
        5232  0255
        5233  0140
        5234  0601
        5235  1114
        5236  0504
        5237  5440
        5240  0611
        5241  0514
        5242  0440
        5243  6040
        5244  4000
2471
2472
2473
```



```
2474
2475    5376  6200
2476    5377  6244
              5400      *5400
2477                    /*****************************************************************************
2478                    /REAL TIME CLOCK TEST
2479                    /*****************************************************************************
2480
2481
2482
2483                    /*****************************************************************************
2484                    /REAL TIME CLOCK TEST 1 - CHECKS THAT CLOCK FLAG WILL SET AND
2485                    /                        THAT CAF WILL CLEAR IT, THE TEST IS
2486                    /                        CHECKED NOT TO INTERRUPT.
2487                    /*****************************************************************************
2488                    /
2489    5400  7300      BEGRTC, CLA CLL
2490    5401  6002              IOF
2491    5402  1020              TAD PSR         /EXECUTE REAL TIME CLOCK TEST?
2492    5403  0377              AND (0002
2493    5404  7640              SZA CLA
2494    5405  5776'             JMP BEGBST      /NO
2495    5406  4520              FIXIL           /FIXUP INTERRUPT LINKAGE
2496    5407  4242              JMS PRTCMS      /PRINT REAL TIME CLOCK TESTING MESSAGE
2497    5410  4535      RTCT1,  INTST
2498    5411  1375              TAD (RTCI1      /PATCH INTERRUPT LINKAGE TO RETURN TO THIS
2499    5412  3003              DCA 3           /       TEST ON INTERRUPT.
2500    5413  6007              CAF
2501    5414  6001              ION
2502    5415  4541              CLSKWT          /WAIT FOR THE CLOCK FLAG TO SET
2503    5416  4533              CSERR           /CLOCK FLAG FAILED TO SET
2504    5417  6007              CAF             /CLEAR THE CLOCK FLAG
2505    5420  6137              CLSK            /SKIP ON THE CLOCK FLAG
2506    5421  7610              SKP CLA
2507    5422  4533              CSERR           /CAF FAILED TO CLEAR CLOCK FLAG OR CLSK SKIPPED
2508    5423  4536      RTCT1D, ENDTST
2509    5424  5263              JMP RTCT2
2510
2511    5425  4533      RTCI1,  CSERR           /CAF FAILED TO DISABLE CLOCK INT.
2512    5426  5223              JMP RTCT1D
2513
2514                    /ROUTINE TO WAIT FOR THE REAL TIME CLOCK FLAG
2515
2516    5427  0000      WTCLSK, 0
2517    5430  3241              DCA RCNT
2518    5431  6137              CLSK            /WAS THE CLOCK FLAG SET
2519    5432  7410              SKP             /NO
2520    5433  5237              JMP .+4         /YES
2521    5434  2241              ISZ RCNT
2522    5435  5231              JMP .-4
2523    5436  7410              SKP
2524    5437  2227              ISZ WTCLSK
2525    5440  5627              JMP I WTCLSK
2526    5441  0000      RCNT,   0
2527
```

```
                        /ROUTINE TO PRINT "REAL TIME CLOCK TESTING" MESSAGE
                        
5442  0000  PRTCMS, 0
5443  4521          C8CRLF
5444  4522          C8PRNT
5445  5452          RTCMS
5446  4522          C8PRNT
5447  2213          TESTMS
5450  4521          C8CRLF
5451  5642          JMP I PRTCMS
                        
5452  2205  RTCMS,  TEXT    "REAL TIME CLOCK  "
5453  0114
5454  4024
5455  1115
5456  0540
5457  0314
5460  1703
5461  1340
5462  4000
                        
                        /*****************************************************************************
                        /REAL TIME CLOCK TEST 2 - CHECKS THAT CLOCK FLAG WILL SET AND THAT
                        /                        IT CAN BE CLEARED BY CLCL.  THE TEST IS
                        /                        CHECKED NOT TO INTERRUPT.
                        /*****************************************************************************
                        
5463  4535  RTCT2,  INTST
5464  1374          TAD (RTCI2      /PATCH INTERRUPT LINKAGE TO RETURN TO THIS
5465  3003          DCA 3           /       TEST ON INTERRUPT.
5466  6007          CAF
5467  6001          ION
5470  4541          CLSKWT          /WAIT FOR THE CLOCK FLAG TO SET
5471  4533          C8ERR           /CLOCK FLAG FAILED TO SET.
5472  6136          CLCL            /CLEAR THE CLOCK FLAG
5473  7610          SKP CLA
5474  4533          C8ERR           /CLCL SKIPPED
5475  6137          CLSK            /SKIP ON CLOCK FLAG
5476  7610          SKP CLA
5477  4533          C8ERR           /CLCL FAILED TO CLEAR CLOCK FLAG
5500  4536  RTCT2D, ENDTST
5501  5304          JMP RTCT3
                        
5502  4533  RTCI2,  C8ERR           /CAF FAILED TO DISABLE CLOCK INT.
5503  5300          JMP RTCT2D
                        
                        /*****************************************************************************
                        /REAL TIME CLOCK TEST 3 - CHECK THAT CLOCK INT. ENABLE CAN BE SET
                        /                        AND CLEARED BY DATA BIT 11 AND CLLE USING
                        /                        THE CLOCK FLAG TO INTERRUPT ON.
                        /*****************************************************************************
                        
5504  4535  RTCT3,  INTST
5505  1373          TAD (ISZ RTCIF  /FIX UP INT. LINKAGE TO SET REAL TIME CLOCK
```



```
5506  3002          DCA 2           /       INTERRUPT FLAG AND RETURN HERE ON INT.
5507  1372          TAD (JMP I 0
5510  3003          DCA 3
5511  3113          DCA RTCIF       /CLEAR CLOCK INT. FLAG
5512  6007          CAF             /CLEAR ALL FLAGS
5513  6001          ION
5514  4541          CLSKWT          /WAIT FOR THE CLOCK FLAG TO SET
5515  4533          C8ERR           /CLOCK FLAG FAILED TO SET
5516  6136          CLCL            /CLEAR CLOCK FLAG AGAIN
5517  6137          CLSK            /SKIP ON CLOCK FLAG
5520  7610          SKP CLA
5521  4533          C8ERR           /CLCL FAILED TO CLEAR CLK FLAG
5522  7301          CLA CLL IAC     /SET DATA BIT 11 TO A ONE
5523  6135          CLLE            /TRY AND SET CLOCK INT. ENABLE
5524  7610          SKP CLA
5525  4533          C8ERR           /CLLE SKIPPED
5526  1113          TAD RTCIF
5527  7640          SZA CLA
5530  4533          C8ERR           /PROGRAM INTERRUPTED WITH CLOCK FLAG CLEARED
5531  4541          CLSKWT          /WAIT FOR CLOCK FLAG TO SET
5532  4533          C8ERR           /CLOCK FLAG FAILED TO SET
5533  1113          TAD RTCIF
5534  7650          SNA CLA
5535  4533          C8ERR           /CLLE FAILED TO SET CLOCK INT. ENABLE
                                    /       OR NO INTERRUPT OCCURRED.
5536  3113          DCA RTCIF       /CLEAR REAL TIME CLOCK INT. FLAG
5537  6135          CLLE            /CLEAR CLOCK INT. ENABLE
5540  6001          ION             /TURN THE INTERRUPT ON
5541  7300          CLA CLL
5542  1113          TAD RTCIF       /GET THE REAL TIME CLOCK INT. FLAG
5543  7640          SZA CLA         /DID IT INTERRUPT?
5544  4533          C8ERR           /YES--CLLE FAILED TO CLEAR CLOCK INT. ENABLE
5545  6136          CLCL            /CLEAR CLOCK FLAG
5546  6137          CLSK            /SKIP ON CLOCK FLAG
5547  7610          SKP CLA
5550  4533          C8ERR           /CLCL FAILED TO CLEAR FLAG
5551  4536          ENDTST
5552  5771'         JMP RTCT4
                        
                        
                        
5571  5600
5572  5400'
5573  2113
5574  5502
5575  5425
5576  6000
5577  0302
      5600    PAGE
                        /*****************************************************************************
                        /REAL TIME CLOCK TEST 4 - CHECK THAT CLOCK INT. ENABLE CAN BE SET
                        /                        AND THAT CAF WILL CLEAR IT USING THE CLOCK
                        /                        FLAG TO INTERRUPT ON.
                        /*****************************************************************************
                        
```

SEQ 0067

```
2629  5600  4535  RTCT4,  INTST
2630  5601  3113          DCA RTCIF
2631  5602  6007          CAF             /CLEAR ALL FLAGS
2632  5603  6001          ION
2633  5604  4541          CLSKWT          /WAIT FOR THE CLOCK FLAG TO SET
2634  5605  4533          C8ERR           /CLOCK FLAG FAILED TO SET
2635  5606  7301          CLA CLL IAC
2636  5607  6135          CLLE            /SET INTERRUPT ENABLE TO A ONE
2637  5610  7300          CLA CLL         /SHOULD INTERRUPT HERE
2638  5611  1113          TAD RTCIF
2639  5612  7650          SNA CLA
2640  5613  4533          C8ERR           /PROGRAM FAILED TO INT, WITH CLOCK FLAG SET
2641                      /       AND CLOCK INT, ENABLED,
2642  5614  3113          DCA RTCIF       /CLEAR CLOCK FLAG
2643  5615  6007          CAF             /CLEAR ALL FLAGS AND DISABLE CLK INT,
2644  5616  6001          ION
2645  5617  4541          CLSKWT          /WAIT FOR FLAG
2646  5620  4533          C8ERR           /CLOCK FLAG FAILED TO SET
2647  5621  1113          TAD RTCIF       /GET THE CLOCK INT, FLAG
2648  5622  7640          SZA CLA         /DID IT INTERRUPT?
2649  5623  4533          C8ERR           /CAF FAILED TO CLEAR CLOCK INT, ENABLE
2650  5624  6136          CLCL            /CLEAR THE CLOCK FLAG
2651  5625  4536          ENDTST
2652  5626  5227          JMP RTCT5
2653
2654                /*************************************************************************
2655                /REAL TIME CLOCK TEST 5 - CHECK THAT THE THREE REAL TIME CLOCK IOTS
2656                /                         DON'T AFFECT THE AC,
2657                /*************************************************************************
2658
2659  5627  4535  RTCT5,  INTST
2660  5630  6136          CLCL
2661  5631  6001          ION
2662  5632  7344          CLA CLL CMA RAL /-2
2663  5633  6135          CLLE            /CLEAR CLOCK INT, ENABLE
2664  5634  1377          TAD (2
2665  5635  7440          SZA
2666  5636  4533          C8ERR           /CLLE CHANGED THE AC
2667  5637  7240          CLA CMA
2668  5640  6136          CLCL            /CLEAR CLOCK FLAG
2669  5641  7001          IAC
2670  5642  7440          SZA
2671  5643  4533          C8ERR           /CLCL CHANGED THE AC
2672  5644  7240          CLA CMA
2673  5645  6137          CLSK            /SKIP ON CLOCK FLAG
2674  5646  7000          NOP
2675  5647  7001          IAC
2676  5650  7440          SZA
2677  5651  4533          C8ERR           /CLSK CHANGED THE AC
2678  5652  7200          CLA
2679  5653  4536          ENDTST
2680  5654  5255          JMP RTCT6
2681
2682
2683                /*************************************************************************
```


SEQ 0068

```
2684                /REAL TIME CLOCK TEST 6 - CHECK CLOCK TIMING
2685                /*************************************************************************
2686
2687  5655  4535  RTCT6,  INTST
2688  5656  4520          FIXIL
2689  5657  1376          TAD (CLKIR      /FIX UP INT, LINKAGE TO RETURN TO THIS TEST ON INT,
2690  5660  3003          DCA 3
2691  5661  6136          CLCL            /CLEAR CLOCK FLAG
2692  5662  3312          DCA CLKCT       /CLEAR CLOCK COUNTER
2693  5663  6001          ION
2694  5664  4541          CLSKWT          /WAIT FOR CLOCK FLAG TO SET
2695  5665  4533          C8ERR           /CLOCK FLAG FAILED TO SET
2696  5666  6136          CLCL            /CLEAR FLAG
2697  5667  7301          CLA CLL IAC
2698  5670  6135          CLLE            /ENABLE CLOCK INTERRUPT
2699  5671  2312          ISZ CLKCT
2700  5672  5271          JMP .-1
2701  5673  4533          C8ERR           /CLOCK FAILED TO TRIGGER INTERRUPT
2702  5674  1312  CLKIR,  TAD CLKCT
2703  5675  7041          CIA
2704  5676  1313          TAD CLCON
2705  5677  7500          SMA
2706  5700  5315          JMP CLKERR
2707  5701  1314          TAD CDELTA
2708  5702  7510          SPA
2709  5703  5315          JMP CLKERR
2710  5704  7300  CONTT,  CLA CLL
2711  5705  6135          CLLE            /DISABLE CLOCK INTERRUPT
2712  5706  4536          ENDTST
2713  5707  3075          DCA TSTNO       /CLEAR TEST NUMBER
2714  5710  4520          FIXIL           /FIX UP INTERRUPT LINKAGE
2715  5711  5775'         JMP BEGBST
2716
2717  5712  0000  CLKCT,  0
2718  5713  1200  CLCON,  1200    /LOWER LIMIT ON EXPECTED CLOCK COUNT
2719  5714  0010  CDELTA, 10      /ALLOWED RANGE FOR CLOCK COUNT
2720
2721  5715  7300  CLKERR, CLA CLL
2722  5716  1312          TAD CLKCT
2723  5717  4533          C8ERR           /CLOCK TIMING ERROR - AC = ACTUAL COUNT
2724                      /       CONTINUE FOR EXPECTED COUNT,
2725  5720  7300          CLA CLL
2726  5721  1313          TAD CLCON
2727  5722  1314          TAD CDELTA
2728  5723  7421          MQL
2729  5724  1313          TAD CLCON
2730  5725  4533          C8ERR           /EXPECTED TIMING - AC,MQ = LOWER LIMIT,UPPER LIMIT
2731                      /                         FOR COUNT,
2732  5726  5304          JMP CONTT
2733
2734
2735
```

```
                5775  6000
                5776  5674
                5777  0002
                      6000    *6000
                              /*****************************************************************************
                              /BAUD RATE SWITCH TEST
                              /*****************************************************************************


                              /THIS TEST READS BAUD RATE SWITCH AND DISPLAYS SETTING.
                              /OPERATOR CAN CHANGE SWITCH SETTING &PRESS ANY KEY (EXCEPT RETURN)
                              /       TO DISPLAY NEW SETTING.
                              /OPERATOR EXITS TEST BY PRESSING THE RETURN KEY.

                      6000  7300  BEGBST, CLA CLL
                      6001  6002        IOF
                      6002  1022        TAD HCW2            /RUNNING UNDER APT CONTROL?
                      6003  7710        SPA CLA
                      6004  5225        JMP DOSLU           /YES-DON'T EXECUTE THIS TEST-CONTINUE
                                                            /WITH SLU TESTING.
                      6005  1020        TAD PSR             /NO-IS BAUD SWITCH TEST REQUESTED?
                      6006  0377        AND (0001           /(CHECK PSR BIT 11)
                      6007  7650        SNA CLA
                      6010  5225        JMP DOSLU           /NO-CONTINUE WITH SLU TESTING
                      6011  4227        JMS PBRSMS          /YES-PRINT BAUD RATE SWITCH TESTING MESSAGE
                      6012  7300  BSTLP,  CLA CLL
                      6013  7604        LAS                 /GET CURRENT SWITCH SETTING
                      6014  0376        AND (0017           /MASK OFF UNWANTED BITS
                      6015  1375        TAD (BASEP          /INDEX INTO BAUD RATE TABLE
                      6016  3275        DCA TBLPTR
                      6017  4521        C8CRLF              /PRINT A CARRIAGE RETURN & LINE FEED
                      6020  4276        JMS PRTBRS                  /PRINT DECIMAL SETTING
                      6021  4247        JMS LISNSR          /LISTEN FOR A CHARACTER
                      6022  1374        TAD (-015           /IS IT A CARRIAGE RETURN?
                      6023  7640        SZA CLA
                      6024  5212        JMP BSTLP           /NO-DISPLAY NEW SETTING
                      6025  6213  DOSLU,  CDI 10            /YES-EXIT TO SLU TESTING IN FIELD 1
                      6026  5773' 
                                        JMP C1REST

                              /ROUTINE TO PRINT "BAUD RATE SWITCH TESTING" MESSAGE

                      6027  0000  PBRSMS, 0
                      6030  4521        C8CRLF
                      6031  4522        C8PRNT
                      6032  6036        BRSMS
                      6033  4522        C8PRNT
                      6034  2213        TESTMS
                      6035  5627        JMP I PBRSMS

                      6036  0201  BRSMS,  TEXT    "BAUD RATE SWITCH "
                      6037  2504
                      6040  4022
                      6041  0124
                      6042  0540
```



```
                6043  2327
                6044  1124
                6045  0310
                6046  4000

                              /ROUTINE TO LISTEN FOR A KEYBOARD CHARACTER

                      6047  0000  LISNSR, 0
                      6050  6031        KSF                 /WAIT FOR KEYBOARD FLAG
                      6051  5250        JMP .-1
                      6052  6036        KRB                 /READ THE CHARACTER TYPED
                      6053  0372        AND (177            /MASK TO 7 BIT ASCII
                      6054  5647        JMP I LISNSR        /RETURN WITH CHAR IN AC

                              /BAUD RATE SWITCH TABLE

                      6055  0050  BASEP,  0050
                      6056  0075        0075
                      6057  0110        0110
                      6060  0134        0134
                      6061  0150        0150
                      6062  0300        0300
                      6063  0600        0600
                      6064  1200        1200
                      6065  0000  SD1,    0000                /1800
                      6066  2000        2000
                      6067  2400        2400
                      6070  3600        3600
                      6071  0000  SD2,    0000                /4800
                      6072  7200        7200
                      6073  0000  SD3,    0000                /9600
                      6074  0000  SD4,    0000                /19200

                      6075  0000  TBLPTR, 0000

                              /ROUTINE TO PRINT BAUD RATE SETTING=DECIMAL NUMBER

                      6076  0000  PRTBRS, 0
                      6077  1675        TAD I TBLPTR            /GET PRINT SETTING FROM TABLE
                      6100  7450        SNA
                      6101  5304        JMP DECPRT              /SETTING=0 - INDICATES DECIMAL #
                      6102  4523        C8PRT4                  /SETTING CONTAINS NO DECIMAL DIGITS
                                                                /       PRINT 4 OCTAL DIGITS
                      6103  5676        JMP I PRTBRS
                      6104  1275  DECPRT, TAD TBLPTR            /SETTING CONTAINS A DECIMAL DIGIT
                      6105  7041        CIA                     /DETERMINE WHICH SETTING SHOULD BE PRINTED
                      6106  1371        TAD (SD1
                      6107  7450        SNA
                      6110  5342        JMP PSS1                /PRINT 1800
                      6111  1370        TAD (4
                      6112  7450        SNA
                      6113  5334        JMP PSS2                /PRINT 4800
                      6114  1367        TAD (2
                      6115  7650        SNA CLA
                      6116  5326        JMP PSS3                /PRINT 9600
```

```
2837    6117  4350    PSS4,   JMS PRDD              /PRINT 192
2838    6120  0261            0261
2839    6121  0271            0271
2840    6122  0262            0262
2841    6123  0000            0000
2842    6124  4530            PRNT2                 /PRINT TRAILING 2 ZEROS
2843    6125  5676            JMP I PRTBRS
2844    6126  4350    PSS3,   JMS PRDD              /PRINT 96
2845    6127  0271            0271
2846    6130  0266            0266
2847    6131  0000            0000
2848    6132  4530            PRNT2                 /PRINT TRAILING 2 ZEROS
2849    6133  5676            JMP I PRTBRS
2850    6134  4350    PSS2,   JMS PRDD              /PRINT 48
2851    6135  0264            0264
2852    6136  0270            0270
2853    6137  0000            0000
2854    6140  4530            PRNT2                 /PRINT TRAILING 2 ZEROS
2855    6141  5676            JMP I PRTBRS
2856    6142  4350    PSS1,   JMS PRDD              /PRINT 18
2857    6143  0261            0261
2858    6144  0270            0270
2859    6145  0000            0000
2860    6146  4530            PRNT2                 /PRINT TRAILING 2 ZEROS
2861    6147  5676            JMP I PRTBRS
2862
2863    6150  0000    PRDD,   0                     /PRINT ASCII DIGITS FOLLOWING CALL
2864    6151  1750            TAD I PRDD
2865    6152  7450            SNA
2866    6153  5750            JMP I PRDD            /DIGIT=0 = RETURN
2867    6154  4527            TYPE
2868    6155  2350            ISZ PRDD
2869    6156  5351            JMP PRDD+1
2870
2871
2872
```



```
2873
2874
2875    6167  0002
2876    6170  0004
2877    6171  6065
2878    6172  0177
2879    6173  0200
2880    6174  7763
2881    6175  6055
2882    6176  0017
2883    6177  0001
              6200    *6200
2884                  /*************************************************************************
2885                  /FIELD 0 INTERRUPT SKIP CHAIN
2886                  /*************************************************
2887
2888
2889    6200  3276    SKPCHN, DCA SAVAC              /GET HERE VIA INTERRUPT
2890                                                 /SAVE AC
2891    6201  4516            CHKKSF                 /CHECK FOR CONSOLE PACKAGE INT,
2892    6202  5206            JMP RFINT              /SET=BUT IGNORE
2893    6203  7000            NOP                    /NOT SET
2894    6204  7000            NOP
2895    6205  4533    UEI,    C8ERR                  /UNEXPECTED INTERRUPT
2896    6206  1276    RFINT,  TAD SAVAC
2897    6207  5400            JMP I 0                /CONTINUE WITH DIAGNOSTIC
2898
2899
2900                  /DISPLAY ROUTINE FOR UNEXPECTED INTERRUPT IN FIELD 0,
2901
2902    6210  4521    SERUEI, C8CRLF
2903    6211  4522            C8PRNT
2904    6212  6311            UEIMES
2905    6213  4521            C8CRLF
2906    6214  4777'           JMS MTN                /DISPLAY TEST NUMBER
2907    6215  1000            TAD 0
2908    6216  3776'           DCA PCSAVE
2909    6217  4775'           JMS MPC                /DISPLAY PC
2910    6220  1276            TAD SAVAC
2911    6221  3774'           DCA ACSAVE
2912    6222  4773'           JMS MAC                /DISPLAY AC
2913    6223  4772'           JMS MFL                /DISPLAY FLAGS
2914    6224  4521            C8CRLF
2915    6225  4522            C8PRNT
2916    6226  6331            FSMES
2917    6227  1371            TAD (CDI
2918    6230  3274            DCA VCDI
2919    6231  4233            JMS CKFLG              /DISPLAY FLAGS SET
2920    6232  5770'           JMP IEH
2921
2922    6233  0000    CKFLG,  0
2923    6234  6041            TSF
2924    6235  5240            JMP UL1
2925    6236  4522            C8PRNT                 /SLU #1 XMIT FLAG SET
2926    6237  6337            MXMT1
```

```
                6240  6311  UL1,    TSF1
                6241  5244          JMP UL2
                6242  4522          CALL PRNT                 /SLU #2 XMIT FLAG SET
                6243  6342          MXMT2
                6244  6331  UL2,    TSF2
                6245  5250          JMP UL3
                6246  4522          CALL PRNT                 /SLU #3 XMIT FLAG SET
                6247  6345          MXMT3
                6250  2040  UL3,    ISZ KSFLG
                6251  5254          JMP UL4
                6252  4522          CALL PRNT                 /SLU #1 REC FLAG SET
                6253  6350          MREC1
                6254  6301  UL4,    KSF1
                6255  5260          JMP UL5
                6256  4522          CALL PRNT                 /SLU #2 REC FLAG SET
                6257  6353          MREC2
                6260  6321  UL5,    KSF2
                6261  5264          JMP UL6
                6262  4522          CALL PRNT                 /SLU #3 REC FLAG SET
                6263  6356          MREC3
                6264  6661  UL6,    PSKF
                6265  5270          JMP UL7
                6266  4522          CALL PRNT                 /LA180 PRINTER FLAG SET
                6267  6361          MLAP
                6270  6500  UL7,    LQSK
                6271  5274          JMP VCDI
                6272  4522          CALL PRNT                 /LQP PRINT FLAG SET
                6273  6364          MLQP
                6274  6203  VCDI,   CDI 00
                6275  5633          JMP I CKFLG
                6276  0000  SAVAC,  0
                6277  1501  MMID,   TEXT    "MAINDEC-08-DKVTB-A"
                6300  1116
                6301  0405
                6302  0355
                6303  6070
                6304  5504
                6305  1326
                6306  2402
                6307  5501
                6310  0000
                6311  2516  UEIMES, TEXT    "UNEXPECTED INTERRUPT - FIELD 0"
                6312  0530
                6313  2005
                6314  0324
                6315  0504
                6316  4011
                6317  1624
                6320  0522
                6321  2225
                6322  2024
                6323  4055
                6324  4036
                6325  1105
                6326  1404
```



```
                6327  4060
                6330  0000
                6331  0614  FSMES,  TEXT    "FLAGS SET:"
                6332  0107
                6333  2340
                6334  2305
                6335  2472
                6336  0040
                6337  4040  MXMT1,  TEXT    "  X1"
                6340  3061
                6341  0000
                6342  4040  MXMT2,  TEXT    "  X2"
                6343  3062
                6344  0000
                6345  4040  MXMT3,  TEXT    "  X3"
                6346  3063
                6347  0000
                6350  4040  MREC1,  TEXT    "  R1"
                6351  2261
                6352  0000
                6353  4040  MREC2,  TEXT    "  R2"
                6354  2262
                6355  0000
                6356  4040  MREC3,  TEXT    "  R3"
                6357  2263
                6360  0000
                6361  4040  MLAP,   TEXT    "  LA"
                6362  1401
                6363  0000
                6364  4040  MLQP,   TEXT    "  LQ"
                6365  1421
                6366  0000
```

```
2969
2970    6370  6646
2971    6371  6203
2972    6372  6472
2973    6373  6456
2974    6374  6675
2975    6375  6532
2976    6376  6674
2977    6377  6524
              6400    *6400
2978                  /**************************************************************************
2979                  /ERROR DISPLAY FORMAT ROUTINES
2980                  /**************************************************************************
2981
2982
2983                  /NORMAL DISPLAY = TN,PC,AC,MQ,FLAGS
2984
2985    6400  4314    NORMDIS,JMS MESHDR      /PRINT ERROR HEADER & PC
2986    6401  4256            JMS MAC         /PRINT AC
2987    6402  4264            JMS MMQ         /PRINT MQ
2988    6403  4272            JMS MFL         /PRINT FLAGS
2989    6404  4521            C8CRLF
2990    6405  5777'           JMP IEH
2991
2992                  /COMBINED CPU MICROINST SKIP FAILURE DISPLAY
2993
2994    6406  4314    CPUSDIS,JMS MESHDR      /PRINT ERROR HEADER & PC
2995    6407  4300            JMS MINS                /PRINT INSTRUCTION
2996    6410  4521            C8CRLF
2997    6411  1067            TAD ACDATA              /PRINT AC CONTENTS BEFORE INST EXECUTION
2998    6412  3776'           DCA ACSAVE
2999    6413  4256            JMS MAC
3000    6414  1072            TAD MQDATA              /PRINT MQ CONTENTS BEFORE INST EXECUTION
3001    6415  3775'           DCA MQSAVE
3002    6416  4264            JMS MMQ
3003    6417  4306            JMS MLK                 /PRINT LINK CONTENTS BEFORE INST EXECUTION
3004    6420  4521            C8CRLF
3005    6421  5777'           JMP IEH
3006
3007                  /COMBINED CPU MICROINST DATA ERROR DISPLAY
3008
3009    6422  4314    CPUDIS, JMS MESHDR              /PRINT ERROR HANDLER & PC
3010    6423  4300            JMS MINS                /PRINT INSTRUCTION
3011    6424  4521            C8CRLF
3012    6425  4522            C8PRNT
3013    6426  6547            MESACT                  /PRINT ACTUAL AC,MQ,LINK
3014    6427  1054            TAD ACWAS
3015    6430  3776'           DCA ACSAVE
3016    6431  4256            JMS MAC
3017    6432  1055            TAD MQWAS
3018    6433  3775'           DCA MQSAVE
3019    6434  4264            JMS MMQ
3020    6435  1056            TAD LKWAS
3021    6436  3071            DCA LKDATA
3022    6437  4306            JMS MLK
```



```
3023    6440  4521            C8CRLF
3024    6441  4522            C8PRNT
3025    6442  6556            MESEXP
3026    6443  1072            TAD BIT11
3027    6444  3776'           DCA ACSAVE
3028    6445  4256            JMS MAC
3029    6446  1065            TAD BIT8
3030    6447  3775'           DCA MQSAVE
3031    6450  4264            JMS MMQ
3032    6451  1067            TAD BIT7
3033    6452  3071            DCA LKDATA
3034    6453  4306            JMS MLK
3035    6454  4521            C8CRLF
3036    6455  5777'           JMP IEH
3037
3038                  /SUBROUTINES FOR DISPLAY ROUTINES
3039
3040    6456  0000    MAC,    0               /DISPLAY AC MESSAGE
3041    6457  4522            C8PRNT
3042    6460  6663            MESAC
3043    6461  1776'           TAD ACSAVE
3044    6462  4523            C8PRT4
3045    6463  5656            JMP I MAC
3046
3047    6464  0000    MMQ,    0               /DISPLAY MQ MESSAGE
3048    6465  4522            C8PRNT
3049    6466  6666            MESMQ
3050    6467  1775'           TAD MQSAVE
3051    6470  4523            C8PRT4
3052    6471  5664            JMP I MMQ
3053
3054    6472  0000    MFL,    0               /DISPLAY FLAGS MESSAGE
3055    6473  4522            C8PRNT
3056    6474  6671            MESFL
3057    6475  1774'           TAD FLSAVE
3058    6476  4523            C8PRT4
3059    6477  5672            JMP I MFL
3060
3061    6500  0000    MINS,   0               /DISPLAY OCTAL INSTRUCTION
3062    6501  4522            C8PRNT
3063    6502  6543            MESINS
3064    6503  1505            TAD I INSTTR
3065    6504  4523            C8PRT4
3066    6505  5700            JMP I MINS
3067
3068    6506  0000    MLK,    0               /DISPLAY LINK MESSAGE
3069    6507  4522            C8PRNT
3070    6510  6540            MESLK
3071    6511  1071            TAD LKDATA
3072    6512  4523            C8PRT4
3073    6513  5706            JMP I MLK
3074
3075    6514  0000    MESHDP, 0               /DISPLAY MESSAGE HEADER & PC
3076    6515  4521            C8CRLF
3077    6516  4522            C8PRNT
```

```
3078    6517  5230          ERRMES
3079    6520  4521          C8CRLF
3080    6521  4324          JMS MTN
3081    6522  4332          JMS MPC
3082    6523  5714          JMP I MESHDR
3083
3084    6524  0000  MTN,     0               /DISPLAY TEST NUMBER
3085    6525  4522          C8PRNT
3086    6526  6565          MESTN
3087    6527  1075          TAD TSTNO
3088    6530  4523          C8PRT4
3089    6531  5724          JMP I MTN
3090
3091    6532  0000  MPC,     0               /DISPLAY PC
3092    6533  4522          C8PRNT
3093    6534  6660          MESPC
3094    6535  1773*         TAD PCSAVE
3095    6536  4523          C8PRT4
3096    6537  5732          JMP I MPC
3097
3098
3099    6540  4040  MESLK,   TEXT    "  LK:"
        6541  1413
        6542  7200
3100    6543  4040  MESINS,  TEXT    "  INST:"
        6544  1116
        6545  2324
        6546  7200
3101    6547  4040  MESACT,  TEXT    "  ACTUAL     "
        6550  0103
        6551  2425
        6552  0114
        6553  4040
        6554  4040
        6555  4000
3102    6556  4040  MESEXP,  TEXT    "  EXPECTED   "
        6557  0530
        6560  2005
        6561  0324
        6562  0504
        6563  4040
        6564  4000
3103    6565  4040  MESTN,   TEXT    "  TN:"
        6566  2416
        6567  7200
3104
3105
3106
3107
```



```
3108    6573  6674
3109    6574  6677
3110    6575  6676
3111    6576  6675
3112    6577  6646
              6600  *6600
3113                /*****************************************************************************
3114                /            CONSOLE ROUTINES
3115                /*****************************************************************************
3116
3117
3118                /THIS ROUTINE WILL DETERMINE WHAT TO DO WHEN A C8ERR IS ENCOUNTERED
3119                /WILL CHECK IF UNDER APT CONTROL.
3120                /       C8ERR=  JMS XC8ERR
3121                /EX,    C8ERR           /GO TO C8ERR CALL
3122                /                       /RETURN IS CALL PLUS ONE AC =0000
3123
3124
3125
3126    6600  0000  XC8ERR,  0
3127    6601  6002          IOF
3128    6602  7000  OWAPT,   NOP           /OVERWRITTEN WITH 'JMP APTER' IF RUNNING UNDER APT CONTROL
3129    6603  3275          DCA     ACSAVE          /SAVE AC
3130    6604  6004          GTF
3131    6605  3277          DCA     FLSAVE          /SAVE THE FLAGS
3132    6606  7501          MQA
3133    6607  3276          DCA     MQSAVE          /SAVE THE MQ
3134    6610  7340          CLA CLL CMA             /SUBTRACT A 1 FOR TRUE LOCATION
3135    6611  1200          TAD     XC8ERR          /GET RETTURN LOCATION
3136    6612  3274          DCA     PCSAVE          /SAVE ADD OF C8ERR CALL
3137    6613  6031          KSF                     /SAVE STATE OF SLU #1 REC FLAG FOR USE
3138    6614  7410          SKP                     /  BY UNEXPECTED INT, ROUTINE
3139    6615  7040          CMA                     /KBCHK ROUTINE CLEARS FLAG UNCONDITIONALLY
3140    6616  3040          DCA KSFLG
3141    6617  4517          KBCHK                   /CHECK FOR KEYBOARD INTERVENTION
3142    6620  1777*         TAD TSLUP
3143    6621  3300          DCA TLOOP
3144    6622  1020          TAD PSR                 /INHIBIT ERROR TYPEOUT?
3145    6623  0376          AND (0200               /MASK BIT 4 = INHIBIT BIT
3146    6624  7640          SZA CLA
3147    6625  5246          JMP IEH                 /NO ERROR PRINTOUT
3148    6626  1274          TAD PCSAVE
3149    6627  7041          CIA
3150    6630  1375          TAD (UEI
3151    6631  7650          SNA CLA
3152    6632  5774*         JMP SERUEI              /USE UNEXPECTED INT, DISPLAY
3153    6633  1274          TAD PCSAVE
3154    6634  7041          CIA
3155    6635  1373          TAD (SPE1
3156    6636  7650          SNA CLA
3157    6637  5772*         JMP CPUSDIS             /USE MICROINST SKIP FAILURE DISPLAY
3158    6640  1274          TAD PCSAVE
3159    6641  7041          CIA
3160    6642  1371          TAD (SPE2
3161    6643  7650          SNA CLA
```

```
3162    6644  5770'           JMP CPUDIS              /USE MICROINST DATA FAILURE DISPLAY
3163    6645  5767'           JMP NORMDIS             /USE NORMAL DISPLAY
3164    6646  1020    IEH,    TAD PSR                 /INHIBIT ERROR HALT?
3165    6647  7700            SMA CLA                 /TEST BIT 0
3166    6650  4524            C8SWIT                  /NO - GO TO THE INQUIRE ROUTINE
3167    6651  1020            TAD PSR                 /LOOP ON ERROR?
3168    6652  7004            RAL                     /TEST BIT 1
3169    6653  7710            SPA CLA
3170    6654  5703            JMP I TLOOP             /LOOP
3171    6655  4303            JMS C8GET               /CONTINUE TEST
3172    6656  7000            NOP                     /LEAVE INTERRUPT SYSTEM DISABLED
3173    6657  5600            JMP I   XC8ERR
3174    6660  4040    MESPC,  TEXT    "  PC:"
        6661  2003
        6662  7200
3175    6663  4040    MESAC,  TEXT    "  AC:"
        6664  0103
        6665  7200
3176    6666  4040    MESMQ,  TEXT    "  MQ:"
        6667  1521
        6670  7200
3177    6671  4040    MESFL,  TEXT    "  FL:"
        6672  0614
        6673  7200
3178    6674  7777    PCSAVE, 7777
3179    6675  7777    ACSAVE, 7777
3180    6676  7777    MQSAVE, 7777
3181    6677  7777    FLSAVE, 7777
3182    6700  0000    TLOOP,  0
3183    6701  5702    APTOW1, JMP I .+1
3184    6702  7000            APTER
3185
3186
3187    6703  0000    C8GET,  0
3188    6704  1276            TAD MQSAVE
3189    6705  7421            MQL                     /RESTORE THE MQ
3190    6706  1277            TAD FLSAVE
3191    6707  7004            RAL                     /RESTORE THE LINK
3192    6710  7200            CLA
3193    6711  1200            TAD XC8ERR              /RESTORE AC IF IN CPU TEST, OTHERWISE CLEAR AC
3194    6712  1366            TAD (-2400
3195    6713  7710            SPA CLA
3196    6714  1275            TAD ACSAVE              /RESTORE THE AC
3197    6715  5703            JMP I C8GET
3198
3199
3200                    /*****************************************************************
3201
3202                    /XC8START IS CALLED AT START OF PROGRAM TO PRINT THE MAINDEC NUMBER
3203                    /AND THE SWITCH REGISTER QUESTION.
3204
3205    6716  0000    XC8START,       0
3206    6717  4532            C8APT                   /CHECK FOR APT CONTROL
3207    6720  4521            C8CRLF                  //PRINT A CR LF
3208    6721  4522            C8PRNT
```



```
3209    6722  6277            MMID                    /PRINT ID
3210    6723  4521            C8CRLF
3211    6724  4524            C8SWIT                  /ASK THE SWITCH REGISTER QUESTION
3212    6725  4540            C8H3                    /ASK THE HOW3 QUESTION
3213    6726  6211            CDF 10
3214    6727  3765            DCA I (PASSNO           /ZERO PASS COUNTER
3215    6730  6201            CDF 00
3216    6731  5716    LXC8ST, JMP I   XC8START                /EXIT C8START
3217
3218
3219
3220
3221
3222                    /*****************************************************************************
3223
3224                    /APT/   ROUTINE TO NOTIFY APT THAT THE PROGRAM IS RUNNING OK.
3225    6732  0000    APTOK,  0                       /APT/
3226    6733  6002            IOF                     /APT/
3227    6734  7200            CLA                     /APT/
3228    6735  1354            TAD     APTIMX          /APT/DELAY 100MS.
3229    6736  3356            DCA     APTCTX          /APT/
3230    6737  1355            TAD     APTIMY          /APT/
3231    6740  3357            DCA     APTCTY          /APT/
3232    6741  2357            ISZ     APTCTY          /APT/
3233    6742  5341            JMP     .-1             /APT/
3234    6743  2356            ISZ     APTCTX          /APT/
3235    6744  5337            JMP     .-5             /APT/
3236    6745  6224            RIF                     /APT/AC=IF.
3237    6746  1364            TAD     (6201           /APT/CREATE A CDF INST.
3238    6747  3350            DCA     .+1             /APT/MODIFY NEXT CDF INST.
3239    6750  6201            CDF                     /APT/(MODIFIED CDF) DF=IF.
3240    6751  6272            CIF     70              /APT/IF=FIELD 7.
3241    6752  4763'           JMS     6500            /APT/CALL APT - 'PROG OK'.
3242    6753  5732            JMP I   APTOK           /APT/RTN FROM APT - RTN TO CALL+1.
3243
3244    6754  7771    APTIMX, -7                      /APT/
3245    6755  0000    APTIMY, 0                       /APT/
3246    6756  0000    APTCTX, 0                       /APT/
3247    6757  0000    APTCTY, 0                       /APT/
3248
3249    6760  4310    HOW3MS, TEXT    "@HW3="
        6761  2763
        6762  7500
3250
3251    6763  6500
3252    6764  6201
3253    6765  0137
3254    6766  5400
3255    6767  6400
3256    6770  6422
3257    6771  2060
3258    6772  6406
3259    6773  2054
3260    6774  6213
3261    6775  6205
```

```
3262  6776  0200
3263  6777  2226
            7000    PAGE
3264
3265                /**********************************************************************************
3266
3267
3268                /APT/   ROUTINE TO HANDLE ERRORS UNDER APT CONTROL.
3269
3270  7000  6002    APTER,  IOF                     /APT/
3271  7001  7200            CLA                     /APT/
3272  7002  6224            RIF                     /APT/AC=IF,
3273  7003  1377            TAD     (6201           /APT/CREATE A CDF INST,
3274  7004  3207            DCA     .+3             /APT/MODIFY NEXT CDF INST,
3275  7005  7240            CLA CMA                 /APT/
3276  7006  1776'           TAD     XC8ERR          /APT/AC=ERROR PC,
3277  7007  6201            CDF                     /APT/(MODIFIED CDF) DF=IF,
3278  7010  6272            CIF     70              /APT/IF=FIELD 7,
3279  7011  5775'           JMP     6520            /APT/CALL APT - 'ERROR'.
3280
3281
3282
3283
3284                /ROUTINE USED FOR CONSOLE REGISTER CHANGES
3285
3286  7012  0000    XC8RC,  0
3287  7013  1612            TAD I XC8RC             /GET MESSAGE PARAMETER
3288  7014  3300            DCA PROPMS
3289  7015  2212            ISZ XC8RC
3290  7016  1612            TAD I XC8RC             /GET THE REGISTER PARAMETER
3291  7017  3302            DCA PROPLC
3292  7020  2212            ISZ XC8RC
3293  7021  4276    RQEST,  JMS PPRMS               /PRINT REG QUESTION
3294  7022  1702            TAD I PROPLC            /GET THE VALUE OF THE REGISTER
3295  7023  4523            C8PRT4                  /PRINT THE 4 DIGITS
3296  7024  7346            CLA CLL CMA RTL         /SETUP A COUNTER TO ACCEPT 4 DIGITS
3297  7025  3304            DCA     TTYCNT          /SAVE THE COUNTER
3298  7026  1374            TAD     (CHARR0         /GET POINTER FOR FIRST CHARACTER
3299  7027  3232            DCA     CHGCHR          /SAVE THE POINTER FOR DIGITS
3300  7030  4525            LISN                    /WAIT FOR KEYBOARD INPUT
3301  7031  0001            1                       /CHECK FOR A OCTAL DIGIT
3302  7032  7250    CHGCHR, CHARR0                  /THIS LOCATION WILL GET MODIFIED
3303  7033  7566            =212                    /CHECK FOR LINE FEED
3304  7034  5200            START                   /LINE FEED TYPED= RETURN TO START
3305  7035  7563            =215                    /CHECK FOR CARRAIGE RETURN
3306  7036  7464            RETYPE                  /RETYPE SR AND CONT IF DIGITS TYPED
3307  7037  7575            =203                    /CHECK FOR A CONTROL C
3308  7040  7105            C8RM                    /CONTROL C TYPED =RETURN TO MONITOR
3309  7041  7555            =223                    /CHECK FOR A CONTROL S
3310  7042  7145            CNTRS                   /WAS CONTROL S WAIT FOR ^Q OR ^C
3311  7043  0000            0                       /NONE OF ABOVE CHARACTERS=ILLEGAL CHAR
3312  7044  7045            .+1                     /GO TO NEXT ADDRESS TO PRINT ?
3313  7045  4522            C8PRNT                  /GO PRINT ?
3314  7046  7315            QESTMK                  /POINTER TO ? MESSAGE
3315  7047  5221            JMP     RQEST           /RETURN AND ASK QUESTION AGAIN
```



```
3316  7050  3702    CHARR0, DCA I PROPLC            /SAVE THE LEAST SIGNIFICANT BIT
3317  7051  1373            TAD     (CHARR1         /UPDATA POINTER FOR CHARACTERS 2 3 4
3318  7052  3232            DCA     CHGCHR          /SAVE THE POINTER ADDRESS
3319  7053  5230            JMP     CHGCHR+2        /RETURN FOR NEXT CHARACTER INPUT
3320  7054  3303    CHARR1, DCA     SAVCHR          /SAVE THE CHARACTER TYPED
3321  7055  1702            TAD I PROPLC            /GET THE VALUE OF REG
3322  7056  7106            CLL     RTL             /MOVE IT INTO NEXT POSITION
3323  7057  7004            RAL
3324  7060  1303            TAD     SAVCHR          /ADD NEW CHARACTER TO IT
3325  7061  3702            DCA I PROPLC            /SAVE THE NEW VALUE
3326  7062  2304            ISZ     TTYCNT          /DONE ALL 4 CHARACTERS
3327  7063  5230            JMP     CHGCHR+2        /NO GET NEXT INPUT FROM KEYBOARD
3328  7064  1374    RETYPE, TAD     (CHARR0         /GET POINTER TO SEE IF REG ECHOED
3329  7065  7041            CIA                     /NEGATE THE POINTER
3330  7066  1232            TAD     CHGCHR          /GET THE POINTER STORED
3331  7067  7650            SNA     CLA             /ECHO VALUE OF REG?
3332  7070  5612            JMP  I  XC8RC           /NO=ONLY CR WAS TYPED=USE ORIGINAL VALUE
3333  7071  4276            JMS PPRMS               /RE=ECHO VALUE TYPED
3334  7072  1702            TAD  I PROPLC                   /GET VALUE OF REG
3335  7073  4523            C8PRT4                  /PRINT THE 4 OCTAL DIGITS
3336  7074  4521            C8CRLF                  /ISSUE A CR AND LF
3337  7075  5612            JMP  I  XC8RC           /RETURN TO PROGRAM
3338  7076  0000    PPRMS,  0                       /PRINT REGISTER MESSAGE
3339  7077  4522            C8PRNT
3340  7100  0000    PROPMS, 0
3341  7101  5676            JMP I PPRMS
3342
3343  7102  0000    PROPLC, 0
3344  7103  0000    SAVCHR, 0
3345  7104  0000    TTYCNT, 0
3346
3347
3348  7105  6007    C8RM,   CAF
3349  7106  6203            CDF CIF                 /CHANGE INST AND DATA FIELD TO 0
3350  7107  5710            JMP I .+1               /GOTO 7600 OF THAT FIELD
3351  7110  7600            7600                    /MONITOR STARTING ADDRESS
3352
3353
3354                /**********************************************************************************
3355
3356
3357
3358                /ROUTINE TO CHECK FOR CONSOLE RECEIVE FLAG
3359
3360  7111  0000    XCHKKSF,0
3361  7112  6031            KSF                     /SKIP  ON CONSOLE RECEIVE FLAG
3362  7113  5337            JMP  NOCRF              /RECEIVE FLAG NOT SET RETURN TO PROGRAM
3363  7114  1022            TAD HCW2                        /CHECK TO SEE IF CONSOLE WAS ACTIVE
3364  7115  0047            AND K4000               /(VERSUS APT IN CONTROL),
3365  7116  7650            SNA CLA
3366  7117  5322            JMP     .+3             /ACTIVE CONSOLE=CHECK FOR ^C OR ^G
3367  7120  6032            KCC                     /APT ACTIVE,CLEAR CONSOLE RECEIVE FLAG
3368  7121  5711            JMP  I  XCHKKSF         /RETURN TO PROGRAM
3369  7122  4772'           JMS SSUBLK              /SAVE SUBROUTINE LINKAGE
3370  7123  4525            LISN                    /CHECK THE KEYBOARD CHARACTER
```

```
3371    7124  7575          -203                    /CODE FOR ^C
3372    7125  7125          CRRM                    /WAS A CONTROL C-EXIT TO MONITOR
3373    7126  7571          -207                    /CODE FOR ^G
3374    7127  7141          CNTRLG                  /WAS  ^G ECHO CHAR-ENTER SR QUESTION
3375    7130  7555          -223                    /CHECK FOR A CONTROL S
3376    7131  7147          CNTRS1                  /WAS A CONTROL S WAIT FOR ^Q OR ^C
3377    7132  0000          0                       /CHAR WAS NOT ^C OR ^ G
3378    7133  7134          .+1                     /ECHO CHAR AND QUESTION MARK
3379    7134  1371          TAD (277                /PRINT ?
3380    7135  4527          TYPE
3381    7136  5350          JMP  RLK                /RETURN TO PROGRAM
3382    7137  2311  NOCRF,  ISZ XCHKKSF
3383    7140  5711          JMP I XCHKKSF
3384
3385    7141  4522  CNTRLG, C8PRNT                  /PRINT ^G AND CR LF
3386    7142  7317          UPARRG                  /POINTER  TO MESSAGE
3387    7143  4770'         JMS     XC8SW           /GO ASK THE SR QUESTION
3388    7144  5350          JMP  RLK                /RETURN TO THE PROGRAM
3389
3390    7145  4767' CNTRS,  JMS     WAITQC          /GO WAIT FOR A CONTROL Q OR C
3391    7146  5230          JMP     CHGCHR-2        /GO WAIT FOR NEXT CHAR
3392
3393    7147  4767' CNTRS1, JMS     WAITQC          /WAIT FOR A CONTROL Q OR C
3394    7150  4766' RLK,    JMS RSUBLK              /RESTORE SUBROUTINE LINKAGE
3395    7151  5711          JMP  I  XCHKKSF         /RETURN TO PROGRAM
3396    7152  0004  FILLER,0004                     /SET TO NUMBER OF FILLERS REQUIRED.
3397
3398
3399
3400
3401
3402                /PRINT THE TWO OCTAL NUMBERS IN THE AC 6 THRU 11
3403
3404    7153  0000  XPRNT2, 0                       /CALL BY "PRNT2"
3405    7154  3364          DCA     TWOOCK
3406    7155  1364          TAD     TWOOCK
3407    7156  7012          RTR
3408    7157  7010          RAR
3409    7160  4526          PRNT1
3410    7161  1364          TAD     TWOOCK
3411    7162  4526          PRNT1
3412    7163  5753          JMP I   XPRNT2
3413
3414    7164  0000  TWOOCK, 0
3415
3416
3417
3418    7166  7345
3419    7167  7521
3420    7170  7360
3421    7171  0277
3422    7172  7335
3423    7173  7054
3424    7174  7050
3425    7175  6520
```



