IDENTIFICATION

PRODUCT CODE: MAINDEC-08-DKVT8-A-D

PRODUCT NAME: VT78 CPU DIAGNOSTIC

PRODUCT DATE: JULY 1977

MAINTAINER: DIAGNOSTIC GROUP

AUTHOR: BARRY S. POLAND

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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 PROCESSOP 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 SIMULATOP, 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 RXA1 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 DKVT8A 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 OPERATOP 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 PROCEEDS 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

TN 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 CHARACTER 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 XOR 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    NOWAS,  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    MODATA, 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    1454    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,  KTRN
0115    2023    TEST,   TESTS
        4516            CHKKSF=JMS I .
0116    7111                    XCHKKSF
        4517            KBCHK=JMS I .
0117    7237                    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    6500                    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    7774    DATPAT, 7774
```

```
                        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  1420            TAD PSR
0206  0377            AND (180        /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            C8EPR           /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 SNA FAILED TO SKIP
0233  7510            SPA
0234  7410            SKP
0235  4533            C8ERR           /SNA CLEARED AC0,OR SPA SKIPPED WHEN AC0=1
                        /**********************************************************************************
                        /TEST CLA CLL TO CLEAR AC AND LINK
0236  7388    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  7180    TSIIAC, 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          CSERR           /CLA CLEARED LINK
 329   0316  7440          SZA
 330   0317  4531          CSERR           /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          CSERR           /NOP SKIPPED OR CLEARED LINK
 336   0323  7440          SZA
 337   0324  4533          CSERR           /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          CSERR           /NOP SKIPPED OR SET LINK
 343   0332  7450          SNA
 344   0333  4533          CSERR           /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          CSERR           /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          CSERR           /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          CSERR           /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          CSERR           /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          CSERR           /BSW 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          CSERR           /TAD DID NOT LOAD AC, OR TAD SKIPPED,
 390   0404  7430          SZL
 391   0405  4533          CSERR           /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          CSERR           /TAD USED INCORRECT VALUE,OR ADDER CARRY CKT
                           /FAULTY OR TAD SKIPPED
 397
 398   0411  7420          SNL
 399   0412  4533          CSERR           /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          CSERR           /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          CSERR           /ADDING 0000 TO 0000 PRODUCED NON-ZERO RESULT
                           /OR COMPLEMENTED LINK
 414
 415
 416                 /*************************************************************************************
 417   0424  1353   /TEST ADDER'S ABILITY TO PROPAGATE CARRY WHEN ACN=1,MDN=1,AND CARRY IN N=1
 418   0425  1053          TAD     K7777   /AC TO 7777,LINK=0
 419   0426  7420          TAD     K7777   /AC TO 7776,LINK TO 1
 420   0427  4533          SNL
 421   0430  7001          CSERR           /CARRY DID NOT PROPAGATE TO LINK
 422   0431  7040          IAC             /MAKE AC=7777 FOR EASE OF CHECKING RESULT OF PREVIOUS TAD
 423   0432  7440          CMA             /AC TO 0000
 424   0433  4533          SZA
 425                       CSERR           /CARRY DID NOT PROPAGATE CORRECTLY
 426                       /OR TAD USED INCORRECT OPERAND
 427                 /*************************************************************************************
 428   0434  1046   /TEST ADDER'S ABILITY TO GENERATE CARRY WHEN ACN=1, MDN=1, AND CARRY IN N=0 IN ODD NUMBERED BIT POSITIONS
 429   0435  1046          TAD     K2525   /AC TO 2525,LINK = 1
 430   0436  1046          TAD     K2525   /AC IO 5252
 431   0437  7040          TAD     K2525   /AC TO 7777,LINK = 1(NO CARRY GENERATED TO LINK)
 432   0440  7440          CMA             /AC TO 0000,LINK = 1
 433   0441  4533          SZA
 434   0442  7420          CSERR           /CARRY FAILED IN AN ODD BIT POSITION
 435   0443  4533          SNL
                           CSERR           /LINK COMPLEMENTED WHEN NO CARRY OUT EXPECTED
```