```
3426    7176  6600
3427    7177  6201
              7200  PAGE
3428                /TYPE A CR AND LF WITH NUMBER OF FILLERS
3429                /AS DETERMINED BY LOCATION "FILLER"
3430
3431    7200  0000  XC8CRLF,0                       /CALL BY "CRLF"
3432    7201  7200          CLA
3433    7202  1215          TAD     K215
3434    7203  4527          TYPE
3435    7204  1777'         TAD     FILLER
3436    7205  7040          CMA
3437    7206  3214          DCA     XORS
3438    7207  1216          TAD     K212
3439    7210  4527          TYPE
3440    7211  2214          ISZ     XORS
3441    7212  5210          JMP     .-2
3442    7213  5600          JMP I   XC8CRLF
3443
3444    7214  0000  XORS,   0
3445    7215  0215  K215,215
3446    7216  0212  K212,212
3447
3448                /PRINT 2 SPACES
3449
3450    7217  0000  SPACX2, 0       /CALL BY "SPACE2"
3451    7220  4522          C8PRNT
3452    7221  7223          .+2
3453    7222  5617          JMP I SPACX2
3454    7223  4040          4040
3455    7224  0000          0000
3456
3457
3458                /COMPARE INPUT TO LIST FOLLOWING CALL
3459                /INPUT ONE CHARACTER IF AC=0
3460                /USE LAST INPUT IF AC NON ZERO
3461
3462    7225  0000  XLISN,  0                       /CALL BY "LISN"
3463    7226  7640          SZA CLA
3464    7227  5255          JMP     LISN1           /USE LAST INPUT SINCE AC NOT ZERO
3465    7230  6031          KSF
3466    7231  5230          JMP     .-1
3467    7232  6036          KRB
3468    7233  0376          AND     (177
3469    7234  1045          TAD     K200
3470    7235  3311          DCA     CH1REC
3471    7236  1311          TAD     CH1REC
3472    7237  1310          TAD     M212
3473    7240  7450          SNA                     /IS IT A LF?
3474    7241  5245          JMP     .+4             /YES
3475    7242  1307          TAD     M3
3476    7243  7640          SZA CLA                 /IS IT A CR?
3477    7244  5247          JMP     .+3             /NO
3478    7245  4521          CRCRLF
3479    7246  5255          JMP     LISN1
```

```
3480    7247  1311          TAD     CH1REC          /GET THE CHAR
3481    7250  1375          TAD     (-223           /CHECK FOR A CONTROL S
3482    7251  7650          SNA     CLA             /WAS IT A CONTROL S
3483    7252  5255          JMP     LISN1           /YES-DO NOT ECHO CHARACTER
3484    7253  1311          TAD     CH1REC
3485    7254  4527          TYPE                    /PRINT THE CHARACTER
3486    7255  1625  LISN1,  TAD I   XLISN           /GET COMPARE VALUE
3487    7256  2225          ISZ     XLISN
3488    7257  7450          SNA                     /EXIT?
3489    7260  5266          JMP     LISN3           /YES
3490    7261  7500          SMA
3491    7262  5276          JMP     LISNUM          /LOOK FOR OCTAL NUMBER
3492    7263  1311          TAD     CH1REC          /COMPARE
3493    7264  7640          SZA CLA                 /EQUAL?
3494    7265  5273          JMP     LISN2           /NO
3495    7266  3214  LISN3,  DCA     XORS
3496    7267  1625          TAD I   XLISN
3497    7270  3225          DCA     XLISN
3498    7271  1214          TAD     XORS
3499    7272  5625          JMP I   XLISN          /AC IS ZERO UNLESS OCTAL NUMBER
3500    7273  7200  LISN2,  CLA
3501    7274  2225          ISZ     XLISN
3502    7275  5255          JMP     LISN1
3503    7276  7200  LISNUM, CLA                     /LOOK FOR OCTAL NUMBER
3504    7277  1311          TAD     CH1REC
3505    7300  1304          TAD     M270
3506    7301  7500          SMA                     /IS IT LESS THAN 8?
3507    7302  5273          JMP     LISN2           /NO, SO NOT AN OCTAL NUMBER
3508    7303  1042          TAD     K10
3509    7304  7510  M270,   SPA                     /IS IT GREATER THAN ZERO?
3510    7305  5273          JMP     LISN2           /NO, SO NOT A NUMBER
3511    7306  5266          JMP     LISN3
3512    7307  7775  M3,     -3
3513    7310  7566  M212,   7566
3514    7311  0000  CH1REC, 0
3515
3516
3517    7312  4323  SRMESG, TEXT    "#SR="
        7313  2275
        7314  0000
3518    7315  7743  QESTMK, TEXT    "?#"
        7316  0000
3519    7317  3607  UPARRG, TEXT    "^G#"
        7320  4300
3520                  /TYPE THE ASCII CHARACTER IN THE AC
3521
3522    7321  0000  XTYPE,  0                       /CALL BY "TYPE"
3523    7322  3334          DCA     CHAR            /SAVE THE CHARACTER
3524    7323  7000  TYOUT,  NOP/JMP I XTYPE         /OVERWRITTEN IF RUNNING UNDER APT CONTROL,
3525    7324  4774' TYOUT+1 JMS     CNTRLS          /CONSOLE ACTIVE=CHECK FOR CONTROL S
3526    7325  1334          TAD     CHAR            /GET THE CHARACTER SAVED AND PRINT
3527    7326  6046          TLS
3528    7327  7200          CLA
3529    7330  6041          TSF
3530    7331  5330          JMP     .-1
```



```
3531    7332  6042          TCF
3532    7333  5721  APTCON, JMP I   XTYPE
3533
3534    7334  0000  CHAR,   0
3535
3536                  /ROUTINE TO SAVE SUBROUTINE LINKAGES WHICH MAY GET DESTROYED
3537                  /       BY A KEYBOARD INTERVENTION CHECK.
3538
3539    7335  0000  SSUBLK, 0
3540    7336  1773' TAD XCHKKSF
3541    7337  3355          DCA LSAV1
3542    7340  1772' TAD MESAGX
3543    7341  3356          DCA LSAV2
3544    7342  1771' TAD XPRNT4
3545    7343  3357          DCA LSAV3
3546    7344  5735          JMP I SSUBLK
3547
3548                  /ROUTINE TO RESTORE SUBROUTINE LINKAGES SAVED BY SSUBLK ROUTINE
3549
3550    7345  0000  RSUBLK, 0
3551    7346  1355          TAD LSAV1
3552    7347  3773' TAD XCHKKSF
3553    7350  1356          TAD LSAV2
3554    7351  3772' TAD MESAGX
3555    7352  1357          TAD LSAV3
3556    7353  3771' TAD XPRNT4
3557    7354  5745          JMP I RSUBLK
3558    7355  0000  LSAV1,  0
3559    7356  0000  LSAV2,  0
3560    7357  0000  LSAV3,  0
3561
3562                  /ASK SWITCH REGISTER QUESTION
3563
3564    7360  0000  XC8SW,  0
3565    7361  4537          C8RC
3566    7362  7312          SRMESG
3567    7363  0020          PSR
3568    7364  5760          JMP I XC8SW
3569
3570    7371  7464
3571    7372  7423
3572    7373  7111
3573    7374  7506
3574    7375  7555
3575    7376  0177
3576    7377  7152
              7400  PAGE
3577
3578
3579
3580
3581                  /*************************************************************************
3582
3583    7400  0000  XC8APT, 0
3584    7401  6002          IOF
```

```
3585  7402  1022          TAD HCW2        /RUN UNDER APT CONTROLS?
3586  7403  7200          SMA CLA
3587  7404  5600          JMP I XC8APT
3588  7405  1777'         TAD APTOW1      /YES--OVERWRITE C8ERR ROUTINE (FLD 0)
3589  7406  3776'         DCA OWAPT
3590  7407  1775'         TAD APTCON      /OVERWRITE 'TYPE' ROUTINE (FLD 0) TO INHIBIT
3591                      /       OUTPUT TO VT78 VIDEO.
3592  7410  3774'         DCA TYOUT
3593  7411  6211          CDF 10
3594  7412  1773'         TAD AP1OW1      /OVERWRITE 'ERROR' ROUTINE (FLD 1)
3595  7413  3776'         DCA OW1APT
3596  7414  1372          TAD (APT1CON    /OVERWRITE 'TYPE' ROUTINE (FLD 1)
3597  7415  3771          DCA I (TYOUT1
3598  7416  6231          CDF 30          /GET HARDWARE CONFIG, WORD 3 FROM APT LOADER/MONITOR
3599  7417  1770          TAD I (APTHW3
3600  7420  6201          CDF 00
3601  7421  3023          DCA HCW3        /STORE IN LOC 23 IN FIELD 0
3602  7422  5767'         JMP  LAC8ST
3603
3604                /PRINT PACKED ASCII TEXT TERMINATED BY
3605                /SIX-BIT 00
3606
3607  7423  0000    MESAGX, 0
3608  7424  4517          KBCHK                   /CHECK FOR KEYBOARD INTERVENTION
3609  7425  1623          TAD I   MESAGX
3610  7426  3263          DCA     FOROCK
3611  7427  2223          ISZ     MESAGX          /SET UP RETURN
3612  7430  1663          TAD I FOROCK
3613  7431  7012          RTR
3614  7432  7012          RTR
3615  7433  7012          RTR
3616  7434  4241          JMS     MESAGF
3617  7435  1663          TAD I FOROCK
3618  7436  4241          JMS     MESAGF
3619  7437  2263          ISZ     FOROCK
3620  7440  5230          JMP     .-10
3621  7441  0000    MESAGF, 0
3622  7442  0043          AND     K77
3623  7443  7450          SNA                     /TERMINATOR (00)?
3624  7444  5623          JMP I   MESAGX          /YES
3625  7445  1260          TAD     M43
3626  7446  7450          SNA                     /CRLF?
3627  7447  5256          JMP     .+7             /YES
3628  7450  1261          TAD     K3
3629  7451  7510          SPA                     /200 OR 300
3630  7452  1044          TAD     K100            /300
3631  7453  1262          TAD     K240            /200
3632  7454  4527          TYPE
3633  7455  5641          JMP I MESAGF
3634  7456  4521          C8CRLF
3635  7457  5641          JMP I   MESAGF
3636  7460  7735    M43,    7735
3637  7461  0003    K3,     0003
3638  7462  0240    K240,240
3639  7463  0000    FOROCK, 0
```



```
3640
3641                /PRINT FOUR OCTAL NUMBERS IN AC 11 THRU 0 FOLLOWED
3642                /BY TWO SPACES
3643
3644  7464  0000    XPRNT4, 0                       /CALL BY "PRNT4"
3645  7465  3263          DCA     FOROCK
3646  7466  1263          TAD     FOROCK
3647  7467  7012          RTR
3648  7470  7012          RTR
3649  7471  7012          RTR
3650  7472  4530          PRNT2
3651  7473  1263          TAD     FOROCK
3652  7474  4530          PRNT2
3653  7475  4531          SPACE2
3654  7476  5664          JMP I   XPRNT4
3655                /
3656                /PRINT THE OCTAL NUMBER IN AC 9 THRU 11
3657  7477  0000    XPRNT1, 0                       /CALL BY "PRNT1"
3658  7500  0305          AND     K7
3659  7501  1304          TAD     K260
3660  7502  4527          TYPE
3661  7503  5677          JMP I   XPRNT1
3662
3663  7504  0260    K260,   260
3664  7505  0007    K7,     7
3665
3666                /ROUTINE TO CHECK FOR A CONTROL S WHILE TYPING OUT MESSAGES
3667                /TO EXIT ROUTINE IF A CONTROL S WAS TYPED-A CONTROL Q OR C MUST BE
3668                /INPUTTED ON THE KEYBOARD
3669
3670  7506  0000    CNTRLS, 0
3671  7507  6031          KSF                     /SKIP ON CONSOLE KEYBOARD FLAG
3672  7510  5706          JMP  I  CNTRLS          /RETURN TO TYPE ROUTINE-FLAG NOT SET
3673  7511  6034          KRS                     /READ THE CHARACTER STATICALLY
3674  7512  0366          AND     (177            /MASK TO 7 BIT ASCII
3675  7513  1365          TAD     (-23            /CHECK FOR A CONTROL S
3676  7514  7640          SZA     CLA             /WAS IT A CONTROL S
3677  7515  5706          JMP  I  CNTRLS          /NO-RETURN WITH KEYBOARD FLAG STILL SET
3678  7516  6032          KCC                     /CLEAR KEYBOARD FLAG FROM "S
3679  7517  4321          JMS     WAITQC          /WAIT FOR CONTROL Q OR C
3680  7520  5706          JMP  I  CNTRLS          /RETURN TO PRINT MESSAGE BEING TYPED
3681
3682  7521  0000    WAITQC, 0                       /ROUTINE TO WAIT FOR CONTROL Q OR C
3683  7522  6031          KSF                     /WAIT FOR A CONTROL Q OR C TO EXIT
3684  7523  5322          JMP     .-1             /
3685  7524  6036          KRB                     /READ THE CHARACTER TYPED
3686  7525  0366          AND     (177            /MASK TO 7 BIT ASCII
3687  7526  1364          TAD     (-3             /CHECK FOR A CONTROL C
3688  7527  7450          SNA                     /WAS IT A CONTROL C?
3689  7530  5763'         JMP     C8RM            /YES-RESTORE MONITOR AND RETURN
3690  7531  1362          TAD     (-7             /CHECK FOR A LINE FEED CHARACTER
3691  7532  7450          SNA                     /WAS IT A LINE FEED
3692  7533  5761'         JMP     START           /YES GO RESTART THE PROGRAM
3693  7534  1362          TAD     (-7             /CHECK FOR A CONTROL Q "Q
3694  7535  7640          SZA     CLA             /WAS IT A CONTROL Q
```

```
 3695    7536  5322            JMP     WAITQC+1        /NO=WAIT FOR APPROPRIATE KEY
 3696    7537  5721            JMP  I  WAITQC          /RETURN TO WHENCE IT CAME
 3697
 3698                    /ASK HCW3 QUESTION  (HCW3=HARDWARE OPTION WORD 3 = LOC 23)
 3699
 3700    7540  0000    XC8H3,  0
 3701    7541  4537            CARC                    /PRINT QUESTION
 3702    7542  6760            HCW3MS
 3703    7543  0023            HCW3
 3704    7544  5740            JMP I XC8H3
 3705
 3706
 3707
 3708    7561  0200
 3709    7562  7771
 3710    7563  7105
 3711    7564  7775
 3712    7565  7755
 3713    7566  0177
 3714    7567  6731
 3715    7570  6143
 3716    7571  7402
 3717    7572  5600
 3718    7573  6713
 3719    7574  7323
 3720    7575  7333
 3721    7576  6602
 3722    7577  6701
               0001    FILLD 1
```



```
0000  11111111  11111110  11110000  00000000  11111111  11111111  11111111  11111111
0100  11111111  11111111  11111111  11111111  11000000  00000000  00000000  00000001

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111111  11111111  11111111  11111111  11100000  00001111

0400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0500  11111111  11111111  11111111  11111111  11111111  11111111  11100001  11111111

0600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700  11111111  11111111  11111111  11111111  11111111  11111111  10000000  00011111


1000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1100  11111111  11111111  11111111  11111111  11111111  11111111  11111110  00000001

1200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300  11111111  11111111  11111111  11111111  11111111  11111100  00000000  00000011

1400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1500  11111111  11111111  11111110  00000000  00000000  00000000  00000000  00001111

1600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1700  11111111  11111111  11111111  11111111  11111111  10000000  00000000  00000001


2000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2100  11111111  11111111  11111111  11111110  00000000  00000000  00000000  00000011

2200  11111111  11111111  11111111  11111111  11111111  00000000  00000000  00000000
2300  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000

2400
2500

2600
2700


3000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3100  11111111  11111111  11111111  11111111  11111111  11111111  10000001  11111111

3200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  01111111

3400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3500  11111111  11000000  00000000  00000000  00000000  00000000  00000000  00111111

3600  11111111  11111111  11111111  11111111  11111111  11111111  11111000  00000000
3700  00000000  00000000  00000000  00000000  00000000  00000000  00000000  01111111
```

```
4000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11110000
4100  00000000  00000000  00000000  00000000  00000000  00000000  00000001  11111111

4200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111110
4300  00000000  00000000  00000000  00000000  00000000  00000000  00000000  01111111

4400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4500  11111111  11111111  11111111  11111111  11111100  00000000  01111111  11111111

4600  11111111  11111111  11111111  11111111  11111111  11111111  11000000  00000000
4700  00000000  00000000  00000000  00000000  00000000  00000000  00001111  11111111


5000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5100  11111111  11111111  11000000  00000000  00000000  00000000  00000000  11111111

5200  11111111  11111111  11111111  11111111  11111000  00000000  00000000  00000000
5300  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000011

5400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5500  11111111  11111111  11111111  11111111  11111111  11100000  00000000  01111111

5600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5700  11111111  11111111  11111110  00000000  00000000  00000000  00000000  00000111


6000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6100  11111111  11111111  11111111  11111111  11111111  11111110  00000001  11111111

6200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6300  11111111  11111111  11111111  11111111  11111111  11111111  11111110  11111111

6400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  00011111

6600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111


7000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
7100  11111111  11111111  11111111  11111111  11111111  11111111  11111011  11111111

7200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
7300  11111111  11111111  11111111  11111111  11111111  11111111  11111000  01111111

7400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
7500  11111111  11111111  11111111  11111111  11111000  00000000  01111111  11111111

7600
7700
```



```
3723
3724                    /
3725                    /VT78 CPU DIAGNOSTIC - PART 2 - FIELD 1
3726                    /
3727                    /
3728
3729                    /PROCESSOR INSTRUCTIONS
3730            6007    CAF=6007                        /CLEAR ALL FLAGS
3731            7402    HLT=7402
3732            6244    RMF=6244                        /RESTORE MEMORY FIELD
3733            6005    RTF=6005
3734            6004    GTF=6004
3735            7421    MQL=7421
3736            7501    MQA=7501
3737            6661    PSKF=6661
3738            6500    LQSK=6500
3739
3740
3741                    ////////////////////////////////////////////////////////////////////////////
3742                    //SERIAL LINE UNIT #1
3743                    ////////////////////////////////////////////////////////////////////////////
3744                    /RECEIVER IOTS
3745            6030    KCF=6030                /CLEAR RECEIVE FLAG
3746            6031    KSF=6031                /SKIP ON RECEIVE FLAG
3747            6032    KCC=6032                /CLEAR RECEIVE FLAG AND AC
3748            6034    KRS=6034                /"OR" CONTENTS OF RECEIVE BUFFER INTO AC.
3749            6035    KIE=6035                /AC 11=1 SET INTERRUPT ENABLE
3750                                            /AC 11=0 CLEAR INTERRUPT ENABLE
3751            6036    KRB=6036                /LOAD CONTENT OF RECEIVE BUFFER INTO AC; CLR REC FLG
3752            6037    KLB=6037                /LOAD CONTENT OF AC11 INTO LOOPBACK FLIP FLOP
3753                                            /SETTING THE LOOPBACK FLIP-FLOP DISCONNECTS ALL
3754                                            /SERIAL LINE UNITS FROM THEIR RESPECTIVE CONNECTORS
3755                                            /AND CONNECTS THE OUTPUT OF EACH SLU TRANSMITTER
3756                                            /TO ITS RECEIVER.
3757                    /TRANSMIT IOTS
3758
3759            6040    SPF=6040                /SET TRANSMIT FLAG ENABLE
3760            6041    TSF=6041                /SKIP ON TRANSMIT FLAG SET AND ENABLED
3761            6042    TCF=6042                /CLEAR THE TRANSMIT FLAG ENABLE
3762            6043    TSB=6043                /SET BAUD RATE
3763            6044    TPC=6044                /SAME AS TLS
3764            6045    TSK=6045                /SKIP IF INT ENABLE SET AND IF
3765                                            /RECEIVE FLAG IS SET OR IF THE TRANSMIT FLAG
3766                                            /FLAG AND TRANSMIT FLAG ENABLE ARE BOTH SET.
3767            6046    TLS=6046                /LOAD TRANSMIT BUFFER FROM AC4-11 AND SEND CHAR OUT OVER
3768                                            /SERIAL LINE, SET THE TRANSMIT FLAG ENABLE, AS SOON
3769                                            /AS A NEW CHARACTER CAN BE LOADED INTO THE
3770                                            /TRANSMITTER, SET TRANSMIT FLAG.
3771
3772                    ////////////////////////////////////////////////////////////////////////////
3773                    //SERIAL LINE UNIT #2
3774                    ////////////////////////////////////////////////////////////////////////////
3775
3776                    /RECEIVER IOTS
3777
```

```
3778          6300    KCF1=6300               /CLEAR RECEIVE FLAG
3779          6301    KSF1=6301               /SKIP ON RECEIVE FLAG
3780          6302    KCC1=6302               /CLEAR RECEIVE FLAG AND AC
3781          6304    KRS1=6304               /"OR" CONTENTS OF RECEIVE BUFFER INTO AC
3782          6305    KIE1=6305               /AC 11=1 SET INTERRUPT ENABLE
3783                                          /AC 11=0 CLEAR INTERRUPT ENABLE
3784          6306    KRB1=6306               /LOAD CONTENT OF RECEIVE BUFFER INTO AC; CLR RECV FLG
3785          6307    KMD1=6307               /SET THE OPERATING MODE OF SLU 2
3786
3787                  /TRANSMIT IOTS
3788
3789          6310    SPF1=6310               /SET TRANSMIT FLAG ENABLE
3790          6311    TSF1=6311               /SKIP IF TRANSMIT FLAG IS SET AND ENABLED
3791          6312    TCF1=6312               /CLEAR TRANSMIT FLAG ENABLE
3792          6313    TSB1=6313               /SET BAUD RATE
3793          6314    TPC1=6314               /SAME AS TLS1
3794          6315    TSK1=6315               /SKIP IF INT EN SET AND IF RECV FLAG IS SET
3795                                          /OR IF XMIT FLAG AND XMIT EN ARE BOTH SET
3796          6316    TLS1=6316               /LOAD TRANSMIT BUFFER FROM AC4-11 AND SEND CHAR
3797                                          /OUT OVER SERIAL LINE, SET THE TRAMSMIT FLAG ENABLE,
3798                                          /AS SOON AS A NEW CHARACTER CAN BE LOADED INTO
3799                                          /THE TRANSMITTER, SET TRANSMIT FLAG,
3800
3801                  ////////////////////////////////////////////////////////////////////////
3802                  //SERIAL LINE UNIT #3
3803                  ////////////////////////////////////////////////////////////////////////
3804
3805                  /RECEIVER IOTS
3806
3807          6320    KCF2=6320               /CLEAR RECEIVE FLAG
3808          6321    KSF2=6321               /SKIP ON RECEIVE FLAG
3809          6322    KCC2=6322               /CLEAR RECEIVE FLAG AND AC
3810          6324    KRS2=6324               /"OR" CONTENTS OF RECEIVE BUFFER INTO AC
3811          6325    KIE2=6325               /AC 11=1 SET INTERRUPT ENABLE
3812                                          /AC 11=0 CLEAR INTERRUPT ENABLE
3813          6326    KRB2=6326               /LOAD CONTENT OF RECEIVE BUFFER INTO AC; CLR RECV FLG
3814
3815                  /TRANSMIT IOTS
3816
3817          6330    SPF2=6330               /SET TRANSMIT FLAG ENABLE
3818          6331    TSF2=6331               /SKIP IF TRANSMIT FLAG IS SET AND ENABLED
3819          6332    TCF2=6332               /CLEAR TRANSMIT FLAG ENABLE
3820          6333    TSB2=6333               /SET BAUD RATE
3821          6334    TPC2=6334               /SAME AS TLS1
3822          6335    TSK2=6335               /SKIP IF INT EN SET AND IF RECV FLAG IS SET
3823                                          /OR IF XMIT FLAG AND XMIT EN ARE BOTH SET
3824          6336    TLS2=6336               /LOAD TRANSMIT BUFFER FROM AC4-11 AND SEND CHAR
3825                                          /OUT OVER SERIAL LINE, SET THE TRAMSMIT FLAG ENABLE,
3826                                          /AS SOON AS A NEW CHARACTER CAN BE LOADED INTO
3827                                          /THE TRANSMITTER, SET TRANSMIT FLAG,
3828
3829
3830
3831
3832                  ////////////////////////////////////////////////////////////////
```



```
3833                  /BAUD RATE TABLE
3834                  ////////////////////////////////////////////////////////////////
3835
3836                  /AC 8-11      BAUD RATE          AC 8-11     BAUD RATE
3837                  /-----------------------         -----------------------
3838                  /0              50              10              1800
3839                  /1              75              11              2000
3840                  /2              110             12              2400
3841                  /3              134.5           13              3600
3842                  /4              150             14              4800
3843                  /5              300             15              7200
3844                  /6              600             16              9600
3845                  /7              1200            17              19200
3846
3847
3848                  ////////////////////////////////////////////////////////////////////////
3849                  /SLU #2 MODE
3850                  ////////////////////////////////////////////////////////////////////////
3851
3852          0027    MODE1=0027      /8 BIT,NO PARITY,1 STOP
3853          0006    MODE2=0006      /8 BIT,ODD PARITY,1 STOP
3854          0007    MODE3=0007      /8 BIT,EVEN PARITY,1 STOP
3855
3856
3857                  ////////////////////////////////////////////////////////////////////////////////
3858                  /FLOPPY IOTS
3859                  ////////////////////////////////////////////////////////////////////////////////
3860
3861          6750    SEL=6750                /IF AC11=0 SELECT UNIT A (SEL BY CAF & POWER ON)
3862                                          /IF AC11=1 SELECT UNIT B
3863          6751    LCD=6751                /LOAD COMMAND REG,CLEAR AC
3864          6752    XDR=6752                /TRANSFER DATA REGISTER
3865          6753    STR=6753                /SKIP ON XFER REG FLAG,CLEAR FLAG
3866          6754    SER=6754                /SKIP ON ERROR FLAG,CLEAR FLAG
3867          6755    SDN=6755                /SKIP ON DONE FLAG,CLEAR FLAG
3868          6756    INTR=6756               /INTERRUPT ENABLE/DISABLE
3869          6757    INIT=6757               /INIT CONTROLLER & RECALIBRATE DRIVES
3870
3871
3872                  ////////////////////////////////////////////////////////////////////////////////
3873                  /PARALLEL I/O INTERFACE  IOTS
3874                  ////////////////////////////////////////////////////////////////////////////////
3875
3876          6660    PSSF=6660               /SET PRINT FLAG
3877          6661    PSKF=6661               /SKIP ON FLAG
3878          6662    PCLF=6662               /CLEAR FLAG
3879                                          /6663=UNUSED
3880          6664    PSTB=6664               /LOAD PRINTER BUFFER;ISSUE CHAR STROBE
3881          6665    PCIE=6665               /IF AC11=0 CLEAR INTERRUPT ENABLE
3882                                          /IF AC11=1 SET INTERRUPT ENABLE
3883          6666    PCLP=6666               /LOAD PRINTER BUFFER;ISSUE CHAR STROBE;CLEAR FLAG
3884          6667    PRDB=6667               /IF OUT=0 READ EXTERNAL DEVICE(PRINTER)
3885                                          /IF OUT=1 READ INTERFACE BUFFER
3886
3887
```

```
3888
3889          6500    LQSK=6500               /SKIP ON DONE FLAG
3890          6501    LQRB=6501               /IF OUT=0 READ EXTERNAL DEVICE(PRINTER)
3891                                          /IF OUT=1 READ INTERFACE BUFFER
3892          6502    LQMP=6502               /MOVE PAPER
3893          6503    LQMC=6503               /MOVE CARRIAGE
3894          6504    LQPC=6504               /PRINT CHAR
3895          6505    LQRS=6505               /READ STATUS AND CLEAR DONE FLAG
3896          6506    LQLS=6506               /WRITE STATUS AND SET DONE FLAG
3897          6507    LQRE=6507               /RESTORE AND CLEAR DONE FLAG
3898
3899
3900
3901
3902          0000    *0
3903    0000  4450            ERROR
3904                  /LOCATIONS 0-10 GET DESTROYED BY MEMORY EXTENSION
3905                  /TESTING FROM FIELD 0.
3906
3907          0004    *4
3908    0004  7000            NOP
3909    0005  7000            NOP
3910    0006  7000            NOP             /LEAVE LOCS 4,5, & 6 OPEN FOR ODT
3911
3912
3913
3914
3915          0024    *24
3916    0024  0016    NSQBDR, 16              /BAUD RATE USED FOR NORMAL TEST SEQUENCE
3917
3918    0025  0000    SDEVC,  0               /DEVICE CODE BEING TESTED.
3919    0026  0016    BDR1,   16              /BAUD RATE INDICATOR FOR SLU#1
3920    0027  0016    BDR2,   16              /BAUD RATE INDICATOR FOR SLU#2
3921    0030  0016    BDR3,   16              /BAUD RATE INDICATOR FOR SLU#3
3922    0031  0000    LOOPA,  0               /STATUS OF LOOPAROUND (1=LOOPED,0=NOT LOOPED)
3923
3924
3925          4432            C1CRLF=JMS I .
3926    0032  7200                    XC1CRLF
3927          4433            SLU2MC=JMS I .
3928    0033  1660                    XMODE2
3929          4434            C1PRNT=JMS I .
3930    0034  7414                    MESAG
3931          4435            C1PRT4=JMS I .
3932    0035  7453                    X1PRN4
3933          4436            C1SWIT=JMS I .
3934    0036  7013                    XC1SW
3935          4437            LISNF1=JMS I .
3936    0037  7223                    XLISN1
3937          4440            SPAC21=JMS I .
3938    0040  7215                    SPAC2
3939          4441            PRN11=JMS I .
3940    0041  7466                    X1PRN1
3941          4442            TYPE1=JMS I .
3942    0042  7400                    X1TYPE
```



```
3943          4443            C1EOP=JMS I .
3944    0043  7306                    XC1EOP
3945          4444            PRN21=JMS I .
3946    0044  7525                    X1PRN2
3947          4445            CH1KSF=JMS I .
3948    0045  7136                    XCH1KSF
3949
3950          4446            LOOPPC=JMS I.
3951    0046  2200                    PCLOOP
3952          4447            DONLOP=JMS I.
3953    0047  2242                    LOPDON
3954          4450            ERROR=JMS I.
3955    0050  6600                    XC1ERR
3956          4451            TSFWAT=JMS I.
3957    0051  2333                    WATTSF
3958          4452            KSFWAT=JMS I.
3959    0052  2346                    WATKSF
3960          4453            SLUDAT=JMS I.
3961    0053  2421                    DATSLU
3962          4454            SLUDER=JMS I.
3963    0054  2462                    DERSLU
3964          4455            CLREIF=JMS I .
3965    0055  2234                    EIFCLR
3966          4456            CLREXI=JMS I .
3967    0056  2214                    EXICLR
3968          4457            CLRERI=JMS I .
3969    0057  2220                    ERICLR
3970          4460            SETEXI=JMS I .
3971    0060  2224                    EXISET
3972          4461            SETERI=JMS I .
3973    0061  2230                    ERISET
3974          4462            KB1CHK=JMS I .
3975    0062  3320                    CH1KB
3976          4463            MIOT=JMS I .
3977    0063  3424                    XMIOT
3978          4464            WAIT=JMS I .
3979    0064  5553                    XWAIT
3980          4465            GETSR=JMS I .
3981    0065  3312                    XGETSR
3982          4466            GETHW3=JMS I .
3983    0066  6346                    XGHW3
3984          4467            LOOP=JMS I .
3985    0067  3233                    SLOOPA
3986          4470            DELAY=JMS I .
3987    0070  3245                    XDELAY
3988          4471            CLREPI=JMS I .
3989    0071  4475                    XCLEPI
3990          4472            SETEPI=JMS I .
3991    0072  4501                    XSEPI
3992          4473            VDELAY=JMS I .
3993    0073  1667                    XVDLY
3994
3995
3996                  /MSLU IOTS
3997
```

```
3998            4474            MKCF=JMS I .
3999    0074    2620                    XMKCF
4000            4475            MKSF=JMS I .
4001    0075    2635                    XMKSF
4002            4476            MKCC=JMS I .
4003    0076    2612                    XMKCC
4004            4477            MKRS=JMS I .
4005    0077    2617                    XMKRS
4006            4500            MKIE=JMS I .
4007    0100    2624                    XMKIE
4008            4501            MKRB=JMS I .
4009    0101    2631                    XMKRB
4010            4502            MSPF=JMS I .
4011    0102    2636                    XMSPF
4012            4503            MTSF=JMS I .
4013    0103    2643                    XMTSF
4014            4504            MTCF=JMS I .
4015    0104    2650                    XMTCF
4016            4505            MTSB=JMS I .
4017    0105    2655                    XMTSB
4018            4506            MTPC=JMS I .
4019    0106    2707                    XMTPC
4020            4507            MTSK=JMS I .
4021    0107    2714                    XMTSK
4022            4510            MTLS=JMS I .
4023    0110    2721                    XMTLS
4024            4511            SLUCAF=JMS I .
4025    0111    3252                    XSCAF
4026            4512            CFSLU=JMS I .
4027    0112    3265                    XCFSLU
4028            4513            KLSIM=JMS I .
4029    0113    4511                    XKLSIM
4030            4514            RLOOP=JMS I .
4031    0114    3240                    CLOOPA
4032            4515            APTREP=JMS I .
4033    0115    2502                    REPAPT
4034            4516            SPCIE=JMS I .
4035    0116    3544                    XSPCIE
4036
4037
4038
4039
4040                            /LOCATIONS USED BY THE PROGRAM
4041
4042    0117    0000    INTFLG, 0
4043    0120    0000    EXMITI, 0
4044    0121    0000    ERECI,  0
4045    0122    0000    CNT,    0
4046    0123    0000    CNT1,   0
4047    0124    0000    TESTF1, 0
4048    0125    0000    TSTLOP, 0
4049    0126    0000    SLUXMT, 0
4050    0127    0000    SLUREC, 0
4051    0130    0000    BLANK,  0
4052    0131    0000    EAC,    0
```



```
4053    0132    0000    GOOD,   0
4054    0133    0000    RXHERE, 0
4055    0134    0000    COMP,   0
4056    0135    0000    EPRNTI, 0
4057    0136    0000    ECONSI, 0
4058    0137    0000    PASSNO, 0
4059    0140    0000    TSTNU,  0
4060
4061
4062                            /ROUTINE TO SETUP FIELD 0 TO HANDLE INTERRUPTS FROM ANOTHER FIELD
4063
4064
4065    0141    0000    PATCH,  0
4066    0142    1541            TAD  I  PATCH           /GET THE INTERRUPT SERVICE ADDRESS
4067    0143    3166            DCA ITOLOC
4068    0144    1177            TAD (LOC1-1
4069    0145    3010            DCA     10              /SETUP AUTO INDEX 10
4070    0146    3011            DCA     11              /CLEAR AUTO INDEX 11
4071    0147    7346            CLA CLL CMA RTL         /SETUP MOVE COUNTER TO -3
4072    0150    3123            DCA     CNT1            /SAVE THE MOVE COUNTER
4073    0151    6224            RIF                     /READ THIS INSTRUCTION FIELD
4074    0152    1155            TAD     KCDF            /MAKE CDF INSTR TO THIS FIELD
4075    0153    3157            DCA     .+4             /SAVE THE CDF INSTRUCTION
4076    0154    1410            TAD  I  10              /GET FIRST CONTENTS TO TRANSFER
4077    0155    6201    KCDF,   CDF     00              /CHANGE DATA FIELD TO FIELD 0
4078    0156    3411            DCA  I  11              /SAVE THE CONTENTS IN ADDRESSES 1-3
4079    0157    6201            CDF                     /CHANGE DATA FIELD BACK TO PROGRAM FIELD
4080    0160    2123            ISZ     CNT1            /DONE
4081    0161    5154            JMP     .-5             /NO-GO MOVE NEXT CONTENTS FROM 1-3
4082    0162    2141            ISZ     PATCH           /BUMP RETURN
4083    0163    5541            JMP  I  PATCH           /RETURN TO THE PROGRAM
4084
4085    0164    6244    LOC1,   RMF
4086    0165    5403            JMP I 3
4087    0166    0000    ITOLOC, 0
```

```
4088
4089                0200    *200
4090
4091    0200  6002  C1REST, IOF
4092    0201  3140          DCA TSTNU               /CLEAR TEST # FOR ERROR DISPLAY
4093    0202  7240          CLA CMA
4094    0203  3136          DCA ECONSI              /WHILE SLU'S ARE LOOPED OPERATOR CANNOT
4095                                                /GET CONTROL VIA CONSOLE PACKAGE.
4096                                                /SLU'S ARE LOOPED DURING SLU TESTS 6-17.
4097    0204  4141          JMS PATCH               /SETUP INTERRUPT SERVICE LINKAGE
4098    0205  6200          SKP1CHN
4099    0206  4465          GETSR                   /GET PSEUDO SWITCH REGISTER FROM FIELD 0.
4100    0207  0377          AND (0020
4101    0210  7640          SZA CLA                 /EXECUTE SLU TEST??????
4102    0211  5776'         JMP PRTEST              /NO
4103    0212  4775'         JMS INIT1               /INITIALIZE FOR SLU TESTING STARTUP
4104    0213  4277  $MES,   JMS PSMES               /PRINT "SLU TESTING" MESSAGE IF NOT
4105                                                /       NOT UNDER APT CONTROL.
4106    0214  4774' NXTDC,  JMS BDRNS               /SETUP BAUD RATE FOR NORMAL TEST SEQUENCE
4107    0215  4773'         JMS XIOT                /SETUP DEVICE CODE FOR SLU TO TEST
4108    0216  4433          SLU2MC                  /SETUP MODE CONTROL IN SLU #2
4109    0217  0027          MODE1
4110    0220  4515          APTREP                  /IF UNDER APT CONTROL REPORT OK STATUS TO APT
4111
4112
4113
4114
4115                /*********************************************************************
4116                /INITIALIZATION TEST
4117                /TEST 1 - CHECKS THAT CAF (INITIALIZE) WILL CLEAR THE RECEIVE  FLAG AND DISABLE XMIT FLAG.
4118                /NOTE: INITIALIZE SETS THE SERIAL LINE UNIT'S INTERRUPT ENABLE.
4119                /*********************************************************************
4120
4121    0221  4446  TEST1,  LOOPPC          /SETUP  LOOPING ADDRESS
4122    0222  1372          TAD (1                  /SETUP TEST NUMBER FOR ERROR DISPLAY
4123    0223  3140          DCA TSTNU
4124    0224  6002          IOF
4125    0225  4455          CLREIF          /CLEAR 'EXPECTING INTERRUPT' FLAGS.
4126    0226  4511          SLUCAF          /INITIALIZE THE MODULE - CAF SETS INT ENA ON SLU
4127    0227  4475          MKSF            /SKIP ON RECEIVE FLAG
4128    0230  7410          SKP
4129    0231  4450          ERROR           /RECEIVE FLAG SET OR KSF SKIPPED
4130    0232  4503          MTSF            /SKIP ON TRANSMIT FLAG SET AND ENABLED
4131    0233  7410          SKP
4132    0234  4450          ERROR           /TRANSMIT FLAG SET AND ENABLED OR TSF SKIPPED
4133    0235  4507          MTSK            /SKIP ON XMIT/RECEIVE + INT ENA
4134    0236  7410          SKP
4135    0237  4450          ERROR           /TRANSMIT FLAG SET & ENABLED OR MTSK SKIPPED
4136    0240  4447          DONLOP          /CHECK FOR LOOP ON TEST
4137
4138
4139                /*********************************************************************
4140                /TEST 2 - TRY TO CLEAR SLU INT ENA BY ISSUING A KIE COMMAND.  THEN TEST THE SLU XMIT
4141                /FLAG EN TO SET BY SPF AND CLEAR BY TCF.  THE FLAG IS CHECKED WITH TSF AND TSK.  IF AN
4142                /INTERRUPT OCCURRED, IT MAY BE DUE TO INT ENA NOT BEING CLEARED BY KIE AND DATA BIT 11 ON A 0.
```



```
4143                /*********************************************************************
4144
4145    0241  4446  TEST2,  LOOPPC
4146    0242  1371          TAD (2                  /SETUP TEST NUMBER FOR ERROR DISPLAY
4147    0243  3140          DCA TSTNU
4148    0244  4455          CLREIF                  /CLEAR EXPECTING INTERRUPT FLAGS
4149    0245  4511          SLUCAF                  /CLEAR ALL FLAGS + SET SLU INT ENA
4150    0246  6001          ION                     /TURN THE INTERRUPT ON
4151    0247  4475          MKSF                    /CHECK TO SEE IF RECEIVE FLAG IS A 0
4152    0250  7610          SKP CLA
4153    0251  4450          ERROR                   /RECEIVE FLAG SET OR KSF SKIPPED
4154    0252  4500          MKIE                    /CLEAR SLU INT ENA
4155    0253  4502          MSPF                    /SET XMIT FLAG ENABLE
4156    0254  4503          MTSF                    /SKIP ON XMIT FLAG SET AND ENABLED
4157    0255  4450          ERROR                   /SPF FAILED TO SET XMIT FLAG OR NO SKIP OCCURRED
4158    0256  4507          MTSK                    /SKIP ON XMIT/RECEIVE + INT ENA ON A 1
4159    0257  7410          SKP
4160    0260  4450          ERROR                   /TSK SKIPPED OR KIE AND DATA 11 L FAILED TO CLEAR INT ENA
4161    0261  4475          MKSF                    /SKIP ON RECEIVE FLAG
4162    0262  7410          SKP
4163    0263  4450          ERROR                   /RECEIVE FLAG SET BY ABOVE CODE
4164    0264  4504          MTCF                    /CLEAR TRANSMIT FLAG ENABLE
4165    0265  4503          MTSF                    /SKIP ON XMIT FLAG SET AND ENABLED
4166    0266  7410          SKP
4167    0267  4450          ERROR                   /TCF FAILED TO CLEAR XMIT FLAG ENABLE
4168    0270  4507          MTSK                    /SKIP ON XMIT/RECEIVE + INT ENA ON A 1
4169    0271  7610          SKP CLA
4170    0272  4450          ERROR                   /TSK SKIPPED WITH XMIT FLAG + INT ENA A 0
4171    0273  4475          MKSF                    /SKIP ON RECEIVE FLAG
4172    0274  7610          SKP CLA
4173    0275  4450          ERROR                   /RECEIVE FLAG GOT SET BY ABOVE CODE
4174    0276  4447          DONLOP
4175
4176                /PRINT "SLU TESTING MESSAGE"
4177
4178    0277  0000  PSMES,  0
4179    0300  4432          C1CRLF
4180    0301  4434          C1PRNT
4181    0302  3303          SLUMES
4182    0303  4434          C1PRNT
4183    0304  3306          TESMES
4184    0305  4432          C1CRLF
4185    0306  5677          JMP I PSMES
4186
4187
4188
4189    0371  0002
4190    0372  0001
4191    0373  3000
4192    0374  3200
4193    0375  3077
4194    0376  3400
4195    0377  0020
              0400  PAGE
4196
```

```
                        /*****************************************************************
                        /TEST 3 - CHECKS THAT CAF WILL CLEAR THE TRANSMIT FLAG EN.  THE PROGRAM
                        /CHECKS THAT NO INTERRUPTS OCCURRED.
                        /*****************************************************************

0402  4446  TEST3,  LOOPPC
0401  1377          TAD (3                  /SETUP TEST NUMBER FOR ERROR DISPLAY
0402  3140          DCA TSTNU
0403  4455          CLREIF                  /CLEAR EXPECTING INTERRUPT FLAGS,
0404  4511          SLUCAF
0405  6001          ION                     /TURN THE INTERRUPT ON
0406  4500          MKIE                    /CLEAR SLU INT ENA
0407  4502          MSPF                    /SET THE TRANSMIT FLAG ENABLE
0410  4503          MTSF                    /SKIP ON THE XMIT FLAG SET AND ENABLED
0411  4450          ERROR                   /SPF FAILED TO SET THE XMIT FLAG
0412  4507          MTSK                    /SKIP ON XMIT/RECEIVE + INT ENA
0413  7410          SKP
0414  4450          ERROR                   /TSK SKIPPED WITHOUT INT ENA SET OR KIE FAILED
0415  4511          SLUCAF                  /CLEAR ALL FLAGS
0416  4503          MTSF                    /SKIP ON THE TRANSMIT FLAG SET AND ENABLED
0417  7410          SKP
0420  4450          ERROR                   /FAILED TO CLEAR XMIT FLAG
0421  4475          MKSF                    /SKIP ON RECEIVE FLAG
0422  7610          SKP CLA
0423  4450          ERROR                   /RECEIVE FLAG SET BY ABOVE CODE
0424  4447          DONLOP

                        /*****************************************************************
                        /TEST 4 - CHECK THAT CAF WILL SET SLU INT ENABLE AND THAT KIE
                        /AND DATA 11 ON A 0 WILL CLEAR IT USING XMIT FLAG TO INTERRUPT ON.
                        /TSK IS CHECKED TO SKIP AND NOT TO SKIP.
                        /*****************************************************************

0425  4446  TEST4,  LOOPPC
0426  1376          TAD (4                  /SETUP TEST NUMBER FOR ERROR DISPLAY
0427  3140          DCA TSTNU
0430  4455          CLREIF                  /CLEAR EXPECTING INTERRUPT FLAGS,
0431  4511          SLUCAF                  /CLEAR ALL FLAGS BUT SET SLU INTERRUPT ENABLE
0432  6001          ION                     /TURN THE INTERRUPT ON
0433  4503          MTSF                    /SKIP ON XMIT FLAG SET AND ENABLED
0434  7410          SKP
0435  4450          ERROR                   /XMIT FLAG ENABLE SET AFTER A CAF
0436  4507          MTSK                    /SKIP ON XMIT/RECEIVE AND INT ENA ON A 1
0437  7410          SKP
0440  4450          ERROR                   /TSK SKIPPED WITH INT ENA SET AND NO FLAG
0441  4460          SETEXI                  /SET EXPECTING XMIT INTERRUPT FLAG
0442  4502          MSPF                    /SET THE TRANSMIT FLAG ENABLE
0443  4456          CLREXI                  /CLEAR EXPECTING XMIT INTERRUPT FLAG
0444  4503          MTSF                    /SKIP ON THE TRANSMIT FLAG SET AND ENABLED
0445  4450          ERROR                   /TFL FAILED TO SET THE XMIT FLAG
0446  4507          MTSK                    /SKIP ON XMIT FLAG AND INT ENA ON A 1
0447  4450          ERROR                   /CAF FAILED TO SET SLU INT ENA OR TSK DIDN'T SKIP
0450  2117          ISZ INTFLG              /DID THE PROGRAM INTERRUPT WITH XMIT + INT ENA
0451  4450          ERROR                   /PROGRAM FAILED TO INTERRUPT WITH XMIT + INT ENA SET
0452  7200          CLA                     /CLEAR THE ACCUMULATOR
```



```
0453  4500          MKIE                    /CLEAR INT ENA ON SLU
0454  3117          DCA INTFLG              /CLEAR PROGRAM INTERRUPT FLAG,
0455  6001          ION                     /TURN THE INTERRUPT BACK ON
0456  4503          MTSF                    /SKIP ON TRANSMIT FLAG SET AND ENABLED
0457  4450          ERROR                   /XMIT FLAG EN GOT CLEARED
0460  4507          MTSK                    /SKIP ON XMIT AND INT ENA ON A 1
0461  7410          SKP
0462  4450          ERROR                   /KIE AND DATA 11 FAILED TO CLEAR INT ENA
0463  4504          MTCF                    /CLEAR XMIT FLAG ENABLE
0464  4503          MTSF                    /SKIP ON TRANSMIT FLAG SET AND ENABLED
0465  7410          SKP
0466  4450          ERROR                   /TCF FAILED TO CLEAR XMIT FLAG
0467  4475          MKSF                    /SKIP ON RECEIVE FLAG
0470  7410          SKP
0471  4450          ERROR                   /RECEIVE FLAG GOT SET BY ABOVE CODE
0472  4447          DONLOP

                        /*****************************************************************
                        /TEST 5 - CHECKS THAT SLU INT ENA CAN BE SET AND CLEARD BY KIE
                        /AND DATA BIT 11 USING THE XMIT FLAG TO INTERRUPT ON.
                        /*****************************************************************

0473  4446  TEST5,  LOOPPC
0474  1375          TAD (5                  /SETUP TEST NUMBER FOR ERROR DISPLAY
0475  3140          DCA TSTNU
0476  4455          CLREIF                  /CLEAR EXPECTING INTERRUPT FLAGS,
0477  4511          SLUCAF                  /CLEAR ALL FLAGS
0500  4500          MKIE                    /CLEAR SLU INTERRUPT ENABLE
0501  6001          ION                     /TURN THE INTERRUPT ON
0502  4502          MSPF                    /SET THE TRANSMIT FLAG ENABLE
0503  4503          MTSF                    /SKIP ON TRANSMIT FLAG SET AND EN
0504  4450          ERROR                   /SPF FAILED TO SET TRANSMIT FLAG
0505  4507          MTSK                    /SKIP ON XMIT/RECEIVE + INT ENA ON A 1
0506  7610          SKP CLA
0507  4450          ERROR                   /ERROR, INT ENA SET OR KIE FAILED TO CLEAR INT ENA
0510  4460          SETEXI                  /SET EXPECTING TRANSMIT INT FLAG
0511  7301          CLA CLL IAC             /SET DATA 11 TO A 1
0512  4500          MKIE                    /SET INT ENA
0513  4456          CLREXI                  /CLEAR EXP XMIT INT FLAG
0514  4503          MTSF                    /SKIP ON TRANSMIT FLAG SET AND ENABLED
0515  4450          ERROR                   /XMIT FLAG GOT CLEARED
0516  4507          MTSK                    /SKIP ON XMIT + INT ENA ON A 1
0517  4450          ERROR                   /KIE AND DATA 11 ON A 1 FAILED TO SET INT ENA
0520  7200          CLA
0521  2117          ISZ INTFLG
0522  4450          ERROR                   /PROGRAM FAILED TO INTERRUPT WITH INT ENA + XMIT FLAG
0523  3117          DCA INTFLG
0524  4500          MKIE                    /CLEAR INTERRUPT ENABLE
0525  6001          ION                     /TURN THE INTERRUPT ON
0526  4503          MTSF                    /SKIP ON XMIT FLAG SET AND ENABLED
0527  4450          ERROR                   /XMIT FLAG CLEARED
0530  4507          MTSK                    /SKIP ON XMIT + INT ENA ON A 1
0531  7610          SKP CLA
0532  4450          ERROR                   /KIE + DATA 11 ON A 0 FAILED TO CLEAR INT ENA
0533  4504          MTCF                    /CLEAR THE XMIT FLAG ENABLE
```

```
 4307   0534  4503          MTSF                    /SKIP ON SLU XMIT FLAG SET AND ENABLED
 4308   0535  7610          SKP CLA
 4309   0536  4450          ERROR                   /TCF FAILED TO CLEAR XMIT FLAG
 4310   0537  4475          MKSF                    /SKIP ON RECEIVE FLAG
 4311   0540  7610          SKP CLA
 4312   0541  4450          ERROR                   /RECEIVE FLAG SET BY ABOVE CODE
 4313   0542  4447          DONLOP
 4314
 4315   0575  0005
 4316   0576  0004
 4317   0577  0003
               0600    PAGE
 4318
 4319                 /*****************************************************************
 4320                 /TEST 6 - CHECKS THAT TLS WILL CLEAR THE XMIT FLAG AND THEN SET IT WHEN
 4321                 /XMISSION OF CHAR COMPLETE,  THE PROGRAM THEN CLEARS THE XMIT FLAG AND WAITS FOR
 4322                 /RCV DATA  TO SET RECEIVE FLAG,  THE RECEIVE FLAG IS CHECKED TO  CAUSE KSF TO
 4323                 /SKIP AND INTERRUPT AND THEN TO CLEAR BY KCF,
 4324                 /*****************************************************************
 4325
 4326
 4327   0600  1377    PTEST6, TAD (MTLS
 4328   0601  3252            DCA TS60W1
 4329   0602  1377            TAD (MTLS
 4330   0603  3263            DCA TS60W2
 4331   0604  1376            TAD (6                  /SETUP TEST NUMBER FOR ERROR DISPLAY
 4332   0605  3140            DCA TSTNU
 4333   0606  4446    TEST6,  LOOPPC
 4334   0607  1775*           TAD BORATE              /IS BAUD RATE SET = 19200 BITS/SEC ?
 4335   0610  0374            AND (0017
 4336   0611  7640            SZA CLA
 4337   0612  5224            JMP RES60W              /NO=DO FULL INTERRUPT TEST
 4338   0613  1373            TAD (NOP                /YES=REPLACE SOME OF THE IONS WITH NOPS
 4339                                                 /OTHERWISE THE SECOND RECV FLAG WILL GET
 4340                                                 /LOST DUE TO PROGRAM TIMING
 4341   0614  3264            DCA TS60W3
 4342   0615  1373            TAD (NOP
 4343   0616  3274            DCA TS60W4
 4344   0617  1373            TAD (NOP
 4345   0620  3301            DCA TS60W5
 4346   0621  1373            TAD (NOP
 4347   0622  3307            DCA TS60W6
 4348   0623  5235            JMP OWSET
 4349   0624  1372    RES60W, TAD (ION                /RESTORE TEST6 TO NORMAL
 4350   0625  3264            DCA TS60W3
 4351   0626  1371            TAD (ERROR
 4352   0627  3274            DCA TS60W4
 4353   0630  1372            TAD (ION
 4354   0631  3301            DCA TS60W5
 4355   0632  1371            TAD (ERROR
 4356   0633  3307            DCA TS60W6
 4357   0634  5235            JMP OWSET
 4358   0635  4455    OWSET,  CLREIF                  /CLEAR EXPECTING INTERRUPT FLAGS,
 4359   0636  4512            CFSLU                   /CLEAR ALL FLAGS BUT SET SLU INT ENA
 4360   0637  4467            LOOP                    /SETUP LOOPAROUND ON ALL SLUS,
```



```
 4361   0640  3136            DCA ECONSI              /INT, CANNOT BE ATTRIBUTED TO CONSOLE PACK REQ
 4362                                                 /  WHILE LOOPED,
 4363   0641  6001            ION                     /TURN THE INTERRUPT ON
 4364   0642  4460            SETEXI                  /SET EXP XMIT INT FLAG
 4365   0643  4502            MSPF                    /SET THE TRANSMIT FLAG EN
 4366   0644  4503            MTSF                    /SKIP ON XMIT FLAG SET AND EN
 4367   0645  4450            ERROR                   /TRANSMIT FLAG FAILED TO SET BY SPF
 4368   0646  4507            MTSK                    /SKIP ON XMIT FLAG AND INT ENA ON A 1
 4369   0647  4450            ERROR                   /TSK FAILED TO SKIP WITH INT ENA + FLAG SET
 4370   0650  2117            ISZ INTFLG              /DID THE PROGRAM INTERRUPT
 4371   0651  4450            ERROR                   /PROGRAM FAILED TO INTERRUPT WITH XMIT AND INT ENA SET
 4372   0652  4510    TS60W1, MTLS/MTPC               /LOAD TRANSMIT BUFFER, TRANSMIT ,CLEAR XMIT FLAG, SET XMIT EN
 4373   0653  6001            ION                     /TURN THE INTERRUPT ON
 4374   0654  4503            MTSF                    /NOTE: XMIT FUNCTION IN UART IS BUFFERED,
 4375                                                 /  THE FIRST TLS WILL BRING THE XMIT FLAG BACK
 4376                                                 /  UP VERY QUICKLY,  THE SECOND TLS MUST WAIT FOR THE
 4377                                                 /  FIRST CHARACTER TO BE XMITTED BEFORE
 4378                                                 /  BRINGING UP XMIT FLAG,
 4379   0655  7610            SKP CLA
 4380   0656  5261            JMP .+3
 4381   0657  4451            TSFWAT
 4382   0660  4450            ERROR                   /NO XMIT FLAG
 4383   0661  2117            ISZ INTFLG
 4384   0662  4450            ERROR                   /ERROR, NO INTERRUPT OCCURRED
 4385   0663  4510    TS60W2, MTLS/MTPC
 4386   0664  6001    TS60W3, ION/NOP
 4387   0665  4503            MTSF                    /SKIP ON THE TRANSMIT FLAG
 4388   0666  7610            SKP CLA
 4389   0667  4450            ERROR                   /TLS FAILED TO CLEAR XMIT FLAG
 4390   0670  4461            SETERI                  /SET EXPECTING RECEIVE INTERRUPT FLAG
 4391                                                 /NOTE;FIRST REC FLAG MAY SET BEFORE SECOND XMIT FLAG
 4392   0671  4451            TSFWAT                  /WAIT FOR TRANSMIT FLAG TO SET
 4393   0672  4450            ERROR                   /TIMEOUT;UART FAILED TO SET XMIT FLAG
 4394   0673  2117            ISZ INTFLG              /DID THE PROGRAM INTERRUPT?
 4395   0674  4450    TS60W4, ERROR/NOP               /ERROR, NO INTERRUPT WITH XMIT AND INT ENA SET
 4396   0675  4507            MTSK                    /SKIP ON XMIT FLAG SET & EN +INT ENA SET,
 4397   0676  4450            ERROR                   /FAILED TO SKIP OR INT ENA OR FLAG GOT CLEARED
 4398   0677  4504            MTCF                    /CLEAR TRANSMIT FLAG ENABLE
 4399   0700  4456            CLREXI                  /CLEAR EXPECTING TRANSMIT INTERRUPT FLAG
 4400   0701  6001    TS60W5, ION/NOP                 /TURN THE INTERRUPT ON
 4401   0702  4452            KSFWAT                  /WAIT FOR THE RECEIVE FLAG TO SET
 4402   0703  4450            ERROR                   /NO SKIP, OR RECEIVE FLAG NOT SET BY RCD DATA AVAILABLE
 4403   0704  4507            MTSK                    /SKIP ON RCV FLAG AND INT ENA
 4404   0705  4450            ERROR
 4405   0706  2117            ISZ INTFLG              /DID RCV AND INT ENA CAUSE AN INTERRUPT?
 4406   0707  4450    TS60W6, ERROR/NOP               /NO, ERROR
 4407   0710  4474            MKCF                    /CLEAR RECEIVE FLAG
 4408   0711  6001            ION                     /TURN THE INTERRUPT ON
 4409   0712  4452            KSFWAT                  /WAIT FOR SECOND CHAR TO BE RECEIVED
 4410   0713  4450            ERROR
 4411   0714  4474            MKCF                    /CLEAR RECEIVE FLAG
 4412   0715  6001            ION
 4413   0716  4475            MKSF                    /SKIP ON RECEIVE FLAG
 4414   0717  7610            SKP CLA
 4415   0720  4450            ERROR                   /KCF FAILED TO CLEAR RECEIVE FLAG
```

```
4416  0721  4503          MTSF                    /SKIP ON XMIT FLAG
4417  0722  7610          SKP CLA
4418  0723  4450          ERROR                   /TRANSMIT FLAG GOT RESET BY ABOVE CODE
4419  0724  4447          DONLOP
4420
4421                      /*************************************************************************
4422                      /TEST 7 - CHECKS THAT TPC PRODUCES SAME RESULTS AS TLS.
4423                      /REEXECUTE TEST 6 WITH TLS REPLACED WITH TPC.
4424                      /*************************************************************************
4425
4426  0725  1370  TEST7, TAD (MTPC
4427  0726  3252          DCA TS60W1
4428  0727  1370          TAD (MTPC
4429  0730  3263          DCA TS60W2
4430  0731  1367          TAD (7
4431  0732  3140          DCA TSTNU
4432  0733  5206          JMP TEST6
4433
4434
4435  0767  0007
4436  0770  4506
4437  0771  4450
4438  0772  6001
4439  0773  7000
4440  0774  0017
4441  0775  3124
4442  0776  0006
4443  0777  4510
            1000  PAGE
4444
4445                      /*************************************************************
4446                      /TEST 10 - CHECKS THAT THE TLS-TCF SEQUENCE WILL CLEAR XMIT FLAG ENABLE
4447                      /PREVENTING THE FOLLOWING INTERRUPT, ALSO CHECKS THAT THE RECEIVE FLAG
4448                      /WILL SET AND THAT IT CAN BE CLEARED BY KCC.
4449                      /*************************************************************
4450
4451  1000  4446  TEST10, LOOPPC
4452  1001  1377          TAD (10                 /SETUP TEST NUMBER FOR ERROR DISPLAY
4453  1002  3140          DCA TSTNU
4454  1003  4455          CLREIF                  /CLEAR EXPECTING INTERRUPTFLAGS
4455  1004  4511          SLUCAF                  /CLEAR ALL FLAGS BUT SET INT ENABLE
4456  1005  4467          LOOP                    /SETUP LOOPAROUND ON SLU'S
4457  1006  6001          ION                     /TURN THE INTERRUPT ON
4458  1007  4460          SETEXI                  /SET EXPECTING TRANSMIT INTERRUPT FLAG
4459  1010  4502          MSPF                    /SET THE TRANSMIT FLAG ENABLE
4460  1011  4456          CLREXI                  /CLEAR EXPECTING TRANSMIT INTERRUPT FLAG
4461  1012  4503          MTSF                    /SKIP ON TRANSMIT FLAG SET AND ENABLED
4462  1013  4450          ERROR                   /SPF FAILED TO SET XMIT FLAG
4463  1014  2117          ISZ INTFLG
4464  1015  4450          ERROR                   /PROGRAM FAILED TO INTERRUPT
4465  1016  4510          MTLS
4466  1017  4504          MTCF
4467  1020  4461          SETERI                  /SET EXPECTING RECEIVE INTERRUPT FLAG
4468  1021  6001          ION
4469  1022  4503          MTSF                    /SKIP ON XMIT FLAG SET AND ENABLED
```



```
4470  1023  7410          SKP                     /TLS - TCF FAILED TO CLEAR XMIT FLAG ENABLE
4471  1024  4450          ERROR                   /WAIT FOR XMIT FLAG + EN TO SET (SHOULD NOT)
4472  1025  4451          TSFWAT                  /TIMEOUT AS EXPECTED.
4473  1026  7410          SKP                     /XMIT FLAG + EN =1
4474  1027  4450          ERROR                   /WAIT FOR RECEIVE FLAG TO SET
4475  1030  4452          KSFWAT                  /RECEIVE FLAG FAILED TO SET
4476  1031  4450          ERROR                   /CLEAR EXPECTING INTERRUPT FLAG
4477  1032  4457          CLRERI                  /SKIP ON RCV FLAG AND INT ENA
4478  1033  4507          MTSK                    /FAILED TO SKIP
4479  1034  4450          ERROR                   /DID THE PROGRAM INTERRUPT
4480  1035  2117          ISZ INTFLG              /FAILED TO INTERRUPT WITH RCV AND INT ENA SET
4481  1036  4450          EPROR                   /CLEAR THE RECEIVE FLAG
4482  1037  4476          MKCC                    /TURN THE INTERRUPT ON
4483  1040  6001          ION                     /SKIP ON RECEIVE FLAG
4484  1041  4475          MKSF
4485  1042  7610          SKP CLA
4486  1043  4450          ERROR                   /KCC FAILED TO CLEAR RCV FLAG
4487  1044  4447          DONLOP
4488
4489
4490
4491                      /*************************************************************
4492                      /TEST 11 - CHECKS THAT KRB WILL CLEAR THE RCV FLAG,  THE RCV FLAG
4493                      /IS SET BY ISSUING TLS COMMAND.
4494                      /*************************************************************
4495
4496  1045  4446  TEST11, LOOPPC
4497  1046  1376          TAD (11                 /SETUP TEST NUMBER FOR ERROR DISPLAY
4498  1047  3140          DCA TSTNU
4499  1050  4455          CLREIF                  /CLEAR EXPECTING INTERRUPT FLAG
4500  1051  4511          SLUCAF                  /CLEAR ALL FLAGS AND SET SLU INT ENA
4501  1052  4467          LOOP                    /SETUP LOOPAROUND ON SLU'S
4502  1053  6001          ION                     /TURN THE INTERRUPT ON
4503  1054  7000          NOP
4504  1055  4460          SETEXI                  /SET EXPECTING XMIT INTERRUPT FLAG
4505  1056  4510          MTLS                    /TRANSMIT,SET XMIT EN,CLEAR XMIT FLAG
4506  1057  4451          TSFWAT                  /WAIT FOR THE XMIT FLAG TO SET
4507  1060  4450          ERROR                   /XMIT FLAG FAILED TO SET BY TLS
4508  1061  2117          ISZ INTFLG              /DID THE PROGRAM INTERRUPT
4509  1062  4450          ERROR                   /FAILED TO INTERRUPT WITH INT ENA AND XMIT FLAG
4510  1063  4504          MTCF                    /CLEAR XMIT FLAG
4511  1064  4456          CLREXI                  /CLEAR EXPECTING TRANSMIT INTERRUPT FLAG
4512  1065  4461          SETERI                  /SET EXPECTING RECEIVE INTERRUPT FLAG,
4513  1066  6001          ION                     /TURN THE INTERRUPT ON
4514  1067  4452          KSFWAT                  /WAIT FOR THE RCV FLAG TO SET
4515  1070  4450          ERROR                   /RECEIVE FLAG FAILED TO SET
4516  1071  4457          CLRERI                  /CLEAR EXPECTING RECEIVE INTERRUPT FLAG
4517  1072  4477          MKRS                    /READ THE RECEIVE BUFFER
4518  1073  4475          MKSF                    /SKIP ON RECEIVE FLAG
4519  1074  4450          ERROR                   /KRS CLEARED THE RCV FLAG
4520  1075  2117          ISZ INTFLG              /DID THE PROGRAM INTERRUPT
4521  1076  4450          ERROR                   /FAILED TO INTERRUPT WITH INT ENA + RCV FLAG
4522  1077  4521          MKRB                    /CLEAR RECEIVE FLAG
4523  1100  6001          ION                     /TURN THE INTERRUPT BACK ON
4524  1101  4475          MKSF                    /SKIP ON RECEIVE FLAG
```

```
 4525   1102  7610          SKP CLA
 4526   1103  4450          ERROR                   /KRB FAILED TO CLEAR RECEIVE FLAG
 4527   1104  4447          DONLOP
 4528
 4529                       /*********************************************************************
 4530                       /TEST 12 - CHECKS THAT CAF WILL CLEAR RCV FLAG
 4531                       /*********************************************************************
 4532
 4533   1105  4446    TEST12, LOOPPC
 4534   1106  1375          TAD (12                 /SETUP TEST NUMBER FOR ERROR DISPLAY
 4535   1107  3140          DCA TSTNU
 4536   1110  4455          CLREIF                  /CLEAR EXPECTING INTERRUPT FLAGS
 4537   1111  4511          SLUCAF                  /CLEAR ALL FLAGS
 4538   1112  4467          LOOP                    /SETUP LOOPAROUND ON ALL SLU'S
 4539   1113  6001          ION                     /TURN THE INTERRUPT ON
 4540   1114  7000          NOP
 4541   1115  4460          SETEXI                  /SET EXPECTING TRANSMIT INTERRUPT FLAG
 4542   1116  4510          MTLS                    /TRANSMIT,SET XMIT EN,CLEAR XMIT FLAG
 4543   1117  4451          TSFWAT                  /WAIT FOR XMIT FLAG
 4544   1120  4450          ERROR                   /XMIT FLAG FAILED TO SET
 4545   1121  4456          CLREXI                  /CLEAR EXPECTING TRANSMIT INTERRUPT FLAG
 4546   1122  2117          ISZ INTFLG              /DID THE PROGRAM INTERRUPT?
 4547   1123  4450          ERROR                   /PROGRAM FAILED TO INTERRUPT
 4548   1124  4504          MTCF                    /CLEAR TRANSMIT FLAG EN
 4549   1125  4461          SETERI                  /SET EXPECTING RECEIVE INTERRUPT FLAG
 4550   1126  6001          ION
 4551   1127  4452          KSFWAT                  /WAIT FOR RECEIVE FLAG
 4552   1130  4450          ERROR                   /RECEIVE FLAG FAILED TO SET
 4553   1131  4457          CLRERI                  /CLEAR EXPECTING RECEIVE INTERRUPT
 4554   1132  2117          ISZ INTFLG              /DID THE PROGRAM INTERRUPT
 4555   1133  4450          ERROR                   /PROGRAM FAILED TO INTERRUPT
 4556   1134  4511          SLUCAF                  /CLEAR ALL FLAGS
 4557   1135  6001          ION                     /TURN THE INTERRUPT BACK ON
 4558   1136  4475          MKSF                    /SKIP ON RECEIVE FLAG
 4559   1137  7610          SKP CLA
 4560   1140  4450          ERROR                   /INITIALIZE FAILED TO CLEAR RECEIVE FLAG
 4561   1141  4447          DONLOP
 4562
 4563   1175  0012
 4564   1176  0011
 4565   1177  0010
               1200    PAGE
 4566
 4567
 4568                       /*********************************************************************
 4569                       /TEST 13 - CHECKS THE EFFECT OF THE SLU IOT'S UPON THE AC
 4570                       /*********************************************************************
 4571
 4572   1200  4446    TEST13, LOOPPC
 4573   1201  1377          TAD (13                 /SETUP TEST NUMBER FOR ERR DISPLAY
 4574   1202  3140          DCA TSTNU
 4575   1203  4455          CLREIF                  /CLEAR EXPECTING INTERRUPT FLAGS
 4576   1204  4511          SLUCAF                  /CLEAR ALL FLAGS
 4577   1205  4467          LOOP                    /SETUP LOOPAROUND ON SLU'S
 4578   1206  6001          ION                     /TURN THE INTERRUPT ON
```



```
 4579   1207  7344          CLA CLL CMA RAL         /SET THE AC TO -2
 4580   1210  4500          MKIE                    /CLEAR SLU INTERRUPT ENABLE
 4581   1211  7050          CMA RAR
 4582   1212  7420          SNL
 4583   1213  4450          ERROR                   /KIE CHANGED THE AC
 4584   1214  7240          CLA CMA
 4585   1215  4476          MKCC                    /CLEAR RECEIVE FLAG AND AC
 4586   1216  7440          SZA
 4587   1217  4450          ERROR                   /KCC FAILED TO CLEAR THE AC
 4588   1220  7240          CLA CMA
 4589   1221  4501          MKRB                    /CLEAR AC AND READ RECEIVE BUFFER
 4590   1222  7510          SPA
 4591   1223  4450          ERROR                   /KRB FAILED TO CLEAR AC
 4592   1224  7240          CLA CMA
 4593   1225  4477          MKRS                    /READ RECEIVE BUFFER - INCLUSIVE OR WITH AC
 4594   1226  7040          CMA                     /SET THE AC BACK TO 0
 4595   1227  7440          SZA
 4596   1230  4450          ERROR                   /KRS CHANGED THE AC
 4597   1231  7340          CLA CLL CMA
 4598   1232  4475          MKSF                    /SKIP ON RECEIVE FLAG
 4599   1233  7040          CMA
 4600   1234  7440          SZA
 4601   1235  4450          ERROR                   /KSF CHANGED THE AC
 4602   1236  7240          CLA CMA
 4603   1237  4474          MKCF                    /CLEAR RECEIVE FLAG
 4604   1240  7040          CMA
 4605   1241  7440          SZA
 4606   1242  4450          ERROR                   /KCF CHANGED THE AC
 4607   1243  7240          CLA CMA
 4608   1244  4502          MSPF                    /SET TRANSMIT FLAG ENABLE
 4609   1245  7040          CMA
 4610   1246  7440          SZA
 4611   1247  4450          ERROR                   /TFL CHANGED THE AC
 4612   1250  7240          CLA CMA
 4613   1251  4504          MTCF                    /CLEAR THE TRANSMIT FLAG EN
 4614   1252  7040          CMA
 4615   1253  7440          SZA
 4616   1254  4450          ERROR                   /TCF CHANGED THE AC
 4617   1255  7240          CLA CMA
 4618   1256  4503          MTSF                    /SKIP ON TRANSMIT FLAG SET AND ENABLED
 4619   1257  7040          CMA
 4620   1260  7440          SZA
 4621   1261  4450          ERROR                   /TSF CHANGED THE AC
 4622   1262  7240          CLA CMA
 4623   1263  4506          MTPC                    /LOAD TRANSMIT BUFFER AND TRANSMIT
 4624   1264  7040          CMA
 4625   1265  7440          SZA
 4626   1266  4450          ERROR                   /TPC CHANGED THE AC
 4627   1267  4451          TSFWAT                  /WAIT FOR THE TRANSMIT FLAG
 4628   1270  4450          ERROR                   /TRANSMIT FLAG FAILED TO SET
 4629   1271  4452          KSFWAT                  /WAIT FOR THE RECEIVE FLAG
 4630   1272  4450          ERROR                   /RECEIVE FLAG FAILED TO SET
 4631   1273  4504          MTCF                    /CLEAR THE XMIT FLAG EN
 4632   1274  4474          MKCF                    /CLEAR THE RECEIVE FLAG
 4633   1275  7240          CLA CMA
```

```
4634  1276  4507          MTSK                    /SKIP IF XMIT/RCV FLAG SET AND INT ENA SET
4635  1277  7040          CMA
4636  1300  7440          SZA
4637  1301  4450          ERROR                   /TSK CHANGED THE AC
4638  1302  7240          CLA CMA
4639  1303  4510          MTLS                    /LOAD TRANSMIT BUFFER, TRANSMIT + CLEAR FLAG, SET XMIT EN
4640  1304  7040          CMA
4641  1305  7440          SZA
4642  1306  4450          ERROR                   /TLS CHANGED THE AC
4643  1307  4451          TSFWAT                  /WAIT FOR THE TRANSMIT FLAG
4644  1310  4450          ERROR                   /TRANSMIT FLAG FAILED TO SET
4645  1311  4452          KSFWAT                  /WAIT FOR THE RECEIVE FLAG TO SET
4646  1312  4450          ERROR                   /ERROR RECEIVE FLAG FAILED TO SET
4647  1313  4504          MTCF                    /CLEAR THE TRANSMIT FLAG
4648  1314  4476          MKCC                    /CLEAR AC AND RECEIVE FLAG
4649  1315  4447          DONLOP
4650
4651                      /**********************************************************************
4652                      /TEST 14 - CHECKS THAT ALL ZEROES CAN BE TRANSMITTED AND READ BACK IN
4653                      /**********************************************************************
4654
4655  1316  4446  TEST14, LOOPPC
4656  1317  1376          TAD (14                 /SETUP TEST NUMBER FOR ERROR DISPLAY
4657  1320  3140          DCA TSTNU
4658  1321  4455          CLREIF                  /CLEAR EXPECTING INT FLAGS
4659  1322  4512          CFSLU                   /CLEAR ALL SLU FLAGS AND EN SLU INT.
4660  1323  3126          DCA SLUXMT              /CLEAR THE WORD TO BE TRANSMITTED
4661  1324  4453          SLUDAT                  /GO TRANSMIT, READ AND COMPARE THE WORD
4662  1325  4454          SLUDER                  /DATA ERROR-WORD WAS NON ZERO BEING READ BACK
4663  1326  4447          DONLOP
4664
4665
4666
4667                      /**********************************************************************
4668                      /TEST 15 - CHECKS THAT ALL ONES CAN BE TRANSMITTED AND READ BACK
4669                      /**********************************************************************
4670
4671  1327  4446  TEST15, LOOPPC
4672  1330  4775*        JMS APTR                /CHECK FOR APT CONTROL AND OK REPORT TO APT
4673  1331  1374          TAD (15                 /SETUP TEST NUMBER FOR ERROR DISPLAY
4674  1332  3140          DCA TSTNU
4675  1333  4455          CLREIF                  /CLEAR EXPECTING INT FLAGS
4676  1334  4512          CFSLU                   /CLEAR ALL SLU FLAGS AND EN SLU INT.
4677  1335  1373          TAD (377
4678  1336  3126          DCA SLUXMT              /SET THE WORD TO BE TRANSMITTED TO ALL ONE'S
4679  1337  4453          SLUDAT                  /GO TRANSMIT, READ AND COMPARE
4680  1340  4454          SLUDER                  /DATA ERROR - WORDS DO NOT COMPARE
4681  1341  4447          DONLOP
4682
4683
4684
4685                      /**********************************************************************
4686                      /TEST 16 - CHECKS THAT A COMPLEMENTING PATTERN (252-125) CAN BE
4687                      /TRANSMITTED AND READ BACK.
4688                      /**********************************************************************
```



```
4689
4690  1342  4446  TEST16, LOOPPC
4691  1343  1372          TAD (16                 /SETUP TEST NUMBER FOR ERROR DISPLAY
4692  1344  3140          DCA TSTNU
4693  1345  4455          CLREIF                  /CLEAR EXPECTING INT FLAGS
4694  1346  4512          CFSLU                   /CLEAR ALL SLU FLAGS AND EN SLU INT.
4695  1347  1371          TAD (252
4696  1350  3126          DCA SLUXMT              /SET THE TRANSMIT WORD TO 252
4697  1351  4453          SLUDAT                  /TRANSMIT, READ AND COMPARE THE WORD
4698  1352  4454          SLUDER                  /DATA ERROR - TRANSMITTED A 252
4699  1353  1370          TAD (125
4700  1354  3126          DCA SLUXMT              /SET TRANSMIT WORD TO 125
4701  1355  4453          SLUDAT                  /TRANSMIT, READ AND COMPARE THE WORD
4702  1356  4454          SLUDER                  /DATA ERROR - TRANSMITTED A 125
4703  1357  4447          DONLOP
4704
4705  1370  0125
4706  1371  0252
4707  1372  0016
4708  1373  0377
4709  1374  0015
4710  1375  2513
4711  1376  0014
4712  1377  0013
            1400          PAGE
4713                      /**********************************************************************
4714                      /TEST 17 - CHECKS FOR LOADING AND READING A ONE THROUGH A FIELD
4715                      / OF ZEROS AND A ZERO THROUGH A FIELD OF ONES PATTERNS.
4716                      /**********************************************************************
4717
4718
4719  1400  4446  TEST17, LOOPPC
4720  1401  1377          TAD (17                 /SETUP TEST NUMBER FOR ERROR DISPLAY
4721  1402  3140          DCA TSTNU
4722  1403  4455          CLREIF                  /CLEAR EXPECTING INTERRUPT FLAGS
4723  1404  4512          CFSLU                   /CLEAR ALL SLU FLAGS AND EN SLU INT.
4724  1405  7301  OTZ,     CLA CLL IAC
4725  1406  3126          DCA SLUXMT
4726  1407  4453          SLUDAT
4727  1410  4454          SLUDER
4728  1411  1126          TAD SLUXMT
4729  1412  0376          AND (0200
4730  1413  7640          SZA CLA
4731  1414  5220          JMP ZTO
4732  1415  1126          TAD SLUXMT
4733  1416  7104          CLL RAL
4734  1417  5206          JMP OTZ+1
4735  1420  7144  ZTO,     CLL CMA RAL
4736  1421  0375          AND (0377
4737  1422  3126          DCA SLUXMT
4738  1423  4453          SLUDAT
4739  1424  4454          SLUDER
4740  1425  1126          TAD SLUXMT
4741  1426  0376          AND (0200
4742  1427  7650          SNA CLA
```

```
4743  1430  5235          JMP DONT17
4744  1431  1126          TAD SLUXMT
4745  1432  7120          STL
4746  1433  7004          RAL
4747  1434  5221          JMP ZTO+1
4748  1435  4447  DONT17, DONLOP
4749
4750
4751
4752                /**********************************************************************
4753                /TEST 20 - CHECKS THE TIMING OF THE SERIAL LINE UNIT FROM 50 BAUD TO
4754                / 19200 BAUD.
4755                **********************************************************************
4756
4757  1436  4446  TEST20, LOOPPC
4758  1437  1374          TAD (20                 /SETUP TEST NUMBER FOR ERROR DISPLAY
4759  1440  3140          DCA TSTNU
4760  1441  6002          IOF
4761  1442  4455          CLRFIF                  /CLEAR EXPECTING INTERRUPT FLAGS
4762  1443  4433          SLU2MC                  /SET SLU # 2 MODE
4763  1444  0027          MODE1                   /8 BIT,NO PARITY,1 STOP BIT
4764  1445  4514          RLOOP                   /REMOVE SLU LOOPAROUND
4765  1446  4512          CFSLU                   /CLEAR ALL SLU FLAGS AND EN SLU INT.
4766  1447  4141          JMS PATCH               /SETUP INTERRUPT LINKAGE TO RETURN TO LOCATION 'INTRTN'
4767  1450  1514          INTRTN
4768  1451  3266          DCA ATIMLS              /CLEAR ACTUAL TIME COUNTERS
4769  1452  3267          DCA ATIMMS
4770  1453  4510          MTLS                    /LOAD TRANSMIT REGISTER
4771  1454  4503          MTSF
4772  1455  5254          JMP .-1
4773  1456  4510          MTLS                    /LOAD TRANSMIT BUFFER
4774  1457  6001          ION                     /ENABLE XMIT FLAG TO TRIGGER INT
4775  1460  2266          ISZ ATIMLS              /       WHEN TRANSMISSION OF CHAR IS COMPLETE
4776  1461  5260          JMP .-1
4777  1462  2267          ISZ ATIMMS              /COUNT TILL INTERRUPT
4778  1463  5260          JMP .-3
4779  1464  4450          ERROR                   /TIMEOUT-EXPECTED INT DID NOT OCCUR
4780  1465  5347          JMP CLUPEX
4781
4782  1466  0000  ATIMLS, 0                       /ACTUAL TIME COUNT,LEAST SIGN WORD
4783  1467  0000  ATIMMS, 0                       /                 ,MOST SIGN WORD
4784  1470  0000  SVBDC,  0
4785  1471  0000  ETIMMS, 0                       /ADDRESS OF EXPECTED TIME COUNT
4786                                              /  MOST SIGNIFIGANT WORD
4787  1472  0000  ETIMLL, 0                       /ADDRESS OF EXPECTED TIME COUNT
4788                                              /  LOWER LIMIT ON LEAST SIGN WORD
4789  1473  0000  ETIMLU, 0                       /ADDRESS OF EXPECTED TIME COUNT
4790                                              /  UPPER LIMIT ON LEAST SIGN WORD
4791
4792  1474  1766  TIMERR, TAD ATIMLS             /TIMING PROBLEM
4793  1475  7421          MQL
4794  1476  1767          TAD ATIMMS
4795  1477  4450          ERROR                   /AC,MQ=ACTUAL TIME COUNT - CONTINUE (RETURN)
4796  1500  7300          CLA CLL                 /  DIAGNOSTIC FOR EXPECTED TIME COUNT
4797  1501  1672          TAD I ETIMLL
```



```
4798  1502  7421          MQL
4799  1503  1671          TAD I ETIMMS
4800  1504  4450          ERROR                   /AC,MQ=EXPECTED TIME COUNT-LOWER LIMIT
4801  1505  7300          CLA CLL                 /  CONTINUE DIAGNOSTIC FOR EXPECTED
4802  1506  1673          TAD I ETIMLU            /  TIME COUNT UPPER LIMIT.
4803  1507  7421          MQL
4804  1510  1671          TAD I ETIMMS
4805  1511  4450          ERROR                   /AC,MQ=EXPECTED TIME COUNT-UPPER LIMIT
4806  1512  7300          CLA CLL
4807  1513  5347          JMP CLUPEX
4808  1514  7240  INTRTN, CLA CMA                 /RETURN FROM EXPECTED XMIT INTERRUPT
4809  1515  1773          TAD BDRATE
4810  1516  3270          DCA SVBDC               /USE BAUD RATE CONST AS TABLE INDEX
4811  1517  1270          TAD SVBDC
4812  1520  1372          TAD (SLUMST
4813  1521  3271          DCA ETIMMS              /POINTER TO EXPECTED TIME
4814  1522  1270          TAD SVBDC
4815  1523  1371          TAD (SLULSL
4816  1524  3272          DCA ETIMLL
4817  1525  1270          TAD SVBDC
4818  1526  1370          TAD (SLULSU
4819  1527  3273          DCA ETIMLU
4820  1530  1671          TAD I ETIMMS            /CHECK MOST SIGN WORD OF TIME COUNT
4821  1531  7041          CIA
4822  1532  1267          TAD ATIMMS
4823  1533  7640          SZA CLA
4824  1534  5274          JMP TIMERR
4825  1535  1672          TAD I ETIMLL            /CHECK LEAST SIGN WORD OF TIME COUNT
4826  1536  7041          CIA
4827  1537  1266          TAD ATIMLS
4828  1540  7710          SPA CLA
4829  1541  5274          JMP TIMERR
4830  1542  1673          TAD I ETIMLU
4831  1543  7041          CIA
4832  1544  1266          TAD ATIMLS
4833  1545  7740          SMA SZA CLA
4834  1546  5274          JMP TIMERR
4835  1547  4141  CLUPEX, JMS PATCH
4836  1550  6200          SKP1CHN                 /RESTORE INTERRUPT LINKAGE AND EXIT
4837  1551  4447          DONLOP
4838
4839
4840  1570  1640
4841  1571  1620
4842  1572  1600
4843  1573  3124
4844  1574  0020
4845  1575  0377
4846  1576  0200
4847  1577  0017
              1600  PAGE
4848                /SERIAL LINE UNIT TIMING VERIFICATION TABLES
4849
4850  1600  0003  SLUMST, 0003          /BAUD RATE -   50    MOST SIGN COUNT WORD
4851  1601  0002          0002          /              75
```

```
4852  1602  0001          0001          /          110
4853  1603  0021          0021          /          134.5
4854  1604  0001          0001          /          150
4855  1605  0000          0000          /          300
4856  1606  0000          0000          /          600
4857  1607  0000          0000          /          1200
4858  1610  0000          0000          /          1800
4859  1611  0000          0000          /          2000
4860  1612  0000          0000          /          2400
4861  1613  0000          0000          /          3600
4862  1614  0000          0000          /          4800
4863  1615  0000          0000          /          7200
4864  1616  0000          0000          /          9600
4865  1617  0000          0000          /          19200
4866
4867
4868  1620  1275    SLULSL, 1275        /BAUD RATE =    50    LEAST SIGN COUNT WORD,LOWER LIMIT
4869  1621  0720          0720          /          75
4870  1622  3415          3415          /          110
4871  1623  1330          1330          /          134.5
4872  1624  0345          0345          /          150
4873  1625  0160          0160          /          300
4874  1626  0060          0060          /          600
4875  1627  1025          1025          /          1200
4876  1630  0540          0540          /          1800
4877  1631  0475          0475          /          2000
4878  1632  0410          0410          /          2400
4879  1633  0255          0255          /          3600
4880  1634  0200          0200          /          4800
4881  1635  0124          0124          /          7200
4882  1636  0076          0076          /          9600
4883  1637  0033          0033          /          19200
4884
4885
4886  1640  1302    SLULSU, 1302        /BAUD RATE =    50    LEAST SIGN COUNT WORD,UPPER LIMIT
4887  1641  0726          0726          /          75
4888  1642  3421          3421          /          110
4889  1643  1334          1334          /          134.5
4890  1644  0352          0352          /          150
4891  1645  0163          0163          /          300
4892  1646  0067          0067          /          600
4893  1647  1032          1032          /          1200
4894  1650  0546          0546          /          1800
4895  1651  0502          0502          /          2000
4896  1652  0413          0413          /          2400
4897  1653  0261          0261          /          3600
4898  1654  0203          0203          /          4800
4899  1655  0126          0126          /          7200
4900  1656  0100          0100          /          9600
4901  1657  0035          0035          /          19200
4902
4903
4904                      /ROUTINE TO SET MODE FOR SLU #2
4905
4906  1660  0000    XMODE2, 0
```



```
4907  1661  7300          CLA CLL
4908  1662  1660          TAD I XMODE2          /GET MODE REQUEST
4909  1663  6307          KMD1                  /ISSUE MODE SETTING IOT
4910  1664  7300          CLA CLL
4911  1665  2260          ISZ XMODE2
4912  1666  5660          JMP I XMODE2
4913
4914                      /VARIABLE DELAY ROUTINE = DELAY IS APPROX. 15.3 MICRO SEC PER REQUEST COUNT
4915
4916  1667  0000    XVDLY,  0
4917  1670  7300          CLA CLL
4918  1671  1667          TAD I XVDLY
4919  1672  7041          CIA
4920  1673  3300          DCA VDCTR
4921  1674  2267          ISZ XVDLY
4922  1675  2300          ISZ VDCTR
4923  1676  5275          JMP .-1
4924  1677  5667          JMP I XVDLY
4925  1700  0000    VDCTR,  0
4926
4927                      /*************************************************************************
4928                      /TEST 21 - VERIFY EIA DRIVERS ON SIGNAL DISTRIBUTION BOARD
4929                      /              (EXCEPT FOR SLU #1 WHICH IS NOT AVVAILABLE ON
4930                      /              ON AN EXTERNAL CONNECTOR FOR EXTERNAL LOOPAROUND)
4931                      *************************************************************************
4932
4933  1701  4446    TEST21, LOOPPC
4934  1702  1377          TAD (21
4935  1703  3140          DCA TSTNU             /SETUP TEST NUMBER FOR ERROR DISPLAY.
4936  1704  6002          IOF
4937  1705  4466          GETHW3                /GET HARDWARE WORD 3
4938  1706  0376          AND (0200
4939  1707  7650          SNA CLA               /PERIPHERAL SIMULATOR ATTACHED?
4940  1710  5330          JMP T21DN             /NO-SKIP THIS TEST
4941  1711  1775'         TAD IOT0              /SLU #1 BEING TESTED
4942  1712  7041          CIA
4943  1713  1374          TAD (KCF
4944  1714  7650          SNA CLA
4945  1715  5330          JMP T21DN             /YES--SKIP THIS TEST
4946  1716  6507          LQRE                  /YES-LOOP SLU'S EXTERNALLY
4947                                            /       VIA SIMULATOR (RESTORE)
4948  1717  4455          CLREIF                /CLEAR EXPECTING INTERRUPT FLAGS
4949  1720  4512          CFSLU                 /CLEAR ALL SLU FLAGS & EN SLU INT.
4950  1721  1373          TAD (0252
4951  1722  3126          DCA SLUXMT            /SET UP THE WORD TO BE TRANSMITTED = 252
4952  1723  1372          TAD (RLOOP
4953  1724  3771'         DCA DLOP              /MODIFY SLUDAT ROUTINE = INHIBIT THE
4954                                            /       INTERNAL LOOPAROUND.
4955  1725  4453          SLUDAT                /GO TRANSMIT,READ AND COMPARE
4956  1726  4454          SLUDER                /DATA ERROR = FAULTY EIA DRIVER
4957  1727  6007          CAF                   /REMOVE EXTERNAL LOOPAROUND
4958  1730  4447    T21DN,  DONLOP
4959
4960
4961  1771  2423
```

```
4962    1772  4514
4963    1773  0752
4964    1774  6030
4965    1775  2601
4966    1776  0200
4967    1777  0021
              2000    PAGE

4968
4969                  /*****************************************************************************
4970                  /TEST 22 - VERIFY PROGRAMMABLE MODES OF SLU #2 & AND STATUS ERROR BITS
4971                  /*****************************************************************************
4972
4973    2000  4446    TEST22, LOOPPC
4974    2001  1377            TAD (22                 /SETUP TEST NUMBER FOR ERROR DISPLAY
4975    2002  3140            DCA TSTNU
4976    2003  4455            CLKEIF          /CLEAR EXPECTING INTERRUPT FLAGS
4977    2004  4512            CFSLU           /CLEAR ALL SLU FLAGS AND EN SLU INT.
4978    2005  1776'           TAD IOT0        /SLU #2 BEING TESTED?
4979    2006  7041            CIA
4980    2007  1375            TAD (KCF1
4981    2010  7640            SZA CLA
4982    2011  5345            JMP EXS17       /NO-SKIP TEST 17
4983    2012  7040            CMA
4984    2013  3126            DCA SLUXMT      /SETUP XMIT WORD TO ALL ONES
4985    2014  3216            DCA VMODE       /CLEAR MODE CONTROL WORD
4986    2015  4433    CHARLP, SLU2MC          /SET MODE IN SLU#2
4987    2016  0000    VMODE,  0000
4988    2017  4453            SLUDAT          /TRANSMIT CHAR AND READ REC'D CHAR
4989    2020  5223            JMP L211        /REC'D CHAR NOT=XMIT WORD (AS EXPECTED)
4990    2021  1127            TAD SLUREC
4991    2022  4450            ERROR           /REC'D CHAR CONTAINS 12 ONES - ALL FOUR ERROR
4992                          /       BITS ARE SET, AC=RECEIVED CHARACTER
4993    2023  1216    L211,   TAD VMODE
4994    2024  0374            AND (0006       /ISOLATE CHAR LENGTH BITS IN VMODE
4995    2025  7110            CLL RAR
4996    2026  1346            TAD LENBAS
4997    2027  3362            DCA PTED        /SETUP POINTER TO EXPECTED RECV DATA
4998    2030  1762            TAD I PTED
4999    2031  7041            CIA
5000    2032  1127            TAD SLUREC      /COMPARE REC'D DATA WITH EXPECTED DATA
5001    2033  7640            SZA CLA
5002    2034  4353            JMS SLULER      /NOT EQUAL
5003    2035  2216            ISZ VMODE       /EQUAL - WORK ON NEXT MODE
5004    2036  1216            TAD VMODE
5005    2037  0373            AND (0040
5006    2040  7650            SNA CLA
5007    2041  5215            JMP CHARLP
5008    2042  4433            SLU2MC          /ALL MODES TESTED
5009    2043  0027            MODE1           /RESTORE SLU #2 TO NORMAL MODE
5010    2044  6002            IOF
5011    2045  1372            TAD (-4         /CHECK FOR SLU#2 OVERRUN ERROR
5012    2046  3344            DCA XLCTR
5013    2047  6316    XNC,    TLS1            /XMIT FOUR CHARACTERS BEFORE UNLOADING RECEIVE BUFFER REGISTER
5014    2050  6311            TSF1
5015    2051  5250            JMP .-1
```



```
5016    2052  2344            ISZ XLCTR
5017    2053  5247            JMP XNC
5018    2054  4452            KSFWAT          /FOUR CHAR HAVE BEEN XMITTED-WAIT FOR REC FLAG
5019    2055  4450            ERROR           /NO RECEIVE FLAG
5020    2056  6306            KRB1            /CLEAR AC AND REC FLAG AND READ BUFFER
5021    2057  3127            DCA SLUREC      /SAVE REC'D STATUS
5022    2060  1127            TAD SLUREC
5023    2061  0371            AND (7400       /MASK OFF STATUS BITS
5024    2062  1370            TAD (-4400      /EXPECTED OE=4400
5025    2063  7640            SZA CLA
5026    2064  4330            JMS OERR
5027    2065  4470            DELAY           /DELAY AND THEN CLEANUP RECEIVER
5028    2066  4512            CFSLU           /CLEAR ALL SLU FLAGS AND EN SLU INT.
5029    2067  1027            TAD BDR2        /SKIP PARITY CHECK IF BAUD RATE IS NOT 9600.
5030    2070  1367            TAD (-16        /(DELAYS ARE SET FOR 9600 BAUD RATE ONLY)
5031    2071  7640            SZA CLA
5032    2072  5345            JMP EXS17
5033    2073  1374            TAD (MODE2      /CHECK FOR PARITY ERROR USING ODD PARITY MODE
5034    2074  3276            DCA PMODE
5035    2075  4433            SLU2MC
5036    2076  0000    PMODE,  0000
5037    2077  6316            TLS1            /XMIT AN ALL ZERO CHAR
5038    2100  6311            TSF1
5039    2101  5300            JMP .-1
5040    2102  4473            VDELAY          /PRE-DELAY  LET FIRST FEW BITS OF CHAR BE XMITTED
5041    2103  0010            0010
5042    2104  6037            KLB             /REMOVE LOOPAROUND LONG ENOUGH TO MESS UP REC DATA AND
5043    2105  4473            VDELAY          /       CAUSE A PARITY ERROR.
5044    2106  0004            0004
5045    2107  7201            CLA IAC         /RESTORE LOOPAROUND
5046    2110  6037            KLB
5047    2111  4452            KSFWAT          /WAIT FOR RECEIVE FLAG
5048    2112  4450            ERROR           /NO RECEIVE FLAG
5049    2113  6306            KRB1            /CLEAR AC AND REC FLAG AND READ BUFFER
5050    2114  3127            DCA SLUREC      /SAVE REC'D STATUS
5051    2115  1127            TAD SLUREC
5052    2116  0371            AND (7400       /MASK OFF STATUS BITS
5053    2117  1366            TAD (-6000      /EXPECTED PE=6000
5054    2120  7640            SZA CLA
5055    2121  4335            JMS PERR
5056    2122  1276            TAD PMODE
5057    2123  1365            TAD (-MODE2
5058    2124  7640            SZA CLA
5059    2125  5345            JMP EXS17
5060    2126  2276            ISZ PMODE       /PERFORM SAME PARITY ERROR CHECK USING EVEN PARITY MODE
5061    2127  5275            JMP PMODE-1
5062
5063    2130  0000    OERR,   0
5064    2131  1127            TAD SLUREC
5065    2132  4450            ERROR           /AC=REC'D DATA AND STATUS-OVERRUN SHOULD HAVE OCCURRED
5066    2133  7300            CLA CLL
5067    2134  5730            JMP I OERR
5068
5069    2135  0000    PERR,   0
5070    2136  1276            TAD PMODE
```

```
2137  7421            MQL
2140  1127            TAD SLUREC
2141  4450            ERROR                   /AC,MQ=REC'D DATA AND STATUS,MODE
                                              /        PARITY ERROR SHOULD HAVE OCCURRED
2142  7300            CLA CLL
2143  5735            JMP I PERR
2144  0000    XLCTR,  0
2145  4447    EXS17,  DONLOP

2146  2147    LENBAS, .+1
2147  0037            0037                    /EXPECTED DATA - CHAR LENGTH=     5 BITS
2150  0077            0077                    /                                 6
2151  0177            0177                    /                                 7
2152  0377            0377                    /                                 8


2153  0000    SLULER, 0                       /ERROR DISPLAY ROUTINE
2154  1127            TAD SLUREC
2155  7421            MQL
2156  1216            TAD VMODE
2157  4450            ERROR                   /AC,MQ=MODE,REC'D DATA
                                              /EXPECTED DATA=ALL 1'S FOR CHAR LENGTH
                                              /DESIGNATED BY MODE
2160  7300            CLA CLL                 /NOTE:AC BITS 0,1,2,3 ARE THE SLU2 ERROR BITS
2161  5753            JMP I SLULER
2162  0000    PTED,   0
```



```
2165  7772
2166  2000
2167  7762
2170  3400
2171  7400
2172  7774
2173  0040
2174  0006
2175  6300
2176  2601
2177  0022
      2200            PAGE

              /ROUTINE TO SETUP # OF PASSES/TEST AND TO STORE THE RETURN ADDRESS FOR SCOPE LOOPING

2200  0000    PCLOOP, 0
2201  7300            CLA CLL
2202  1377            TAD (SLUEND
2203  7041            CIA
2204  1200            TAD PCLOOP
2205  7710            SPA CLA
2206  5211            JMP NUOK
2207  2140            ISZ TSTNU               /UPDATE TEST NUMBER PROVIDE  SLU TESTING IS NOT BEING DONE
2210  7000            NOP
2211  1200    NUOK,   TAD PCLOOP
2212  3124            DCA TESTF1
2213  5600            JMP I PCLOOP

              /EXPECTED INTERRUPT ROUTINES

2214  0000    EXICLR, 0                       /CLEAR EXPECTING TRANSMIT INT FLAG
2215  7300            CLA CLL
2216  3120            DCA EXMITI
2217  5614            JMP I EXICLR

2220  0000    ERICLR, 0                       /CLEAR EXPECTING RECEIVE INTERRUPT FLAG
2221  7300            CLA CLL
2222  3121            DCA ERECI
2223  5620            JMP I ERICLR

2224  0000    EXISET, 0                       /SET EXPECTING XMIT INTERRUPT FLAG
2225  7240            CLA CMA
2226  3120            DCA EXMITI
2227  5624            JMP I EXISET

2230  0000    ERISET, 0                       /SET EXPECTING RECV INT FLAG
2231  7240            CLA CMA
2232  3121            DCA ERECI
2233  5630            JMP I ERISET

2234  0000    EIFCLR, 0                       /CLEAR ALL EXPECTING INT FLAGS
2235  7300            CLA CLL
2236  3120            DCA EXMITI
2237  3121            DCA ERECI
2240  3117            DCA INTFLG                       /CLEAR PROGRAM INT FLAG
```