```
                        /*************************************************************************************
                        /TEST ADDER'S ABILITY TO GENERATE CARRY WHEN ACN=1,MDN=1, AND CARRY IN N=0 IN ALL EVEN BIT POSITIONS
0438  0444  1050            TAD     K5252   /AC TO 5252,LINK=1
0439  0445  1050            TAD     K5252   /AC TO 2524,LINK TO 0
0440  0446  1050            TAD     K5252   /AC TO 7776,LINK=0
0441  0447  7001            IAC             /AC TO 7777,LINK=0
0442  0450  7040            CMA             /AC TO 0000,LINK=0
0443  0451  7440            SZA
0444  0452  4533            CSEPR           /CARRY FAILED IN AN EVEN BIT POSITION
0445  0453  7430            SZL
0446  0454  4533            CSERR           /CARRY OUT FAILED TO COMPLEMENT LINK
                        /*************************************************************************************
                        /TEST AND INSTRUCTION TO NOT SET ANY AC BITS WHEN AC =0000
0447  0455  0053            AND     K7777   /AC=0000,LINK=0
0450  0456  7450            SNA
0451  0457  7430            SZL
0452  0460  4533            CSERR           /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
0453  0461  1053            TAD     K7777   /AC TO 7777,LINK = 0
0454  0462  0377            AND     (0      /AC TO 0000,LINK = 0
0455  0463  7450            SNA
0456  0464  7430            SZL
0457  0465  4533            CSERR           /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
0460  0466  1053            TAD     K7777   /AC TO 7777
0461  0467  0053            AND     K7777   /AC=7777,LINK=0
0462  0470  7040            CMA             /AC TO 0000,LINK =0
0463  0471  7450            SNA
0464  0472  7430            SZL
0465  0473  4533            CSERR           /AND OF 7777 CLEARED AC BIT OR SET LINK
                        /*************************************************************************************
                        /TEST FOR ADJACENT PIN SHORTS IN "AND" CIRCUITRY
0466  0474  1046            TAD     K2525   /AC TO 2525
0467  0475  0050            AND     K5252   /AC TO 0000
0470  0476  7440            SZA
0471  0477  4533            CSERR           /"AND" DID NOT CLEAR AC,POSSIBLE ADJACENT PIN SHORTS IN AND CIRCUITRY
0472  0500  4536            ENDTST
                        /*************************************************************************************
                        /CPU TEST 3 = TEST ADDER FUNCTION
                        /*************************************************************************************
                        /TEST BIT 11 INPUT TO ADDER=0
0473  0501  0535    CPUT3,  INTST
0474  0502  1041            TAD     K1      /AC TO 0001
0475  0503  7450            SNA
0476  0504  4533            CSERR           /ADDER=0 OPEN ON BIT 11 INPUT
                        /*************************************************************************************
                        /TEST BIT 10 INPUT TO ADDER=0
0477  0505  7200            CLA             /AC TO 0000
0500  0506  1376            TAD     (2      /AC TO 0002
0501  0507  7450            SNA
0502  0510  4533            CSERR           /ADDER=0 OPEN ON BIT 10 INPUT
                        /*************************************************************************************
                        /TEST BIT 9 INPUT TO ADDER=0
```



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0503  0511  7200            CLA             /AC TO 0000
0504  0512  1375            TAD     (4      /AC TO 0004
0505  0513  7450            SNA
0506  0514  4533            CSERR           /ADDER=0 OPEN ON BIT 9 INPUT
                        /*************************************************************************************
                        /TEST BIT 8 INPUT TO ADDER=0
0507  0515  7200            CLA             /AC TO 0000
0510  0516  1042            TAD     K10
0511  0517  7450            SNA
0512  0520  4533            CSEPR           /ADDER=0 OPEN ON BIT 8 INPUT
                        /*************************************************************************************
                        /TEST BIT 7 INPUT TO ADDER=0
0513  0521  7200            CLA             /AC TO 0000
0514  0522  1374            TAD     (20     /AC TO 0020
0515  0523  7450            SNA
0516  0524  4533            CSERR           /ADDER=0 OPEN ON BIT 7 INPUT
                        /*************************************************************************************
                        /TEST BIT 6 INPUT TO ADDER=0
0517  0525  7200            CLA             /AC TO 0000
0520  0526  1373            TAD     (40
0521  0527  7450            SNA
0522  0530  4533            CSERR           /ADDER=0 OPEN ON BIT 6 INPUT
                        /*************************************************************************************
                        /TEST BIT 5 INPUT TO ADDER=0
0523  0531  7200            CLA             /AC TO 0000
0524  0532  1044            TAD     K100
0525  0533  7450            SNA
0526  0534  4533            CSERR           /ADDER=0 OPEN ON BIT 5 INPUT
                        /*************************************************************************************
                        /TEST BIT 4 INPUT TO ADDER=0
0527  0535  7200            CLA             /AC TO 0000
0530  0536  1045            TAD     K200    /AC TO 0200
0531  0537  7450            SNA
0532  0540  4533            CSERR           /ADDER=0 OPEN ON BIT 4 INPUT
                        /*************************************************************************************
                        /TEST BIT 3 INPUT TO ADDER=0
0533  0541  7200            CLA             /AC TO 0000
0534  0542  1372            TAD     (400    /AC TO 0400
0535  0543  7450            SNA
0536  0544  4533            CSERR           /ADDER=0 OPEN ON BIT 3 INPUT
                        /*************************************************************************************
                        /TEST BIT 2 INPUT TO ADDER=0
0537  0545  7200            CLA             /AC TO 0000
0540  0546  1371            TAD     (1000   /AC TO 1000
0541  0547  7450            SNA
0542  0550  4533            CSERR           /ADDER=0 OPEN ON BIT 2 INPUT
                        /*************************************************************************************
                        /TEST BIT 1 INPUT TO ADDER=0
0543  0551  7200            CLA             /AC TO 0000
0544  0552  1370            TAD     (2000
0545  0553  7450            SNA
0546  0554  4533            CSERR           /ADDER=0 OPEN ON BIT 1 INPUT
                        /*************************************************************************************
                        /TEST BIT 0 INPUT TO ADDER=0
0547  0555  7200            CLA             /AC TO 0000
```