```
5152    2241  5634          JMP I EIFCLR
5153
5154
5155                  /DONE TEST ROUTINE
5156
5157    2242  0000    LOPDON, 0
5158    2243  7300            CLA CLL
5159    2244  1257            TAD LLLD                /SLU TESTING IN PROGRESS?
5160    2245  7041            CIA
5161    2246  1267            TAD KJILD
5162    2247  7640            SZA CLA
5163    2250  5253            JMP GSR                 /YES
5164    2251  4462            KBICHK                  /CHECK FOR KEYBOARD INTERVENTION
5165    2252  5253            JMP GSR
5166    2253  4465    GSR,    GETSR   /CHECK FOR LOOP ON TEST
5167    2254  7006            RTL
5168    2255  7710            SPA CLA         /LOOP?
5169    2256  5524            JMP I TESTF1    /YES,LOOP ON THIS TEST
5170    2257  2265    LLLD,   ISZ TESTAB/JMP I LOPDON
5171                                          /LOCATION LLLD CONTAINS 'ISZ TESTAB' WHEN EXECUTING SLU TESTS
5172                                          /AND 'JMP I LOPDON' WHEN EXECUTING PARALLEL I/O
5173                                          /AND FLOPPY TESTS.
5174    2260  1665            TAD I TESTAB    /ANY TESTS REMAINING?
5175    2261  7450            SNA
5176    2262  5271            JMP CKBRSQ      /NO=BAUD RATE SEQ OF TESTS DONE?
5177    2263  3266            DCA TJLOC       /YES=GO TO NEXT TEST IN TABLE
5178    2264  5666            JMP I TJLOC
5179    2265  0000    TESTAB, 0
5180    2266  0000    TJLOC,  0
5181    2267  5642    KJILD,  JMP I LOPDON
5182    2270  2265    KISZIT, ISZ TESTAB
5183
5184    2271  4776'   CKBRSQ, JMS XBAUD       /SETUP FOR NEXT BAUD RATE
5185    2272  5775'           JMP NXTDC       /ALL BAUD RATES TESTED,DO NEXT SLU
5186    2273  1374            TAD (BDRSQ-1    /MORE BAUD RATES YET TO BE TESTED
5187                                          /SETUP TESTAB WITH BEGINNING OF BAUD RATE TEST SEQ TABLE
5188    2274  3265            DCA TESTAB
5189    2275  5257            JMP LLLD
5190
5191                  /NORMAL TEST SEQUENCE
5192                  /BAUD RATE FIXED=(NSQBDR)
5193
5194    2276  0221    NORMSQ, TEST1
5195    2277  0241            TEST2
5196    2300  0400            TEST3
5197    2301  0425            TEST4
5198    2302  0473            TEST5
5199    2303  0600            PTEST6
5200    2304  0725            TEST7
5201    2305  1000            TEST10
5202    2306  1045            TEST11
5203    2307  1105            TEST12
5204    2310  1200            TEST13
5205    2311  1316            TEST14
5206    2312  1327            TEST15
```



```
5207    2313  1342            TEST16
5208    2314  1400            TEST17
5209    2315  1701            TEST21
5210    2316  2000            TEST22
5211    2317  0000            0
5212    2320  0000            0
5213    2321  0000            0
5214
5215
5216                  /VARIABLE BAUD RATE TEST SEQUENCE
5217                  /TESTS LISTED HERE ARE REPEATED FOR EACH BAUD RATE POSSIBLE
5218
5219    2322  0600    BDRSQ,  PTEST6
5220    2323  1316            TEST14
5221    2324  1327            TEST15
5222    2325  1342            TEST16
5223    2326  1436            TEST20
5224    2327  0000            0
5225    2330  0000            0
5226    2331  0000            0
5227    2332  0000            0
5228
5229
5230                  /ROUTINE TO WAIT FOR SERIAL LINE UNITS XMIT FLAG
5231
5232    2333  0000    WATTSF, 0
5233    2334  7300            CLA     CLL
5234    2335  4500            MKIE                    /CLEAR INTERRUPT ENABLE F/F
5235    2336  1373            TAD (7777
5236    2337  3123            DCA CNT1
5237    2340  3122            DCA     CNT
5238    2341  4772'           JMS OFONKI              /CHECK TO SEE IF INT EN
5239    2342  4503            MTSF
5240    2343  4357            JMS     ADDTIM          /GO ADD ONE TO THE COUNTER
5241    2344  2333            ISZ     WATTSF
5242    2345  5733            JMP  I  WATTSF          /RETURN TO THE PROGRAM=GOT THE FLAG
5243
5244                  /ROUTINE TO WAIT FOR THE SERIAL LINE UNIT RECEIVE FLAG
5245
5246    2346  0000    WATKSF, 0
5247    2347  7300            CLA     CLL
5248    2350  1373            TAD (7777
5249    2351  3123            DCA CNT1
5250    2352  3122            DCA     CNT
5251    2353  4475            MKSF                    /SKIP ON SLU RECEIVE FLAG
5252    2354  4357            JMS     ADDTIM          /GO ADD A ONE TO THE COUNTER
5253    2355  2346            ISZ     WATKSF
5254    2356  5746            JMP  I  WATKSF          /RETURN TO THE PROGRAM=GOT THE FLAG
5255
5256
5257                  /ROUTINE TO WAIT FOR THE FLAG
5258
5259    2357  0000    ADDTIM, 0
5260    2360  2122            ISZ     CNT     /EACH INCREMENT ON CNT = APP. 67.5 MICROSEC
5261    2361  7610            SKP CLA
```

```
5262  2362  2123          ISZ CNT1                    /EACH INCREMENT ON CNT1 = APP. 216 MILLISEC
5263  2363  7346          CLA CLL CMA RTL
5264  2364  7001          IAC
5265  2365  1357          TAD     ADDTIM
5266  2366  3357          DCA     ADDTIM
5267  2367  5757          JMP  I  ADDTIM
5268
5269
5270  2372  2471
5271  2373  7777
5272  2374  2321
5273  2375  0214
5274  2376  3112
5275  2377  3331
            2400          PAGE
5276
5277                      /THIS ROUTINE SETS UP A RETURN ADDRESS FOR INTERRUPT RETURNS FROM ANOTHER FIELD
5278
5279  2400  0000    RETURN, 0
5280  2401  6201          CDF                         /CHANGE DATA FIELD TO FIELD 0
5281  2402  1616          TAD  I  K0                  /GET THE INTERRUPT PC
5282  2403  3217          DCA     RET1ADD             /SAVE IT
5283  2404  6224          RIF                         /READ THE PROGRAM INSTRUCTION FIELD
5284  2405  1155          TAD     KCDF                /ADD A CDF INSTRUCTION TO IT
5285  2406  3207          DCA     .+1                 /SAVE IT IN THE NEXT LOCATION
5286  2407  7402          HLT/CDF                     /RETURN TO THE PROGRAM DATA FIELD
5287  2410  1600          TAD  I  RETURN              /GET THE INTERRUPT RETURN LOCATION
5288  2411  3220          DCA     SAVLOC              /SAVE IT
5289  2412  2200          ISZ     RETURN
5290  2413  1217          TAD     RET1ADD
5291  2414  3620          DCA  I  SAVLOC
5292  2415  5600          JMP  I  RETURN
5293
5294  2416  0000    K0,     0
5295  2417  0000    RET1ADD,        0
5296  2420  0000    SAVLOC, 0
5297
5298                      /ROUTINE FOR TRANSMITTING,READING AND COMPARING DATA FOR SLU
5299
5300  2421  0000    DATSLU, 0
5301  2422  7300          CLA CLL
5302  2423  4467    DLOP,   LOOP                /SETUP LOOPAROUND IN SLU'S
5303  2424  1377          TAD (LOOP           /SETUP LOOP INST, IN CASE EIA DRIVER TEST
                          /       (TEST 21) HAS CHANGED IT TO A NOP
5304
5305  2425  3223          DCA DLOP
5306  2426  6001          ION                 /TURN THE INTERRUPT ON
5307  2427  3117          DCA     INTFLG      /CLEAR THE PROGRAM INTERRUPT FLAG
5308  2430  4460          SETEXI              /SET EXPECTING TRANSMIT INT FLAG
5309  2431  1126          TAD     SLUXMT      /GET THE WORD TO BE TRANSMITTED
5310  2432  4510          MTLS                /LOAD AND TRANSMIT IT AND CLEAR THE FLAG
5311  2433  4451          ISFWAT              /WAIT FOR THE TRANSMIT FLAG
5312  2434  4450          ERROR               /XMIT FLAG FAILED TO SET
5313  2435  4450          CLREXI              /CLEAR EXP XMIT INT FLAG
5314  2436  2117          ISZ     INTFLG      /DID THE PROGRAM INTERRUPT?
5315  2437  4450          ERROR               /PROGRAM FAILED TO INTERRUPT
```



```
5316  2440  4504          MTCF                /CLEAR THE XMIT FLAG EN
5317  2441  4461          SETERI              /SET EXP RECV INT FLAG
5318  2442  6001          ION                 /TURN THE INTERRUPT BACK ON
5319  2443  4452          KSFWAT              /WAIT FOR THE RECEIVE FLAG TO SET
5320  2444  4450          ERROR               /RECEIVE FLAG FAILED TO SET
5321  2445  4457          CLRERI              /CLEAR EXP RECV INT FLAG
5322  2446  2117          ISZ     INTFLG      /DID THE RECEIVE FLAG CAUSE A INTERRUPT
5323  2447  4450          ERROR               /RECEIVE FLAG FAILED TO CAUSE A INTERRUPT
5324  2450  4501          MKRB                /CLEAR THE AC AND RCV FLAG AND READ BUFFER
5325  2451  3127          DCA     SLUREC      /SAVE THE WORD READ BACK
5326  2452  6001          ION                 /TURN THE INTERRUPT BACK ON
5327  2453  1126          TAD     SLUXMT      /GET THE WORD TRANSMITTED
5328  2454  7041          CIA
5329  2455  1127          TAD     SLUREC      /GET THE WORD READ BACK
5330  2456  7640          SZA     CLA
5331  2457  5621          JMP  I  DATSLU      /DATA ERROR=RETURN TO REPORT THE ERROR
5332  2460  2221          ISZ     DATSLU      /BUMP RETURN ADDRESS POINTER BY ONE
5333  2461  5621          JMP  I  DATSLU      /RETURN TO TEST
5334
5335
5336
5337                      /DATA ERROR ROUTINE FOR SERIAL LINE UNIT
5338
5339  2462  0000    DERSLU, 0
5340  2463  7240          CLA     CMA
5341  2464  1262          TAD     DERSLU  /
5342  2465  3270          DCA DDERSLU             /SAVE ADDRESS WHERE ERROR WAS DETECTED
5343  2466  4450    SPE3,   ERROR               /WORD XMITTED NOT= WORD RECEIVED
5344  2467  5662          JMP  I  DERSLU      /NO, RETURN TO TEST
5345  2470  0000    DDERSLU,0
5346
5347
5348  2471  0000    OFONKI, 0                       /ROUTINE TO TURN INT ENA OFF OR ON
5349  2472  1124          TAD     TESTF1          /GET THE TEST BEING EXECUTED
5350  2473  1376          TAD     (-TEST13-1
5351  2474  7640          SZA CLA
5352  2475  7301          CLA CLL IAC             /NO, SET THE AC TO 0001
5353  2476  1375          TAD (2                  /
5354  2477  4500          MKIE                    /ENABLE OR DISABLE SLU INT ENA
5355                                              /ENABLE SLU 2 STATUS BITS
5356  2500  7200          CLA                     /CLEAR THE AC BIT IF SET
5357  2501  5671          JMP  I  OFONKI          /RETURN
5358
5359                      /ROUTINE TO CHECK IF UNDER APT CONTROL--IF SO REPORT OK STATUS TO APT.
5360
5361  2502  0000    REPAPT, 0
5362  2503  7300          CLA CLL
5363  2504  6201          CDF 00
5364  2505  1774          TAD I (HCW2             /UNDER APT CONTROL?
5365  2506  6211          CDF 10
5366  2507  7700          SMA CLA
5367  2510  5702          JMP I REPAPT            /NO
5368  2511  4773*         JMS APTOK1              /YES--REPORT OK TO APT
5369  2512  5702          JMP I REPAPT
5370
```

```
                        /REPORT TO APT DURING VARIABLE BAUD RATE SEQUENCE OF TESTING WHEN
                        /       BAUD RATE FOR TEST REACHES A PRESET VALUE.
                        APTP,   0
5375  2513  0000              TAD BDRATE              /GET CURRENT SETTING(+1)
5376  2514  1772'             AND (0003               /LOOK AT ONLY 2 LEAST SIGNIF. BITS
5377  2515  0371              CIA
5378  2516  7041              TAD RPTBR               /AGREE WITH PRESET VALUE?
5379  2517  1323              SNA CLA
5380  2520  7650              APTREP                  /YES--REPORT TO APT
5381  2521  4515              JMP I APTR
5382  2522  5713              RPTBR,  0002
5383  2523  0002
5384
5385
5386
5387  2571  0003
5388  2572  3124
5389  2573  6725
5390  2574  0022
5391  2575  0002
5392  2576  6577
5393  2577  4467
                        PAGE
5394                    /*************************************************************************
5395                    /SUBROUTINES TO ISSUE SLU IOTS
5396                    /*************************************************************************
5397
5398  2600  0000        XMKCF,  0
5399  2601  6030        IOT0,   KCF             /CLEAR RECEIVE FLAG
5400  2602  5600              JMP I XMKCF
5401  2603  4450              ERROR             /KCF SKIPPED
5402  2604  5600              JMP I XMKCF
5403
5404  2605  0000        XMKSF,  0
5405  2606  6031        IOT1,   KSF             /SKIP ON RECEIVE FLAG
5406  2607  5605              JMP I XMKSF       /RECV FLAG NOT SET
5407  2610  2205              ISZ XMKSF
5408  2611  5605              JMP I XMKSF       /RECV FLAG SET = SKIP OCCURRED
5409
5410  2612  0000        XMKCC,  0
5411  2613  6032        IOT2,   KCC             /CLEAR RECV FLAG & AC
5412  2614  5612              JMP I XMKCC
5413  2615  4450              ERROR             /KCC SKIPPED
5414  2616  5612              JMP I XMKCC
5415
5416  2617  0000        XMKRS,  0
5417  2620  6034        IOT3,   KRS             /'OR' CONTENTS OF RECV BUFFER INTO AC
5418  2621  5617              JMP I XMKRS
5419  2622  4450              ERROR             /KRS SKIPPED
5420  2623  5617              JMP I XMKRS
5421
5422  2624  0000        XMKIE,  0
5423  2625  6035        IOT4,   KIE             /IF AC11=1 SET INT EN
5424                                            /IF AC11=0 CLR INT EN
```



```
5425  2626  5624              JMP I XMKIE
5426  2627  4450              ERROR             /KIE SKIPPED
5427  2630  5624              JMP I XMKIE
5428
5429  2631  0000        XMKRB,  0
5430  2632  6036        IOT5,   KRB             /LOAD CONTENT OF REC BUFFER INTO AC,CLR REC FLAG
5431  2633  5631              JMP I XMKRB
5432  2634  4450              ERROR             /KRB SKIPPED
5433  2635  5631              JMP I XMKRB
5434
5435  2636  0000        XMSPF,  0
5436  2637  6040        IOT7,   SPF             /SET XMIT FLAG ENABLE
5437  2640  5636              JMP I XMSPF
5438  2641  4450              ERROR             /SPF SKIPPED
5439  2642  5636              JMP I XMSPF
5440
5441  2643  0000        XMTSF,  0
5442  2644  6041        IOT8,   TSF             /SKIP ON XMIT FLAG SET AND ENABLED
5443  2645  5643              JMP I XMTSF       /XMIT FLAG NOT SET
5444  2646  2243              ISZ XMTSF
5445  2647  5643              JMP I XMTSF       /XMIT FLAG SET = SKIP OCCURRED
5446
5447  2650  0000        XMTCF,  0
5448  2651  6042        IOT9,   TCF             /CLEAR XMIT FLAG ENABLE
5449  2652  5650              JMP I XMTCF
5450  2653  4450              ERROR             /TCF SKIPPED
5451  2654  5650              JMP I XMTCF
5452
5453  2655  0000        XMTSB,  0
5454  2656  1302              TAD IOT10         /DETERMINE WHICH SLU IS BEING WORKED ON.
5455  2657  0377              AND (0030
5456  2660  7450              SNA
5457  2661  5275              JMP SBDR1
5458  2662  1376              TAD (-10
5459  2663  7650              SNA CLA
5460  2664  5271              JMP SBDR2
5461  2665  1775'       SBDR3,  TAD BDRATE      /SLU3 IS BEING WORKED ON.
5462  2666  0374              AND (0017
5463  2667  3030              DCA BDR3          /UPDATE BAUD RATE INDICATOR FOR SLU#3
5464  2670  5300              JMP ISSTSB
5465  2671  1775'       SBDR2,  TAD BDRATE      /SLU#2 IS BEING WORKED ON.
5466  2672  0374              AND (0017
5467  2673  3027              DCA BDR2          /UPDATE BAUD RATE INDICATOR FOR SLU#2
5468  2674  5300              JMP ISSTSB
5469  2675  1775'       SBDR1,  TAD BDRATE      /SLU#1 IS BEING WORKED ON.
5470  2676  0374              AND (0017
5471  2677  3026              DCA BDR1          /UPDATE BAUD RATE INDICATOR FOR SLU#1
5472  2700  1775'       ISSTSB, TAD BDRATE
5473  2701  0374              AND (0017
5474  2702  6043        IOT10,  TSB             /SET BAUD RATE
5475  2703  7300              CLA CLL
5476  2704  5655              JMP I XMTSB
5477  2705  4450              ERROR             /TSB SKIPPED
5478  2706  5655              JMP I XMTSB
5479
```

```
5480  2707  0000  XMTPC,  0
5481  2710  6044  IOT11,  TPC              /SAME AS TLS
5482  2711  5707          JMP I XMTPC
5483  2712  4456'         ERROR            /TPC SKIPPED
5484  2713  5707          JMP I XMTPC
5485
5486  2714  0000  XMTSK,  0
5487  2715  6045  IOT12,  TSK              /SKIP ON INT EN & REC FLAG OR INT EN & XMIT FLAG & XMIT EN
5488  2716  5714          JMP I XMTSK              /NO SKIP
5489  2717  2314          ISZ XMTSK
5490  2720  5714          JMP I XMTSK              /SKIP OCCURRED
5491
5492  2721  0000  XMTLS,  0
5493  2722  6046  IOT13,  TLS              /LOAD XMIT BUFFER,XMIT,EN XMIT FLAG
5494  2723  5721          JMP I XMTLS
5495  2724  4450          ERROR            /TLS SKIPPED
5496  2725  5721          JMP I XMTLS
5497
5498                      /DON'T TEST SLU #3 IF RUNNING UNDER APT CONTROL - CAN'T LOOP AROUND
5499                      /       SLU#3 WHEN RUNNING UNDER APT.
5500
5501  2726  0000  APT3CK, 0
5502  2727  1773'         TAD TABADD               /GET REC DEV CODE FROM TABLE
5503  2730  3346          DCA STAB
5504  2731  1746          TAD I STAB
5505  2732  0372          AND (0770
5506  2733  1371          TAD (-320
5507  2734  7640          SZA CLA                  /NEXT SLU TO BE TESTED = 3?
5508  2735  5726          JMP I APT3CK             /NO
5509  2736  6201          CDF 00                   /YES
5510  2737  1770          TAD I (HCW2              /RUNNING UNDER APT CONTROL?
5511  2740  6211          CDF 10
5512  2741  7700          SMA CLA
5513  2742  5726          JMP I APT3CK             /NO
5514  2743  2773'         ISZ TABADD               /YES-SKIP TESTING OF THIS SLU
5515  2744  2773'         ISZ TABADD
5516  2745  5726          JMP I APT3CK
5517
5518  2746  0000  STAB,   0
5519
5520
5521  2770  3822
5522  2771  7460
5523  2772  0770
5524  2773  3055
5525  2774  0017
5526  2775  3124
5527  2776  7770
5528  2777  6030
            3000          PAGE
5529                      /SETUP IOTS FOR PARTICULAR SLU UNDER TEST
5530
5531  3000  0000  XIOT,   0
5532  3001  6002          IOF
5533  3002  4514          RLOOP                    /CLEAR LOOP AROUND.
```



```
5534  3003  4777'         JMS APT3CK               /CHECK FOR APT CONTROL AND SLU UNDER TEST=#3,
5535  3004  1655          TAD I TABADD             /GET REC DEV CODE FROM TABLE - IF ANY
5536  3005  7450          SNA                      /WAS IT A DEVICE CODE
5537  3006  5331          JMP ENDSLU               /ALL SLUS TESTED
5538  3007  0376          AND (770                 /MASK IN CASE ANY UNWANTED BITS SET
5539  3010  4463          MIOT                     /GO MODIFY RECV IOTS
5540  3011  3056          IOTREC                   /REC IOT TABLE ADDRESS
5541  3012  2255          ISZ TABADD
5542  3013  1655          TAD I TABADD             /GET THE XMIT DEVICE CODE
5543  3014  7450          SNA
5544  3015  5331          JMP ENDSLU               /NO XMIT DEV CODE - IGNORE REC CODE
5545  3016  0376          AND (770                 /MASK
5546  3017  4463          MIOT                     /MODIFY ODD IOTS
5547  3020  3066          IOTXMT                   /XMT IOT TABLE ADDRESS
5548  3021  2255          ISZ TABADD
5549  3022  7000          NOP
5550  3023  5600          JMP I XIOT
5551
5552                      /MODIFY DEVICE CODE FOR A LIST OF IOT ADDRESSES
5553
5554  3024  0000  XMIOT,  0
5555  3025  3025          DCA SDEVC                /SAVE DEVICE CODE
5556  3026  1624          TAD I XMIOT
5557  3027  2224          ISZ XMIOT
5558  3030  3243          DCA IOTTA                /SAVE TABLE ADDRESS
5559  3031  1643          TAD I IOTTA              /GET NEXT IOT ADDRESS
5560  3032  7450          SNA                      /END OF LIST? (ZERO)
5561  3033  5624          JMP I XMIOT              /YES
5562  3034  3244          DCA IOTADD               /SAVE NEXT ADDRESS
5563  3035  1644          TAD I IOTADD             /GET IOT
5564  3036  0375          AND (7007                /REMOVE OLD DEVICE CODE
5565  3037  1025          TAD SDEVC                /ADD NEW DEVICE CODE
5566  3040  3644          DCA I IOTADD             /PUT BACK IOT
5567  3041  2243          ISZ IOTTA
5568  3042  5231          JMP .-11
5569  3043  0000  IOTTA,  0
5570  3044  0000  IOTADD, 0
5571
5572
5573  3045  0030  DVCTAB, 0030
5574  3046  0040          0040
5575  3047  0300          0300
5576  3050  0310          0310
5577  3051  0320          0320
5578  3052  0330          0330
5579  3053  0000          0000
5580  3054  0000          0000
5581
5582  3055  0000  TABADD, 0
5583
5584  3056  2601  IOTREC, IOT0
5585  3057  2606          IOT1
5586  3060  2613          IOT2
5587  3061  2620          IOT3
5588  3062  2625          IOT4
```

SEQ 0127

```
5589    3063  2632          IOT5
5590    3064  6727          CKRFG
5591    3065  0000          0
5592
5593    3066  2637    IOTXMT, IOT7
5594    3067  2644          IOT8
5595    3070  2651          IOT9
5596    3071  2702          IOT10
5597    3072  2710          IOT11
5598    3073  2715          IOT12
5599    3074  2722          IOT13
5600    3075  6224          CKXMFG
5601    3076  0000          0
5602
5603
5604                  /INITIALIZE FOR STARTUP
5605
5606    3077  0000    INIT1,  0
5607    3100  7300            CLA CLL
5608    3101  3324            DCA BDRATE              /INIT TEST BAUD RATE TO 50 BITS/SEC
5609    3102  1374            TAD (DVCTAB             /INIT TABADD TO START OF DEVICE CODE TABLE
5610    3103  3255            DCA TABADD
5611    3104  1373            TAD (NORMSQ-1
5612    3105  3772'           DCA TESTAB              /INITIALIZE  TESTAB TO NORMAL TEST SEQUENCE.
5613    3106  1771'           TAD KISZTT              /SETUP DONLOP ROUTINE FOR SLU TESTING
5614    3107  3770'           DCA LLLD
5615    3110  3140            DCA TSTNU       /CLEAR TEST NUMBER USED FOR ERROR DISPLAY
5616    3111  5677            JMP I INIT1
5617
5618
5619
5620                  /SET BAUD RATE IN SLU UNDER TEST
5621    3112  0000    XBAUD,  0
5622    3113  1324            TAD BDRATE              /GET BAUD RATE CONSTANT
5623    3114  0367            AND (0020               /MASK
5624    3115  7640            SZA CLA                 /BAUD RATE SEQ 50-19200 COMPLETE?
5625    3116  5325            JMP LLXB                /YES - WORK ON NEXT SLU.
5626    3117  4535            MTSB                    /NO-SET BAUD RATE IN SLU UNDER TEST
5627    3120  2324            ISZ BDRATE              /GET SETUP FOR NEXT BAUD RATE LOOP
5628    3121  4470            DELAY                   /WAIT FOR BAUD RATE CHANGES TO TAKE EFFECT
5629    3122  2312            ISZ XBAUD
5630    3123  5712            JMP I XBAUD
5631    3124  0000    BDRATE, 0
5632
5633    3125  3324    LLXB,   DCA BDRATE
5634    3126  1373            TAD (NORMSQ-1
5635    3127  3772'           DCA TESTAB
5636    3130  5712            JMP I XBAUD
5637
5638
5639                  /SET BAUD RATES BEFORE LEAVING SLU DIAGNOSTIC;REMOVE LOOPAROUND
5640
5641    3131  4350    ENDSLU, JMS SETBDR              /SET BAUD RATES-SLU1 & 3 = 9600, SLU2 PER SW
5642    3132  1366            TAD (16
5643    3133  3026            DCA BDR1
```


SEQ 0128

```
5644    3134  1366            TAD (16
5645    3135  3030            DCA BDR3
5646    3136  7604            LAS
5647    3137  0365            AND (0017
5648    3140  3027            DCA BDR2                /BAUD RATE INDICATORS UPDATED
5649    3141  6002            IOF                     /DISABLE INT. SYSTEM WHILE REMOVING LOOPAROUND
5650    3142  4514            RLOOP                   /REMOVE LOOPAROUND
5651    3143  3025            DCA SDEVC               /CLEAR SLU DEVICE CODE
5652    3144  1764'           TAD KJILD               /RESTORE DONLOP ROUTINE FOR NON SLU USE.
5653    3145  3770'           DCA LLLD
5654    3146  3140            DCA TSTNU               /CLEAR TEST NUMBER
5655    3147  5763'           JMP PRTEST              /ENTER PARALLEL I/O DIAGNOSTIC
5656
5657                  /SET BAUD RATES IN ALL SLUS;SLU1=9600, SLU2=FROM SWITCH, SLU3=9600.
5658
5659    3150  0000    SETBDR, 0
5660    3151  1366            TAD (16
5661    3152  6043            TSB             /RESTORE SLU#1 BAUD RATE TO 9600
5662    3153  6333            TSB2            /RESTORE SLU#3 BAUD RATE TO 9600
5663    3154  7604            LAS
5664    3155  0365            AND (0017
5665    3156  6313            TSB1            /RESTORE SLU#2 BAUD RATE FROM BAUD RATE SWITCH
5666    3157  7300            CLA CLL
5667    3160  4470            DELAY           /WAIT FOR BAUD RATE CHANGES TO TAKE EFFECT
5668    3161  5750            JMP I SETBDR
5669
5670
5671
5672    3163  3400
5673    3164  2267
5674    3165  0017
5675    3166  3016
5676    3167  0020
5677    3170  2257
5678    3171  2270
5679    3172  2265
5680    3173  2275
5681    3174  3445
5682    3175  7007
5683    3176  6770
5684    3177  2720
              3200          PAGE
5685                  /SET BAUD RATE IN ALL 3 SLUS TO NORMAL TEST SEQUENCE
5686                  /       BAUD RATE (PRESET TO 9600)
5687
5688    3200  0000    BDRNS,  0
5689    3201  1024            TAD NSQBDR
5690    3202  6043            TSB
5691    3203  6313            TSB1
5692    3204  6333            TSB2
5693    3205  3026            DCA BDR1
5694    3206  4470            DELAY
5695    3207  1024            TAD NSQBDR
5696    3210  3027            DCA BDR2
5697    3211  1024            TAD NSQBDR
```

```
5698    3212  3334          DCA BDR3
5699    3213  5600          JMP I BDRNS
5700
5701                  /RESTORE BAUD RATES AND LOOPAROUND TO STATES EXPECTED BY DIAGNOSTIC
5702
5703    3214  0000    RESTBR, 0
5704    3215  1026          TAD BDR1
5705    3216  6043          TSB                     /SLU#1 BAUD RATE RESTORED
5706    3217  7300          CLA CLL
5707    3220  1027          TAD BDR2
5708    3221  6313          TSB1                    /SLU#2 BAUD RATE RESTORED
5709    3222  7300          CLA CLL
5710    3223  1030          TAD BDR3
5711    3224  6333          TSB2                    /SLU#3 BAUD RATE RESTORED
5712    3225  7300          CLA CLL
5713    3226  1031          TAD LOOPA
5714    3227  6037          KLB                     /LOOPAROUND RESTORED
5715    3230  7300          CLA CLL
5716    3231  4470          DELAY                   /WAIT FOR BAUD RATE CHANGES TO TAKE EFFECT
5717    3232  5614          JMP I RESTBR
5718
5719
5720                  /SETUP LOOPAROUND ON ALL SLU'S
5721
5722    3233  0000    SLOOPA, 0
5723    3234  7301          CLA CLL IAC
5724    3235  6037          KLB
5725    3236  3031          DCA LOOPA
5726    3237  5633          JMP I SLOOPA
5727
5728                  /CLEAR LOOPAROUND ON ALL SLU'S
5729
5730    3240  0000    CLOOPA, 0
5731    3241  7300          CLA CLL
5732    3242  6037          KLB
5733    3243  3031          DCA LOOPA
5734    3244  5640          JMP I CLOOPA
5735
5736
5737    3245  0000    XDELAY, 0
5738    3246  2251          ISZ DELAY1              /.063 SEC DELAY
5739    3247  5246          JMP .-1
5740    3250  5645          JMP I XDELAY
5741    3251  0000    DELAY1, 0
5742
5743
5744
5745                  /CLEAR ALL FLAGS ROUTINE FOR SLU TESTING.
5746
5747    3252  0000    XSCAF,  0
5748    3253  6007          CAF             /CLEAR ALL FLAGS & EN INT. FROM SLUS.
5749    3254  7000          NOP/CLA CLL
5750    3255  7000          NOP/KIE         /DISABLE INT. FROM SLU1
5751    3256  7000          NOP/KIE1                /DISABLE INT. FROM SLU2
5752    3257  7000          NOP/KIE2                /DISABLE INT. FROM SLU3
```



```
5753    3260  7000          NOP/IAC
5754    3261  7000          NOP/MKIE                /EN INT. FROM SLU UNDER TEST
5755                  /ABOVE 6 NOPS CAN BE REPLACED WITH CODE SHOWN TO DISABLE INTERRUPTS FROM THOSE SLUS
5756                  /       NOT CURRENTLY BEING TESTED.
5757    3262  7300          CLA CLL
5758    3263  6665          PCIE            /DISABLE INT. FROM PARALLEL INTERFACE
5759    3264  5652          JMP I XSCAF
5760
5761
5762                  /CLEAR SLU FLAGS AND ENABLE SLU INTERRUPTS
5763                  / (A SUBSTITUTE FOR CAF =AVOIDS RX01 CLICKING)
5764
5765    3265  0000    XCFSLU, 0
5766    3266  6030          KCF     /CLEAR REC AND XMIT FLAGS IN ALL 3 SLUS
5767    3267  6042          TCF
5768    3270  6300          KCF1
5769    3271  6312          TCF1
5770    3272  6320          KCF2
5771    3273  6332          TCF2
5772    3274  7300          CLA CLL
5773    3275  1377          TAD (0003
5774    3276  6035          KIE/MKIE        /EN INT. FROM SLU UNDER TEST(ALSO EN SLU2 ERROR STATUS)
5775    3277  6305          KIE1/NOP
5776    3300  6325          KIE2/NOP
5777                  /THE ABOVE 3 KIE'S CAN BE REPLACED WITH CODE SHOWN TO DISABLE INTERRUPTS FROM
5778                  /       THOSE SLUS NOT CURRENTLY UNDER TEST.
5779    3301  7300          CLA CLL
5780    3302  5665          JMP I XCFSLU
5781
5782
5783                  /SLU TESTING MESSAGE
5784    3303  2314    SLUMES, TEXT    "SLU "
        3304  2540
        3305  0000
5785    3306  2405    TESMES, TEXT    "TESTING"
        3307  2324
        3310  1116
        3311  0700
5786
5787                  /GET PSEUDO SWITCH REGISTER FROM LOCATION 20 IN FIELD 0
5788
5789    3312  0000    XGETSR, 0
5790    3313  7300          CLA CLL
5791    3314  6201          CDF 00
5792    3315  1776          TAD I (PSR
5793    3316  6211          CDF 10
5794    3317  5712          JMP I XGETSR
5795
5796                  /ROUTINE TO CHECK FOR KEYBOARD INTERVENTION
5797
5798    3320  0000    CH1KB,  0
5799    3321  7300          CLA CLL
5800    3322  6035          KIE             /DISABLE INTERRUPTS FROM KEYBOARD
5801    3323  4445          CH1KSF          /CHECK FOR KEYBOARD FLAG
5802    3324  7000          NOP
```

```
5003    3325  7201          CLA IAC
5004    3326  6035          KIE             /ENABLE INTERRUPTS FROM KEYBOARD
5005    3327  7300          CLA CLL
5006    3330  5720          JMP I CH1KB
5007
5008
5009
5010
5011                        /*********************
5012          3331          SLUEND=.                /END MARKER FOR SLU TESTS-THIS MARKER MUST ALWAYS
5013                                                /       BE LOCATED AFTER LAST SLU TEST LOOP
5014                                                /       USED BY LOOPPC & ERROR ROUTINE.
5015
5016
5017                        /*********************
5018                        /WARNING
5019          3347          *3347                   /LOCATION DESTROYED BY MEMORY EXTENSION TESTING
5020                                                /       FROM FIELD 0 (MEM EXT TEST 4)
5021
5022
5023
5024
5025
```



```
5026
5027                    /SLU TESTING COMPLETE  -  DIAGNOSE PARALLEL I/O INTERFACE
```

```
        3376  0020
        3377  0003
              3400     *3400

                       /*****************************************************************************
                       /PARALLEL INTERFACE DIAGNOSTIC
                       /*****************************************************************************

        3400  4465     PRTEST, GETSR                   /GET PSEUDO SWITCH REGISTER FROM FIELD 0.
        3401  0377             AND (0004
        3402  7640             SZA CLA                 /EXECUTE PARALLEL INTERFACE TEST?????
        3403  5776'            JMP PRETEST             /NO
        3404  6002             IOF
        3405  7240             CLA CMA
        3406  3136             DCA ECONSI              /SET FLAG INDICATING THAT A CONSOLE INTERRUPT IS POSSIBLE NOW.
        3407  1775'            TAD KJILD
        3410  3774'            DCA LLLD
        3411  4773'    PPIM,   JMS PPIMES              /PRINT PARALLEL I/O INTERF TESTING MESSAGE
                                                       /IF NOT UNDER APT CONTROL.
        3412  6007             CAF                     /CLEAR ALL FLAGS & DISABLE PARALLEL I/O SIMULATION
                                                       /       STROBE DECODER.
        3413  4141             JMS PATCH               /SETUP INTERRUPT SERVICE LINKAGE
        3414  6200             SKP1CHN
        3415  5772'            JMP SIMCK0              /CHECK FOR SIMULATOR IN USE

                       /*************
                       /WARNING
                       /LOCATION 3422 & LOCATION 3425 GET DESTROYED BY MEM EXT TEST 4
              3426     *3426

        3426  4466     NOSIM0, GETHW3
        3427  0371             AND (1000
        3430  7640             SZA CLA
        3431  5770'            JMP T1LQ                /NO PARALLEL INTERFACE DEVICE CABLED TO SYSTEM
        3432  4466             GETHW3
        3433  0367             AND (400
        3434  7640             SZA CLA
        3435  5770'            JMP T1LQ

                       /*****************************************************************************
                       /PARALLEL I/O DEVICE CODE = 66
                       /*****************************************************************************
                       /
                       /
                       /
                       /*****************************************************************************
                       /TEST 1 - CHECK FOR PCLF TO CLR PRINT FLAG AND PSSF TO SET
                       /         PRINT FLAG. USE PSKF TO VERIFY.
                       /*****************************************************************************

        3436  4446     T1LA,   LOOPPC
        3437  6662             PCLF            /CLEAR PRINT FLAG
        3440  7410             SKP
        3441  4450             ERROR           /PCLF SKIPPED
```



```
        3442  6661             PSKF            /SKIP ON FLAG
        3443  7410             SKP
        3444  4450             ERROR           /EITHER PCLF FAILED TO CLEAR FLAG
                                               /       OR PSKF SKIPPED ON NO FLAG.
        3445  6660             PSSF            /SET PRINT FLAG
        3446  7410             SKP
        3447  4450             ERROR           /PSSF SKIPPED
        3450  6661             PSKF            /SKIP ON FLAG
        3451  4450             ERROR           /EITHER PSSF FAILED TO SET FLAG OR
                                               /       PSKF FAILED TO SKIP.
        3452  6662             PCLF            /CLEAR THE KNOWN SET FLAG.
        3453  6661             PSKF            /SKIP ON FLAG.
        3454  7410             SKP
        3455  4450             ERROR           /PCLF FAILED TO CLEAR FLAG.
        3456  4447             DONLOP


                       /*****************************************************************************
                       /TEST 2 - CHECK THAT PCIE WILL SET AND CLEAR INTERRUPT ENABLE.
                       /*****************************************************************************

        3457  4446     T2LA,   LOOPPC
        3460  4471             CLREPI          /CLEAR EXPECTING PRINTER INTERRUPTS.
        3461  4516             SPCIE           /CLEAR PRINTER INT. ENABLE
        3462  7410             SKP
        3463  4450             ERROR           /PCIE SKIPPED.
        3464  6001             ION
        3465  6660             PSSF            /SET PRINTER FLAG
        3466  6661             PSKF
        3467  4450             ERROR           /FLAG FAILED TO SET
        3470  6662             PCLF            /CLEAR FLAG
        3471  6661             PSKF
        3472  7410             SKP
        3473  4450             ERROR           /FLAG FAILED TO CLEAR
        3474  7201             CLA IAC
        3475  4516             SPCIE           /SET INT. ENABLE
        3476  4472             SETEPI          /SET EXPECTING PRINNER INT.
        3477  6660             PSSF            /SET PRINTER FLAG
        3500  7000             NOP
        3501  4471             CLREPI          /CLEAR EXXPECTING PRINTER INT.
        3502  6661             PSKF
        3503  4450             ERROR           /FLAG FAALED TO SET OR NO SKIP
        3504  2117             ISZ INTFLG
        3505  4450             ERROR           /PROGRAM FAILED TO INT.
        3506  6662             PCLF
        3507  6001             ION
        3510  6661             PSKF
        3511  7410             SKP
        3512  4450             ERROR           /FLAG FAILED TO CLEAR
        3513  4447             DONLOP


                       /*****************************************************************************
                       /TEST 3 - CHECK THAT CAF ENABLES PRINTER INTERRUPTS & CLEARS FLAGS
                       /*****************************************************************************
```

```
5937
5938  3514  4446  T3LA,  LOOPPC
5939  3515  4471         CLREPI          /CLEAR EXPECTING PRINTER INT,
5940  3516  6662         PCLF            /CLEAR PRINT FLAG
5941  3517  4516         SPCIE           /DISABLE PRINTER INT,
5942  3520  6007         CAF             /ENABLE PRINTER INTERRUPTS & CLEAR FLAGS
5943                                     /NOTE: CAF CLEARS LIFT RIBBON, IF THE SIMULATOR
5944                                     / IS IN USE CLEARING LIFT RIBBON SWITCHES THE
5945                                     / PARALLEL INTERFACE TO THE LQP MODE,
5946  3521  7326         CLA CLL CML RTL /IN CASE SIMULATOR IS IN USE SWITCH MODE BACK TO LA
5947                                     / & CLEAR FLAGS, THIS LQLS INST, HAS NO EFFECT
5948                                     / IF SIMULATOR IS NOT IN USE,
5949  3522  6536         LQLS
5950  3523  6662         PCLF
5951  3524  6001         ION
5952  3525  4472         SETEPI          /SET EXPECTING PRINTER INT,
5953  3526  6660         PSSF
5954  3527  7000         NOP
5955  3530  4471         CLREPI
5956  3531  6661         PSKF
5957  3532  4450         ERROR           /FLAG NOT SET OR NO SKIP
5958  3533  2117         ISZ INTFLG
5959  3534  4450         ERROR           /PROGRAM FAILED TO INTERRUPT
5960  3535  6662         PCLF            /CLEAR PRINT FLAG
5961  3536  6001         ION
5962  3537  6661         PSKF
5963  3540  7410         SKP
5964  3541  4450         ERROR           /FLAG FAILED TO CLEAR
5965  3542  4447         DONLOP
5966  3543  5766'        JMP T4LA
5967
5968
5969                     /ROUTINE TO ISSUE PCIE AND LEAVE LIFT RIBBON = 0,
5970                     /       NOTE; LIFT RIBBON = 0 DESIGNATES LA MODE WHEN SIMULATOR IS IN USE,
5971
5972  3544  0000   XSPCIE, 0
5973  3545  1365         TAD (2          /AC BIT 10 CONTROLS LIFT RIBBON STATE UPON PCIE EXECUTION
5974  3546  6665         PCIE
5975  3547  7200         CLA
5976  3550  5744         JMP I XSPCIE
5977  3551  0002
5978  3552  3600
5979  3553  0400
5980  3554  4005
5981  3555  1000
5982  3556  4520
5983  3557  4342
5984  3560  2257
5985  3561  2267
5986  3562  5000
5987  3563  0004
            3600   PAGE
5988
5989
5990                     /*************************************************************************
```



```
5991                     /TEST 4 - CHECK THAT PSTB LOADS AND PRDB READS PRINTER
5992                     /               INTERFACE BUFFER, CHECK THAT PSTB LEAVES FLAG ALONE,
5993                     /               VERIFIES JAM INTO AC,
5994                     /*************************************************************************
5995
5996  3600  4446   T4LA,  LOOPPC
5997  3601  4471         CLREPI
5998  3602  4516         SPCIE           /DISABLE PRINTER INTERRUPTS
5999  3603  6660         PSSF            /SET PRINTER FLAG
6000  3604  6664         PSTB            /LOAD 0 INTO PRINTER INTERFACE BUFFER
6001  3605  7410         SKP
6002  3606  4450         ERROR           /PSTB SKIPPED
6003  3607  6661         PSKF
6004  3610  4450         ERROR           /PSTB CLEARED FLAG
6005  3611  7240         STA
6006  3612  6667         PRDB            /READ WORD BACK
6007  3613  7410         SKP
6008  3614  4450         ERROR           /PRDB SKIPPED
6009  3615  6661         PSKF
6010  3616  4450         ERROR           /PRDB CLEARED FLAG
6011  3617  7440         SZA
6012  3620  4450         ERROR           /DATA READ NOT = DATA WRITTEN
6013                                     /AC CONTAINS WORD READ
6014                                     /WORD WRITTEN=0
6015  3621  6662         PCLF
6016  3622  7240         STA
6017  3623  6664         PSTB            /LOAD INTERFACE BUFFER WITH ALL ONES
6018  3624  6661         PSKF
6019  3625  7410         SKP
6020  3626  4450         ERROR           /PSTB SET FLAG--NOTE; PARALLEL I/O DEVICE IS POWERED DOWN
6021  3627  7200         CLA
6022  3630  6667         PRDB            /READ WORD BACK
6023  3631  6661         PSKF
6024  3632  7410         SKP
6025  3633  4450         ERROR           /PRDB SET FLAG--NOTE; PARALLEL I/O DEVICE IS POWERED DOWN
6026  3634  6667         PRDB            /READ WORD BACK AGAIN--IN CASE THE PREVIOUS 'ERROR' OCCURRED,
6027  3635  7040         CMA
6028  3636  7440         SZA
6029  3637  4450         ERROR           /DATA READ NOT = DATA WRITTEN
6030                                     /AC CONTAINS COMPLEMENT OF WORD READ
6031                                     /WORD WRITTEN = 7777
6032  3640  4447         DONLOP
6033
6034
6035                     /*************************************************************************
6036                     /TEST 5 - CHECK THAT PCLP LOADS PRINTER INTERFACE BUFFER AND CLEARS FLAG,
6037                     /*************************************************************************
6038
6039  3641  4446   T5LA,  LOOPPC
6040  3642  4471         CLREPI
6041  3643  4516         SPCIE           /DISABLE PRINTER INTERRUPTS
6042  3644  6001         ION
6043  3645  6660         PSSF            /SET FLAG
6044  3646  6666         PCLP            /LOAD PRINTER INTERFACE BUFFER
6045  3647  7410         SKP
```

```
6046    3650  4450          ERROR           /PCLP SKIPPED
6047    3651  6661          PSKF
6048    3652  7410          SKP
6049    3653  4450          ERROR           /PCLP FAILED TO CLEAR FLAG
6050    3654  7240          STA
6051    3655  6667          PRDB            /READ WORD BACK
6052    3656  7440          SZA
6053    3657  4450          ERROR           /DATA READ NOT = DATA WRITTEN
6054                                        /AC CONTAINS WORD READ
6055                                        /WORD WRITTEN=0
6056    3660  7240          STA
6057    3661  6666          PCLP            /LOAD ALL ONES INTO BUFFER
6058    3662  7200          CLA
6059    3663  6667          PRDB            /READ WORD BACK
6060    3664  7040          CMA
6061    3665  7440          SZA
6062    3666  4450          ERROR           /DATA READ NOT = DATA WRITTEN
6063                                        /AC CONTAINS COMPLEMENT OF WROD READ
6064                                        /WORD WRITTEN=7777
6065    3667  4447          DONLOP
6066
6067                /*************************************************************************
6068                /TEST 6 - CHECK THAT PSSF,PSKF,PCLF,PSTB,PCIE AND PCLP LEAVE ACC
6069                /               UNCHANGED, ALSO CHECK THAT PSSF,PSKF,PCLF,PCIE PRDB
6070                /               LEAVE INTERFACE REGISTER UNCHANGED.
6071                /*************************************************************************
6072
6073
6074    3670  4446    T6LA,   LOOPPC
6075    3671  6002            IOF
6076    3672  1377            TAD (5252
6077    3673  6664            PSTB            /LOAD INTERFACE BUFFER
6078    3674  1376            TAD (-5252
6079    3675  7440            SZA
6080    3676  4450            ERROR           /PSTB CHANGED AC CONTENTS
6081    3677  1377            TAD (5252
6082    3700  6660            PSSF
6083    3701  1376            TAD (-5252
6084    3702  7440            SZA
6085    3703  4450            ERROR           /PSSF CHANGED AC CONTENTS
6086    3704  1377            TAD (5252
6087    3705  6661            PSKF
6088    3706  7000            NOP
6089    3707  1376            TAD (-5252
6090    3710  7440            SZA
6091    3711  4450            ERROR           /PSKF CHANGED AC CONTENTS
6092    3712  1377            TAD (5252
6093    3713  6665            PCIE
6094    3714  1376            TAD (-5252
6095    3715  7440            SZA
6096    3716  4450            ERROR           /PCIE CHANGED AC CONTENTS
6097    3717  1377            TAD (5252
6098    3720  6662            PCLF
6099    3721  1376            TAD (-5252
6100    3722  7440            SZA
```



```
6101    3723  4450            ERROR           /PCLF CHANGED AC CONTENTS
6102    3724  6667            PRDB            /READ INTERFACE BUFFER
6103    3725  1376            TAD (-5252
6104    3726  7440            SZA
6105    3727  4450            ERROR           /INTERFACE BUFFER CHANGED SINCE LOAD BY PSTB ABOVE
6106    3730  6667            PRDB
6107    3731  1376            TAD (-5252
6108    3732  7440            SZA
6109    3733  4450            ERROR           /PRDB CHANGED INTEERFACE BUFFER CONTENTS
6110    3734  4447            DONLOP
6111    3735  5775*           JMP T7LA
6112
6113    3775  4000
6114    3776  2526
6115    3777  5252
              4000      PAGE
6116                    /*************************************************************************
6117                    /TEST 7 - CHECK OUT PRINTER INTERFACE BUFFER REGISTER
6118                    /               (ONE THROUGH A FIELD OF ZEROS AND VICE VERSA)
6119                    /*************************************************************************
6120
6121    4000  1377      T7LA,   TAD (NOP
6122    4001  3776*             DCA T7OW1
6123    4002  1377              TAD (NOP
6124    4003  3775*             DCA T7OW2
6125    4004  5774*             JMP T7LQ
6126
6127
6128
6129
6130
6131
6132                    /*************************************************************************
6133                    /PARALLEL I/O DEVICE CODE = 50
6134                    /*************************************************************************
6135
6136
6137
6138                    /*************************************************************************
6139                    /TEST  1 - CHECK THAT LQRE AND LQRS CLEAR DONE FLAG AND THAT
6140                    /               LQLS SETS DONE FLAG.  CHECK USING LQSK.
6141                    /*************************************************************************
6142
6143    4005  4446      T1LQ,   LOOPPC
6144    4006  6002              IOF
6145    4007  6505              LQRS            /READ STATUS AND CLEAR DONE FLAG
6146    4010  7410              SKP
6147    4011  4450              ERROR           /LQRS SKIPPED
6148    4012  6500              LQSK            /SKIP ON DONE FLAG
6149    4013  7410              SKP
6150    4014  4450              ERROR           /LQRS FAILED TO CLEAR DONE FLAG OR
6151                                            /       LQSK SKIPPED.
6152    4015  7300              CLA CLL
6153    4016  6506              LQLS            /WRITE STATUS (CLEAR LIFT RIBBON & INT EN)
6154                                            /       AND SET DONE FLAG
```

```
6155  4017  7410          SKP
6156  4020  4450          ERROR           /LQLS SKIPPED
6157  4021  6520          LQSK            /SKIP ON DONE FLAG
6158  4022  4450          ERROR           /LQLS FAILED TO SET DONE FLAG
6159  4023  6505          LQRS            /CLEAR KNOWN SET DONE FLAG
6160  4024  6520          LQSK            /SKIP ON DONE FLAG
6161  4025  7410          SKP
6162  4026  4450          ERROR           /LQRS FAILED TO CLEAR DONE FLAG
6163  4027  7300          CLA CLL
6164  4030  6506          LQLS            /WRITE STATUS (CLEAR LIFT RIBBON &INT EN,)
6165                                      /       AND SET DONE FLAG
6166  4031  6507          LQRE            /RESTORE AND CLEAR DONE FLAG
6167  4032  7410          SKP
6168  4033  4450          ERROR           /LQRE SKIPPED
6169  4034  6500          LQSK            /SKIP ON DONE FLAG
6170  4035  7410          SKP
6171  4036  4450          ERROR           /LQRE FAILED TO CLEAR DONE FLAG
6172  4037  4513          KLSIM           /DISABLE PARALLEL I/O SIMULATOR IF IN USE.
6173  4040  4447          DONLOP
6174
6175
6176                      /*************************************************************************
6177                      /TEST 2 - CHECK THAT LQLS WRITES STATUS AND LQRS READS STATUS.
6178                      /               ALSO CHECKS INTERRUPT ENABLE FUNCTION.
6179                      /*************************************************************************
6180
6181  4041  4446  T2LQ,   LOOPPC
6182  4042  4471          CLREPI
6183  4043  6506          LQLS            /WRITE STATUS (CLEARS LIFT RIBBON
6184                                      /       AND INT EN)AND SET DONE FLAG.
6185  4044  7040          CMA
6186  4045  6505          LQRS            /READ STATUS AND CLEAR DONE FLAG
6187  4046  6001          ION
6188  4047  0373          AND (0003       /MASK OFF ALL BUT LIFT RIBBON AND INT EN BITS
6189  4050  7440          SZA
6190  4051  4450          ERROR           /LQLS FAILED TO WRITE STATUS OR LQRS
6191                                      /       INCORRECTLY READ STATUS.
6192  4052  6506          LQLS            /WRITE STATUS (CLEAR LIFT RIBBON AND INT EN)(
6193                                      /       AND SET DONE FLAG. CHECK FOR NO INT.
6194  4053  4466          GETHW3          /IF PARALLEL I/O SIMULATOR IS IN USE, SETTING
6195  4054  0372          AND (0200       / LIFT RIBBON WOULD CAUSE A SWITCH TO LA MODE.
6196  4055  7640          SZA CLA
6197  4056  5267          JMP SKPLRC      /SKIP THIS STATUS WRITE CHECK WHEN SIMULATOR IS IN USE.
6198  4057  1371          TAD (0002
6199  4060  6506          LQLS            /WRITE STATUS (SET LIFT RIBBON, CLEAR INT EN),
6200                                      /       AND SET DONE FLAG
6201  4061  7300          CLA CLL
6202  4062  6505          LQRS            /READ STATUS AND CLEAR DONE FLAG
6203  4063  0373          AND (0003
6204  4064  1370          TAD (-0002
6205  4065  7440          SZA
6206  4066  4450          ERROR           /STATUS WRITE FAILED
6207  4067  4472  SKPLRC, SETEPI         /SET EXPECTING PRINTER INTERRUPT
6208  4070  1367          TAD (0001
6209  4071  6506          LQLS            /WRITE STATUS (CLEAR LIFT RIBBON
```



```
6210                                      /       SET INT, EN,) AND SET DONE FLAG
6211  4072  7300          CLA CLL
6212  4073  4471          CLREPI
6213  4074  6505          LQRS            /READ STATUS AND CLEAR DONE FLAG
6214  4075  0373          AND (0003
6215  4076  1366          TAD (-0001
6216  4077  7440          SZA
6217  4100  4450          ERROR           /STATUS WRITE FAILED
6218  4101  2117          ISZ INTFLG
6219  4102  4450          ERROR           /PROGRAM FAILED TO INT, WITH FLAG
6220                                      /       SET AND ENABLED.
6221  4103  6506          LQLS            /WRITE STATUS (CLEAR LIFT RIBBON AND INT, EN)
6222                                      /       SET DONE FLAG
6223  4104  6001          ION
6224  4105  6500          LQSK
6225  4106  4450          ERROR           /LQLS FAILED TO SET DONE FLAG
6226  4107  6507          LQRE            /CLEAR DONE FLAG
6227  4110  4513          KLSIM           /DISABLE PARALLEL I/O SIMULATOR IF IN USE.
6228  4111  4447          DONLOP
6229
6230
6231                      /*************************************************************************
6232                      /TEST 3 - CHECK THAT CAF DISABLES LQP INTERRUPTS & CLEAR LIFT RIBBON
6233                      /*************************************************************************
6234
6235
6236  4112  4446  T3LQ,   LOOPPC
6237  4113  4471          CLREPI
6238  4114  6002          IOF
6239  4115  1366          TAD (7777
6240  4116  6506          LQLS            /WRITE STATUS (SET INT EN & SET LIFT RIBBON)
6241                                      /       SET DONE FLAG
6242  4117  6007          CAF             /SHOULD CLEAR INT, EN & LIFT RIBBON
6243  4120  6001          ION
6244  4121  7200          CLA
6245  4122  6505          LQRS            /READ STATUS AND CLEAR DONE FLAG
6246  4123  0365          AND (0337       /VERIFY ALSO THAT UNUSED STATUS BITS RETURN AS 0.
6247  4124  7440          SZA
6248  4125  4450          ERROR           /CAF FAILED TO CLEAR INT, EN AND/OR LIFT RIBBON.
6249  4126  4447          DONLOP
6250  4127  5764*         JMP T4LQ
6251
6252  4164  4200
6253  4165  0337
6254  4166  7777
6255  4167  0001
6256  4170  7776
6257  4171  0002
6258  4172  0200
6259  4173  0003
6260  4174  4400
6261  4175  4446
6262  4176  4421
6263  4177  7000
            4200    PAGE
```

```
6264
6265                    /*************************************************************************
6266                    /TEST 4 - CHECK THAT LQMP,LQMC,LQPC,AND LQRE LOAD INTERFACE BUFFER
6267                    /               AND THAT LQRB READS INTERFACE BUFFER, NOTE; DATA IS
6268                    /               INVERTED BEFORE BEING STORED IN INTERFACE BUFFER.
6269                    /*************************************************************************
6270
6271    4200  4446    T4LQ,   LOOPPC
6272    4201  4471            CLREPI
6273    4202  1377            TAD (LQ4TAB
6274    4203  3251            DCA LQTAB
6275    4204  5232            JMP INITL
6276    4205  6506    INSL1,  LQLS            /DISABLE LQP INTERRUPTS AND SET DONE FLAG
6277    4206  6001            ION
6278    4207  6502    LQI1,   LQMP/LQMC/LQPC/LQRE             /AC0-11 TO INTERFACE BUFFER,CLEAR AC, CLEAR DONE FLAG
6279    4210  7410            SKP
6280    4211  4450            ERROR           /LQXX SKIPPED-DETERMINE LQXX FROM LOCATION LQI1
6281    4212  6500            LQSK
6282    4213  7410            SKP
6283    4214  4450            ERROR           /LQXX FAILED TO CLEAR DONE FLAG
6284    4215  6501            LQRB            /READ INTERFACE BUFFER
6285    4216  7410            SKP
6286    4217  4450            ERROR           /LQRB SKIPPED
6287    4220  7040            CMA
6288    4221  7440            SZA
6289    4222  4450            ERROR           /DATA READ NOT = EXPECTED READ DATA
6290                                          /AC CONTAINS WORD READ BACK FROM INT BUFFER
6291                                          /WORD WRITTEN = 0; EXPECTED READ DATA=7777
6292    4223  7240            STA
6293    4224  6502    LQI2,   LQMP/LQMC/LQPC/LQRE     /AC0-11 TO INTERF. BUFFER,CLEAR AC,CLEAR DONE FLAG
6294    4225  7240            STA
6295    4226  6501            LQRB            /READ INTERFACE BUFFER
6296    4227  7440            SZA
6297    4230  4450            ERROR           /DATA READ NOT = EXPECTED READ DATA
6298                                          /AC CONTAINS WORD READ BACK FROM INTERF BUFFER
6299                                          /WORD WRITTEN=7777; EXPECTED READ DATA = 0000
6300    4231  2251            ISZ LQTAB       /PERFORM SAME CHECKS ON LQMC,LQPC,AND LQRE
6301    4232  1651    INITL,  TAD I LQTAB
6302    4233  7450            SNA
6303    4234  5241            JMP TABDON
6304    4235  3207            DCA LQI1
6305    4236  1651            TAD I LQTAB
6306    4237  3224            DCA LQI2
6307    4240  5205            JMP INSL1
6308    4241  7300    TABDON, CLA CLL         /CHECK THAT LQRB DOES NOT CLEAR DONE FLAG
6309    4242  4513            KLSIM           /DISABLE PARALLEL I/O SIMULATOR IF IN USE.
6310    4243  6506            LQLS            /SET DONE FLAG
6311    4244  6501            LQRB
6312    4245  6500            LQSK
6313    4246  4450            ERROR           /LQRB CLEARED DONE FLAG
6314    4247  4447            DONLOP
6315    4250  5257            JMP T5LQ
6316
6317    4251  0000    LQTAB,  0
6318    4252  6502    LQ4TAB, LQMP
```



```
6319    4253  6503            LQMC
6320    4254  6501            LQPC
6321    4255  6507            LQRE
6322    4256  0000            0
6323
6324
6325
6326
6327                    /*************************************************************************
6328                    /TEST 5 - CHECK THAT LQMP,LQMC,LQLS AND LQPC CLEAR AC.
6329                    /*************************************************************************
6330
6331    4257  4446    T5LQ,   LOOPPC
6332    4260  4471            CLREPI
6333    4261  6002            IOF
6334    4262  1376            TAD (7775       /IN CASE SIMULATOR IS IN USE DON'T SET LIFT
6335                                          / RIBBON - THIS WOULD SWITCH MODES TO LA.
6336    4263  6506            LQLS
6337    4264  7440            SZA
6338    4265  4450            ERROR           /LQLS FAILED TO CLEAR AC
6339    4266  6506            LQLS            /DISABLE LQP INTERRUPTS AND SET DONE FLAG
6340    4267  6001            ION
6341    4270  7040            CMA
6342    4271  6502            LQMP
6343    4272  7440            SZA
6344    4273  4450            ERROR           /LQMP FAILED TO CLEAR AC
6345    4274  7040            CMA
6346    4275  6503            LQMC
6347    4276  7440            SZA
6348    4277  4450            ERROR           /LQMC FAILED TO CLEAR AC
6349    4300  7040            CMA
6350    4301  6504            LQPC
6351    4302  7440            SZA
6352    4303  4450            ERROR           /LQPC FAILED TO CLEAR AC
6353    4304  4447            DONLOP
6354
6355
6356                    /*************************************************************************
6357                    /TEST 6 - CHECK THAT LQSK,AND LQRE LEAVE AC UNCHANGED, ALSO CHECKS
6358                    /               THAT LQSK,LQRB,LQRS, AND LQLS LEAVE INTERFACE BUFFER
6359                    /               REGISTER UNCHANGED.
6360                    /*************************************************************************
6361
6362    4305  4446    T6LQ,   LOOPPC
6363    4306  6002            IOF
6364    4307  1375            TAD (5252
6365    4310  6503            LQMC            /LOAD INTERFACE BUFFER
6366    4311  1375            TAD (5252
6367    4312  6500            LQSK
6368    4313  7000            NOP
6369    4314  1374            TAD (-5252
6370    4315  7440            SZA
6371    4316  4450            ERROR           /LQSK CHANGED AC
6372    4317  6505            LQRS
6373    4320  6501            LQRB
```

```
 6374   4321  7200          CLA
 6375   4322  6501          LQRB            /READ INTERFACE BUFFER
 6376   4323  1373          TAD (5253
 6377   4324  7440          SZA
 6378   4325  4450          ERROR           /LQSK,LQRB,LQRS OR LQLS CHANGED INIERFACE BUFFER
 6379   4326  1375          TAD (5252
 6380   4327  6507          LQRE
 6381   4330  1374          TAD (-5252
 6382   4331  7440          SZA
 6383   4332  4450          ERROR           /LQRE CHANGED AC
 6384   4333  4513          KLSIM           /DISABLE PARALLEL I/O SIMULATOR IF IN USE,
 6385   4334  4447          DONLOP
 6386   4335  1372          TAD (CMA        /RESTORE TEST 7 FOR LQ MODE
 6387   4336  3771'         DCA T7OW1
 6388   4337  1372          TAD (CMA
 6389   4340  3770'         DCA T7OW2
 6390   4341  5767'         JMP T7LQ
 6391
 6392                      /ROUTINE TO PRINT "PARALLEL I/O INTERFACE TESTING"
 6393
 6394   4342  0000    PPIMES, 0
 6395   4343  4432          C1CRLF
 6396   4344  4434          C1PRNT
 6397   4345  4352          PIMES
 6398   4346  4434          C1PRNT
 6399   4347  3306          TESMES
 6400   4350  4432          C1CRLF
 6401   4351  5742          JMP I PPIMES
 6402
 6403   4352  2001    PIMES,  TEXT    "PARALLEL I/O INTERFACE "
        4353  2201
        4354  1414
        4355  0514
        4356  4011
        4357  5717
        4360  4011
        4361  1624
        4362  0522
        4363  0601
        4364  0305
        4365  4000
 6404
 6405
 6406   4367  4400
 6407   4370  4446
 6408   4371  4421
 6409   4372  7440
 6410   4373  5253
 6411   4374  2526
 6412   4375  5252
 6413   4376  7775
 6414   4377  4252
              4400    PAGE
 6415                 /*************************************************************************
 6416                 /TEST 7 = CHECK OUT PRINTER INTERFACE BUFFER REGISTER  (ONE THROUGH A
```



```
 6417                 /               FIELD OF ZEROS AND VICE VERSA)
 6418                 /*************************************************************************
 6419
 6420   4400  4446    T7LQ,   LOOPPC
 6421   4401  4471            CLREPI
 6422   4402  4516            SPCIE
 6423   4403  6506            LQLS            /DISABLE PRINTER INTERRUPTS
 6424   4404  6001            ION
 6425   4405  7301            CLA CLL IAC     /TRY ONE THROUGH A FIELD OF ZEROS
 6426   4406  3273    LL1,    DCA SXMT
 6427   4407  1273            TAD SXMT
 6428   4410  7421            MQL             /LOAD MQ WITH WORD WRITTEN
 6429   4411  1273            TAD SXMT
 6430   4412  6666            PCLP            /LOAD WORD INTO BUFFER
 6431   4413  6504            LQPC
 6432   4414  7300            CLA CLL
 6433   4415  6667            PRDB            /READ BUFFER
 6434   4416  6501            LQRB
 6435   4417  3274            DCA SREC        /SAVE ACTUAL WORD READ
 6436   4420  1274            TAD SREC
 6437   4421  7440    T7OW1,  CMA/NOP         /CMA FOR LQ DEVICE CODE; NOP FOR LA DEV CODE
 6438   4422  7041            CIA
 6439   4423  1273            TAD SXMT
 6440   4424  7640            SZA CLA
 6441   4425  4305            JMS BDTA        /WORD READ NOT = EXPECTED READ DATA
 6442   4426  1273            TAD SXMT
 6443   4427  7104            CLL RAL
 6444   4430  7440            SZA
 6445   4431  5206            JMP LL1
 6446   4432  7144            CLL CMA RAL     /TRY ZERO THROUGH A FIELD OF ONES
 6447   4433  3273    LL2,    DCA SXMT
 6448   4434  1273            TAD SXMT
 6449   4435  7421            MQL
 6450   4436  1273            TAD SXMT
 6451   4437  6666            PCLP
 6452   4440  6504            LQPC
 6453   4441  7300            CLA CLL
 6454   4442  6667            PRDB            /READ BUFFER
 6455   4443  6501            LQRB
 6456   4444  3274            DCA SREC        /SAVE ACTUAL WORD READ
 6457   4445  1274            TAD SREC
 6458   4446  7040    T7OW2,  CMA/NOP         /CMA FOR LQ DEVICE CODE;NOP FOR LA DEV CODE
 6459   4447  7041            CIA
 6460   4450  1273            TAD SXMT
 6461   4451  7640            SZA CLA
 6462   4452  4305            JMS BDTA        /WORD READ NOT = EXPECTED READ DATA
 6463   4453  1273            TAD SXMT
 6464   4454  7120            STL
 6465   4455  7004            RAL
 6466   4456  7430            SZL
 6467   4457  5233            JMP LL2
 6468   4460  4447            DONLOP
 6469
 6470
 6471   4461  6662    EXITLA, PCLF            /CLEAR FLAG
```

```
 6472   4462  7201          CLA IAC
 6473   4463  6665          PCIE            /ENABLE LA PRINTER INTERRUPTS - SET LIFT RIBBON=1
 6474                       /       NOTE:LIFT RIBBON=1 INDICATES LQ MODE WHEN SIMULATOR IS IN USE.
 6475   4464  6002          IOF
 6476   4465  6506          LQLS            /ENABLE LQ INTERRUPTS AND SET DONE FLAG
 6477   4466  6505          LQRS            /CLEAR DONE FLAG
 6478   4467  7300          CLA CLL
 6479   4470  3140          DCA TSTNU               /CLEAR TEST NUMBER
 6480   4471  5331          JMP SIMCK1
 6481   4472  5777*  NOSIM1, JMP PRETEST
 6482
 6483   4473  0000   SXMT,  0
 6484   4474  0000   SREC,  0
 6485
 6486
 6487                       / SUBROUTINES USED BY PRINTER TESTS
 6488
 6489   4475  0000   XCLEPI, 0              /CLEAR EXPECTING PRINTER INT.
 6490   4476  7300          CLA CLL
 6491   4477  3135          DCA EPRNTI
 6492   4500  5675          JMP I XCLEPI
 6493
 6494   4501  0000   XSEPI, 0
 6495   4502  7240          CLA CMA
 6496   4503  3135          DCA EPRNTI
 6497   4504  5701          JMP I XSEPI
 6498
 6499
 6500                       /TEST 7 ERROR ROUTINE
 6501
 6502   4505  0000   BDTA,  0
 6503   4506  1274          TAD SREC
 6504   4507  4450          ERROR           /WORD READ NOT = EXPECTED READ DATA
                            /AC,MQ = ACTUAL WORD READ, WORD WRITTEN
 6505                       /NOTE: WHEN TESTING WITH LQ DEVICE CODES DATA
 6506                       /READ SHOULD BE THE COMPLEMENT OF DATA WORD WRITTEN
 6507
 6508   4510  5705          JMP I BDTA
 6509
 6510
 6511                       /DISABLE PARALLEL I/O SIMULATOR IF IN USE - NOTE: LQRE ENABLES SIMULATOR
 6512
 6513   4511  0000   XKLSIM, 0
 6514   4512  7300          CLA CLL
 6515   4513  4466          GETHW3          /IS PARALLEL I/O SIMULATOR IN USE?
 6516   4514  0376          AND (0200
 6517   4515  7640          SZA CLA
 6518   4516  6007          CAF             /YES - DISABLE IT
 6519   4517  5711          JMP I XKLSIM
 6520
 6521
 6522
 6523   4520  4466   SIMCK0, GETHW3         /USING SIMULATORS FOR PARALLEL I/O DEVI E?
 6524   4521  0376          AND (0200
 6525   4522  7650          SNA CLA
 6526   4523  5775*         JMP NOSIM0      /NO
```



```
 6527   4524  6505          LQRS            /YES-VERIFY LIFT RIBBON FALSE BY READ STATUS
 6528   4525  0374          AND (0002
 6529   4526  7440          SZA
 6530   4527  4450          ERROR           /INITIALIZE(CAF) FAILED TO CLEAR LIFT RIBBON FLOP.
 6531   4530  5773*         JMP T1LQ        /EXECUTE NORMAL LQ TYPE DIAGNOSTIC (DEVICE CODE=50)
 6532
 6533   4531  4466   SIMCK1, GETHW3         /USING SIMULATORS FOR PARALLEL I/O DEVICE?
 6534   4532  0376          AND (0200
 6535   4533  7650          SNA CLA
 6536   4534  5272          JMP NOSIM1      /NO.
 6537   4535  1221          TAD T7OW1       /YES - BOTH DEVICE CODES TESTED?
 6538   4536  1372          TAD (-CMA
 6539   4537  7640          SZA CLA
 6540   4540  5771*         JMP T10LS       /YES - TEST LOGIC WHICH CAN ONLY BE CHECKED BY
 6541                       /       USING AN EXTERNAL SIMULATOR.
 6542   4541  7326          CLA CLL CML RTL /NO - SETUP FOR DEVICE CODE 66 INTERFACE TESTING
 6543                       /       SET LIFT RIBBON (AC=2)
 6544   4542  6506          LQLS
 6545   4543  5776*         JMP T1LA        /EXECUTE NORMAL LA TYPE DIAGNOSTIC (DEVICE CODE=66)
 6546
 6547
 6548   4570  3436
 6549   4571  4600
 6550   4572  0740
 6551   4573  4005
 6552   4574  0002
 6553   4575  3426
 6554   4576  0200
 6555   4577  5000
               4600   PAGE
 6556                 /THE FOLLOWING TESTS CHECK OUT PARALLEL I/O INTERFACE LOGIC WHICH
 6557                 /       CAN ONLY BE CHECKED USING A SPECIAL EXTERNAL HARDWARE SIMULATOR.
 6558
 6559                 /TEST 10 - SIMULATOR REQUIRED - VERIFY IN/OUT AND DATA INTERFACE
 6560                 /          CONNECTOR.
 6561
 6562   4600  4446   T10LS,  LOOPPC
 6563   4601  1377          TAD (10
 6564   4602  3140          DCA TSTNU       /SETUP TEST NUMBER FOR ERROR DISPLAY.
 6565   4603  6506          LQLS            /CLEAR LIFT RIBBON FLOP - SHOULD ALREADY BE CLEAR
 6566   4604  6507          LQRE            /ENABLE PARALLEL I/O SIMULATOR
 6567   4605  6504          LQPC            /ZERO INTERFACE BUFFER AND SWITCH IN/OUT
 6568   4606  6503          LQMC            /       TO LOW BY SETTING ALL
 6569   4607  7040          CMA             /       SIMULATOR STROBE FLOPS.
 6570   4610  6502          LQMP
 6571   4611  6501          LQRB            /READ & VERIFY THAT IN DATA = 7777
 6572   4612  7040          CMA
 6573   4613  7440          SZA
 6574   4614  4450          ERROR           /IN/OUT FAILED TO DISABLED INTERFACE BUFFER
 6575                       /       OUTPUT. AC CONTAINS DATA READ.
 6576   4615  7040          CMA
 6577   4616  6507          LQRE            /ISSUE 'RESTORE' TO SET IN/OUT = H
 6578   4617  7300          CLA CLL
 6579   4620  6501          LQRB            /READ & VERIFY THAT 'IN' DATA = 0000
 6580   4621  7440          SZA
```

SEQ 0147

```
6581  4622  4450          ERROR           /IN/OUT FAILED TO ENABLE INTERFACE BUFFER OUTPUT.
6582  4623  6505          LQRS            /READ STATUS & VERIFY THAT ALL READY FLAGS=0.
6583  4624  7440          SZA             /       ISSUE CLEAR FLAG.
6584  4625  4450          ERROR           /STATUS INCORRECT - AC = STATUS -SHOULD BE ZERO
6585  4626  6500          LQSK            /VERIFY NO-SKIP
6586  4627  7410          SKP
6587  4630  4450          ERROR           /LQSK SKIPPED WITH ALL FLAGS CLEAR
6588  4631  4447          DONLOP
6589
6590                      /TEST 11 - SIMULATOR REQUIRED. TEST PAPER STROBE AND PAPER READY LOGIC
6591
6592  4632  4446  T11LS,  LOOPPC
6593  4633  6502          LQMP            /ISSUE PAPER STROBE
6594  4634  6500          LQSK            /VERIFY SKIP
6595  4635  4450          ERROR           /LQSK FAILED TO SKIP WITH PAPER READY FLAG SET
6596  4636  6505          LQRS            /READ STATUS AND VERIFY PAPER READY
6597  4637  1376          TAD (-400
6598  4640  7640          SZA CLA
6599  4641  4450          ERROR           /PAPER READY FLAG DID NOT SET
6600  4642  6507          LQRE            /ISSUE RESTORE TO CLEAR FLAG
6601  4643  6505          LQRS            /READ STATUS AND VERIFY ALL FLAGS=0
6602  4644  7440          SZA
6603  4645  4450          ERROR           /PAPER READY FLAG FAILED TO CLEAR
6604  4646  6500          LQSK            /VERIFY NO SKIP
6605  4647  7410          SKP
6606  4650  4450          ERROR           /LQSK SKIPPED WITH ALL FLAGS CLEAR
6607  4651  4447          DONLOP
6608
6609                      /TEST 12 - SIMULATOR REQUIRED. TEST CARRIAGE STROBE AND CARRIAGE READY LOGIC.
6610
6611  4652  4446  T12LS,  LOOPPC
6612  4653  6503          LQMC            /ISSUE CARRIAGE STROBE
6613  4654  6500          LQSK            /VERIFY SKIP
6614  4655  4450          ERROR           /LQSK FAILED TO SKIP WITH CARRIAGE RDY FLAG SET
6615  4656  6505          LQRS            /READ STATUS AND VERIFY CARRIAGE READY
6616  4657  1375          TAD (-1000
6617  4660  7640          SZA CLA
6618  4661  4450          ERROR           /CARRIAGE READY FLAG DID NOT SET.
6619  4662  6507          LQRE            /ISSUE RESTORE TO CLEAR FLAG
6620  4663  6505          LQRS            /READ STATUS AND VERIFY ALL FLAGS = 0.
6621  4664  7440          SZA
6622  4665  4450          ERROR           /CARRIAGE READY FLAG FAILED TO CLEAR
6623  4666  6500          LQSK            /VERIFY NO SKIP
6624  4667  7410          SKP
6625  4670  4450          ERROR           /LQSK SKIPPED WITH ALL FLAGS CLEAR
6626  4671  4447          DONLOP
6627
6628                      /TEST 13 - SIMULATOR REQUIRED. TEST CHARACTER STROBE AND CHAR READY LOGIC.
6629
6630  4672  4446  T13LS,  LOOPPC
6631  4673  6504          LQPC            /ISSUE CHARACTER STROBE
6632  4674  6500          LQSK            /VERIFY SKIP
6633  4675  4450          ERROR           /LQSK FAILED TO SKIP WITH CHAR RDY FLAG SET
6634  4676  6505          LQRS            /READ STATUS AND VERIFY CHARACTER READY
6635  4677  1374          TAD (-2000
```


SEQ 0148

```
6636  4700  7640          SZA CLA
6637  4701  4450          ERROR           /CHARACTER READY FLAG DID NOT SET
6638  4702  6507          LQRE            /ISSUE RESTORE TO CLEAR FLAG
6639  4703  6505          LQRS            /READ STATUS AND VERIFY ALL FLAGS=0
6640  4704  7440          SZA
6641  4705  4450          ERROR           /CHAR RDY FLAG FAILED TO CLEAR
6642  4706  6500          LQSK            /VERIFY NO SKIP
6643  4707  7410          SKP
6644  4710  4450          ERROR           /LQSK SKIPPED WITH ALL FLAGS CLEAR
6645  4711  4447          DONLOP
6646
6647                      /TEST 14 - SIMULATOR REQUIRED. TEST PRINTER READY LOGIC.
6648
6649  4712  4446  T14LS,  LOOPPC
6650  4713  6502          LQMP            /ACTIVATE PRINTER READY INPUT - REQUIRES
6651  4714  6503          LQMC            /       ISSUEING CARRIAGE STROBE AND PAPER STROBE
6652  4715  6500          LQSK            /VERIFY SKIP
6653  4716  4450          ERROR           /LQSK FAILED TO SKIP WITH PTR RDY FLAG SET
6654  4717  6505          LQRS
6655  4720  1373          TAD (-4000
6656  4721  7640          SZA CLA
6657  4722  4450          ERROR           /PRINTER READY FLAG DID NOT SET
6658  4723  6507          LQRE            /ISSUE RESTORE TO CLEAR FLAG
6659  4724  6505          LQRS            /READ STATUS AND VERIFY ALL FLAGS = 0
6660  4725  7440          SZA
6661  4726  4450          ERROR           /PTR RDY FLAG FAILED TO CLEAR
6662  4727  6500          LQSK            /VERIFY NO SKIP
6663  4730  7410          SKP
6664  4731  4450          ERROR           /LQSK SKIPPED WITH ALL FLAGS CLEAR.
6665  4732  4447          DONLOP
6666
6667                      /TEST 15 - SIMULATOR REQUIRED. TEST CHECK LOGIC.
6668
6669  4733  4446  T15LS,  LOOPPC
6670  4734  6502          LQMP            /ACTIVATE CHECK INPUT - REQUIRES
6671  4735  6504          LQPC            /       ISSUEING PAPER STROBE AND CHAR STROBE
6672  4736  6500          LQSK            /VERIFY SKIP
6673  4737  4450          ERROR           /LQSK FAILED TO SKIP WITH CHECK SET
6674  4740  6505          LQRS
6675  4741  1372          TAD (-40
6676  4742  7640          SZA CLA
6677  4743  4450          ERROR           /CHECK FLAG DID NOT SET
6678  4744  6507          LQRE            /ISSUE RESTORE TO CLEAR ALL FLAGS
6679  4745  6505          LQRS            /READ AND VERIFY STATUS = 0
6680  4746  7440          SZA
6681  4747  4450          ERROR           /RESTORE FAILED TO CLEAR CHECK FLAG
6682  4750  6500          LQSK            /VERIFY NO SKIP
6683  4751  7410          SKP
6684  4752  4450          ERROR           /LQSK SKIPPED WITH ALL FLAGS CLEAR.
6685  4753  4447          DONLOP
6686  4754  7300          CLA CLL
6687  4755  3140          DCA TSTNU
6688  4756  5771*         JMP NOSIM1
6689
6690
```

```
 6691
 6692
 6693    4771  4472
 6694    4772  7740
 6695    4773  4000
 6696    4774  6000
 6697    4775  7000
 6698    4776  7400
 6699    4777  0010
               5000          *5000
 6700                        /TEST 1 - INITIALIZE [CAF] PART 1 / FLAG DETECTION PART 1
 6701                        /
 6702                        / (A)   IF AN RX01 MICROCONTROLLER IS NOT CABLED TO THE RX8 INTERFACE,
 6703                        /       THEN ALL FLAGS (DONE, TRANSFER REQUEST, AND ERROR)
 6704                        /       SHOULD HAVE BEEN CLEARED BY INITIALIZE (IF EVER SET).
 6705                        /       NOTE-FOR THE VT78 SYSTEM CAF DOES NOT CLEAR INTERFACE XFER REGISTER
 6706                        /
 6707                        / (B)   IF AN RX01 MICROCONTROLLER IS CABLED TO THE RX8 INTERFACE,
 6708                        /       THEN INITIALIZE SHOULD HAVE SET THE DONE FLAG BECAUSE
 6709                        /       ANY INIT OF THE RX01 MICROCONTROLLER IS AN IMPLIED READ SECTOR
 6710                        /       OF TRACK 0 SECTOR 1 (FOR SYSTEMS PROGRAMMING BOOTSTRAP APPLICATIONS).
 6711                        /
 6712                        /       THEREFORE, ANY ERROR (EXCEPT PARITY) THAT MAY OCCUR FROM A NORMAL
 6713                        /       "READ SECTOR" COMMAND MAY OCCUR HERE CAUSEING THE ERROR FLAG TO SET, AND
 6714                        /       DISPLAYING THE ERROR STATUS WITHIN THE TRANSFER REGISTER AT "DONE".
 6715                        /
 6716                        /       THE TRANSFER REQUEST FLAG SHOULD BE CLEARED.
 6717                        /
 6718                        /
 6719    5000  4465    PRETEST,GETSR           /GET PSEUDO SWITCH REGISTER FROM FIELD 0
 6720    5001  0377          AND (0010
 6721    5002  7640          SZA CLA           /EXECUTE FLOPPY INTERFACE TEST?????
 6722    5003  4443          C1EOP             /NO
 6723    5004  6002          IOF
 6724    5005  7240          CLA CMA
 6725    5006  3136          DCA ECONSI        /SET FLAG INDICATING THAT A CONSOLE INTERRUPT IS POSSIBLE NOW
 6726    5007  4141          JMS PATCH         /SETUP INTERRUPT SERVICE LINKAGE
 6727    5010  6200          SKP1CHN
 6728    5011  4345    PFM,  JMS PFMES                 /PRINT "FLOPPY INTERF TESTING"
 6729                                                  /MESSAGE IF NOT UNDER APT CONTROL.
 6730    5012  1776'         TAD KJILD                 /MODIFY DONLOP ROUTINE.
 6731    5013  3775'         DCA LLLD
 6732    5014  4446    T1,   LOOPPC
 6733    5015  6007          CAF               /IN CASE FLOPPY SIMULATOR IS IN USE SETUP FLOPPY
 6734                                          /TO 'UNCABLED'(NO RX01) STATE.
 6735                                          /SET PARALLEL I/O MODE TO LQ AND CLEAR FLOPPY
 6736                                          /FLAGS,DISABLE FLOPPY DATA LOOPBACK TO ERRORL.
 6737    5016  7300          CLA CLL           /ENABLE PARALLEL I/O SIMULATOR AND SETUP FLOPPY
 6738    5017  6502          LQMP              /TO NORMAL 'UNCABLED' STATE(1>DONE,1>XFER RQSTL
 6739                                          /1>OUTL,1>ERRORL,1>RXDATAL).
 6740    5020  7300          CLA CLL
 6741    5021  4466          GETHW3                    /SETUP RXHERE
 6742    5022  0374          AND (2200
 6743    5023  3133          DCA RXHERE                /RXHERE=0 IF RX01 IS CABLED TO INTERFACE.
 6744    5024  6753          STF
```



```
 6745    5025  7410          SKP
 6746    5026  4450    E0PRE,  EPRROR                  /UNEXPECTED TRANSFER REQUEST FLAG
 6747    5027  6754          SER
 6748    5030  7410          SKP
 6749    5031  4450    E2PRE,  ERROR                   /UNEXPECTED ERROR FLAG
 6750                        /
 6751                        /*****************************************************************************
 6752                        /*****************************************************************************
 6753                        /
 6754                        /IF AN RX01 MICROCONTROLLER IS CABLED TO THE RX8 INTERFACE
 6755                        /THEN THE DONE FLAG SHOULD BE SET
 6756                        /
 6757    5032  1133          TAD RXHERE
 6758    5033  7640          SZA CLA
 6759    5034  5253          JMP NORX01
 6760    5035  4464          WAIT
 6761    5036  6755          SDN
 6762    5037  5235          JMP     .-2               /WAIT FOR DONE FLAG
 6763                        /
 6764                        /*****************************************************************************
 6765                        /*****************************************************************************
 6766                        /THE ENTIRE STATUS WORD IS DISPLAYED IN THE TRANSFER REGISTER AT ERROR/DONE TIME.
 6767                        /
 6768                        /IF AN RX01 CONTROLLER IS CABLED TO THE RX8 INTERFACE
 6769                        / (AND DRIVE 0 IS READY THEN THE STATUS SHOULD INDICATE " SEL DRV RDY" ), ALSO
 6770                        /DELETED DATA MAY = 1 IF TRACK 0/SECTOR 1 WAS WRITTEN WITH DELETED DATA
 6771                        /AND "INIT DONE" SHOULD BE SET.
 6772                        /
 6773    5040  4466          GETHW3                  /IS DRIVE 0 READY?
 6774    5041  0373          AND (6000
 6775    5042  7650          SNA CLA
 6776    5043  5247          JMP RDY                 /YES
 6777    5044  1372          TAD (0277               /NO
 6778    5045  3134          DCA COMP
 6779    5046  5252          JMP NORX01+1
 6780    5047  1372    RDY,  TAD (0277
 6781    5050  3134          DCA COMP
 6782                        /
 6783                        /
 6784    5051  1371          TAD (40                 /PROGRAM EXPECTS DRIVE 0 TO BE READY
 6785                        /
 6786                        /
 6787                        ////////////////////////////////////////////////////////////////////////////
 6788                        /
 6789                        /       4       5       -       -       8       9       10      11      /
 6790                        /
 6791                        /       SEL                             WRITE   INIT    PAR             /
 6792                        /       DRIVE   DD                      PROTECT [DONE]          CRC     /
 6793                        /       RDY                                             (N/A)           /
 6794                        /
 6795                        ////////////////////////////////////////////////////////////////////////////
 6796                        /
 6797                        /
 6798    5052  7107          CLL IAC RTL             / 4  [INIT] DONE OR 204
 6799    5053  3132    NORX01, DCA GOOD
```

SEQ 0151

```
6800    5054  1132          TAD GOOD                        /LOAD MQ FOR DISPLAY
6801    5055  7421          MQL
6802    5056  6752          XDR                             /TRANSFER DATA REGISTER FROM RX01 CONTROL
6803                                                        /NOTE: IF NO RX01 IS CABLED ,THEN
6804                                                        /THIS XDR INST WILL CAUSE AC(=0) > INTERFACE REGISTER,
6805    5057  3130          DCA BLANK                       /ACTUAL STATUS FROM (INIT)
6806    5060  1130          TAD BLANK
6807    5061  0134          AND     COMP
6808    5062  3131          DCA EAC                         /STATUS MINUS DELETED DATA (BIT 5)
6809    5063  1131          TAD EAC
6810    5064  7041          CIA
6811    5065  1132          TAD GOOD                        /EXPECTED
6812    5066  7650          SNA CLA
6813    5067  5272          JMP .+3                         /OK
6814    5070  1131          TAD EAC
6815    5071  4450  E1PRE,  ERROR                           / [INIT] STATUS NOT = EXPECTED
6816                                                        /AC,MQ=ACTUAL STATUS,EXPECTED STATUS
6817                /
6818                /IF AN RX01 MICROCONTROLLER IS CABLED TO THE RX8 INTERFACE
6819                /THEN THE PREVIOUS "SDN" SHOULD HAVE CLEARED THE DONE FLAG, BUT
6820                /
6821                /IF AN RX01 MICROCONTROLLER IS NOT CABLED TO THE RX8 INTERFACE
6822                /THEN INITIALIZE SHOULD HAVE CLEARED THE DONE FLAG
6823                /
6824                /TECHNICAL NOTE:
6825                /
6826                /IF THE DONE FLAG IS SET, AND IF THE INTERRUPT ENABLE FLIP-FLOP IS SET ILLEGALLY,
6827                /THEN AN "UNEXPECTED RX01 INTERRUPT" WILL OCCUR IN TEST 2 (IF AN RX01 CONTROLLER
6828                / IS CABLED TO THE RX8 INTERFACE) OR IN TEST 3 WHEN THE MAINTENANCE FLIP-
6829                /FLOP "SETS ALL FLAGS"
6830                /
6831    5072  6755          SDN
6832    5073  7410          SKP
6833    5074  4450  E4PRE,  ERROR                           /UNEXPECTED DONE FLAG
6834    5075  4447          DONLOP
6835
6836
6837                /TEST 2 - FLAG DETECTION PART II / " C " LINES VERIFICATION PART I
6838                /
6839                /*************************************************************************
6840                /*************************************************************************
6841                /
6842                /IF AN RX01 MICROCONTROLLER IS CABLED TO THE RX8 INTERFACE
6843                /THEN DON'T EXECUTE THIS TEST
6844                /BECAUSE ISSUING THE IOT LCD WITH THE AC = 177
6845                /RESEMBLES A COMMAND TO THE RX01
6846                /
6847    5076  4446  T2,     LOOPPC
6848    5077  1133          TAD RXHERE
6849    5100  7650          SNA CLA
6850    5101  5321          JMP T3
6851    5102  3132          DCA GOOD
6852                /*************************************************************************
6853                /*************************************************************************
6854                /
```


SEQ 0152

```
6855                /THE PURPOSE OF THIS TEST IS TO VERIFY THAT THE LCD (LOAD COMMAND REGISTER)
6856                /IOT 6751 DOES NOT SET THE MAINTENANCE FLIP-FLOP WHEN THE CONTENTS
6857                /OF THE AC = 177 AT THE TIME THE LCD IOT IS ISSUED.
6858                /
6859                /
6860                /TECHNICAL NOTE:
6861                /
6862                /IF AN ERROR OCCURS, THEN IT IS ASSUMED (CAF) INIT FAILED TO CLEAR THE
6863                /MAINTENANCE FLIP-FLOP, OR, THAT THE ISSUING OF THE LCD IOT REALLY
6864                / SET THE MAINTENANCE FLIP-FLOP INSTEAD OF CLEARING .
6865                /
6866                / " C " LINES VERIFICATION PART I
6867                /
6868    5103  1370          TAD (177)
6869    5104  6751          LCD                     /MAINTENANCE MODE <OFF>
6870                /THE (AC) SHOULD = 0 BECAUSE IOT LCD 6751 SHOULD CLEAR THE AC
6871                /
6872    5105  7440          SZA
6873    5106  4450  E0,     ERROR                           / IOT 6751 DID NOT CLEAR THE AC
6874                /
6875                /FLAG DETECTION PART II
6876                /
6877                /THE PURPOSE OF THIS TEST IS TO VERIFY THAT ISSUING IOT LCD 6751 WITH
6878                /THE AC = 177 DOES NOT SET THE MAINTENANCE FLIP-FLOP
6879                /WHICH IN TURN WOULD SET ALL FLAGS
6880                /
6881                /THEREFORE ALL FLAGS SHOULD BE CLEARED
6882                /
6883    5107  6753          STR
6884    5110  7410          SKP
6885    5111  4450  E1,     ERROR                           /UNEXPECTED TRANSFER REQUEST FLAG
6886    5112  6754          SER
6887    5113  7410          SKP
6888    5114  4450  E2,     ERROR                           /UNEXPECTED ERROR FLAG
6889    5115  6755          SDN
6890    5116  7410          SKP
6891    5117  4450  E3,     ERROR                           /UNEXPECTED DONE FLAG
6892    5120  4447          DONLOP
6893                /
6894                /TEST 3 - DIRECTION OF IOT XDR (6752) PART I / IOT DECODING PART I
6895                /
6896                /       - " C " LINES VERIFICATON PART II
6897                /
6898                /THE PURPOSE OF THIS TEST IS TO VERIFY THAT
6899                /ISSUING THE IOT XDR (TRANSFER DATA REGISTER) 6752 DOES NOT CLEAR
6900                /THE MAINTENANCE FLIP-FLOP
6901                /
6902                /TECHNICAL NOTE:
6903                /
6904                /IF THE CONTENTS OF THE TRANSFER REGISTER IS NOT = 200, THEN IT MUST
6905                /BE ASSUMED THAT THE SECOND LCD IOT CLEARED THE MAINTENANCE FLIP-FLOP
6906                /OR THAT IOT XDR CLEARED THE MAINTENANCE FLIP-FLOP
6907                /
6908    5121  4446  T3,     LOOPPC
6909    5122  3132          DCA GOOD
```

```
6910    5123  1367            TAD (200)
6911    5124  6751            LCD                     / MAINTENANCE MODE <ON>
6912                    /THE (AC) SHOULD = 0 AFTER ISSUING IOT LCD 6751
6913                    /
6914    5125  7440            SZA
6915    5126  4450    E11,    ERROR                   / IOT LCD 6751 FAILED TO CLEAR AC
6916                    /
6917    5127  1367            TAD (200)
6918    5130  6751            LCD                     / MAINTENANCE MODE <ON>, AGAIN
6919    5131  6752            XDR                     /CONTENTS OF TRANSFER REGISTER
6920    5132  3131            DCA EAC                 /SAVE
6921    5133  1131            TAD EAC
6922    5134  1366            TAD (-200)              /COMPARE WITH "EXPECTED"
6923    5135  7650            SNA CLA
6924    5136  5343            JMP .+5                 / OK
6925    5137  1367            TAD (200)
6926    5140  7421            MQL                     / "EXPECTED" RESULT
6927    5141  1131            TAD EAC                 / "ACTUAL" RESULT
6928    5142  4450    E10,    ERROR                   /TRANSFER REGISTER NOT =200
                                                      /AC,MQ=ACTUAL,EXPECTED RESULT
6929
6930    5143  4447            DONLOP
6931    5144  5765'           JMP T4
6932
6933
6934                    /ROUTINE TO PRINT "FLOPPY INTERFACE TESTING" MESSAGE
6935
6936    5145  0000    PFMES,  0
6937    5146  4432            C1CRLF
6938    5147  4434            C1PRNT
6939    5150  5242            FLMES
6940    5151  4434            C1PRNT
6941    5152  3306            TESMES
6942    5153  4432            C1CRLF
6943    5154  5745            JMP I PFMES
6944
6945
6946
6947    5165  5200
6948    5166  7600
6949    5167  0200
6950    5170  0177
6951    5171  0040
6952    5172  0277
6953    5173  6000
6954    5174  2200
6955    5175  2257
6956    5176  2267
6957    5177  0010
              5200          PAGE
6958                    /TEST 4 = FLAG DETECTION PART III / " C " LINES VERIFICATION PART III
6959                    /
6960                    /       THE SETTING OF THE MAINTENANCE FLIP-FLOP SHOULD "DIRECT SET" ALL
6961                    /       FLAGS (DONE, TRANSFER REQUEST, AND ERROR).
6962                    /
6963    5200  4446    T4,     LOOPPC
```



```
6964    5201  1377            TAD (200)
6965    5202  6751            LCD                     / MAINTENANCE <ON>
6966    5203  6755            SDN
6967    5204  4450    E20,    ERROR                   /MISSING DONE FLAG
6968    5205  6753            STR
6969    5206  4450    E21,    ERROR                   /MISSING TRANSFER REQUEST FLAG
6970    5207  6754            SFR
6971    5210  4450    E22,    ERROR                   /MISSING ERROR FLAG
6972                    /
6973                    /ALL FLAGS SHOULD REMAIN " DIRECT SET "
6974                    /BECAUSE THE MAINTENANCE FLIP-FLOP SHOULD STILL BE SET
6975                    /
6976                    /IF THE FLAGS ARE "MISSING" THEN IT IS ASSUMED THAT THE PREVIOUS
6977                    /FLAG TESTING ACTUALLY (CLEARED) THE FLAGS.
6978                    /
6979    5211  6755            SDN
6980    5212  4450    E23,    ERROR                   /MISSING DONE FLAG
6981    5213  6753            STR
6982    5214  4450    E24,    ERROR                   /MISSING TRANSFER REQUEST FLAG
6983    5215  6754            SFR
6984    5216  4450    E25,    ERROR                   /MISSING ERROR FLAG
6985                    / " C " LINES VERIFICATION PART III
6986                    /
6987                    /THE FOLLOWING RX8 INTERFACE IOT'S SHOULD NOT CLEAR THE AC:
6988                    /
6989                    /IOT'S: SDN(6755), SER(6754), OR STR(6753)
6990                    /
6991    5217  7240            STA
6992    5220  3132            DCA GOOD
6993    5221  1132            TAD GOOD
6994    5222  6755            SDN
6995    5223  7000            NOP
6996    5224  7650            SNA CLA
6997    5225  4450    E26,    ERROR                   / IOT SDN (6755) CLEARED THE AC
6998    5226  1132            TAD GOOD
6999    5227  6753            STR
7000    5230  7000            NOP
7001    5231  7650            SNA CLA
7002    5232  4450    E27,    ERROR                   / IOT STR (6753) CLEARED THE AC
7003    5233  1132            TAD GOOD
7004    5234  6754            SFR
7005    5235  7000            NOP
7006    5236  7650            SNA CLA
7007    5237  4450    E28,    ERROR                   / IOT SER (6754) CLEARED THE AC
7008    5240  4447            DONLOP
7009    5241  5253            JMP T5
7010    5242  0614    FLMES,  TEXT    "FLOPPY INTERFACE "
        5243  1720
        5244  2031
        5245  4011
        5246  1624
        5247  0522
        5250  0601
        5251  0305
        5252  4000
```

```
                        /TEST 5 - TRANSFER REGISTER DIRECTION TESTING (PART II)
                        /
                        /       - " C " LINES VERIFICATION PART IV
                        /
                        /WITH THE MAINTENANCE FLIP-FLOP SET THE PROGRAM WILL VERIFY THE DIRECTION
                        /AND TRANSFER MODE (8-BIT MODE INCLUSIVE "OR", AND 12-BIT MODE "JAM")
                        /TRANSFERS INTO THE ACCUMULATOR FROM THE RX8 TRANSFER REGISTER BY ISSUING
                        /IOT "XDR" (TRANSFER DATA REGISTER) 6752 AFTER PREVIOUSLY LOADING THE
                        /THE TRANSFER REGISTER WITH THE CONTENTS OF THE ACCUMULATOR REPRESENT-
                        /ATIVE OF THE FOLLOWING PATTERNS WHEN THE "LCD" IOT 6751 IS ISSUED.
                        /
                        /               (1)     200     - MAINTENANCE MODE <ON>
                        /               (2)     376     -
                        /               (3)     375     -
                        /               (4)     373     - (BYTES 2 THRU 7)
                        /               (5)     367     - (INCLUSIVE "OR" )
                        /               (6)     357     -
                        /               (7)     337     -
                        /               (8)    7677     - (WORD 8 = "JAM " )
                        /
                        /THE LCD IOT WILL BE ISSUED A TOTAL OF 8 TIMES.
                        /
                        /THE 1ST LCD IOT WILL BE ISSUED WITH THE AC = 200 WHICH INITIALLY SETS THE
                        /MAINTENANCE FLIP-FLOP THEREBY GUARANTEEING THE CONTENTS OF THE TRANSFER
                        /REGISTER AFTER EACH SUCCEEDING LCD IOT.
                        /
                        /LCD IOT'S 2 THUR 8 ARE ISSUED WITH THE ACCUMULATOR CONTAINING THE PATTERNS
                        /DESCRIBED ABOVE.
                        /
                        /ALL PATTERNS EXCEPT WORD 8 (7677) TEST THE INCLUSIVE "OR" TRANSFER OF
                        /THE RX8 INTERFACE TRANSFER REGISTER.  WORD 8 TESTS THE 12-BIT "JAM" TRANSFER.
                        /
5253  4446      T5,     LOOPPC
5254  1377              TAD (200)
5255  6751              LCD                             /MAINTENANCE MODE <ON>
5256  7350              CLL STA RAR                     / 3777
5257  3130              DCA BLANK
5260  1130      T5B,    TAD BLANK
5261  7120              STL
5262  7500              SMA
5263  7100              CLL
5264  7004              RAL
5265  3130              DCA BLANK
5266  1130              TAD BLANK                       / (BLANK) = (AC) BEFORE LCD IOT 6751
5267  6751              LCD                             /  TO
                        /
                        / " C " LINES VERIFICATION PART IV
                        /
                        /THE PURPOSE OF THIS TEST IS TO VERIFY THAT SUCCEEDING LCD IOT'S(6751)
                        /TRANSFER THE (AC) INTO THE DATA REGISTER CLEARING THE ACCUMULATOR
                        /
5270  3131              DCA EAC                         / (AC) AFTER ISSUING IOT LCD (6751)
5271  3132              DCA GOOD                        / PROGRAM EXPECTS AC = 0
```