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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  0200
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,  INTST
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
```

```
                        CØERR           /BSW CLEARED LINK
                        CMA             /AC TO 7700
                        TAD     K100    /AC TO 0000, LINK TO 0
                        SZA
                        CØERR           /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
                        CØERR           /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
                        CØERR           /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
                        CØERR           /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
                        CØERR           /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
                        CØERR           /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
                        CØERR           /MQA SET LINK
```



```
                        CMA             /AC TO 0000 MQ=7777
                        SZA
                        CØERR           /MQA DID NOT OR MQ WITH AC
                        SWP             /AC TO 7777 MQ TO 0000
                        SNA
                        CØERR           /MQA CLEARED MQ
                        JMP CAMTST
0773  1000
0774  3333
0775  6666
0776  1111
0777  4444
      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
                        CØERR           /CAM DID NOT CLEAR AC
                        SNL
                        CØERR           /CAM CLEARED LINK
                        SWP             /AC=0000 MQ=0000
                        SZA
                        CØERR           /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
                        CØERR           /ACL DID NOT LOAD 0000 TO AC
                        SNL
                        CØERR           /ACL CLEARED LINK
                        CMA             /AC TO 7777
                        SWP             /AC TO 0000 MQ TO 7777
                        SZA
                        CØERR           /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
                        CØERR           /DCA DID NOT CLEAR AC, OR DCA SKIPPED
                        SZL
                        CØERR           /DCA SET LINK
                        TAD     TESLOC  /AC TO 7777
                        CMA
                        SZA
                        CØERR           /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                      CSERR           /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                      CSERR           /ISZ SKIPPED WHEN NO OVERFLOW, OR ISZ SET AC BIT
1051  7430                      SZL
1052  4533                      CSERR           /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                      CSERR           /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                      CSERR           /ISZ DID NOT SKIP ON OVERFLOW
1063  7420                      SNL
1064  4533                      CSERR           /OVERFLOW ON ISZ SET LINK
1065  1072                      TAD     TESLOC  /0000 TO AC
1066  7440                      SZA
1067  4533                      CSERR           /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                      CSERR           /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                      CSERR           /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                      CSERR           /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                      CSERR           /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                      CSERR           /AND TO SAME PAGE DIRECT FAILED
1130  4536                      ENDTST
```