```
5272  1131              TAD EAC
5273  7440              SZA
5274  4450      E42,    ERROR                           / IOT LCD (6751) DIDN'T CLEAR THE AC
                        /
                        /TRANSFER DIRECTION PART II
                        /
5275  6752              XDR                             /  FROM
5276  3131              DCA EAC
5277  1376              TAD (100)
5300  0130              AND BLANK
5301  7106              CLL RTL
5302  7006              RTL                             / LINK = 1 FOR 8-BIT MODE
5303  7006              RTL
```

```
7079  5304  1130          TAD BLANK
7080  5305  7430          SZL
7081  5306  0375          AND (377)                       / 8-BIT BYTE "GOOD" MASK
7082  5307  3132          DCA GOOD
7083  5310  1132          TAD GOOD                        /LOAD MQ FOR DISPLAY ON ERROR
7084  5311  7421          MQL
7085  5312  1132          TAD GOOD                        /EXPECTED RESULT
7086  5313  7041          CIA
7087  5314  1131          TAD EAC                         /ACTUAL RESULT
7088  5315  7650          SNA CLA
7089  5316  5321          JMP .+3                         /COMPARED OK
7090  5317  1131          TAD EAC
7091  5320  4450  E40,    ERROR                           / TRANSFER REGISTER NOT = "GOOD"
7092                                                      /AC,MQ=ACTUAL,EXPECTED RESULTS
7093                      /
7094  5321  1130          TAD BLANK
7095  5322  0376          AND (100)
7096  5323  7640          SZA CLA
7097  5324  5260          JMP T5B                         /UNTIL (BLANK) = 7677
7098  5325  4447          DONLOP
7099
7100
7101                      /TEST 6
7102                      /
7103                      /RX8 IOT DECODING VERIFICATION PART II
7104                      /
7105                      /*****************************************************************************
7106                      /*****************************************************************************
7107                      /
7108                      /NOTE-CLEARING OF THE MAINTENANCE F/F ON THE VT78 DOES NOT
7109                      /RESEMBLE A FILL BUFFER COMMAND
7110                      /
7111  5326  4446  T6,     LOOPPC
7112                      /*****************************************************************************
7113                      /*****************************************************************************
7114                      /
7115                      /THE MAINTENANCE FLIP-FLOP HAS PREVIOUSLY BEEN VERIFIED TO SET AND CLEAR,
7116                      /THE IOT UNDER TEST SHOULD "SKIP AND CLEAR" [ONLY] ITS RESPECTIVE FLAG,
7117                      /ALL OTHER FLAGS SHOULD REMAIN UNCHANGED
7118                      /
7119                      / (I.E. THE SDN IOT 6755 SHOULD SKIP AND CLEAR ONLY THE DONE FLAG, ALL
7120                      /OTHER FLAGS SHOULD REMAIN SET)
7121                      /
7122  5327  1377          TAD (200)
7123  5330  6751          LCD
7124  5331  6751          LCD             / MAINTENANCE <ON> / <OFF>
7125  5332  6752          XDR
7126  5333  7440          SZA
7127  5334  4450  E56,    ERROR                           /TRANSFER REGISTER NOT = 0
7128  5335  6755          SDN
7129  5336  4450  E50,    ERROR                           /DONE FLAG WASN'T SET, OR
7130                                                      /IOT LCD OR XDR CLEARED THE DONE FLAG
7131  5337  6755          SDN
7132  5340  7410          SKP
7133  5341  4450  E53,    ERROR                           /IOT SDN DIDN'T SKIP AND CLEAR
```



```
7134  5342  6753          STR
7135  5343  4450  E51,    ERROR                           /TRANSFER REQUEST FLAG WASN'T EVER SET, OR
7136                                                      /IOT LCD, OR SDN OR XDR CLEARED THE TR FLAG
7137  5344  6753          STR
7138  5345  7410          SKP
7139  5346  4450  E54,    ERROR                           /IOT STR DIDN'T "SKIP AND CLEAR"
7140  5347  6754          SER
7141  5350  4450  E52,    ERROR                           /ERROR FLAG WASN'T EVER SET, OR
7142                                                      /IOTS LCD OR SDN OR XDR OR STR CLEARED THE ERROR FLAG
7143  5351  6754          SER
7144  5352  7410          SKP
7145  5353  4450  E55,    ERROR                           /IOT SER DIDN'T "SKIP AND CLEAR"
7146  5354  4447          DONLOP
7147  5355  5774'         JMP T7
7148
7149
7150
7151
7152  5374  5400
7153  5375  0377
7154  5376  0100
7155  5377  0200
      5400        PAGE
7156              /TEST 7 - INTERRUPT TEST PART I / IOT DECODING VERIFICATION PART III
7157              /
7158              /INTERRUPT TEST PART I   (NO INTERRUPTS SHOULD OCCUR DURING THIS TEST)
7159              /
7160              /THE MAINTENANCE FLIP-FLOP HAS PREVIOUSLY BEEN VERIFIED TO DIRECT
7161              / SET ALL FLAGS AND THE INTERFACE IOT -SKIP ON DONE- "SDN" 6755 WAS
7162              /FOUND TO "SKIP AND CLEAR" SUCCESSFULLY,
7163              /
7164              /FIRST SET THE MAINTENANCE FLIP-FLOP WHICH IN TURN SETS ALL FLAGS,
7165              /
7166              /THEN ISSUE IOT INTR 6756 WITH THE AC = 0 CLEARING THE RX8 INTERRUPT ENABLE
7167              /NO INTERRUPTS SHOULD OCCUR
7168              /
7169  5400  4446  T7,     LOOPPC
7170  5401  6002          IOF
7171  5402  4141          JMS PATCH                       /SETUP INTERRUPT SERVICE LINKAGE TO RETURN TO THIS TEST
7172  5403  5414          E60
7173  5404  6035          KIE                             /DISABLE CONSOLE PACKAGE INTERRUPTS
7174  5405  6001          ION
7175  5406  1377          TAD (200)
7176  5407  6751          LCD
7177  5410  6756          INTR                            /INTERRUPT ENABLE FLIP-FLOP <OFF>
7178  5411  7000          NOP                             /...WAIT
7179  5412  7000          NOP                             /...PLENTY
7180  5413  7410          SKP                             /...OF TIME
7181  5414  4450  E60,    ERROR                           /UNEXPECTED INTERRUPT
7182              /
7183              /
7184              /*****************************************************************************
7185              /*****************************************************************************
7186              /
7187              /IOT DECODING PART III- IOT INTR 6756 DECODING VERIFICATION
```

SEQ 0159

```
                        /
                        /TECHNICAL NOTE:
                        /
                        /ALL FLAGS SHOULD REMAIN SET
                        /IF ANY FLAG IS MISSING,
                        /THEN IT IS ASSUMED THAT IOT "INTR" 6756 CLEARED THE FLAG(S)
                        /
 5415  6751                   LCD                             /MAINTENANCE MODE <OFF>
 5416  6756                   INTR                            /DISABLE THE INTERRUPT ENABLE F/F
 5417  6755                   SDN
 5420  4450           E61,    ERROR                           /MISSING DONE FLAG
 5421  6753                   STR
 5422  4450           E62,    ERROR                           /MISSING TRANSFER REQUEST FLAG
 5423  6754                   SER
 5424  4450           E63,    ERROR                           /MISSING ERROR FLAG
 5425  4447                   DONLOP
                        /
                        /TEST 10 - INTERRUPT TEST PART II
                        /
                        /INTERRUPT TEST PART II   (AN INTERRUPT SHOULD OCCUR IN THIS TEST).
                        /
                        /THE MAINTENANCE FLIP-FLOP HAS PREVIOUSLY BEEN VERIFIED TO DIRECT
                        / SET ALL FLAGS AND THE INTERFACE IOT -SKIP ON DONE- "SDN" 6755 WAS
                        /FOUND TO "SKIP AND CLEAR" SUCCESSFULLY,
                        /
                        /FIRST SET THE MAINTENANCE FLIP-FLOP
                        /WHICH SHOULD DIRECT SET THE DONE FLAG,
                        /THEN BY SETTING THE RX01 INTERRUPT ENABLE
                        /BY ISSUING THE IOT "INTR" 6756 WITH THE AC = 1.
                        /
                        /AN INTERRUPT REQUEST SHOULD BE ASSERTED,
                        /
                        /THE PROGRAM IS EXPECTING AN INTERRUPT.
                        /
                        /TECHNICAL NOTE:
                        /
                        /IF AN INTERRUPT DOES NOT OCCUR, THEN IT IS ASSUMED THAT ISSUING THE IOT
                        / "INTR" 6756 DID NOT SET THE RX8 INTERRUPT ENABLE, OR INTERRUPT REQUEST
                        /
 5426  4446           T10,    LOOPPC
 5427  6002                   IOF
 5430  4141                   JMS PATCH               /SETUP INT, LINKAGE TO RETURN TO THIS TEST
 5431  5444                   T70K
 5432  6035                   KIE                     /DISABLE CONSOLE PACKAGE INT,
 5433  1377                   TAD (200)
 5434  6751                   LCD                     /MAINTENANCE <ON>
 5435  6001                   ION
 5436  7201                   CLA IAC
 5437  6756                   INTR                    /RX01 INTERRUPT ENABLE <ON>
 5440  7000                   NOP
 5441  7000                   NOP
 5442  7000                   NOP
 5443  4450           E70,    ERROR                           /MISSING INTERRUPT
 5444  4447           T70K,   DONLOP
```


SEQ 0160

```
                        /TEST 11
                        /
                        /INTERRUPT TEST (PART III)  (NO INT, SHOULD OCCUR DURING THIS TEST).
                        /
                        /IOT INTR 6756 SHOULD CLEAR THE INTERRUPT ENABLE FLIP-FLOP, THEN
                        /
                        /WITH ALL FLAGS SET, NO INTERRUPTS SHOULD OCCUR
                        /
                        /TECHNICAL NOTE:
                        /
                        /IF AN UNEXPECTED PROGRAM INTERRUPT OCCURS FROM APPROXIMATELY THIS PC
                        /THEN THE RX PROGRAM INTERRUPT REQUEST TOOK TO LONG TO SET
                        /FROM THE PREVIOUS TEST.
                        /
                        /
 5445  4446           T11,    LOOPPC
 5446  6002                   IOF
 5447  4141                   JMS PATCH
 5450  5460                   E100                    /SETUP INT, LINKAGE TO RETURN TO THIS TEST
 5451  6035                   KIE
 5452  6756                   INTR                    /DISABLE CONSOLE PACKAGE INT,
 5453  6001                   ION                     /DISABLE RX8 INTERRUPT ENABLE
 5454  1377                   TAD (200)
 5455  6751                   LCD
 5456  7000                   NOP
 5457  7410                   SKP
 5460  4450           E100,   ERROR                           /UNEXPECTED INTERRUPT
 5461  4447                   DONLOP
                        /
                        /
                        /
                        /TEST 12
                        /
                        /INTERRUPT TEST (PART IV)   (NO INT, SHOULD OCCUR DURING THIS TEST).
                        /
                        /*****************************************************************************
                        /*****************************************************************************
                        /
                        /TOGGLING THE MAINTENANCE MODE <ON> / <OFF> SETS ALL FLAGS AND
                        /
                        /PERMITS IOT SDN TO CLEAR THE DONE FLAG
                        /
                        /THEREFORE NO INTERRUPTS SHOULD OCCUR (ONLY DONE FLAG RAISES AN INTERRUPT REQUEST)
                        /
 5462  4446           T12,    LOOPPC
 5463  6002                   IOF
 5464  4141                   JMS PATCH               /SETUP INTERRUPT LINKAGE TO RETURN TO THIS TEST
 5465  5503                   E110
 5466  6035                   KIE                     /DISABLE CONSOLE PACKAGE INT,
 5467  1377                   TAD (200)
 5470  6751                   LCD
```

```
7298  5471  6751          LCD                     /MAINTENANCE <ON> / <OFF>
7299  5472  6755          SDN
7300  5473  7000          NOP
7301  5474  7000          NOP                     /CLEAR THE DONE FLAG
7302  5475  6001          ION
7303  5476  7201          CLA IAC
7304  5477  6756          INTR                    /RX01 INTERRUPT ENABLE <ON>
7305  5500  7000          NOP
7306  5501  7000          NOP
7307  5502  7410          SKP                             /UNEXPECTED INTERRUPT
7308  5503  4450  E110,   ERROR                           /RX01 INT. EN <OFF>
7309  5504  6756          INTR
7310  5505  4447          DONLOP
7311  5506  5307          JMP T13
7312
7313                      /TEST 13 - INITIALIZE TEST PART II INIT / INTERRUPT TEST PART V
7314                      /
7315                      /*****************************************************************************
7316                      /*****************************************************************************
7317                      /
7318                      /IF AN RX01 IS CABLED TO THE RX8 THEN DON'T EXECUTE THIS TEST
7319                      /
7320  5507  4446  T13,    LOOPPC
7321  5510  1133          TAD RXHERE
7322  5511  7650          SNA CLA
7323  5512  5345          JMP FLDON
7324                      /*****************************************************************************
7325                      /*****************************************************************************
7326                      /
7327                      /INTERRUPT TEST PART V / INITIALIZE TEST PART II
7328                      /  (NO INTERRUPTS SHOULD OCCUR DURING THIS TEST).
7329                      /
7330                      /THE PURPOSE OF THIS TEST IS TO VERIFY THAT IOT INIT CLEARS THE INTERRUPT
7331                      /ENABLE FLIP-FLOP WHEN SET
7332                      /
7333  5513  6002          IOF
7334  5514  4141          JMS PATCH               /SETUP INT. LINKAGE TO RETURN TO THIS TEST
7335  5515  5527          E124
7336  5516  6035          KIE                     /DISABLE CONSOLE PACKAGE INTERRUPTS
7337  5517  6001          ION
7338  5520  7201          CLA IAC
7339  5521  6756          INTR                    / SET THE RX8 INTERRUPT ENABLE F/F
7340  5522  6757          INIT
7341                      /...BUT AN INTERRUPT SHOULD NOT OCCUR
7342                      /
7343                      /IF AN INTERRUPT OCCURS THEN IOT INIT FAILED TO CLEAR
7344                      /
7345                      /THE RX8 INTERRUPT ENABLE FLIP-FLOP
7346                      /
7347  5523  1377          TAD (200)
7348  5524  6751          LCD
7349  5525  6751          LCD                     / MAINTENANCE MODE <ON> / <OFF>
7350                      /
7351                      /THE DONE FLAG SHOULD BE SET, BUT NO INTERUPTS SHOULD OCCUR
7352                      /
```



```
7353  5526  7410          SKP
7354                      /
7355                      /RETURN TO HERE IF AN INTERRUPT OCCURED
7356                      /
7357  5527  4450  E124,   ERROR                           /UNEXPECTED INT.
7358                      /
7359                      /IOT "INIT" 6757 SHOULD CLEAR THE
7360                      /MAINTENANCE FLIP-FLOP, AND ALL FLAGS (DONE, TRANSFER REQUEST, AND ERROR).
7361                      /
7362  5530  7240          STA
7363  5531  6751          LCD                     /ALL 1'S TO TRANSFER REGISTER
7364  5532  6757          INIT                    / IOT 6757
7365  5533  6755          SDN
7366  5534  7410          SKP
7367  5535  4450  E120,   ERROR                           /UNEXPECTED DONE FLAG
7368  5536  6753          STR
7369  5537  7410          SKP
7370  5540  4450  E121,   ERROR                           /UNEXPECTED TRANSFER REQUEST FLAG
7371  5541  6754          SER
7372  5542  7410          SKP
7373  5543  4450  E122,   ERROR                           /UNEXPECTED ERROR FLAG
7374  5544  4447          DONLOP
7375  5545  4466  FLDON,   GETHW3                        /IS THE FLOPPY SIMULATOR IN USE?
7376  5546  0377          AND (0200
7377  5547  7640          SZA CLA
7378  5550  5776' T14S    JMP T14S                        /YES-CONTINUE WITH FLOPPY INTERFACE TESTING,
7379  5551  3140          DCA TSTNU                       /CLEAR TEST NUMBER
7380  5552  4443          C1EOP
7381
7382                      /WAIT FOR FLAG ROUTINE
7383
7384  5553  0000  XWAIT,  0
7385  5554  2366          ISZ H1
7386  5555  5753          JMP I XWAIT
7387  5556  2367          ISZ HANGER
7388  5557  5753          JMP I XWAIT
7389  5560  1353          TAD XWAIT
7390  5561  4450          ERROR                   /FLAG NEVER SET
7391  5562  1353          TAD XWAIT
7392  5563  1375          TAD (2
7393  5564  3353          DCA XWAIT
7394  5565  5753          JMP I XWAIT
7395  5566  0000  H1,     0
7396  5567  0000  HANGER, 0
7397
7398
7399  5575  0002
7400  5576  5600
7401  5577  0200
              5600        PAGE
7402                      /THE REMAINING FLOPPY INTERFACE TESTS REQUIRE A SPECIAL HARDWARE
7403                      /       SIMULATOR CONNECTED TO THE EXTERNAL FLOPPY PORT.
7404
7405  5600  4777' T14S,   JMS INTUN       /INITIALIZE PROG UNIT VARIABLES FOR UNIT A
7406  5601  4446          LOOPPC
```

SEQ 0163

```
7407    5602  4776'  MODAGN, JMS INTMOD       /INITIALIZE PROG MODE VARIABLES FOR 12 BIT MODE
7408    5603  6007           CAF              /INITIALIZE FLOPPY INTERFACE=MAINT MODE=OFF,
7409                                          /       MODE=12 BIT,UNIT=A,IN1,EN=OFF,
7410                                          /       RUNL=FALSE,FLAGS CLEARED,PARITY FLOP=CLEARED,
7411    5604  6507           LORE             /CLEAR PARALLEL I/O STROBE FLOPS AND ENABLE
7412                                          /       THE PARALLEL I/O SIMULATOR & THE FLOPPY
7413                                          /       RXDATAL TO ERRORL LOOPBACK.
7414    5605  1375           TAD (6017        /SETUP FLOPPY (VIA PARALLEL I/O INTERFACE BUFFER)
7415                                          /       TO NORMAL IDLE STATE(0>DONEL,1>XFER RQSTL,
7416                                          /       1>OUTL). NOTE PARALLEL I/O INVERTS DATA
7417                                          /       IN LQP MODE.
7418    5606  6502           LOMP             /ALSO SETS PAPER RDY VIA PAPER STROBE
7419    5607  3774'          DCA SHFTCT       /INITIALIZE SHIFT COUNT TO ZERO
7420    5610  1773'          TAD UNIT         /AC=0 FOR UNIT A, AC=1 FOR UNIT B
7421    5611  6750           SEL              /SETUP 'UNIT' (A OR B )
7422    5612  6505           LQRS             /VERIFY RUNL FALSE VIA PAPER READY
7423    5613  0372           AND (400         /FLAG = SET.
7424    5614  7650           SNA CLA
7425    5615  4450           ERROR            /EITHER CAF FAILED TO ENABLE PARALLEL I/O
7426                                          /       SIMULATOR OR FLOPPY RUNL IS TRUE.
7427                                          /NOTE: RUNL TRUE DISABLES PARALLEL I/O STROBE
7428                                          /       DECODER.
7429    5616  1771'          TAD LCDATA       /AC=2452 FOR 12 BIT MODE,AC=0125 FOR 8 BIT MODE
7430    5617  6751           LCD              /       MAINT BIT = 0 IN EITHER CASE.
7431    5620  6505           LQRS             /VERIFY THAT LCD CAUSES RUNL=TRUE
7432    5621  0372           AND (400
7433    5622  7640           SZA CLA
7434    5623  4450           ERROR            /LCD FAILED TO CAUSE RUNL TO GO TRUE.
7435    5624  1370           TAD (0017        /CHANGE DONEL TO 1 FOR UNIT UNDER TEST
7436    5625  1767'          TAD UDONE        /UDONE=2000 FOR UNIT A,4000 FOR UNIT B
7437    5626  6502           LOMP
7438    5627  6505           LQRS             /VERIFY THAT DONEL GOING H CAUSES RUNL=FALSE
7439                                          /       PAPER RDY FLAG SHOULD BE SET.
7440    5630  0372           AND (400
7441    5631  7650           SNA CLA
7442    5632  4450           ERROR            /DONEL FAILED TO CAUSE RUNL TO GO FALSE
7443    5633  0000    SHIFTO, 0/LQRE/LQPC     /SHIFT OUT FLOPPY INTERFACE REGISTER
7444                                          /       SHIFTL=RESTORE,SHIFT1L=CHAR, STROBE
7445    5634  2774'          ISZ SHFTCT       /UPDATE SHIFT COUNTER
7446    5635  7300           CLA CLL
7447    5636  1774'          TAD SHFTCT       /NO OF SHIFTS ISSUED?
7448    5637  1366           TAD (-10
7449    5640  7450           SNA
7450    5641  5250           JMP CKMODE       /8 = CHECK MODE
7451    5642  7510           SPA
7452    5643  5255           JMP SMORE        /<8 = TEST CURRENT RXDATA BIT & SHIFT.
7453    5644  1365           TAD (-4
7454    5645  7640           SZA CLA
7455    5646  5255           JMP SMORE        /8<SHIFT COUNT<12 = TEST CURRENT RXDAT & SHIFT
7456    5647  5257           JMP TSTPC        /12 = TEST PARITY BIT,DONE SHIFTING
7457    5650  1771'  CKMODE, TAD LCDATA       /CHECK FOR 8 OR 12 BIT MODE
7458    5651  7041           CIA
7459    5652  1764'          TAD DLCD8
7460    5653  7650           SNA CLA
7461    5654  5257           JMP TSTPC        /8 BIT MODE = TEST PARITY BIT
```


SEQ 0164

```
7462    5655  4763'  SMORE,  JMS TSTDAB       /TEST CURRENT RXDATA
7463    5656  5233           JMP SHIFTO       /SHIFT OUT AGAIN
7464    5657  4763'  TSTPC,  JMS TSTDAB       /TEST PARITY BIT=DONE WITH SHIFTING
7465    5660  3774'          DCA SHFTCT       /ZERO SHIFT COUNTER
7466    5661  4762'          JMS SHINDA       /SETUP SHIFT IN DATA
7467    5662  0000    SHIFTI, 0/LQRE/LQPC     /SHIFT IN FLOPPY INTERFACE REGISTER
7468    5663  2774'          ISZ SHFTCT       /UPDATE SHIFT COUNTER
7469                                          /SHIFTL=RESTORE;SHIFT1L=CHAR STROBE.
7470    5664  7300           CLA CLL
7471    5665  1774'          TAD SHFTCT       /NO OF SHIFTS ISSUED?
7472    5666  1366           TAD (-10
7473    5667  7450           SNA
7474    5670  5277           JMP CKIMOD       /8 = CHECK MODE
7475    5671  7510           SPA
7476    5672  5261           JMP SHIFTI-1     /<8 = SHIFT AGAIN
7477    5673  1365           TAD (-4
7478    5674  7640           SZA CLA
7479    5675  5261           JMP SHIFTI-1     /8<SHIFT COUNT<12 = SHIFT AGAIN
7480    5676  5304           JMP CKINDA       /DONE SHIFTING IN, CHECK DATA WORD THAT
7481                                          /       GOT SHIFTED IN.
7482    5677  1761'  CKIMOD, TAD XDRDATA      /CHECK FOR 8 OR 12 BIT MODE.
7483    5700  7041           CIA
7484    5701  1760'          TAD DXDR8
7485    5702  7640           SZA CLA
7486    5703  5261           JMP SHIFTI-1     /12 BIT MODE = CONTINUE SHIFTING
7487                  /DONE SHIFTING IN = CHECK DATA WORD IN INTERFACE REG.
7488
7489    5704  6753    CKINDA, STR              /TRANSFER REQUEST FLAG SHOULD BE CLEAR
7490    5705  7410           SKP
7491    5706  4450           ERROR            /TRANSFER REQUEST FLAG FALSELY SET
7492    5707  1370           TAD (0017
7493    5710  1767'          TAD UDONE        /CHANGE XFER RQSTL TO 0 FOR PROPER UNIT.
7494    5711  1757'          TAD UOUT
7495    5712  1756'          TAD UXFR
7496    5713  6502           LOMP
7497    5714  6753           STR
7498    5715  4450           ERROR            /CHANGING XFER RQSTL TO 0 FAILED TO SET FLAG
7499    5716  6752           XDR              /READ INTERFACE REGISTER INTO AC.
7500    5717  7421           MQL              /SAVE READ DATA IN MQ FOR ERROR DISPLAY
7501    5720  7701           ACL              /RESTORE DATA TO AC FROM MQ
7502    5721  7041           CIA
7503    5722  1761'          TAD XDRDATA      /COMPARE WITH EXPECTED DATA
7504                                          /EXPECTED DATA=0525 FOR 12 BIT MODE
7505                                          /   "      "  =0242 FOR 8 BIT MODE
7506    5723  7440           SZA
7507    5724  4450           ERROR            /BAD SHIFT IN = MQ CONTAINS ACTUAL DATA
7508                                          /       SHIFTED IN.
7509    5725  6505           LQRS             /VERIFY THAT XDR SETS RUNL TO TRUE
7510                                          /       PAPER RDY FLAG=CLEAR
7511    5726  0372           AND (400
7512    5727  7640           SZA CLA
7513    5730  4450           ERROR            /XDR FAILED TO CHANGE RUNL TO TRUE.
7514    5731  1370           TAD (0017        /CHANGE XFR REQ L TO 1 & OUTL TO 1.
7515    5732  1767'          TAD UDONE
7516    5733  6502           LOMP
```

```
7517  5734  6505          LQRS            /VERIFY THAT RUNL GOES FALSE
7518  5735  0355          AND (440        /NOTE:FOR UNIT B TESTING CHAR STROBE GETS SET
7519                                      /       BY LQPC USED IN SHIFTING ABOVE.
7520  5736  7650          SNA CLA
7521  5737  4450          EPROR           /CHANGING XFR RQSTL TO 1 FAILED TO NEGATE RUNL
7522  5740  1375          TAD (6017       /CHANGE DONEL TO 0
7523  5741  6502          LQMP
7524  5742  6755          SDN
7525  5743  4450          EPROR           /DONE FLAG FAILED TO SET
7526  5744  4754*         JMS CHGMOD      /CHANGE MODE & REPEAT TILL BOTH MODES HAVE BEEN TESTED.
7527  5745  5203          JMP MODAGN+1
7528  5746  4753*         JMS CHGUNIT     /CHANGE UNIT & REPEAT TILL BOTH UNITS HAVE BEEN TESTED.
7529  5747  5202          JMP MODAGN
7530  5750  4447          DONLOP
7531  5751  3140          DCA TSTNU
7532  5752  4443          C1EOP
7533
7534  5753  6014
7535  5754  6000
7536  5755  6440
7537  5756  6054
7538  5757  6056
7539  5760  6104
7540  5761  6072
7541  5762  6131
7542  5763  6111
7543  5764  6103
7544  5765  7774
7545  5766  7770
7546  5767  6053
7547  5770  0017
7548  5771  6071
7549  5772  0400
7550  5773  6052
7551  5774  6110
7552  5775  6017
7553  5776  6034
7554  5777  6041
            6000      PAGE
7555                  /ROUTINE TO CHANGE MODE FORM 12 TO 8 BIT & THEN REPEAT TEST.
7556
7557  6000  0000      CHGMOD, 0
7558  6001  1271              TAD MODVAR      /WHICH MODE WAS JUST TESTED?
7559  6002  7041              CIA
7560  6003  1303              TAD M8CON
7561  6004  7650              SNA CLA
7562  6005  5212              JMP ALR8M       /8 BIT MODE
7563  6006  4344              JMS FILVAR      /12 BIT MODE - SWITCH TO 8 BIT MODE
7564  6007  6071              MODVAR          /COPY 8 BIT MODE CONSTANTS INTO MODE VARIABLES
7565  6010  6103              M8CON
7566  6011  5600              JMP I CHGMOD
7567  6012  2200      ALR8M,  ISZ CHGMOD      /MODE TESTING COMPLETE FOR UNIT
7568  6013  5600              JMP I CHGMOD
7569
7570                  /ROUTINE TO CHANGE UNIT FROM A TO B & THEN REPEAT TEST.
```



```
7571
7572  6014  0000      CHGUNIT,0
7573  6015  1252              TAD UNVAR       /WHICH UNIT WAS JUST TESTED?
7574  6016  7041              CIA
7575  6017  1264              TAD UNBCON
7576  6020  7650              SNA CLA
7577  6021  5232              JMP ALRBU       /UNIT B
7578  6022  4344              JMS FILVAR      /UNIT A - SWITCH TO UNIT B
7579  6023  6052              UNVAR           /COPY UNIT B CONSTANTS INTO UNIT VARIABLES
7580  6024  6064              UNBCON
7581  6025  1377              TAD (LQPC       /SETUP LQPC FOR SHIFT INST.
7582  6026  3776*             DCA SHIFTO
7583  6027  1377              TAD (LQPC
7584  6030  3775*             DCA SHIFTI
7585  6031  5614              JMP I CHGUNIT
7586  6032  2214      ALRBU,  ISZ CHGUNIT     /UNIT TESTING COMPLETE
7587  6033  5614              JMP I CHGUNIT
7588
7589                  /INITIALIZE MODE VARIABLES FOR 12 BIT MODE
7590
7591  6034  0000      INTMOD, 0
7592  6035  4344              JMS FILVAR      /COPY MODE 12 CONSTANTS INTO MODE VARIABLES
7593  6036  6071              MODVAR
7594  6037  6076              M12CON
7595  6040  5634              JMP I INTMOD
7596
7597                  /INITIALIZE UNIT VARIABLES FOR UNIT A
7598
7599  6041  0000      INTUN,  0
7600  6042  4344              JMS FILVAR      /COPY UNIT A CONSTANTS INTO UNIT VARIABLES
7601  6043  6052              UNVAR
7602  6044  6057              UNACON
7603  6045  1374              TAD (LQRE       /SETUP LQRE FOR SHIFT INSTRUCTION.
7604  6046  3776*             DCA SHIFTO
7605  6047  1374              TAD (LQRE
7606  6050  3775*             DCA SHIFTI
7607  6051  5641              JMP I INTUN
7608
7609                  /UNIT VARIABLES
7610
7611                  UNVAR,
7612  6052  0000      UNIT,   0               /RX01 UNIT UNDER TEST 0=UNIT A; 1=UNIT B
7613  6053  0000      UDONE,  0
7614  6054  0000      UXFR,   0
7615  6055  0000      UDATA,  0
7616  6056  0000      UOUT,   0
7617
7618                  /UNIT A CONSTANTS
7619
7620                  UNACON,
7621  6057  0000              0000
7622  6060  2000              2000
7623  6061  1000              1000
7624  6062  0040              0040
7625  6063  0200              0200
```

```
                        /UNIT B CONSTANTS
                        UNBCON,
6064  0001                      0001
6065  4000                      4000
6066  0400                      0400
6067  0020                      0020
6070  0100                      0100

                        /MODE VARIABLES

                        MODVAR,
6071  0000              LCDATA, 0
6072  0000              XORDATA,0               /DATA EXPECTED TO READ FROM INTERFACE REG AFTER SHIFT IN.
6073  0000              SLCDTA, 0
6074  0000              SXDRDA, 0               /DATA TO  BE SHIFTED INTO INTERFACE REG
6075  0000                      0

                        /MODE 12 CONSTANTS

                        M12CON,
6076  4452                      4452
6077  0525                      0525
6100  4452                      4452
6101  7252                      7252
6102  0000                      0000

                        /MODE 8 CONSTANTS

                        M8CON,
6103  0125              DLCD8,  0125
6104  0242              DXDR8,  0242
6105  6500                      6500
6106  2720                      2720
6107  0000                      0000

6110  0000              SHFTCT, 0       /SHIFT COUNTER

                        /ROUTINE TO CHECK FOR PROPER DATA AT RXDATA PRIOR TO EACH SHIFT
                        /       OUT PULSE, NOTE: RXDATAL IS LOOPED TO ERRORL VIA SIMULATOR

6111  0000              TSTDAB, 0               /INITIALLY (WHEN SHIFT COUNT=0) SLCDTA CONTAINS
                                                /       LCDATA BITS(EXCEPT BIT 0) CONCATENATED
6112  7300                      CLA CLL         /       WITH PARITY.
6113  1273                      TAD SLCDTA      /AC(0) CONTAINS CURRENT RXDATA H BIT
6114  7004                      RAL
6115  3273                      DCA SLCDTA      /LINK CONTAINS EXPECTED DATA BIT
6116  1310                      TAD SHFTCT      /LOAD AC WITH SHIFT POSITION FOR ERROR DISPLAY
6117  7420                      SNL
6120  5325                      JMP ZEXP
6121  6754                      SER
6122  4450                      ERROR           /EXPECTED RXDATAH BIT=1,ACTUAL=0
                                /       AC CONTAINS SHIFT COUNT
                                /NOTE: DATA AT RXDATAL IS INVERTED.
```



```
6123  7300                      CLA CLL
6124  5711                      JMP I TSTDAB
6125  6754              ZEXP,   SER
6126  7610                      SKP CLA
6127  4450                      ERROR           /EXPECTED RXDATAH BIT=0,ACTUAL = 1
                                /       AC CONTAINS SHIFT COUNT.
                                /NOTE: DATA AT RXDATAL IS INVERTED.
6130  5711                      JMP I TSTDAB

                        /ROUTINE TO SETUP RXDATA PRIOR TO EACH SHIFT IN PULSE.

6131  0000              SHINDA, 0
6132  7300                      CLA CLL         /INITIALLY (BEFORE ANY IN SHIFTING) SXDRDA CONTAINS
                                /       XDRDATA.
6133  1274                      TAD SXDRDA      /AC(0) CONTAINS NEXT DATA BIT TO BE
                                /       SHIFTED IN.
6134  7004                      RAL
6135  3274                      DCA SXDRDA      /SAVE SHIFTED DATA IN
6136  7630                      SZL CLA
6137  1255                      TAD UDATA       /FORM PARALLEL I/O WORD FOR PROPER SHIFT IN
6140  1373                      TAD (0017       /       DATA ON RXDATAL.
6141  1256                      TAD UOUT        /AT SAME TIME CHANGE OUTL TO 0.
6142  1253                      TAD UDONE
6143  5731                      JMP I SHINDA

                        /ROUTINE TO COPY A SET OF 5 CONSTANTS INTO 5 VARIABLES.

6144  0000              FILVAR, 0
6145  1744                      TAD I FILVAR    /GET VARIABLE LOCATION
6146  3364                      DCA VAR
6147  2344                      ISZ FILVAR
6150  1744                      TAD I FILVAR    /GET CONSTANT LOCATION
6151  3365                      DCA CONST
6152  2344                      ISZ FILVAR
6153  1372                      TAD (-5
6154  3366                      DCA FVLCT       /SET A LOOP COUNTER
6155  1765              FVLOOP, TAD I CONST     /COPY CONSTANT INTO VARIABLE
6156  3764                      DCA I VAR
6157  2365                      ISZ CONST
6160  2364                      ISZ VAR
6161  2366                      ISZ FVLCT
6162  5355                      JMP FVLOOP      /REPEAT FOR EACH OF 5 CONSTANTS
6163  5744                      JMP I FILVAR

6164  0000              VAR,    0
6165  0000              CONST,  0
6166  0000              FVLCT,  0
```

SEQ 0169

```
 7731
 7732
 7733    6172  7773
 7734    6173  3017
 7735    6174  6507
 7736    6175  5662
 7737    6176  5633
 7738    6177  6504
               6200    *6200
 7739                  /*******************************************************************************
 7740                  /FIELD 1 INTERRUPT SKIP CHAIN
 7741                  /*******************************************************************************
 7742
 7743
 7744    6200  3255    SKP1CHN,DCA AC                  /GET HERE VIA INTERRUPT
 7745                                                  /SAVE AC.
 7746    6201  6201            CDF 00
 7747    6202  1777            TAD I (0
 7748    6203  3000            DCA 0                   /SAVE PC AT TIME OF INT.
 7749    6204  6244            RMF                     /RESTORE DF
 7750    6205  1120    XR,     TAD EXMITI              /EXPECTING A XMIT INT?
 7751    6206  7640            SZA CLA
 7752    6207  5224            JMP CKXMFG              /YES-VERIFY XMIT FLAG SET
 7753    6210  1121    CRA,    TAD ERECI               /EXPECTING A RECV INT?
 7754    6211  7640            SZA CLA
 7755    6212  5227            JMP CKRFG               /YES-VERIFY RECV FLAG SET
 7756    6213  1135            TAD EPRNTI              /EXPECTING A PRINTER INT.
 7757    6214  7640            SZA CLA
 7758    6215  5232            JMP CKPTFG              /YES-VERIFY PRINT FLAG
 7759    6216  1136            TAD ECONSI              /CAN CONSOLE PACKAGE INT. IN?
 7760    6217  7640            SZA CLA
 7761    6220  5241            JMP CKCON               /YES-CHECK FOR CONSOLE FLAG.
 7762    6221  1000    UNEINT, TAD 0
 7763    6222  4450    UNEI,   ERROR                   /UNEXPECTED INTERRUPT
 7764                                                  /AC= PC AT TIME OF INT.
 7765                                                  /CONT TO DETERMINE WHICH FLAGS ARE SET
 7766    6223  5246            JMP SETIF
 7767
 7768    6224  6041    CKXMFG, TSF                     /OVERWRITTEN WITH PROPER DEVICE CODE = CHECK XMIT FLAG
 7769    6225  5210            JMP CRA                 /NOT SET=INT, DUE TO SOME OTHER FLAG
 7770    6226  5246            JMP SETIF               /XMIT FLAG SET AS EXPECTED
 7771
 7772    6227  6031    CKRFG,  KSF                     /OVERWRITTEN WITH PROPER DEVICE CODE = CHECK RECV FLAG
 7773    6230  5221            JMP UNEINT              /NOT SET=INT, DUE TO SOME OTHER FLAG
 7774    6231  5246            JMP SETIF               /REC FLAG SET AS EXPECTED
 7775
 7776    6232  6500    CKPTFG, LQSK                    /CHECK PRINT FLAG
 7777    6233  7410            SKP
 7778    6234  5246            JMP SETIF               /SET
 7779    6235  6661            PSKF
 7780    6236  7410            SKP
 7781    6237  5246            JMP SETIF               /SET
 7782    6240  5221            JMP UNEINT              /PRINT FLAG NOT SET
 7783
 7784    6241  4445    CKCON,  CH1KSF                  /CHECK FOR CONSOLE REQ
```


SEQ 0170

```
 7785    6242  7410            SKP                     /SET=BUT IGNORE
 7786    6243  5221            JMP UNEINT              /NOT SET
 7787    6244  1255            TAD AC                  /CONT DIAG
 7788    6245  5400            JMP I 0
 7789
 7790    6246  7240    SETIF,  CLA CMA
 7791    6247  3117            DCA INTFLG              /SET PROG INT FLAG
 7792    6250  4776'           JMS RETURN
 7793    6251  6254            INTRET
 7794    6252  1255            TAD AC
 7795    6253  5654            JMP I INTRET
 7796
 7797    6254  0000    INTRET, 0
 7798    6255  0000    AC,     0
 7799
 7800                  /DISPLAY ROUTINE FOR UNEXPECTED INTERRUPT IN FIELD 1
 7801
 7802    6256  4432    SUNEI,  C1CRLF
 7803    6257  4434            C1PRNT
 7804    6260  6303            UNETMS
 7805    6261  4432            C1CRLF
 7806    6262  4775'           JMS M1TN                /DISPLAY TEST NUMBER
 7807    6263  1000            TAD 0
 7808    6264  3774'           DCA PC1SAVE
 7809    6265  4773'           JMS M1PC                /DISPLAY PC
 7810    6266  1255            TAD AC
 7811    6267  3772'           DCA AC1SAVE
 7812    6270  4771'           JMS M1AC                /DISPLAY AC
 7813    6271  4770'           JMS M1FL                /DISPLAY FLAGS
 7814    6272  4432            C1CRLF
 7815    6273  4434            C1PRNT
 7816    6274  6323            FS1MES
 7817    6275  1367            TAD (CDI 10
 7818    6276  6201            CDF 00
 7819    6277  3766            DCA I (VCDI
 7820    6300  6203            CDI 00
 7821    6301  4233            JMS CKFLG               /DISPLAY FLAGS SET
 7822    6302  5765'           JMP IEH1
 7823
 7824
 7825    6303  2516    UNETMS, TEXT    "UNEXPECTED INTERRUPT = FIELD 1"
         6304  0530
         6305  2005
         6306  0324
         6307  0504
         6310  4011
         6311  1624
         6312  0522
         6313  2225
         6314  2024
         6315  4055
         6316  4006
         6317  1105
         6320  1404
         6321  4061
```

```
                6322  0000
 7826           6323  0614    FS1MES, TEXT    "FLAGS SET:"
                6324  0107
                6325  2340
                6326  2305
                6327  2472
                6330  0000
 7827           6331  0413    ERR1MES,TEXT    "DKVTB=A FAILED, FIELD 1  "
                6332  2624
                6333  0255
                6334  0140
                6335  0601
                6336  1114
                6337  0504
                6340  5440
                6341  0611
                6342  0514
                6343  0440
                6344  6140
                6345  4000
 7828
 7829                       /ROUTINE TO GET HARDWARE OPTION WORD 3 (LOC 23) FROM FIELD 0.
 7830
 7831           6346  0000  XGHW3,  0
 7832           6347  7300          CLA CLL
 7833           6350  6201          CDF 00
 7834           6351  1764          TAD I (23
 7835           6352  6211          CDF 10
 7836           6353  5746          JMP I XGHW3
 7837
 7838
```



```
 7839
 7840           6364  0023
 7841           6365  6655
 7842           6366  6274
 7843           6367  6213
 7844           6370  6440
 7845           6371  6424
 7846           6372  6710
 7847           6373  6531
 7848           6374  6707
 7849           6375  6523
 7850           6376  2400
 7851           6377  0000
                6400        *6400
 7852                       /*****************************************************************************
 7853                       /ERROR DISPLAY FORMAT ROUTINES
 7854                       /*****************************************************************************
 7855
 7856
 7857                       /NORMAL DISPLAY = TN,PC,AC,MQ,FLAGS
 7858
 7859           6400  4257  NORDIS, JMS MSHDR              /PRINT ERROR HEADER & PC
 7860           6401  4224        JMS M1AC                /PRINT AC
 7861           6402  4232        JMS M1MQ                /PRINT MQ
 7862           6403  4240        JMS M1FL                /PRINT FLAGS
 7863           6404  4432        C1CRLF
 7864           6405  5777'       JMP IEH1
 7865
 7866                       /SLU DISPLAY = TN,PC,AC,SLU,BR
 7867
 7868           6406  4246  SLUDIS, JMS NORSLU
 7869           6407  5777'       JMP IEH1
 7870
 7871                       /SPECIAL SLU DISPLAY = TN,PC,AC,SLU,BR,XMIT DATA,REC DATA
 7872
 7873           6410  1776' SSLUDIS,TAD DDERSLU
 7874           6411  3775'       DCA PC1SAVE
 7875           6412  4246        JMS NORSLU
 7876           6413  4434        C1PRNT
 7877           6414  6537        MESXM
 7878           6415  1126        TAD SLUXMT
 7879           6416  4435        C1PRT4
 7880           6417  4434        C1PRNT
 7881           6420  6546        MESRC
 7882           6421  1127        TAD SLUREC
 7883           6422  4435        C1PRT4
 7884           6423  5777'       JMP IEH1
 7885
 7886                       /SUBROUTINES FOR DISPLAY ROUTINES
 7887
 7888           6424  0000  M1AC,   0               /DISPLAY AC MESSAGE
 7889           6425  4434        C1PRNT
 7890           6426  6676        MES1AC
 7891           6427  1774'       TAD AC1SAVE
 7892           6430  4435        C1PRT4
```

```
 7893    6431  5624            JMP I M1AC
 7894
 7895    6432  0000    M1MQ,   0               /DISPLAY MQ MESSAGE
 7896    6433  4434            C1PRNT
 7897    6434  6701            MES1MQ
 7898    6435  1773'           TAD MQ1SAVE
 7899    6436  4435            C1PRT4
 7900    6437  5632            JMP I M1MQ
 7901
 7902    6440  0000    M1FL,   0               /DISPLAY FLAGS MESSAGE
 7903    6441  4434            C1PRNT
 7904    6442  6701            MES1FL
 7905    6443  1772'           TAD FL1SAVE
 7906    6444  4435            C1PRT4
 7907    6445  5640            JMP I M1FL
 7908
 7909    6446  0000    NORSLU, 0
 7910    6447  4257            JMS MSHDR       /PRINT HEADER & PC MESSAGE
 7911    6450  4224            JMS M1AC        /PRINT AC
 7912    6451  4232            JMS M1MQ        /PRINT MQ
 7913    6452  4240            JMS M1FL        /PRINT FLAGS
 7914    6453  4267            JMS MSLU        /PRINT SLU#
 7915    6454  4312            JMS MBR         /PRINT BAUD RATE
 7916    6455  4432            C1CRLF
 7917    6456  5646            JMP I NORSLU
 7918
 7919    6457  0000    MSHDR,  0               /DISPLAY MESSAGE HEADER & PC
 7920    6460  4432            C1CRLF
 7921    6461  4434            C1PRNT
 7922    6462  6331            ERR1MES
 7923    6463  4432            C1CRLF
 7924    6464  4323            JMS M1TN
 7925    6465  4331            JMS M1PC
 7926    6466  5657            JMP I MSHDR
 7927
 7928    6467  0000    MSLU,   0               /DISPLAY SLU #
 7929    6470  4434            C1PRNT
 7930    6471  6557            MESSLU
 7931    6472  1771'           TAD IOT10       /DETERMINE WHICH SLU IS BEING WORKED ON.
 7932    6473  0370            AND (0030
 7933    6474  7450            SNA
 7934    6475  5307            JMP U1
 7935    6476  1367            TAD (-10
 7936    6477  7640            SZA CLA
 7937    6500  7001            IAC             /SLU #3
 7938    6501  7001            IAC             /SLU #2
 7939    6502  7001    U1,     IAC             /SLU #1
 7940    6503  3311            DCA SSLUN
 7941    6504  1311            TAD SSLUN
 7942    6505  4435            C1PRT4
 7943    6506  5667            JMP I MSLU
 7944
 7945    6507  7300    UX,     CLA CLL
 7946    6510  5302            JMP U1
 7947    6511  0000    SSLUN,  0
```



```
 7948
 7949    6512  0000    MBR,    0               /DISPLAY SLU BAUD RATE CONSTANT
 7950    6513  4434            C1PRNT
 7951    6514  6563            MESBR
 7952    6515  1360            TAD (BDR1-1
 7953    6516  1311            TAD SSLUN
 7954    6517  3311            DCA SSLUN
 7955    6520  1711            TAD I SSLUN
 7956    6521  4435            C1PRT4
 7957    6522  5712            JMP I MBR
 7958
 7959    6523  0000    M1TN,   0               /DISPLAY TEST NUMBER MESSAGE
 7960    6524  4434            C1PRNT
 7961    6525  6554            MES1TN
 7962    6526  1140            TAD TSTNU
 7963    6527  4435            C1PRT4
 7964    6530  5723            JMP I M1TN
 7965
 7966    6531  0000    M1PC,   0               /DISPLAY PC MESSAGE
 7967    6532  4434            C1PRNT
 7968    6533  6672            MES1PC
 7969    6534  1775'           TAD PC1SAVE
 7970    6535  4435            C1PRT4
 7971    6536  5731            JMP I M1PC
 7972
 7973
 7974    6537  4040    MESXM,  TEXT    "  XMIT DATA:"
         6540  3015
         6541  1124
         6542  4004
         6543  0124
         6544  0172
         6545  0000
 7975    6546  4040    MESRC,  TEXT    "  REC DATA:"
         6547  2205
         6550  0340
         6551  0401
         6552  2401
         6553  7200
 7976    6554  4040    MES1TN, TEXT    "  TN:"
         6555  2416
         6556  7200
 7977    6557  4040    MESSLU, TEXT    "  SLU:"
         6560  2314
         6561  2572
         6562  0000
 7978    6563  4040    MESBR,  TEXT    "  BR:"
         6564  0222
         6565  7200
```

```
6566  2025
6567  7770
6570  0030
6571  2702
6572  6712
6573  6711
6574  6710
6575  6707
6576  2470
6577  6655
      6600    *6600
              /*****************************************************************************
              /                  CONSOLE ROUTINES
              /*****************************************************************************


              /THIS ROUTINE WILL DETERMINE WHAT TO DO WHEN A ERROR IS ENCOUNTERED
              /WILL CHECK IF UNDER APT CONTROL,


6600  0000    XC1ERR, 0
6601  6002            IOF
6602  7000    OW1APT, NOP                  /OVERWRITTEN WITH 'JMP APT1ER' IF RUNNING UNDER APT CONTROL
6603  3310            DCA     AC1SAVE          /SAVE AC
6604  6004            GTF
6605  3312            DCA     FL1SAVE          /SAVE THE FLAGS
6606  7501            MQA
6607  3311            DCA     MQ1SAVE          /SAVE THE MQ
6610  7340            CLA CLL CMA              /SUBTRACT A 1 FOR TRUE LOCATION
6611  1200            TAD     XC1ERR           /GET RETURN LOCATION
6612  3307            DCA     PC1SAVE          /SAVE ADD OF ERROR CALL
6613  6031            KSF                      /CHECK FOR SLU #1 REC FLAG
6614  7410            SKP                      /SAVE STATE OF FLAG IS KSFLG (FLD 0)
6615  7040            CMA                      /KB1CHK CLEARS FLAG
6616  6201            CDF 00                   /KSFLG USED BY UNEXPECTED INT, DISPLAY
6617  3777            DCA I (KSFLG
6620  6211            CDF 10
6621  4462            KB1CHK
6622  1124            TAD TESTF1
6623  3275            DCA TLOOP1
6624  4465            GETSR                    /GET PSR FROM FIELD 0
6625  0376            AND (0200                /INHIBIT ERROR TYPEOUT?
6626  7640            SZA CLA
6627  5255            JMP IEH1                 /NO ERROR PRINTOUT
6630  6037            KLB                      /REMOVE LOOP AROUND ON SLU
6631  1375            TAD (0016                /SET SLU#1 BAUD RATE TO 9600 BITS/SEC
6632  6043            TSB
6633  4470            DELAY           /WAIT FOR BAUD RATE CHANGE TO TAKE EFFECT
6634  7300            CLA CLL
6635  6032            KCC             /CLEAR OUT REC FLAG-MAY BE SET IF ENTERING FROM A SLU ERROR,
6636  1307            TAD PC1SAVE
6637  7041            CIA
```



```
6640  1374            TAD (UNEI
6641  7650            SNA CLA
6642  5773'           JMP SUNEI       /USE UNEXPECTED INTERRUPT DISPLAY
6643  1307            TAD PC1SAVE
6644  7041            CIA
6645  1372            TAD (SPE3
6646  7650            SNA CLA
6647  5771'           JMP SSLUDIS     /USE SPECIAL SLU DISPLAY FORMAT
6650  1307            TAD PC1SAVE
6651  1370            TAD (-SLUEND
6652  7710            SPA CLA
6653  5767'           JMP SLUDIS      /USE SLU DISPLAY FORMAT
6654  5766'           JMP NORDIS      /USE NORMAL DISPLAY FORMAT
6655  4465    IEH1,   GETSR                  /INHIBIT ERROR HALT?
6656  7710            SPA CLA
6657  5262            JMP     C1BY2          /LEAVE
6660  4765'           JMS SETBDR             /NO-SET BAUD RATES IN ALL SLUS IN CASE OPERATOR LEAVES DIAGNOSTIC
6661  4436            C1SWIT                 /GO TO THE INQUIRE ROUTINE
6662  4764'   C1BY2,  JMS RESTBR             /RESTORE BAUD RATES IN ALL SLUS TO
                                             /  STATES PRIOR TO ERROR,
6663  4465            GETSR                  /LOOP ON ERROR?
6664  7004            RAL                    /TEST BIT 1
6665  7710            SPA CLA
6666  5675            JMP I TLOOP1           /LOOP
6667  4315            JMS C1GET              /RESTORE MQ AND LINK,CLEAR AC
6670  7000            NOP                    /LEAVE INT, SYS DISABLED
                                             /NEXT TEST WILL EN IT
6671  5600            JMP I   XC1ERR
6672  4040    MES1PC, TEXT    " PC:"
6673  2003
6674  7200
6675  0000    TLOOP1,0
6676  4040    MES1AC, TEXT    " AC:"
6677  0103
6700  7200
6701  4040    MES1MQ, TEXT    " MQ:"
6702  1521
6703  7200
6704  4040    MES1FL, TEXT    " FL:"
6705  0614
6706  7200
6707  7777    PC1SAVE,7777
6710  7777    AC1SAVE,7777
6711  7777    MQ1SAVE,7777
6712  7777    FL1SAVE,7777
6713  5714    AP1OW1, JMP I .+1
6714  7000            APT1ER


6715  0000    C1GET,  0
6716  7200            CLA
6717  1311            TAD MQ1SAVE
6720  7421            MQL                    /RESTORE THE MQ
6721  1312            TAD FL1SAVE
6722  7004            RAL                    /RESTORE THE LINK
```

```
8080    6723  7200            CLA
8081    6724  5715            JMP I C1GET
8082
8083
8084
8085
8086
8087
8088                    /*************************************************************************
8089
8090                    /APT/   ROUTINE TO NOTIFY APT THAT THE PROGRAM IS RUNNING OK.
8091    6725  0000    APTOK1, 0                       /APT/
8092    6726  6002            IOF                     /APT/
8093    6727  7200            CLA                     /APT/
8094    6730  1347            TAD     APTIM1          /APT/DELAY 100MS.
8095    6731  3351            DCA     APTCT1          /APT/
8096    6732  1350            TAD     APTIM2          /APT/
8097    6733  3352            DCA     APTCT2          /APT/
8098    6734  2352            ISZ     APTCT2          /APT/
8099    6735  5334            JMP     .-1             /APT/
8100    6736  2351            ISZ     APTCT1          /APT/
8101    6737  5332            JMP     .-5             /APT/
8102    6740  6224            RIF                     /APT/AC=IF.
8103    6741  1363            TAD     (6201           /APT/CREATE A CDF INST.
8104    6742  3343            DCA     .+1             /APT/MODIFY NEXT CDF INST.
8105    6743  6201            CDF                     /APT/(MODIFIED CDF) DF=IF.
8106    6744  6272            CIF     70              /APT/IF=FIELD 7.
8107    6745  4762'           JMS     6500            /APT/CALL APT - 'PROG OK'.
8108    6746  5725            JMP I   APTOK1          /APT/RTN FROM APT - RTN TO CALL+1.
8109
8110    6747  7776    APTIM1, -2                      /APT/
8111    6750  0000    APTIM2, 0                       /APT/
8112    6751  0000    APTCT1, 0                       /APT/
8113    6752  0000    APTCT2, 0                       /APT/
8114
8115
8116    6762  6500
8117    6763  6201
8118    6764  3214
8119    6765  3150
8120    6766  6430
8121    6767  6406
8122    6770  4447
8123    6771  6410
8124    6772  2466
8125    6773  6256
8126    6774  6222
8127    6775  0016
8128    6776  6200
8129    6777  0040
              7000    PAGE
8130
8131                    /*************************************************************************
8132
8133
```



```
8134                    /APT/   ROUTINE TO HANDLE ERRORS UNDER APT CONTROL.
8135
8136    7000  6002    APT1ER, IOF                     /APT/
8137    7001  7200            CLA                     /APT/
8138    7002  6037            KLB                     /APT/ REMOVE LOOP AROUND ON SLU'S
8139    7003  6224            RIF                     /APT/AC=IF.
8140    7004  1377            TAD     (6201           /APT/CREATE A CDF INST.
8141    7005  3210            DCA     .+3             /APT/MODIFY NEXT CDF INST.
8142    7006  7240            CLA CMA                 /APT/
8143    7007  1776'           TAD     XC1ERR          /APT/AC=ERROR PC.
8144    7010  6201            CDF                     /APT/(MODIFIED CDF) DF=IF.
8145    7011  6272            CIF     70              /APT/IF=FIELD 7.
8146    7012  5775'           JMP     6520            /APT/CALL APT - 'ERROR'.
8147
8148
8149
8150
8151                    /ROUTINE USED FOR CONSOLE SWITCH REGISTER CHANGES
8152
8153    7013  0000    XC1SW,  0
8154    7014  7200            CLA
8155    7015  4434    SR1QEST,C1PRNT                  /PRINT SR QUESTION
8156    7016  7343            SR1MESG                 /POINTER TO MESSAGE
8157    7017  4465            GETSR                   /GET PSR FORM FIELD 0
8158    7020  4435            C1PRT4                  /PRINT THE 4 DIGITS
8159    7021  7346            CLA CLL CMA RTL         /SETUP A COUNTER TO ACCEPT 4 DIGITS
8160    7022  3301            DCA     TTY1CNT         /SAVE THE COUNTER
8161    7023  1374            TAD     (CH1R0          /GET POINTER FOR FIRST CHARACTER
8162    7024  3227            DCA     CHG1CHR         /SAVE THE POINTER FOR DIGITS
8163    7025  4437            LISNF1                  /WAIT FOR KEYBOARD INPUT
8164    7026  0001            1                       /CHECK FOR A OCTAL DIGIT
8165    7027  7045    CHG1CHR,CH1R0                   /THIS LOCATION WILL GET MODIFIED
8166    7030  7566            -212                    /CHECK FOR LINE FEED
8167    7031  7337            COMPST                  /LINE FEED TYPED- RETURN TO START
8168    7032  7563            -215                    /CHECK FOR CARRAIGE RETURN
8169    7033  7065            RE1TYPE                 /RETYPE SR AND CONT IF DIGITS TYPED
8170    7034  7575            -203                    /CHECK FOR A CONTROL C
8171    7035  7102            C1RM                    /CONTROL C TYPED -RETURN TO MONITOR
8172    7036  7555            -223                    /CHECK FOR A CONTROL S
8173    7037  7144            CTRS1                   /WAS CONTROL S WAIT FOR ^Q OR ^C
8174    7040  0000            0                       /NONE OF ABOVE CHARACTERS-ILLEGAL CHAR
8175    7041  7042            .+1                     /GO TO NEXT ADDRESS TO PRINT ?
8176    7042  4434            C1PRNT                  /GO PRINT ?
8177    7043  7346            QES1MK                  /POINTER TO ? MESSAGE
8178    7044  5215            JMP     SR1QEST         /RETURN AND ASK QUESTION AGAIN
8179    7045  6201    CH1R0,CDF 00            /SAVE THE LEAST SIGNIFICANT BIT
8180    7046  3773            DCA I (PSR
8181    7047  6211            CDF 10
8182    7050  1372            TAD     (CH1R1          /UPDATA POINTER FOR CHARACTERS 2 3 4
8183    7051  3227            DCA     CHG1CHR         /SAVE THE POINTER ADDRESS
8184    7052  5225            JMP     CHG1CHR-2       /RETURN FOR NEXT CHARACTER INPUT
8185    7053  3300    CH1P1,DCA       SAV1CHR         /SAVE THE CHARACTER TYPED
8186    7054  4465            GETSR                   /GET THE VALUE OF SR
8187    7055  7106            CLL     RTL             /MOVE IT INTO NEXT POSITION
8188    7056  7004            RAL
```

SEQ 0179

```
8189  7057  1300          TAD     SAV1CHR         /ADD NEW CHARACTER TO IT
8190  7060  6201          CDF 00
8191  7061  3773          DCA I (PSR
8192  7062  6211          CDF 10
8193  7063  2301          ISZ     TTY1CNT         /DONE ALL 4 CHARACTERS
8194  7064  5225          JMP     CHG1CHR=2       /NO GET NEXT INPUT FROM KEYBOARD
8195  7065  1374  RE1TYPE,TAD     (CH1R0          /GET POINTER TO SEE IF SR ECHOED
8196  7066  7041          CIA                     /NEGATE THE POINTER
8197  7067  1227          TAD     CHG1CHR         /GET THE POINTER STORED
8198  7070  7650          SNA     CLA             /ECHO VALUE OF SR?
8199  7071  5613          JMP  I  XC1SW           /NO=ONLY CR WAS TYPED=USE ORIGINAL VALUE
8200  7072  4434          C1PRNT                  /RE-ECHO VALUE TYPED
8201  7073  7343          SR1MESG                 /POINTER TO SR MESSAGE
8202  7074  4465          GETSR                   /GET PSR FORM FIELD 0
8203  7075  4435          C1PRT4                  /PRINT THE 4 OCTAL DIGITS
8204  7076  4432          C1CRLF                  /ISSUE A CR AND LF
8205  7077  5613          JMP  I  XC1SW           /RETURN TO PROGRAM
8206
8207  7100  0000  SAV1CHR,0
8208  7101  0000  TTY1CNT,0
8209
8210
8211  7102  6007  C1RM,   CAF
8212  7103  6203          CDI 00                  /CHANGE INST AND DATA FIELD TO 0
8213  7104  5705          JMP I .+1               /GOTO 7600 OF THAT FIELD
8214  7105  7600          7600                    /MONITOR STARTING ADDRESS
8215
8216
8217                      /*************************************************************************************
8218
8219
8220
8221                      /ROUTINE TO CHECK FOR CONSOLE RECEIVE FLAG
8222
8223  7106  0000  XCH1KSF,0
8224  7107  6031          KSF                     /SKIP  ON CONSOLE RECEIVE FLAG
8225  7110  5336          JMP  NORF               /RECEIVE FLAG NOT SET RETURN TO PROGRAM
8226  7111  6201          CDF 00
8227  7112  1771          TAD I (HCW2                     /CHECK TO SEE IF CONSOLE WAS ACTIVE
8228  7113  6211          CDF 10
8229  7114  0370          AND (4000               /(VERSUS APT IN CONTROL).
8230  7115  7650          SNA CLA
8231  7116  5321          JMP     .+3             /ACTIVE CONSOLE=CHECK FOR ^C OR ^G
8232  7117  6032          KCC                     /APT ACTIVE,CLEAR CONSOLE RECEIVE FLAG
8233  7120  5706          JMP  I  XCH1KSF         /RETURN TO PROGRAM
8234  7121  4767'         JMS S1SUBL              /SAVE SUBROUTINE LINKAGE
8235  7122  4437          LISNF1                  /CHECK THE KEYBOARD CHARACTER
8236  7123  7575          =203                    /CODE FOR ^C
8237  7124  7102          C1RM                    /WAS A CONTROL C=EXIT TO MONITOR
8238  7125  7571          =207                    /CODE FOR ^G
8239  7126  7140          CNTR1G                  /WAS  ^G ECHO CHAR=ENTER SR QUESTION
8240  7127  7555          =223                    /CHECK FOR A CONTROL S
8241  7130  7146          CNT1S1                  /WAS A CONTROL S WAIT FOR ^Q OR ^C
8242  7131  0000          0                       /CHAR WAS NOT ^C OR ^ G
8243  7132  7133          .+1                     /ECHO CHAR AND QUESTION MARK
```


SEQ 0180

```
8244  7133  1366          TAD (277                /PRINT ?
8245  7134  4442          TYPE1
8246  7135  5347          JMP  R1LK               /RETURN TO PROGRAM
8247  7136  2300  NORF,   ISZ XCH1KSF
8248  7137  5706          JMP I XCH1KSF
8249
8250  7140  4434  CNTR1G, C1PRNT                  /PRINT ^G AND CR LF
8251  7141  7350          UPARR1                  /POINTER  TO MESSAGE
8252  7142  4213          JMS     XC1SW           /GO ASK THE SR QUESTION
8253  7143  5347          JMP  R1LK               /RETURN TO THE PROGRAM
8254
8255  7144  4765' CTRS1,  JMS     WAIT1QC         /GO WAIT FOR A CONTROL Q OR C
8256  7145  5225          JMP     CHG1CHR=2       /GO WAIT FOR NEXT CHAR
8257
8258  7146  4765' CNT1S1, JMS     WAIT1QC         /WAIT FOR A CONTROL Q OR C
8259  7147  4764' R1LK,   JMS R1SUBL              /RESTORE SUBROUTINE LINKAGE
8260  7150  5706          JMP  I  XCH1KSF         /RETURN TO PROGRAM
8261  7151  0004  FILLR1, 0004                    /SET TO NUMBER OF FILLERS REQUIRED.
8262
8263
8264
8265
8266
8267
8268
8269
8270  7164  7547
8271  7165  7506
8272  7166  0277
8273  7167  7537
8274  7170  4000
8275  7171  0022
8276  7172  7053
8277  7173  0020
8278  7174  7045
8279  7175  6520
8280  7176  6600
8281  7177  6201
              7200  PAGE
8282                /TYPE A CR AND LF WITH NUMBER OF FILLERS
8283                /AS DETERMINED BY LOCATION "FILLR1"
8284
8285  7200  0000  XC1CRLF,0                       /CALL BY "CRLF"
8286  7201  7200          CLA
8287  7202  1377          TAD     (215
8288  7203  4442          TYPE1
8289  7204  1776'         TAD     FILLR1
8290  7205  7040          CMA
8291  7206  3214          DCA     XORS1
8292  7207  1375          TAD     (212
8293  7210  4442          TYPE1
8294  7211  2214          ISZ     XORS1
8295  7212  5210          JMP     .-2
8296  7213  5600          JMP I   XC1CRLF
8297
```

```
8298    7214  0000    XORS1,  0
8299
8300                    /PRINT 2 SPACES
8301
8302    7215  0000    SPAC2,  0       /CALL BY "SPAC21"
8303    7216  4434            C1PRNT
8304    7217  7221            .+2
8305    7220  5615            JMP I SPAC2
8306    7221  4040            4040
8307    7222  0000            0000
8308
8309
8310                    /COMPARE INPUT TO LIST FOLLOWING CALL
8311                    /INPUT ONE CHARACTER IF AC=0
8312                    /USE LAST INPUT IF AC NON ZERO
8313
8314    7223  0000    XLISN1, 0                       /CALL BY "LISN1"
8315    7224  7640            SZA CLA
8316    7225  5253            JMP     LISN11          /USE LAST INPUT SINCE AC NOT ZERO
8317    7226  6031            KSF
8318    7227  5226            JMP     .-1
8319    7230  6036            KRB
8320    7231  0374            AND     (177
8321    7232  1373            TAD     (200
8322    7233  3305            DCA     CHAREC
8323    7234  1305            TAD     CHAREC
8324    7235  1372            TAD     (-212
8325    7236  7450            SNA                     /IS IT A LF?
8326    7237  5243            JMP     .+4             /YES
8327    7240  1371            TAD     (-3
8328    7241  7640            SZA CLA                 /IS IT A CR?
8329    7242  5245            JMP     .+3             /NO
8330    7243  4432            C1CRLF
8331    7244  5253            JMP     LISN11
8332    7245  1305            TAD     CHAREC          /GET THE CHAR
8333    7246  1370            TAD     (-223           /CHECK FOR A CONTROL S
8334    7247  7650            SNA     CLA             /WAS IT A CONTROL S
8335    7250  5253            JMP     LISN11          /YES-DO NOT ECHO CHARACTER
8336    7251  1305            TAD     CHAREC
8337    7252  4442            TYPE1                   /PRINT THE CHARACTER
8338    7253  1623    LISN11, TAD I   XLISN1         /GET COMPARE VALUE
8339    7254  2223            ISZ     XLISN1
8340    7255  7450            SNA                     /EXIT?
8341    7256  5264            JMP     LISN31          /YES
8342    7257  7500            SMA
8343    7260  5274            JMP     LIS1NUM         /LOOK FOR OCTAL NUMBER
8344    7261  1305            TAD     CHAREC          /COMPARE
8345    7262  7640            SZA CLA                 /EQUAL?
8346    7263  5271            JMP     LISN21          /NO
8347    7264  3214    LISN31, DCA     XORS1
8348    7265  1623            TAD I   XLISN1
8349    7266  3223            DCA     XLISN1
8350    7267  1214            TAD     XORS1
8351    7270  5623            JMP I   XLISN1          /AC IS ZERO UNLESS OCTAL NUMBER
8352    7271  7200    LISN21, CLA
```



```
8353    7272  2223            ISZ     XLISN1
8354    7273  5253            JMP     LISN11
8355    7274  7200    LIS1NUM,CLA                     /LOOK FOR OCTAL NUMBER
8356    7275  1305            TAD     CHAREC
8357    7276  1367            TAD     (-270
8358    7277  7500            SMA                     /IS IT LESS THAN 8?
8359    7300  5271            JMP     LISN21          /NO, SO NOT AN OCTAL NUMBER
8360    7301  1366            TAD     (10
8361    7302  7510            SPA                     /IS IT GREATER THAN ZERO?
8362    7303  5271            JMP     LISN21          /NO, SO NOT A NUMBER
8363    7304  5264            JMP     LISN31
8364
8365    7305  0000    CHAREC, 0
8366
8367
8368
8369
8370                    /*****************************************************************************
8371
8372                    /END OF PASS ROUTINE
8373
8374
8375    7306  0000    XC1EOP, 0
8376    7307  6002            IOF
8377    7310  4432            C1CRLF                  /    CONTROL TO JMP APTJ01,
8378    7311  4434            C1PRNT
8379    7312  7327            EOP1MES
8380    7313  2137            ISZ PASSNO              /UPDATE PASS COMPLETED NUMBER
8381    7314  7000            NOP
8382    7315  1137            TAD PASSNO
8383    7316  4435            C1PRT4
8384    7317  4432            C1CRLF
8385    7320  4465            GETSR                   /CONTINUE?
8386    7321  0365            AND (0400
8387    7322  7640            SZA CLA
8388    7323  5337            JMP COMPST              /NO-ASK SWITCH REG QUESTION,
8389    7324  4515            APTREP                  /IF UNDER APT CONTROL REPORT OK STATUS TO APT
8390    7325  6203            CDI 00
8391    7326  5764*           JMP  C0REST
8392    7327  0516    EOP1MES,TEXT    "END OF PASS    "
        7330  0440
        7331  1706
        7332  4020
        7333  0123
        7334  2340
        7335  4040
        7336  4000
8393    7337  6203    COMPST, CDI 00
8394    7340  5773*           JMP START
8395
8396    7341  6203    C1RST,  CDI 00
8397    7342  5764*           JMP C0REST
8398
8399    7343  4323    SR1MESG,        TEXT    "#SR="
        7344  2275
```

```
                7345  0000
 8400           7346  7743    QES1MK, TEXT    "?@"
                7347  0020
 8401           7350  3607    UPARR1, TEXT    "^G@"
                7351  4300
 8402
 8403
 8404           7364  0201
 8405           7365  0400
 8406           7366  0010
 8407           7367  7510
 8408           7370  7555
 8409           7371  7775
 8410           7372  7566
 8411           7373  0200
 8412           7374  0177
 8413           7375  0212
 8414           7376  7151
 8415           7377  0215
                7400    PAGE
 8416
 8417
 8418
 8419                   /*****************************************************************************
 8420
 8421                   /TYPE THE ASCII CHARACTER IN THE AC
 8422
 8423           7400  0000    X1TYPE, 0                       /CALL BY "TYPE"
 8424           7401  3213            DCA     CHAR1           /SAVE THE CHARACTER
 8425           7402  7000    TYOUT1, NOP/JMP I X1TYPE        /OVERWRITTEN IF RUNNING UNDER APT CONTROL,
 8426           7403  4273            JMS     CNTR1S          /CONSOLE ACTIVE-CHECK FOR CONTROL S
 8427           7404  1213            TAD     CHAR1           /GET THE CHARACTER SAVED AND PRINT
 8428           7405  6046            TLS
 8429           7406  7200            CLA
 8430           7407  6041            TSF
 8431           7410  5207            JMP     .-1
 8432           7411  6042            TCF
 8433           7412  5600            JMP I   X1TYPE
 8434                 5600    APT1CON=JMP I X1TYPE
 8435
 8436           7413  0000    CHAR1,  0
 8437
 8438
 8439
 8440
 8441
 8442
 8443                   /PRINT PACKED ASCII TEXT TERMINATED BY
 8444                   /SIX-BIT 00
 8445
 8446           7414  0000    MESAG,  0                       /CALL BY "MESAGE"
 8447           7415  7200            CLA
 8448           7416  4462            KB1CHK
 8449           7417  1614            TAD I   MESAG
 8450           7420  3252            DCA     FOR1OCK
```



```
 8451           7421  2214            ISZ     MESAG           /SET UP RETURN
 8452           7422  1652            TAD I FOR1OCK
 8453           7423  7012            RTR
 8454           7424  7012            RTR
 8455           7425  7012            RTR
 8456           7426  4233            JMS     MES1F
 8457           7427  1652            TAD I FOR1OCK
 8458           7430  4233            JMS     MES1F
 8459           7431  2252            ISZ     FOR1OCK
 8460           7432  5222            JMP     .-10
 8461           7433  0000    MES1F,  0
 8462           7434  0377            AND     (77
 8463           7435  7450            SNA                     /TERMINATOR (00)?
 8464           7436  5614            JMP I   MESAG           /YES
 8465           7437  1376            TAD     (-43
 8466           7440  7450            SNA                     /CRLF?
 8467           7441  5250            JMP     .+7             /YES
 8468           7442  1375            TAD     (3
 8469           7443  7510            SPA                     /200 OR 300
 8470           7444  1374            TAD     (100            /300
 8471           7445  1373            TAD     (240            /200
 8472           7446  4442            TYPE1
 8473           7447  5633            JMP I MES1F
 8474           7450  4432            C1CRLF
 8475           7451  5633            JMP I   MES1F
 8476
 8477
 8478
 8479           7452  0000    FOR1OCK,0
 8480
 8481                   /PRINT FOUR OCTAL NUMBERS IN AC 11 THRU 0 FOLLOWED
 8482                   /BY TWO SPACES
 8483
 8484           7453  0000    X1PRN4, 0                       /CALL BY "PRNT4"
 8485           7454  3252            DCA     FOR1OCK
 8486           7455  1252            TAD     FOR1OCK
 8487           7456  7012            RTR
 8488           7457  7012            RTR
 8489           7460  7012            RTR
 8490           7461  4444            PRN21
 8491           7462  1252            TAD     FOR1OCK
 8492           7463  4444            PRN21
 8493           7464  4440            SPAC21
 8494           7465  5653            JMP I   X1PRN4
 8495                   /
 8496
 8497           7466  0000    X1PRN1, 0                       /CALL BY "PRN11"
 8498           7467  0372            AND     (7
 8499           7470  1371            TAD     (260
 8500           7471  4442            TYPE1
 8501           7472  5666            JMP I   X1PRN1
 8502
 8503
 8504
 8505
```

SEQ 0185

```
                        /ROUTINE TO CHECK FOR A CONTROL S WHILE TYPING OUT MESSAGES
                        /TO EXIT ROUTINE IF A CONTROL S WAS TYPED-A CONTROL Q OR C MUST BE
                        /INPUTTED ON THE KEYBOARD

7473  0000      CNTR1S, 0
7474  6031              KSF                     /SKIP ON CONSOLE KEYBOARD FLAG
7475  5673              JMP  I  CNTR1S          /RETURN TO TYPE ROUTINE-FLAG NOT SET
7476  6034              KRS                     /READ THE CHARACTER STATICALLY
7477  0370              AND     (177            /MASK TO 7 BIT ASCII
7500  1367              TAD     (-23            /CHECK FOR A CONTROL S
7501  7640              SZA     CLA             /WAS IT A CONTROL S
7502  5673              JMP  I  CNTR1S          /NO-RETURN WITH KEYBOARD FLAG STILL SET
7503  6032              KCC                     /CLEAR KEYBOARD FLAG FROM ^S
7504  4306              JMS     WAIT1QC         /WAIT FOR CONTROL Q OR C
7505  5673              JMP  I  CNTR1S          /RETURN TO PRINT MESSAGE BEING TYPED

7506  0000      WAIT1QC,0                       /ROUTINE TO WAIT FOR CONTROL Q OR C
7507  6031              KSF                     /WAIT FOR A CONTROL Q OR C TO EXIT
7510  5307              JMP     .-1             /
7511  6036              KRB                     /READ THE CHARACTER TYPED
7512  0370              AND     (177            /MASK TO 7 BIT ASCII
7513  1366              TAD     (-3             /CHECK FOR A CONTROL C
7514  7450              SNA                     /WAS IT A CONTROL C?
7515  5765'             JMP     C1RM            /YES-RESTORE MONITOR AND RETURN
7516  1364              TAD     (-7             /CHECK FOR A LINE FEED CHARACTER
7517  7450              SNA                     /WAS IT A LINE FEED
7520  5763'             JMP     COMPST          /YES GO RESTART THE PROGRAM
7521  1364              TAD     (-7             /CHECK FOR A CONTROL Q ^Q
7522  7640              SZA     CLA             /WAS IT A CONTROL Q
7523  5307              JMP     WAIT1QC+1       /NO-WAIT FOR APPROPRIATE KEY
7524  5706              JMP  I  WAIT1QC         /RETURN TO WHENCE IT CAME


                        /PRINT THE TWO OCTAL NUMBERS IN THE AC 6 THRU 11

7525  0000      X1PRN2, 0                       /CALL BY "PRN21"
7526  3336              DCA     TWO1OCK
7527  1336              TAD     TWO1OCK
7530  7012              RTR
7531  7010              RAR
7532  4441              PRN11
7533  1336              TAD     TWO1OCK
7534  4441              PRN11
7535  5725              JMP I   X1PRN2

7536  0000      TWO1OCK,0

                        /ROUTINE TO SAVE SUBROUTINE LINKAGES WHICH MAY GET DESTROYED BY KEYBOARD
                        /       INTERVENTION CHECK

7537  0000      S1SUBL, 0
7540  1762'             TAD XCHIKSF
7541  3357              DCA L1SAV1
7542  1214              TAD MESAG
7543  3360              DCA L1SAV2
```


SEQ 0186

```
7544  1753              TAD X1PRN4
7545  3361              DCA L1SAV3
7546  5737              JMP I S1SUBL

                        /ROUTINE TO RESTORE LINKAGES SAVED BY S1SUBL ROUTINE

7547  0000      R1SUBL, 0
7550  1357              TAD L1SAV1
7551  3762'             DCA XCHIKSF
7552  1360              TAD L1SAV2
7553  3214              DCA MESAG
7554  1361              TAD L1SAV3
7555  3253              DCA X1PRN4
7556  5747              JMP I R1SUBL

7557  0000      L1SAV1, 0
7560  0000      L1SAV2, 0
7561  0000      L1SAV3, 0

7562  7106
7563  7337
7564  7771
7565  7102
7566  7775
7567  7755
7570  0177
7571  0260
7572  6037
7573  0240
7574  0100
7575  0003
7576  7735
7577  0077
0177  0163
      0000      FIELD 0
```

```
0000  10001110  03000300  00001111  11111111  11111111  11111111  11111111  11111111
0100  11111111  11111111  11111111  11111111  11111111  11111111  11111110  00000001

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111110  03000300  00000F0F  00000000  00000000  00000000  00000000  01111111

0400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0500  11111111  11111111  11111111  11111111  11100000  00000000  00000000  00000111

0600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700  11111111  11111111  11111111  11110000  00000000  00000000  00000001  11111111

1000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1100  11111111  11111111  11111111  11111111  11000000  00000000  00000000  00000111

1200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300  11111111  11111111  11111111  11111111  11111111  11111111  00000000  11111111

1400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1500  11111111  11111111  11111111  11111111  11111111  11000000  00000000  11111111

1600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1700  11111111  11111111  11111111  10000000  00000000  00000000  00000000  01111111

2000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2100  11111111  11111111  11111111  11111111  11111111  11111111  11100111  11111111

2200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  00111111

2400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2500  11111111  11111111  11110000  00000000  00000000  00000000  00000000  01111111

2600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
2700  11111111  11111111  11111111  11111111  11111110  00000000  00000000  11111111

3000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3100  11111111  11111111  11111111  11111111  11111111  11111111  11011111  11111111

3200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3300  11111111  11111111  11111111  10000000  00000000  00000000  00000000  00000011

3400  11111111  11111100  00000011  11111111  11111111  11111111  11111111  11111111
3500  11111111  11111111  11111111  11111111  11111111  10000000  00000111  11111111

3600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3700  11111111  11111111  11111111  11111100  00000000  00000000  00000000  00000111
```



```
4000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4100  11111111  11111111  11111111  00000000  00000000  00000000  00001111  11111111

4200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4300  11111111  11111111  11111111  11111111  11111111  11111111  11111101  11111111

4400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4500  11111111  11111111  11111111  11111111  11110000  00000000  00000000  11111111

4600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4700  11111111  11111111  11111111  11111111  11111111  11111110  00000000  01111111

5000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5100  11111111  11111111  11111111  11111111  11111111  11111000  00000111  11111111

5200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5300  11111111  11111111  11111111  11111111  11111111  11111100  00000000  00001111

5400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  00000111

5600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
5700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

6000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6100  11111111  11111111  11111111  11111111  11111111  11111111  11111110  00111111

6200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6300  11111111  11111111  11111111  11111111  11111111  11110000  00001111  11111111

6400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

6600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
6700  11111111  11111111  11111111  11111111  11111111  11100000  00111111  11111111

7000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
7100  11111111  11111111  11111111  11111111  11111111  11000000  00001111  11111111

7200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
7300  11111111  11111111  11111111  11111111  11111111  11000000  00001111  11111111

7400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
7500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

7600
7700
```

```
8595          0200    *200
8596
8597                  8888
```



```
AC          6255        BIT7        0007        CHGCHR      7032        CONTT       5704
AC1SAV      6710        BIT8        0065        CHGMOD      6000        CPUDIS      6422
ACAIOT      5120        BLANK       0130        CHGUNI      6014        CPUDN       2134
ACCERR      5054        BRSMS       6036        CHKKB       2237        CPUMES      2210
ACDATA      0067        BSTLP       6012        CHKKSF      4516        CPUSDI      6406
ACL         7701        BSW         7002        CIFCK       3365        CPUT1       0212
ACSAVE      6675        C1BY2       6662        CIFCK1      3444        CPUT10      1131
ACWAS       0054        C1CRLF      4432        CIFJMP      3346        CPUT11      1200
ADDTIM      2357        C1EOP       4443        CIFJMS      3421        CPUT12      1235
ADRS        4446        C1GET       6715        CIFJPL      3340        CPUT13      1275
AGAIN1      3333        C1PRNT      4434        CIFJSL      3413        CPUT14      1425
AGAIN2      3406        C1PRT4      4435        CIFOK       3400        CPUT15      1462
ALRBM       6012        C1REST      0200        CIFOK1      3440        CPUT2       0400
ALRBU       6032        C1RM        7102        CKBRSQ      2271        CPUT3       0501
AP1OW1      6713        C1RST       7341        CKCON       6241        CPUT4       0600
APT1CO      5600        C1SWIT      4436        CKFLG       6233        CPUT5       0712
APT1ER      7000        C8APT       4532        CKIMOD      5677        CPUT6       1026
APT3CK      2726        C8CRLF      4521        CKINDA      5704        CPUT7       1071
APTCON      7333        C8ERR       4533        CKMF        3501        CRA         6210
APTCT1      6751        C8GET       6703        CKMODE      5650        CTRS1       7144
APTCT2      6752        C8H3        4540        CKPTFG      6232        CUIPTR      5121
APTCTX      6756        C8PRNT      4522        CKRFG       6227        DAT         0073
APTCTY      6757        C8PRT4      4523        CKXMFG      6224        DATPAT      0177
APTER       7000        C8RC        4537        CLCL        6136        DATSLU      2421
APTHW3      6143        C8REST      0201        CLCON       5713        DDERSL      2470
APTIM1      6747        C8RM        7105        CLKCT       5712        DECPRT      6104
APTIM2      6750        C8STAR      4534        CLKERR      5715        DELAY       4470
APTIMX      6754        C8SWIT      4524        CLKIR       5674        DELAY1      3251
APTIMY      6755        CAB         3366        CLLE        6135        DERSLU      2462
APTOK       6732        CAC         3367        CLOOPA      3240        DF0         3013
APTOK1      6725        CAD         3363        CLREIF      4455        DF1         3025
APTOW1      6701        CAE         3437        CLREPI      4471        DF2         3033
APTR        2513        CAF         6007        CLRERI      4457        DF3         3041
APTREP      4515        CAG         4625        CLREXI      4456        DF4         3047
ATIMLS      1466        CAM         7621        CLSK        6137        DF7         3017
ATIMMS      1467        CAMTST      1000        CLSKWT      4541        DFLD        3207
BASEP       6055        CCDF        3300        CLUPEX      1547        DLCD8       6103
BDR1        0026        CDELTA      5714        CNT         0122        DLOP        2423
BDR2        0027        CDI         6203        CNT1        0123        DNF7        3226
BDR3        0030        CFSLU       4512        CNT181      7146        DONLOP      4447
BDRATE      3124        CH1KB       3320        CNTR1G      7140        DONT17      1435
BDRNS       3200        CH1KSF      4445        CNTR18      7473        DOSIMU      1656
BDRSQ       2322        CH1R0       7045        CNTRLG      7141        DOSLU       6025
BDTA        4505        CH1R1       7053        CNTRLS      7506        DOSWAP      2014
BEGBST      6000        CH1REC      7311        CNTRS       7145        DVCTAB      3045
BEGEXM      3000        CHAR        7334        CNTRS1      7147        DXDR8       6104
BEGRTC      5400        CHAR1       7413        COMP        0134        E0          5106
BIT11       0072        CHAREC      7305        COMPST      7337        E0PRE       5026
BIT3        0062        CHARLP      2015        CONCH       4026        E1          5111
BIT4        0063        CHARR0      7050        CONCHK      4020        E10         5142
BIT5        0064        CHARR1      7054        CONST       6165        E100        5460
BIT6        0102        CHG1CH      7027        CONTDG      4512        E11         5126
```

E110	5503	EXISET	2224	HLTS	3314	JMSLOC	1435
E120	5535	EXITLA	4461	IB0	3064	K0	2416
E121	5540	EXMITI	0120	IB1	3071	K1	0041
E122	5543	EXMT1	3010	IB2	3104	K10	0042
E124	5527	EXMT10	4200	IB3	3117	K100	0044
E1PRE	5071	EXMT11	4400	IB7	3143	K200	0045
E2	5114	EXMT12	4600	IBSF	3276	K212	7216
E20	5204	EXMT13	4636	IBSF1	3402	K215	7215
E21	5206	EXMT14	5000	ICDI	4244	K240	7462
E22	5210	EXMT2	3056	IEH	6646	K2525	0046
E23	5212	EXMT3	3200	IEH1	6655	K260	7504
E24	5214	EXMT4	3277	IFDF	4411	K3	7461
E25	5216	EXMT5	3445	IIB0	3132	K4000	0047
E26	5225	EXMT6	3600	INIT	6757	K5252	0050
E27	5232	EXMT7	4000	INIT1	3077	K5253	0051
E28	5237	EXS17	2145	INITL	4232	K7	7505
E2PRE	5031	FDWRD	4006	INSL1	4205	K7600	1511
E3	5117	FILCOR	4052	INSTRT	1515	K77	0043
E40	5320	FILLER	7152	INSTTR	0105	K7700	0052
E42	5274	FILLR1	7151	INTEN1	1400	K7777	0053
E4PRE	5074	FILVAR	6144	INTFLG	0117	KB1CHK	4462
E50	5336	FIXIL	4520	INTMOD	6034	KBCHK	4517
E51	5343	FIXLKG	5217	INTR	6756	KCC	6032
E52	5350	FL1SAV	6712	INTRET	6254	KCC1	6302
E53	5341	FLDON	5545	INTRTN	1514	KCC2	6322
E54	5346	FLMES	5242	INTST	4535	KCDF	0155
E55	5353	FLSAVE	6677	INTUN	6041	KCF	6030
E56	5334	FOR10C	7452	IOF	6002	KCF1	6300
E60	5414	FOROCK	7463	ION	6001	KCF2	6320
E61	5420	FRET	4526	IOT0	2601	KFLD0	0114
E62	5422	FS1MES	6323	IOT1	2606	KIE	6035
E63	5424	FSAV	3511	IOT10	2702	KIE1	6305
E70	5443	FSMES	6331	IOT11	2710	KIE2	6325
EAC	0131	FVLCT	6166	IOT12	2715	KIOT	5117
ECONSI	0136	FVLOOP	6155	IOT13	2722	KISZTT	2270
EIFCLR	2234	GETHW3	4466	IOT2	2613	KJILD	2267
ENDSLU	3131	GETSR	4465	IOT3	2620	KJMP3	5227
ENDTST	4536	GOOD	0132	IOT4	2625	KKRTN	4634
EOP1ME	7327	GR1SIM	1664	IOT5	2632	KLB	6037
EPRNTI	0135	GR2GR3	1704	IOT7	2637	KLSIM	4513
ERECI	0121	GRFSIM	1600	IOT8	2644	KMD1	6307
ERICLR	2220	GROUP2	1706	IOT9	2651	KNOP	3350
ERISET	2230	GROUP3	2000	IOTADD	3044	KRB	6036
ERR1ME	6331	GSR	2253	IOTLP	5010	KRB1	6306
ERRMES	5230	GTF	6004	IOTREC	3056	KRB2	6326
ERROR	4450	H1	5566	IOTTA	3043	KRS	6034
ETIMLL	1472	HANGER	5567	IOTXMT	3066	KRS1	6304
ETIMLU	1473	HCW1	0021	ISSTSB	2700	KRS2	6324
ETIMMS	1471	HCW2	0022	ITOLOC	0166	KRTN	4627
EXICLR	2214	HCW3	0023	JMPIR	0111	KSF	6031
EXIOT	5027	HCW3MS	6760	JMPRET	4073	KSF1	6301
EXIOTL	5061	HLT	7402	JMSLO2	1452	KSF2	6321

KSFLG	0040	LQTAB	4251	MKSF	4475	NXTONN	2132
KSFWAT	4452	LSAV1	7355	MLAP	6361	NXTPAT	1504
KSTOP	0066	LSAV2	7356	MLK	6506	NXTPTT	2131
KTEST	4660	LSAV3	7357	MLQP	6364	ODT1	0004
KTEST1	4661	LXCRST	6731	MMID	6277	ODT2	0005
L101	4231	M12CON	6076	MMQ	6464	ODT3	0006
L102	4266	M1AC	6424	MODAGN	5602	OERR	2130
L111	4461	M1FL	6440	MODE1	0027	OFONKI	2471
L112	4472	M1MQ	6432	MODE2	0006	OTZ	1405
L1SAV1	7557	M1PC	6531	MODE3	0007	OUT	1724
L1SAV2	7560	M1TN	6523	MODVAR	6071	OW1APT	6602
L1SAV3	7561	M212	7310	MPC	6532	OWAPT	6602
L211	2023	M270	7304	MQ1SAV	6711	OWSET	0635
L61	3623	M3	7307	MQA	7501	PASSNO	0137
L62	3653	M43	7460	MQDATA	0070	PATCH	0141
LCD	6751	M8CON	6103	MQL	7421	PBRSMS	6027
LCDATA	6071	MAC	6456	MQSAVE	6676	PC1SAV	6707
LCDF	3330	MBR	6512	MQWAS	0055	PCIE	6665
LENBAS	2146	MEMES	5210	MREC1	6350	PCLF	6662
LIS1NU	7274	MEOW	3007	MREC2	6353	PCLOOP	2200
LISN	4525	MES1AC	6676	MREC3	6356	PCLP	6666
LISN1	7255	MES1F	7433	MSHDR	6457	PCPUM	0211
LISN11	7253	MES1FL	6704	MSLU	6467	PCPUMS	2200
LISN2	7273	MES1MQ	6701	MSPF	4502	PCSAVE	6674
LISN21	7271	MES1PC	6672	MTCF	4504	PERR	2135
LISN3	7266	MES1TN	6554	MTLS	4510	PFM	5011
LISN31	7264	MESAC	6663	MTN	6524	PFMES	5145
LISNF1	4437	MESACT	6547	MTPC	4506	PIMES	4352
LISNSR	6047	MESAG	7414	MTSB	4505	PMEMES	5200
LISNUM	7276	MESAGF	7441	MTSF	4503	PMODE	2076
LKDATA	0071	MESAGX	7423	MTSK	4507	POINTB	0100
LKWAS	0056	MESBR	6563	MXMT1	6337	POINTC	0101
LL1	4406	MESEXP	6556	MXMT2	6342	POINTD	0102
LL2	4433	MESFL	6671	MXMT3	6345	POINTE	0103
LLLD	2257	MESHDR	6514	NDF	0074	POINTF	0104
LLXB	3125	MESINS	6543	NOCRF	7137	POINTR	0076
LOC1	0164	MESLK	6540	NOPI	4531	PPIM	3411
LOOP	4467	MESMQ	6666	NORDIS	6400	PPIMES	4342
LOOPA	0031	MESPC	6660	NORF	7136	PPRMS	7076
LOOPPC	4446	MESRC	6546	NORMDI	6400	PRDB	6667
LOPDON	2242	MESSLU	6557	NORMSQ	2276	PRDD	6150
LQ4TAB	4252	MESTN	6565	NORSLU	6446	PRETES	5000
LQI1	4207	MESXM	6537	NORX01	5053	PRN11	4441
LQI2	4224	MFL	6472	NOSIM0	3426	PRN21	4444
LQLS	6506	MGTF	3453	NOSIM1	4472	PRNT1	4526
LQMC	6503	MINS	6500	NSQBDR	0024	PRNT2	4530
LQMP	6502	MIOT	4463	NSTKS	4533	PROPLC	7102
LQPC	6504	MKCC	4476	NUMX	4070	PROPMS	7100
LQRB	6501	MKCF	4474	NUOK	2211	PRTBRS	6076
LQRE	6507	MKIE	4500	NXTDC	0214	PRTCMS	5442
LQRS	6505	MKRB	4501	NXTIOT	5040	PRTEST	3400
LQSK	6500	MKRS	4477	NXTONE	1465	PSKF	6661

```
PSMES   0277        RXHERE  0133        SLULSU  1640        T21DN   1730
PSR     0020        S1SUBL  7537        SLUMES  3303        T2LA    3457
PSS1    0142        SAVICH  7100        SLUMST  1600        T2LQ    4041
PSS2    0134        SAVAC   6276        SLUREC  0127        T3      5121
PSS3    0126        SAVCHR  7103        SLUXMT  0126        T3LA    3514
PSS4    0117        SAVFLD  0061        SMES    0213        T3LQ    4112
PSSF    6660        SAVLOC  2420        SMORE   5655        T4      5200
PSTB    6664        SBDR1   2675        SNUMX   4071        T4LA    3600
PTED    2162        SBDR2   2671        SOMSKP  0060        T4LQ    4200
PTEST6  0600        SBDR3   2665        SPAC2   7215        T5      5253
QES1MK  7346        SD1     6065        SPAC21  4440        T5B     5260
QESTMK  7315        SD2     6071        SPACE2  4531        T5LA    3641
R1LK    7147        SD3     6073        SPACX2  7217        T5LQ    4257
R1SUBL  7547        SD4     6074        SPCIE   4516        T6      5326
RCNT    5441        SDATA   4525        SPE1    2054        T6LA    3670
RDF     6214        SDEVC   0025        SPE2    2060        T6LQ    4305
RDY     5047        SDN     6755        SPE3    2466        T7      5400
RE1TYP  7065        SEL     6750        SPF     6040        T70K    5444
REPAPT  2502        SER     6754        SPF1    6310        T7LA    4000
RES60W  0624        SERUEI  6210        SPF2    6330        T7LQ    4400
RESTBR  3214        SET8DR  3150        SR1MES  7343        T70W1   6421
RET     4447        SETEPI  4472        SR1QES  7015        T70W2   4440
RET1AD  2417        SETERI  4461        SREC    4474        TABADD  3055
RETADD  4030        SETEXI  4460        SRMESG  7312        TABDON  4241
RETURN  2400        SETIF   6246        SRQ     6003        TADI    3233
RETYPE  7064        SETSIM  1616        SSLUDI  6410        TBLPTR  6075
REVSEN  1735        SFLDS   4276        SSLUN   6511        TCF     6042
RFINT   6206        SFLGS   3664        SSUBLK  7335        TCF1    6312
RIB     6234        SHFTCT  0110        STAB    2746        TCF2    6332
RIF     6224        SHIFTI  5662        START   0200        TESAGG  2138
RLK     7150        SHIFTO  5633        STKS    0107        TESAGN  1502
RLOOP   4514        SHINDA  6131        STR     6753        TESLOC  0072
RMF     6244        SIMCK0  4520        SUNEI   6256        TESMES  3306
RPERR   3657        SIMCK1  4531        SVBDC   1470        TEST    0115
RPTBR   2523        SIMERR  2055        SWP     7521        TEST1   0221
RQEST   7021        SKON    6000        SXDRDA  6074        TEST10  1000
RSUBLK  7345        SKP1CH  6200        SXMT    4473        TEST11  1045
RTCI1   5425        SKPCHK  2047        T1      5014        TEST12  1105
RTCI2   5502        SKPCHN  6200        T10     5426        TEST13  1200
RTCIF   0113        SKPERR  5046        T10LS   4600        TEST14  1316
RTCMS   5452        SKPLRC  4067        T11     5445        TEST15  1327
RTCT1   5410        SKPPED  0057        T11LS   4632        TEST16  1342
RTCT1D  5423        SLCOTA  6073        T12     5462        TEST17  1400
RTCT2   5463        SLOOPA  3233        T12LS   4652        TEST2   0241
RTCT2D  5500        SLU2MC  4433        T13     5507        TEST20  1436
RTCT3   5504        SLUCAF  4511        T13LS   4672        TEST21  1701
RTCT4   5600        SLUDAT  4453        T14LS   4712        TEST22  2000
RTCT5   5627        SLUDER  4454        T14S    5600        TEST3   0400
RTCT6   5655        SLUDIS  6406        T15LS   4733        TEST4   0425
RTF     6005        SLUEND  3331        T1LA    3436        TEST5   0473
RTFRP   3650        SLULER  2153        T1LQ    4005        TEST6   0606
RTRN    4635        SLULSL  1620        T2      5076        TEST7   0725
```



```
TESTAB  2265        TWO10C  7536        XC1SW   7013        XSEPI   4501
TESTF1  0124        TWOOCK  7164        XC8APT  7400        XSFIB   4522
TESTMS  2213        TYOUT   7323        XC8CRL  7200        XSPCIE  3544
TESTPT  2061        TYOUT1  7402        XC8ERR  6600        XSRTF   4210
TESTS   2023        TYPE    4527        XC8H3   7540        XSTKS   0110
TFLD    3241        TYPE1   4442        XC8RC   7012        XTFLG   0106
TFLG    4537        U1      6502        XC8STA  6716        XTOR    4275
TIMERR  1474        UDATA   6055        XC8SW   7360        XTYPE   7321
TJLOC   2266        UDONE   6053        XCDIL   4240        XVDLY   1667
TLOOP   6700        UEI     6205        XCFSLU  3265        XWAIT   5553
TLOOP1  6675        UEIMES  6311        XCH1KS  7106        ZEXP    6125
TLS     6046        UL1     6240        XCHKKS  7111        ZTO     1420
TLS1    6316        UL2     6244        XCLEPI  4475
TLS2    6336        UL3     6250        XDATA   4524
TNF7    3271        UL4     6254        XDELAY  3245
TPC     6044        UL5     6260        XDR     6752
TPC1    6314        UL6     6264        XDRDAT  6072
TPC2    6334        UL7     6270        XGETSR  3312
TRNXPT  2103        UNACON  6057        XGHW3   6346
TS60W1  0652        UNBCON  6064        XIOT    3000
TS60W2  0663        UNEI    6222        XKLSIM  4511
TS60W3  0664        UNEINT  6221        XLCTR   2144
TS60W4  0674        UNETMS  6303        XLISN   7225
TS60W5  0701        UNIT    6052        XLISN1  7223
TS60W6  0707        UNVAR   6052        XMIOT   3024
TSB     6043        UOUT    6056        XMKCC   2612
TSB1    6313        UPARR1  7350        XMKCF   2600
TSB2    6333        UPARRG  7317        XMKIE   2624
TSBSSK  0243        UPSTK   3255        XMKRB   2631
TSCACL  0236        USED10  5064        XMKRS   2617
TSF     6041        UX      6507        XMKSF   2605
TSF1    6311        UXFR    6054        XMODE2  1660
TSF2    6331        VAR     6164        XMSPF   2636
TSFWAT  4451        VCDI    6274        XMTCF   2650
TSK     6045        VDCTR   1700        XMTLS   2721
TSK1    6315        VDELAY  4473        XMTPC   2707
TSK2    6335        VMODE   2016        XMTSB   2655
TSLOP   2226        WAIT    4464        XMTSF   2643
TSTCLL  0265        WAIT1Q  7506        XMTSK   2714
TSTCML  0273        WAITQC  7521        XNC     2047
TSTDAB  6111        WATKSF  2346        XORS    7214
TSTEND  2227        WATTSF  2333        XORS1   7214
TSTIAC  0253        WTCLSK  5427        XPRNT1  7477
TSTIN   2217        X1      4042        XPRNT2  7153
TSTIOT  5030        X1PRN1  7466        XPRNT4  7464
TSTLCM  0260        X1PRN2  7525        XR      6205
TSTLOP  0125        X1PRN4  7453        XRET    0112
TSTNO   0075        X1TYPE  7400        XRETAD  4072
TSTNU   0140        XBAUD   3112        XRTF1   4066
TSTPC   5657        XC1CRL  7200        XSAV    3510
TTY1CN  7101        XC1EOP  7306        XSCAF   3252
TTYCNT  7104        XC1ERR  6600        XSDF    3461
```

ERRORS DETECTED: 0

LINKS GENERATED: 203

RUN-TIME: 16 SECONDS

4K CORE USED

AC	7744	7787	7794	7798#	7810								
AC1SAV	7811	7891	8004	8067#									
ACAIOT	2375	2376	2387	2393	2433#								
ACCERR	2379	2393#											
ACDATA	151#	1148	1222	1361	1386	2997							
ACL	23#	738	7501										
ACSAVE	2911	2998	3015	3027	3043	3129	3179#	3196					
ACWAS	137#	1155	1324	3014									
ADDTIM	5240	5252	5259#	5265	5266	5267							
ADRS	2161	2165#											
AGAIN1	1751#												
AGAIN2	1797#												
ALRBM	7562	7567#											
ALRBU	7577	7586#											
AP1OW1	3594	8070#											
APT1CO	3596	8434#											
APT1ER	8071	8136#											
APT3CK	5501#	5508	5513	5516	5534								
APTCON	3532#	3590											
APTCT1	8095	8100	8112#										
APTCT2	8097	8098	8113#										
APTCTX	3229	3234	3246#										
APTCTY	3231	3232	3247#										
APTER	3184	3270#											
APTHW3	15#	3599											
APTIM1	8094	8110#											
APTIM2	8096	8111#											
APTIMX	3228	3244#											
APTIMY	3230	3245#											
APTOK	3225#	3242											
APTOK1	5368	8091#	8108										
APTOW1	3183#	3588											
APTR	4672	5375#	5382										
APTREP	4032#	4110	5381	8389									
ATIMLS	4768	4775	4782#	4792	4827	4832							
ATIMMS	4769	4777	4783#	4794	4822								
BASEP	2764	2798#											
BDR1	3919#	5471	5643	5693	5704	7952							
BDR2	3920#	5029	5467	5648	5696	5707							
BDR3	3921#	5463	5645	5698	5710								
BDRATE	4334	4809	5376	5461	5465	5469	5472	5608	5622	5627	5631#	5633	
BDRNS	4106	5688#	5699										
BDRSQ	5186	5219#											
BDTA	6441	6462	6502#	6508									
BEGBST	2494	2715	2750#										
BEGEXM	238	1406	1475#										
BEGRTC	1480	2401	2489#										
BIT11	145#	1170	1212	1237	1246	1311	1321	3026					
BIT3	146#	1182	1187	1227	1300	1303	1316	1326	1336	1350			
BIT4	147#	1180	1191	1229	1268	1289	1302	1305					
BIT5	148#	1178	1195	1231	1250	1273	1291						
BIT6	143#	1176	1199	1233	1254	1277							
BIT7	144#	1174	1203	1235	1258	1262	1267	1281	1293	1296	1313	1314	3032

```
BIT8      1498#  1172   1207   1239   1248   1330   1331   3029
BLANK     4051#  6805   6806   7049   7050   7055   7056   7075   7079   7094
BRSMS     2780   2785#
BSTLP     2761#  2771
BSW         17#   372    644    653
C1BY2     8048   8051#
C1CRLF    3925#  4179   4184   6395   6400   6937   6942   7802   7805   7814   7863   7916   7920   7923
          8204   8330   8377   8384   8474
C1EOP     3943#  6722   7380   7532
C1GET     8057   8074#  8081
C1PRNT    3929#  4180   4182   6396   6398   6938   6940   7803   7815   7876   7880   7889   7896   7903
          7921   7929   7950   7960   7967   8155   8176   8200   8250   8303   8378
C1PRT4    3931#  7879   7883   7892   7899   7906   7942   7956   7963   7970   8158   8203   8383
C1REST    2773   4091#
C1RM      8171   8211#  8237   8529
C1RST     8396#
C1SWIT    3933#  8050
C8APT      198#  3206
C8CRLF     180#  1414   1419   2448   2453   2531   2536   2766   2778   2902   2905   2914   2989   2996
          3004   3011   3023   3035   3076   3079   3207   3210   3336   3478   3634
C8ERR      200#   248    252    255    257    260    266    273    275    278    285    289    293    299
            301    306    312    319    321    328    330    335    337    342    344    351    357    363
            369    375    389    391    396    399    407    413    420    424    433    435    444    446
            452    459    467    473    482    488    494    500    506    512    518    524    530    536
            542    548    570    574    583    590    594    602    609    613    621    627    631    639
            646    649    655    659    669    675    682    691    700    709    712    715    729    731
            734    740    742    746    757    759    763    769    775    777    781    787    789    792
            805    815    824    829    837    849    857    861    870    881    895    905    909    922
            934    945    955    967    978    992   1000   1014   1019   1025   1030   1038   1048   1058
           1060   1067   1079   1083   1090   1094   1099   1107   1346   1354   1491   1498   1505   1512
           1519   1524   1526   1549   1556   1562   1569   1575   1582   1588   1595   1598   1605   1611
           1678   1767   1776   1814   1823   1866   1897   1908   1929   1937   1941   1997   2057   2070
           2086   2099   2175   2185   2190   2203   2218   2220   2289   2300   2317   2325   2390   2396
           2503   2507   2511   2554   2557   2560   2564   2582   2586   2590   2593   2595   2598   2606
           2610   2634   2640   2646   2649   2666   2671   2677   2695   2701   2723   2730   2895
C8GET      3171   3187#  3197
C8H3        210#  3212
C8PRNT     182#  1415   1417   2449   2451   2532   2534   2779   2781   2903   2915   2925   2929   2933
          2937   2941   2945   2949   2953   3012   3024   3041   3048   3055   3062   3069   3077   3085
          3092   3208   3313   3339   3385   3451
C8PRT4     184#  2923   3044   3051   3058   3065   3072   3088   3095   3295   3335
C8RC       208#  3565   3701
C8REST     231#  8391   8397
C8RM      3308   3348#  3372   3689
C8STAR     202#   230
C8SWIT     186#  3166   3211
CAB       1740   1781#
CAC       1742   1782#
CAD       1776#
CAE       1823#
CAF         38#   242   1009   1485   2350   2500   2504   2551   2579   2631   2643   3348   3730#  4957
          5748   5847   5942   6242   6518   6733   7408   8211
CAG       2289#
```



```
CAM         21#   727   1140
CAMTST     716    724#
CCDF      1637   1664   1714#
CDELTA    2707   2719#  2727
CDI         18#  2080   2772   2917   2955   7817   7820   8212   8390   8393   8396
CFSLU     4026#  4359   4659   4676   4694   4723   4765   4949   4977   5028
CH1KB     3975   5798#  5806
CH1KSF    3947#  5801   7784
CH1R0     8161   8165   8179#  8195
CH1R1     8182   8185#
CH1REC    3470   3471   3480   3484   3492   3504   3514#
CHAR      3523   3526   3534#
CHAR1     8424   8427   8436#
CHAREC    8322   8323   8332   8336   8344   8356   8365#
CHARLP    4986#  5007
CHARR0    3299   3302   3316#  3328
CHARR1    3317   3320#
CHG1CH    8162   8165#  8183   8184   8194   8197   8256
CHGCHR    3299   3302#  3318   3319   3327   3330   3391
CHGMOD    7526   7557#  7566   7567   7568
CHGUNI    7528   7572#  7585   7586   7587
CHKKB      177   1448#  1456
CHKKSF     174#  1451   2891
CIFCK     1753   1759   1761   1770   1773   1780#
CIFCK1    1799   1805   1807   1817   1820   1830#
CIFJMP    1752   1756   1758   1762#  1781
CIFJMS    1782   1798   1802   1804   1808#
CIFJPL    1756#  1792
CIFJSL    1802#  1827
CIFOK     1772   1779   1791#
CIFOK1    1819   1826#
CKBRSQ    5176   5184#
CKCON     7761   7784#
CKFLG     2919   2922#  2956   7821
CKIMOD    7474   7482#
CKINDA    7480   7489#
CKMF      1862   1867#
CKMODE    7450   7457#
CKPTFG    7758   7776#
CKRFG     5590   7755   7772#
CKXMFG    5600   7752   7768#
CLCL        46#  2555   2583   2607   2650   2660   2668   2691   2696
CLCON     2704   2718#  2726   2729
CLKCT     2692   2699   2702   2717#  2722
CLKERR    2706   2709   2721#
CLKIR     2689   2702#
CLLE        47#  2588   2601   2636   2663   2698   2711
CLOOPA    4031   5730#  5734
CLREIF    3964#  4125   4148   4205   4233   4277   4358   4454   4499   4536   4575   4658   4675   4693
          4722   4761   4948   4976
CLREPI    3988#  5904   5921   5939   5955   5997   6040   6182   6212   6237   6272   6332   6421
CLRERI    3968#  4477   4516   4553   5321
CLREXI    3966#  4244   4290   4399   4460   4511   4545   5313
```

```
CLSK        45#   2505    2518    2558    2584    2608    2673
CLSKWT     212#   2502    2553    2581    2594    2633    2645    2694
CLUPEX    4700   4807    4835#
CNT       4045#  5237    5250    5260
CNT1      4046#  4072    4080    5236    5249    5262
CNT1S1    8241   8258#
CNTR1G    8239   8253#
CNTR1S    8426   8510#   8512    8517    8520
CNTRLG    3374   3385#
CNTRLS    3525   3670#   3672    3677    3680
CNTRS     3310   3390#
CNTRS1    3376   3393#
COMP      4055#  6770    6781    6807
COMPST    8167   8388    8393#   8532
CONCH     1986#  2001    2003    2005
CONCHK    1973   1980#
CONSI     7713   7717    7719    7726#
CONTOG    2199   2205#   2221
CONTI     2710#  2732
CPUDIS    3009#  3162
CPUDN     1129   1404#
CPUMES    1416   1421#
CPUSDI    2994#  3157
CPUT1      241#
CPUT10     845#
CPUT11     883    889#
CPUT12     928#
CPUT13     973#
CPUT14    1074#
CPUT15    1120#
CPUT2      377    386#
CPUT3      479#
CPUT4      550    564#
CPUT5      665#
CPUT6      752#
CPUT7      799#
CRA       7753#  7769
CTRS1     8173   8255#
CUIPTR    2355   2359    2362    2434#
DAT        155#  1669    1670    1677
DATPAT     216#  1137    1359    1380    1387    1394
DATSLU    3961   5300#   5331    5332    5333
DDERSL    5342   5345#   7873
DECPRT    2822   2826#
DELAY     3986#  5027    5628    5667    5694    5716    8028
DELAY1    5738   5741#
DERSLU    3963   5339#   5341    5344
DF0       1488#
DF1       1500#
DF2       1507#
DF3       1514#
DF4       1521#
DF7       1493#

DFLD      1640#  1651    1654    1656    1657    1659
DLCD8     7459   7657#
DLOP      4953   5302#   5305
DNF7      1649   1655#
DONLOP    3952#  4136    4174    4222    4267    4313    4419    4487    4527    4561    4649    4663    4681    4703
          4748   4837    4958    5078    5896    5931    5965    6032    6065    6110    6173    6228    6249    6314
          6353   6385    6468    6588    6607    6626    6645    6665    6685    6834    6892    6930    7008    7098
          7146   7203    7241    7273    7310    7374    7530
DONT17    4743   4748#
DOSIMU    1217#
DOSLU     2754   2759    2772#
DOSWAP    1297   1300#
DVCTAB    5573#  5609
DXDR8     7484   7658#
E0        6873#
E0PRE     6746#
E1        6885#
E10       6928#
E100      7264   7272#
E11       6915#
E110      7294   7308#
E120      7367#
E121      7370#
E122      7373#
E124      7335   7357#
E1PRE     6815#
E2        6888#
E20       6967#
E21       6969#
E22       6971#
E23       6980#
E24       6982#
E25       6984#
E26       6997#
E27       7002#
E28       7007#
E2PRE     6749#
E3        6891#
E40       7091#
E42       7068#
E4PRE     6833#
E50       7129#
E51       7135#
E52       7141#
E53       7133#
E54       7139#
E55       7145#
E56       7127#
E60       7172   7181#
E61       7198#
E62       7200#
E63       7202#
E70       7240#
```

SEQ 0201

SEQ 0202

```
MKRB     4008#  4522   4589   5324
MKRS     4004#  4517   4593
MKSF     4000#  4127   4151   4161   4171   4219   4264   4310   4413   4484   4518   4524   4558   4598
         5251
MLAP     2950   2967#
MLK      3003   3022   3034   3068#  3073
MLQP     2954   2960#
MMID     2958#  3209
MMQ      2987   3002   3019   3031   3047#  3052
MODAGN   7467#  7527   7529
MODE1    3852#  4109   4763   5009
MODE2    3853#  5033   5057
MODE3    3854#
MODVAR   7558   7564   7593   7638#
MPC      2909   3081   3091#  3096
MQ1SAV   7898   8008   8068#  8076
MQA        20#   707   1298   1301   3132   3736#  8007
MQDATA    152#  1146   1220   1362   1393   3000
MQL        19#   667    686    696    706   1294   1304   1676   1774   1821   1864   1906   1935   1939
         1995   2068   2097   2173   2183   2201   2388   2394   2728   3189   3735#  4793   4798   4803
         5071   5089   6428   6449   6801   6926   7084   7500   8077
MQSAVE   3001   3018   3030   3050   3133   3180#  3188
MQWAS     138#  1161   1334   3017
MREC1    2938   2964#
MREC2    2942   2965#
MREC3    2946   2966#
MSHDR    7859   7910   7919#  7926
MSLU     7914   7928#  7943
MSPF     4010#  4155   4209   4243   4281   4365   4459   4608
MTCF     4014#  4164   4260   4306   4398   4466   4510   4548   4613   4631   4647   5316
MTLS     4022#  4327   4329   4372   4385   4465   4505   4542   4639   4770   4773   5310
MTN      2906   3080   3084#  3089
MTPC     4018#  4426   4428   4623
MTSB     4016#  5626
MTSF     4012#  4130   4156   4165   4210   4216   4236   4245   4255   4261   4282   4291   4301   4307
         4366   4374   4387   4416   4461   4469   4618   4771   5239
MTSK     4020#  4133   4158   4168   4212   4239   4247   4257   4284   4293   4303   4368   4396   4403
         4478   4634
MXMT1    2926   2961#
MXMT2    2930   2962#
MXMT3    2934   2963#
NDF       156#  1636   1641   1653   1658   1663   1672   1675   1689   1694
NOCRF    3362   3382#
NOPI     2217   2220#
NORDIS   7859#  8045
NORF     8225   8247#
NORMDI   2985#  3163
NORMSQ   5194#  5611   5634
NORSLU   7868   7875   7909#  7917
NORX01   6759   6779   6799#
NOSIM0   5858#  6526
NOSIM1   6481#  6536   6688
NSQBDR   3916#  5689   5695   5697
```



```
NSTKS     168   2223#  2226
NUMX     1965   1977   1982   1991   1994   2004   2008   2022#
NUOK     5118   5121#
NXTDC    4106#  5185
NXTIOT   2380#  2392   2398
NXTONE   1123#  1402
NXTONN   1367   1402#
NXTPAT   1140#  1401
NXTPTT   1400   1401#
ODT1       60#
ODT2       61#
ODT3       62#
OEKR     5026   5063#  5067
OFONKI   5238   5348#  5357
OTZ      4724#  4734
OUT      1262#  1276   1280   1283   1284
OW1APT   3595   8003#
OWAPT    3128#  3589
OWSET    4348   4357   4358#
PASSNO   3214   4058#  8380   8382
PATCH    4065#  4066   4082   4083   4097   4766   4835   5849   6726   7171   7229   7263   7293   7334
PBRSMS   2760   2777#  2783
PC1SAV   7808   7874   7969   8011   8031   8036   8041   8066#
PCIE     3881#  5758   5974   6093   6473
PCLF     3878#  5879   5892   5912   5926   5940   5950   5960   6015   6098   6471
PCLOOP   3951   5112#  5116   5121   5123
PCLP     3883#  6044   6057   6430   6451
PCPUM     239#
PCPUMS    239   1413#  1420
PCSAVE   2908   3094   3136   3148   3153   3158   3178#
PERR     5055   5069#  5076
PFM      6728#
PFMES    6728   6936#  6943
PIMES    6397   6403#
PMEMES   1482   2447#  2454
PMODE    5034   5036#  5056   5060   5061   5070
POINTB    100#   853    860    867    940
POINTC    160    161#   854    865    901    902    911    915    919    937   1121   1124   1126   1131
POINTD    143    162#   939
POINTE    163#  1089
POINTF    164#  1105
POINTR    158#   846    892
PPIM     5845#
PPIMES   5845   6394#  6401
PPRMS    3293   3333   3338#  3341
PRDB     3884#  6006   6022   6026   6051   6059   6102   6106   6433   6454
PRDD     2837   2844   2850   2856   2863#  2864   2866   2868   2869
PRETES   5839   6481   6719#
PRN11    3939#  8546   8548
PRN21    3945#  8490   8492
PRNT1     190#  3409   3411
PRNT2     194#  2842   2848   2854   2860   3650   3652
PROPLC   3291   3294   3316   3321   3325   3334   3343#
```

```
SLUDIS   7868#  8044
SLUEND   5114   5812#  8042
SLULER   5002   5087#  5095
SLULSL   4815   4968#
SLULSU   4818   4986#
SLUMES   4181   5784#
SLUMST   4812   4850#
SLUREC   4050#  4990   5000   5021   5022   5050   5051   5064   5072   5088   5325   5329   7882
SLUXMT   4049#  4660   4678   4696   4700   4725   4728   4732   4737   4740   4744   4951   4984   5309
         5327   7878
SMES     4104#
SMORE    7452   7455   7462#
SNUMX    1980   1989   1996   2023#
SOMSKP    141#  1142   1253   1257   1261   1263
SPAC2    3939   8302#  8305
SPAC21   3937#  8493
SPACE2    196#  3653
SPACX2    197   3450#  3453
SPCIE    4034#  5905   5917   5941   5998   6041   6422
SPE1     1346#  3155
SPE2     1354#  3160
SPE3     5343#  8038
SPF        37#  2232   3759#  5436
SPF1     3709#
SPF2     3817#
SR1MES   8156   8201   8399#
SR1QES   8155#  8178
SREC     6435   6436   6456   6457   6484#  6503
SRMESG   3517#  3566
SRQ        29#  1065
SSLUDI   7873#  8040
SSLUN    7940   7941   7947#  7953   7954   7955
SSUBLK   3369   3539#  3546
STAB     5503   5504   5518#
START     230#  3304   3692   8394
STKS      167#  1643   1646   1679   1682   1732   1743   1755   1791   1801   1826   1870   1971   1998
         2074   2104   2129   2205   2225
STR      3865#  6744   6883   6968   6981   6999   7134   7137   7199   7368   7489   7497
SUNFI    7802#  8035
SVBDC    4784#  4810   4811   4814   4817
SWP        22#   672    680    687    697    713    724    732    744   1147   1160   1221   1329
SXDRDA   7642#  7695   7698
SXMT     6426   6427   6429   6439   6442   6447   6448   6450   6460   6463   6483#
T1       6732#
T10      7227#
T10LS    6540   6562#
T11      7261#
T11LS    6592#
T12      7291#
T12LS    6611#
T13      7311   7324#
T13LS    6630#
T14LS    6649#
```



```
T14S     7378   7405#
T15LS    6669#
T1LA     5878#  6545
T1LQ     5861   5865   6143#  6531
T2       6847#
T21DN    4940   4945   4958#
T2LA     5903#
T2LQ     6181#
T3       6850   6908#
T3LA     5938#
T3LQ     6236#
T4       6931   6963#
T4LA     5966   5996#
T4LQ     6250   6271#
T5       7009   7045#
T5B      7050#  7097
T5LA     6039#
T5LQ     6315   6331#
T6       7111#
T6LA     6074#
T6LQ     6362#
T7       7147   7169#
T70K     7230   7241#
T7LA     6111   6121#
T7LQ     6125   6390   6420#
T7OW1    6122   6387   6437#  6537
T7OW2    6124   6389   6458#
TABADD   5502   5514   5515   5535   5541   5542   5548   5582#  5610
TABDON   6303   6309#
TADI     1645   1661#
TBLPTR   2765   2815#  2820   2826
TCF      2310   3531   3761#  5448   5767   8432
TCF1     3791#  5769
TCF2     3819#  5771
TESAGG   1371   1376   1403#
TESAGN   1136#  1403
TESLOC    145    154#   755    760    766    767    773    778    785    786    790    875    879    960
          965
TESMES   4183   5785#  6399   6941
TEST      173#  1242   1270   1295   1299   1306
TEST1    4121#  5194
TEST10   4451#  5201
TEST11   4496#  5202
TEST12   4533#  5203
TEST13   4572#  5204   5330
TEST14   4655#  5205   5220
TEST15   4671#  5206   5221
TEST16   4690#  5207   5222
TEST17   4719#  5208
TEST2    4145#  5195
TEST20   4757#  5223
TEST21   4933#  5209
TEST22   4973#  5210
```

SEQ 0214

```
X1TYPE   3942   8423#  8433   8434
XBAUD    5184   5621#  5629   5630   5636
XC1CRL   3926   8285#  8296
XC1EOP   3944   8375#
XC1ERR   3955   8001#  8010   8060   8143
XC1SW    3934   8153#  8199   8205   8252
XC8APT    199   3583#  3587
XC8CRL    181   3431#  3442
XC8ERR    201   3126#  3135   3173   3193   3276
XC8H3     211   3700#  3704
XC8RC     209   3286#  3287   3289   3290   3292   3332   3337
XC8STA    203   3205#  3216
XC8SW     187   3387   3564#  3568
XCDIL    2078#  2105
XCFSLU   4027   5765#  5780
XCHIKS   3948   8223#  8233   8247   8248   8260   8557   8569
XCHKKS    175   3360#  3368   3382   3383   3395   3540   3552
XCLEPI   3989   6489#  6492
XDATA    2133   2142   2169   2172   2215#
XDELAY   3987   5737#  5740
XDR      3864#  6802   6919   7072   7125   7499
XDRDAT   7482   7503   7640#
XGETSR   3981   5789#  5794
XGHW3    3983   7831#  7836
XIOT     4107   5531#  5550
XKLSIM   4029   6513#  6519
XLCTR    5012   5016   5077#
XLISN     189   3462#  3486   3487   3496   3497   3499   3501
XLISN1   3936   8314#  8338   8339   8348   8349   8351   8353
XMIOT    3977   5554#  5556   5557   5561
XMKCC    4003   5410#  5412   5414
XMKCF    3999   5398#  5400   5402
XMKIE    4007   5422#  5425   5427
XMKRB    4009   5429#  5431   5433
XMKRS    4005   5416#  5418   5420
XMKSF    4001   5404#  5406   5407   5408
XMODE2   3928   4906#  4908   4911   4912
XMSPF    4011   5435#  5437   5439
XMTCF    4015   5447#  5449   5451
XMTLS    4023   5492#  5494   5496
XMTPC    4019   5480#  5482   5484
XMTSB    4017   5453#  5476   5478
XMTSF    4013   5441#  5443   5444   5445
XMTSK    4021   5486#  5488   5489   5490
XNC      5013#  5017
XORS     3437   3440   3444#  3495   3498
XORS1    8291   8294   8298#  8347   8350
XPRNT1    191   3657#  3661
XPRNT2    195   3404#  3412
XPRNT4    185   3544   3556   3644#  3654
XR       7750#
XRET      169    170#
XRETAD   2016   2024#
```



```
XRTF1    2000   2020#
XSAV     1850   1860   1863   1874#
XSCAF    4025   5747#  5759
XSDF     1844   1845   1851#  1868   1869
XSEPI    3991   6494#  6497
XSFIB    2207   2213#
XSPCIE   4035   5972#  5976
XSRTF    2054#  2075
XSTKS     168#  1634   1661   1731   1754   1800   1840   1966   1983   2047   2076   2128
XTFLG     166#  1543   1750   1796   1853   2048   2267
XTOR     2053   2054   2064   2067   2071   2073   2077   2078   2093   2096   2101   2103   2108#
XTYPE     193   3522#  3532
XVDLY    3993   4916#  4918   4921   4924
XWAIT    3979   7384#  7386   7388   7389   7391   7393   7394
ZEXF     7676   7683#
ZTO      4731   4735#  4747
.L0177   4068   8594#
.L0371   4146   4189#
.L0372   4122   4190#
.L0373   4107   4191#
.L0374    377    378#  4106   4192#
.L0375    239    379#  4103   4193#
.L0376    238    380#  4102   4194#
.L0377    236    381#  4100   4195#
.L0567    550    551#
.L0570    540    552#
.L0571    534    553#
.L0572    528    554#
.L0573    510    555#
.L0574    504    556#
.L0575    492    557#  4275   4315#
.L0576    486    558#  4231   4316#
.L0577    410    456    559#  4203   4317#
.L0767   4430   4435#
.L0770   4426   4428   4436#
.L0771   4351   4355   4437#
.L0772   4349   4353   4438#
.L0773    716    717#  4338   4342   4344   4346   4439#
.L0774    637    718#  4335   4440#
.L0775    619    719#  4334   4441#
.L0776    611    624    635    720#  4331   4442#
.L0777    606    617    629    721#  4327   4329   4443#
.L1175   4534   4563#
.L1176   4497   4564#
.L1177    883    884#  4452   4565#
.L1370   4699   4705#
.L1371   4695   4706#
.L1372   4691   4707#
.L1373   4677   4708#
.L1374   4673   4709#
.L1375   4672   4710#
.L1376   1039   1040#  4656   4711#
.L1377    998   1041#  4573   4712#
```

.L1570	4818	4840#								
.L1571	4815	4841#								
.L1572	4812	4842#								
.L1573	4809	4843#								
.L1574	1162	1163#	4758	4844#						
.L1575	1136	1164#	4736	4845#						
.L1576	1134	1165#	4729	4741	4846#					
.L1577	1129	1166#	4720	4847#						
.L1771	4953	4961#								
.L1772	4952	4962#								
.L1773	4950	4963#								
.L1774	4943	4964#								
.L1775	4941	4965#								
.L1776	4938	4966#								
.L1777	1247	1285#	4934	4967#						
.L2165	5057	5098#								
.L2166	5053	5099#								
.L2167	5030	5100#								
.L2170	5024	5101#								
.L2171	5023	5052	5102#							
.L2172	5011	5103#								
.L2173	5005	5104#								
.L2174	4994	5033	5105#							
.L2175	4980	5106#								
.L2176	1406	1409#	4978	5107#						
.L2177	1374	1410#	4974	5108#						
.L2372	5238	5270#								
.L2373	5235	5248	5271#							
.L2374	5186	5272#								
.L2375	5185	5273#								
.L2376	5184	5274#								
.L2377	5114	5275#								
.L2571	5377	5387#								
.L2572	5376	5388#								
.L2573	5368	5389#								
.L2574	5364	5390#								
.L2575	5353	5391#								
.L2576	5350	5392#								
.L2577	5303	5393#								
.L2770	5510	5521#								
.L2771	5506	5522#								
.L2772	5505	5523#								
.L2773	5502	5514	5515	5524#						
.L2774	5462	5466	5470	5473	5525#					
.L2775	5461	5465	5469	5472	5526#					
.L2776	5458	5527#								
.L2777	5455	5528#								
.L3163	5655	5672#								
.L3164	5652	5673#								
.L3165	5647	5664	5674#							
.L3166	5642	5644	5660	5675#						
.L3167	1585	1608	1616#	5623	5676#					
.L3170	1571	1617#	5614	5653	5677#					

.L3171	1559	1618#	5613	5678#						
.L3172	1509	1619#	5612	5635	5679#					
.L3173	1502	1620#	5611	5634	5680#					
.L3174	1495	1516	1621#	5609	5681#					
.L3175	1482	1622#	5564	5682#						
.L3176	1480	1540	1623#	5538	5545	5683#				
.L3177	1478	1624#	5534	5684#						
.L3371	1772	1779	1784#							
.L3372	1751	1785#								
.L3373	1737	1739	1741	1786#						
.L3374	1719	1787#								
.L3375	1715	1788#								
.L3376	1650	1686	1789#	5792	5829#					
.L3377	1642	1652	1668	1688	1790#	5773	5830#			
.L3565	5973	5977#								
.L3566	5966	5978#								
.L3567	5863	5979#								
.L3570	5861	5965	5980#							
.L3571	5859	5981#								
.L3572	1873	1877#	5851	5982#						
.L3573	1846	1878#	5845	5983#						
.L3574	1843	1879#	5844	5984#						
.L3575	1841	1880#	5843	5985#						
.L3576	1797	1881#	5839	5986#						
.L3577	1792	1882#	5837	5987#						
.L3771	1932	1944#								
.L3772	1925	1938	1945#							
.L3773	1916	1934	1946#							
.L3774	1909	1947#								
.L3775	1902	1905	1948#	6111	6113#					
.L3776	1893	1949#	6078	6083	6089	6094	6099	6103	6107	6114#
.L3777	1891	1950#	6076	6081	6086	6092	6097	6115#		
.L4164	6250	6252#								
.L4165	6246	6253#								
.L4166	6215	6239	6254#							
.L4167	2021	2027#	6208	6255#						
.L4170	2017	2028#	6204	6256#						
.L4171	2015	2029#	6198	6257#						
.L4172	2013	2030#	6195	6258#						
.L4173	2010	2031#	6188	6203	6214	6259#				
.L4174	2009	2032#	6125	6260#						
.L4175	1987	2011	2033#	6124	6261#					
.L4176	1984	2012	2034#	6122	6262#					
.L4177	1967	2035#	6121	6123	6263#					
.L4367	6390	6406#								
.L4370	6389	6407#								
.L4371	2107	2110#	6387	6408#						
.L4372	2080	2111#	6386	6388	6409#					
.L4373	2079	2112#	6376	6410#						
.L4374	2072	2102	2113#	6369	6381	6411#				
.L4375	2060	2089	2114#	6364	6366	6379	6412#			
.L4376	2051	2115#	6334	6413#						
.L4377	2049	2116#	6273	6414#						

```
.L4561   2224   2237#
.L4562   2214   2238#
.L4563   2193   2239#
.L4564   2179   2182   2240#
.L4565   2160   2241#
.L4566   2158   2242#
.L4567   2156   2243#
.L4570   2154   2244#  6545   6548#
.L4571   2152   2245#  6540   6549#
.L4572   2150   2246#  6538   6550#
.L4573   2148   2247#  6531   6551#
.L4574   2146   2248#  6528   6552#
.L4575   2144   2249#  6526   6553#
.L4576   2134   2250#  6516   6524   6534   6554#
.L4577   2130   2209   2251#  6481   6555#
.L4764   2327   2332#
.L4765   2282   2333#
.L4766   2280   2334#
.L4767   2278   2335#
.L4770   2276   2336#
.L4771   2275   2337#  6688   6693#
.L4772   2274   2338#  6675   6694#
.L4773   2273   2339#  6655   6695#
.L4774   2272   2340#  6635   6696#
.L4775   2271   2341#  6616   6697#
.L4776   2270   2279   2298   2342#  6597   6698#
.L4777   2269   2343#  6563   6699#
.L5165   6931   6947#
.L5166   6922   6948#
.L5167   6910   6917   6925   6949#
.L5170   2401   2437#  6868   6950#
.L5171   2382   2438#  6784   6951#
.L5172   2377   2439#  6777   6780   6952#
.L5173   2371   2440#  6774   6953#
.L5174   2367   2441#  6742   6954#
.L5175   2364   2442#  6731   6955#
.L5176   2357   2443#  6730   6956#
.L5177   2354   2444#  6720   6957#
.L5374   7147   7152#
.L5375   7081   7153#
.L5376   2465   2475#  7074   7095   7154#
.L5377   2461   2476#  6964   7046   7122   7155#
.L5571   2612   2616#
.L5572   2576   2617#
.L5573   2574   2618#
.L5574   2549   2619#
.L5575   2498   2620#  7392   7399#
.L5576   2494   2621#  7378   7400#
.L5577   2492   2622#  7175   7232   7268   7296   7347   7376   7401#
.L5753   7528   7534#
.L5754   7526   7535#
.L5755   7518   7536#
.L5756   7495   7537#
```



```
.L5757   7494   7538#
.L5760   7484   7539#
.L5761   7482   7503   7540#
.L5762   7466   7541#
.L5763   7462   7464   7542#
.L5764   7459   7543#
.L5765   7453   7477   7544#
.L5766   7448   7472   7545#
.L5767   7436   7493   7515   7546#
.L5770   7435   7492   7514   7547#
.L5771   7429   7457   7548#
.L5772   7423   7432   7440   7511   7549#
.L5773   7420   7550#
.L5774   7419   7445   7447   7465   7468   7471   7551#
.L5775   2715   2737#  7414   7522   7552#
.L5776   2689   2738#  7407   7553#
.L5777   2664   2739#  7405   7554#
.L6167   2834   2875#
.L6170   2831   2876#
.L6171   2828   2877#
.L6172   2793   2878#  7715   7733#
.L6173   2773   2879#  7701   7734#
.L6174   2769   2880#  7603   7605   7735#
.L6175   2764   2881#  7584   7606   7736#
.L6176   2763   2882#  7582   7604   7737#
.L6177   2757   2883#  7581   7583   7738#
.L6364   7834   7840#
.L6365   7822   7841#
.L6366   7819   7842#
.L6367   7817   7843#
.L6370   2920   2970#  7813   7844#
.L6371   2917   2971#  7812   7845#
.L6372   2913   2972#  7811   7846#
.L6373   2912   2973#  7809   7847#
.L6374   2911   2974#  7808   7848#
.L6375   2909   2975#  7806   7849#
.L6376   2908   2976#  7792   7850#
.L6377   2906   2977#  7747   7851#
.L6566   7952   7981#
.L6567   7935   7982#
.L6570   7932   7983#
.L6571   7931   7984#
.L6572   7905   7985#
.L6573   3094   3108#  7898   7986#
.L6574   3057   3109#  7891   7987#
.L6575   3001   3018   3030   3050   3110#  7874   7969   7988#
.L6576   2998   3015   3027   3043   3111#  7873   7989#
.L6577   2990   3005   3036   3112#  7864   7869   7884   7990#
.L6762   8107   8116#
.L6763   3241   3251#  8103   8117#
.L6764   3237   3252#  8051   8118#
.L6765   3214   3253#  8049   8119#
.L6766   3194   3254#  8045   8120#
```

.L6767	3163	3255#	8044	8121#										
.L6770	3162	3256#	8042	8122#										
.L6771	3160	3257#	8040	8123#										
.L6772	3157	3259#	8038	8124#										
.L6773	3155	3259#	8035	8125#										
.L6774	3152	3260#	8033	8126#										
.L6775	3150	3261#	8026	8127#										
.L6776	3145	3262#	8022	8128#										
L6777	3142	3263#	8016	8129#										
.L7164	8259	8270#												
.L7165	8255	8258	8271#											
.L7166	3394	3418#	8244	8272#										
.L7167	3390	3393	3419#	8234	8273#									
.L7170	3387	3420#	8229	8274#										
.L7171	3379	3421#	8227	8275#										
.L7172	3369	3422#	8182	8276#										
.L7173	3317	3423#	8180	8191	8277#									
.L7174	3298	3328	3424#	8161	8195	8278#								
.L7175	3279	3425#	8146	8279#										
.L7176	3276	3426#	8143	8280#										
.L7177	3273	3427#	8140	8281#										
.L7364	8391	8397	8404#											
.L7365	8386	8405#												
.L7366	8360	8406#												
.L7367	8357	8407#												
.L7370	8333	8408#												
.L7371	3544	3556	3570#	8327	8409#									
.L7372	3542	3554	3571#	8324	8410#									
.L7373	3540	3552	3572#	8321	8394	8411#								
.L7374	3525	3573#	8320	8412#										
.L7375	3481	3574#	8292	8413#										
.L7376	3468	3575#	8289	8414#										
.L7377	3435	3576#	8287	8415#										
.L7561	3692	3708#												
.L7562	3690	3693	3709#	8557	8569	8580#								
.L7563	3689	3710#	8532	8581#										
.L7564	3687	3711#	8530	8533	8582#									
.L7565	3675	3712#	8529	8583#										
.L7566	3674	3686	3713#	8527	8584#									
L7567	3602	3714#	8515	8585#										
L7570	3599	3715#	8514	8526	8586#									
.L7571	3597	3716#	8499	8587#										
.L7572	3596	3717#	8498	8588#										
.L7573	3594	3718#	8471	8589#										
.L7574	3592	3719#	8470	8590#										
.L7575	3590	3720#	8468	8591#										
.L7576	3589	3595	3721#	8465	8592#									
.L7577	3588	3722#	8462	8593#										
.V0000	410	456	559#	2009	2032#	7747	7851#							
.V0001	1987	2011	2033#	2757	2883#	4122	4190#	6208	6255#					
.V0002	486	558#	2013	2030#	2492	2622#	2664	2739#	2834	2875#	4146	4189#	5353	5391#
	5973	5977#	6198	6257#	6528	6552#	7392	7399#						
.V0003	2015	2029#	2160	2241#	2270	2279	2298	2342#	4203	4317#	5377	5387#	5773	5830#
	6188	6203	6214	6259#	8468	8591#								
V0004	492	557#	2272	2340#	2831	2876#	4231	4316#	5837	5987#				
V0005	2179	2182	2240#	2274	2338#	4275	4315#							
.V0006	2276	2336#	4331	4442#	4994	5033	5105#							
.V0007	1642	1652	1668	1688	1790#	2017	2028#	2382	2438#	4430	4435#	8498	8588#	
.V0010	2364	2442#	4452	4565#	6563	6699#	6720	6957#	8360	8406#				
.V0011	2072	2102	2113#	2130	2209	2251#	4497	4564#						
.V0012	4534	4563#												
.V0013	4573	4712#												
.V0014	4656	4711#												
.V0015	4673	4709#												
.V0016	4691	4707#	5642	5644	5660	5675#	8026	8127#						
.V0017	2763	2882#	4335	4440#	4720	4847#	5462	5466	5470	5473	5525#	5647	5664	5674#
	7435	7492	7514	7547#	7701	7734#								
.V0020	504	556#	4100	4195#	4758	4844#	5623	5676#	5792	5829#	8180	8191	8277#	
.V0021	4934	4967#												
.V0022	4974	5108#	5364	5390#	5510	5521#	8227	8275#						
.V0023	7834	7840#												
.V0025	7952	7981#												
V0030	5455	5528#	7932	7983#										
V0040	510	555#	1478	1624#	5005	5104#	6784	6951#	8016	8129#				
V0070	1846	1878#	2079	2112#										
.V0077	2060	2089	2114#	2193	2239#	8462	8593#							
.V0100	236	381#	7074	7095	7154#	8470	8590#							
.V0125	4699	4705#												
.V0137	3214	3253#												
.V0163	4068	8594#												
.V0177	2793	2878#	3468	3575#	3674	3686	3713#	6868	6950#	8320	8412#	8514	8526	8586#
.V0200	1925	1938	1945#	2773	2879#	3145	3262#	3692	3708#	4729	4741	4846#	4938	4966#
	6195	6258#	6516	6524	6534	6554#	6910	6917	6925	6949#	6964	7046	7122	7155#
	7175	7232	7268	7296	7347	7376	7401#	8022	8128#	8321	8394	8411#		
.V0201	8391	8397	8404#											
.V0212	8292	8413#												
.V0214	5185	5273#												
.V0215	8287	8415#												
.V0240	8471	8589#												
.V0252	4695	4706#	4950	4963#										
.V0260	8499	8587#												
.V0277	3379	3421#	6777	6780	6952#	8244	8272#							
.V0337	6246	6253#												
.V0377	4677	4708#	4736	4845#	7081	7153#								
.V0400	377	378#	528	554#	5863	5979#	7423	7432	7440	7511	7549#	8386	8405#	
.V0440	7518	7536#												
.V0600	550	551#												
.V0740	6538	6550#												
.V0770	2357	2443#	5505	5523#	5538	5545	5683#							
.V1000	534	553#	716	717#	1902	1905	1948#	2010	2031#	2150	2246#	2367	2441#	5859
	5981#													
.V1111	611	624	635	720#										
.V1200	883	884#												
.V1400	1039	1040#												
V1511	998	1041#												
1600	1162	1163#	4812	4842#										

```
.V1620   4815   4841#
.V1640   4818   4840#
.V2000    540    552#   1247   1285#  1715   1788#  1891   1950#  2049   2116#  5053   5099#
.V2010   2144   2249#
.V2054   3155   3259#
.V2060   3160   3257#
.V2113   2574   2618#
.V2134   1129   1166#
.V2200    239    379#   6742   6954#
.V2226   3142   3263#
.V2257   5614   5653   5677#  5844   5984#  6731   6955#
.V2265   5612   5635   5679#
.V2267   5652   5673#  5843   5985#  6730   6956#
.V2270   5613   5678#
.V2275   5611   5634   5680#
.V2321   5186   5272#
.V2400   7792   7850#
.V2423   4953   4961#
.V2466   8038   8124#
.V2470   7873   7989#
.V2471   5238   5270#
.V2513   4672   4710#
.V2526   2377   2439#  6078   6083   6089   6094   6099   6103   6107   6114#  6369   6381   6411#
.V2601   4941   4965#  4978   5107#
.V2702   7931   7984#
.V2726   5534   5684#
.V3000    238    380#  1406   1409#  4107   4191#
.V3045   5609   5681#
.V3055   5502   5514   5515   5524#
.V3077   4103   4193#
.V3112   5184   5274#
.V3124   4334   4441#  4809   4843#  5376   5388#  5461   5465   5469   5472   5526#
.V3150   8049   8119#
.V3200   4106   4192#
.V3214   8051   8118#
.V3331   5114   5275#
.V3333    637    718#
.V3340   1792   1882#
.V3400   1772   1779   1784#  4102   4194#  5024   5101#  5655   5672#
.V3426   6526   6553#
.V3436   6545   6548#
.V3600   1873   1877#  5966   5978#
.V4000   1932   1944#  6111   6113#  6655   6695#  8229   8274#
.V4005   5861   5865   5980#  6531   6551#
.V4200   1916   1934   1946#  2021   2027#  6250   6252#
.V4252   6273   6414#
.V4342   5845   5983#
.V4400   2107   2110#  6125   6260#  6390   6406#
.V4421   6122   6262#  6387   6408#
.V4444    606    617    629    721#
.V4446   6124   6261#  6389   6407#
.V4447   8042   8122#
.V4450   4351   4355   4437#
```



```
.V4467   5303   5393#
.V4472   6688   6693#
.V4506   4426   4428   4436#
.V4510   4327   4329   4443#
.V4514   4952   4962#
.V4520   5851   5982#
.V4525   2158   2242#
.V4600   2214   2238#  6540   6549#
.V4627   2282   2333#
.V4634   2275   2337#
.V5000   2327   2332#  5839   5986#  6481   6555#
.V5005   2146   2248#
.V5064   2354   2444#
.V5200   1482   1622#  1909   1947#  6931   6947#
.V5252   2371   2440#  6076   6081   6086   6092   6097   6115#  6364   6366   6379   6412#
.V5253   6376   6410#
.V5400   1480   1540   1623#  1719   1787#  1841   1880#  1893   1949#  2051   2115#  2401   2437#  2576
         2617#  3194   3254#  7147   7152#
.V5402   2280   2334#
.V5406   2273   2339#
.V5410   2156   2243#
.V5425   2498   2620#
.V5502   2549   2619#
.V5514   2278   2335#
.V5600   2612   2616#  3596   3717#  7378   7400#
.V5633   7582   7604   7737#
.V5662   7584   7606   7736#
.V5674   2689   2738#
.V6000   2494   2621#  2715   2737#  6635   6696#  6774   6953#  7526   7535#
.V6001   2148   2247#  4349   4353   4438#
.V6014   7528   7534#
.V6017   7414   7522   7552#
.V6030   4943   4964#
.V6034   7407   7553#
.V6041   7405   7554#
.V6052   7420   7550#
.V6053   7436   7493   7515   7546#
.V6054   7495   7537#
.V6055   2764   2881#
.V6056   7494   7538#
.V6065   2828   2877#
.V6071   7429   7457   7548#
.V6072   7482   7503   7540#
.V6103   7459   7543#
.V6104   7484   7539#
.V6110   7419   7445   7447   7465   7468   7471   7551#
.V6111   7462   7464   7542#
.V6131   7466   7541#
.V6143   3599   3715#
.V6200   2465   2475#
.V6201   1843   1879#  1967   2035#  2152   2245#  2269   2343#  3237   3252#  3273   3427#  8103   8117#
         8140   8281#
.V6202   1751   1785#  1797   1881#  1984   2012   2034#  2154   2244#  2271   2341#
```

```
,V6203   2080   2111#   2917    2971#
,V6205   3150   3261#
,V6210   3152   3260#
,V6213   7817   7843#
,V6222   8033   8126#
,V6244   2461   2476#
,V6256   8035   8125#
,V6271   1650   1686    1789#
,V6274   7819   7842#
,V6300   4980   5105#
,V6400   3163   3255#   8045    8120#
,V6406   3157   3258#   8044    8121#
,V6410   8040   8123#
,V6422   3162   3256#
,V6424   7812   7845#
,V6440   7813   7844#
,V6456   2912   2973#
,V6472   2913   2972#
,V6500   3241   3251#   8107    8116#
,V6504   7581   7583    7738#
,V6507   7603   7605    7735#
,V6520   3279   3425#   8146    8279#
,V6523   7806   7849#
,V6524   2906   2977#
,V6531   7809   7847#
,V6532   2909   2975#
,V6577   5350   5392#
,V6600   3276   3426#   8143    8280#
,V6602   3589   3595    3721#
,V6646   2920   2970#   2990    3005    3036    3112#
,V6655   7822   7841#   7864    7869    7884    7990#
,V6666    619    719#
,V6674   2908   2976#   3094    3108#
,V6675   2911   2974#   2998    3015    3027    3043    3111#
,V6676   3001   3018    3030    3050    3110#
,V6677   3057   3109#
,V6701   3588   3722#
,V6707   7808   7848#   7874    7969    7988#
,V6710   7811   7846#   7891    7987#
,V6711   7898   7986#
,V6712   7905   7985#
,V6713   3594   3718#
,V6725   5368   5389#
,V6731   3602   3714#
,V7000   1134   1165#   4338    4342    4344    4346    4439#   6121    6123    6263#   6616    6697#
,V7007   5564   5682#
,V7040   6386   6388    6409#
,V7045   8161   8195    8278#
,V7050   3298   3328    3424#
,V7053   8182   8276#
,V7054   3317   3423#
,V7102   8529   8583#
,V7105   3689   3710#
```



```
,V7106   8557   8569    8580#
,V7111   3540   3552    3572#
,V7151   8289   8414#
,V7152   3435   3576#
,V7323   3592   3719#
,V7333   3590   3720#
,V7335   3369   3422#
,V7337   8532   8581#
,V7345   3394   3418#
,V7360   3387   3420#
,V7400   5023   5052    5102#   6597    6698#
,V7402   1737   1739    1741    1786#   3597    3716#
,V7423   3542   3554    3571#
,V7460   5506   5522#
,V7464   3544   3556    3570#
,V7506   3525   3573#   8255    8258    8271#
,V7510   8357   8407#
,V7521   3390   3393    3419#
,V7537   8234   8273#
,V7547   8259   8270#
,V7555   3481   3574#   8333    8408#
,V7566   8324   8410#
,V7600   6922   6948#
,V7721   1374   1410#
,V7735   8465   8592#
,V7740   6675   6694#
,V7747   1495   1516    1621#
,V7755   3675   3712#   8515    8585#
,V7757   1509   1619#
,V7762   5030   5100#
,V7763   2769   2880#
,V7767   1502   1620#
,V7770   1136   1164#   5458    5527#   7448    7472    7545#   7935    7982#
,V7771   3690   3693    3709#   8530    8533    8582#
,V7772   5057   5098#
,V7773   7715   7733#
,V7774   1585   1608    1616#   2224    2237#   5011    5103#   7453    7477    7544#
,V7775   1571   1617#   3687    3711#   6334    6413#   8327    8409#   8527    8584#
,V7776   1559   1618#   6204    6256#
```