```
                        /**********************************************************************************
                        /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  7410            SZA
1135  4533            C0ERR           /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            C0ERR           /DCA INDIRECT THRU PAGE ZERO FAILED
                        /**********************************************************************************
                        /TEST ISZ INDIRECT THRU PAGE ZERO
1144  2500            ISZ I POINTB    /LOCATION "POINTC" TO 0000, SKIP
1145  4533            C0ERR           /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            C0ERR           /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            C0ERR                   /NO, AUTO INDEX OCCURRED FOR LOCATION 1010
1165  4536            ENDTST
1166  5777*           JMP CPUT11
1177  1700
      1700    PAGE
                        /**********************************************************************************
                        /CPU TEST 11 - TEST TAD,DCA,ISZ, & "AND" INDIRECT THRU SAME PAGE
                        /**********************************************************************************
                        /TEST TAD INDIRECT THRU SAME PAGE
1200  4535    CPUT11, INTST
1201  1601            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
```



```
1205  7440            SZA
1206  4533            C0ERR           /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            C0ERR           /DCA INDIRECT THRU SAME PAGE FAILED
                        /**********************************************************************************
                        /TEST ISZ INDIRECT THRU SAME PAGE
1217  2622            ISZ I .+3       /LOCATION "POINTC" TO 0000, SKIP
1220  4533            C0ERR           /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            C0ERR           /"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            C0ERR           /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            C0ERR           /AUTO-INDEX FAILED TO INCREMENT
                                        /AUTO-INDEX DECODER OPEN ON INPUT FROM BITS 0-3
                        /**********************************************************************************
                        /TEST BIT 0 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  1407           TAD     7       /GET CONTENTS OF LOCATION 0007
 1261  7440           SZA             /DOES IT STILL CONTAIN 0000?
 1262  4533           CSERR           /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  9430           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           CSERR           /YES, LOC 30 AUTO-INDEXED
 1274  4536           ENDTST
                       /*****************************************************************************
                       /CPU TEST 13 - TEST INTERNAL IOT INSTRUCTIONS
                       /*****************************************************************************
                       /TEST GTF TO SAVE LINK
 1275  4535  CPUT13, INTST
 1276  7100           CLL             /CLEAR LINK
 1277  7020           CML             /LINK TO 1
 1300  6004           GTF
 1301  7500           SNA
 1302  4533           CSERR           /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           CSERR           /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           CSERR           /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#1
 1333  7450           SNA
 1334  7430           SZL
 1335  4533           CSERR           /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           CSERR           /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           CSERR           /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           CSERR           /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           CSERR           /IOF DID NOT DISABLE INTERRUPT
 1355  3776*          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  0040           AND     K200    /MASK OUT INT ENABLE BIT
 1403  7450           SNA             /SKIP IF INT ENABLE BIT SET
 1404  4533           CSERR           /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     K8TOP
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  1104            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            SNP                     /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            SNP
1161    1525  3055            DCA     MQWAS
1162    1526  5774*           JMP GRFSIM
1163    1574  1600
1164    1575  7770
1165    1576  7000
1166    1577  2134
              1600    PAGE
```

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1167                    /**********************************************************************************
1168                    /SET UP FOR SIMULATED EXECUTION TO TEST RESULT
1169    1600  7040      GRPSIM, CMA
1170    1601  3077            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  3062            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 INSTR                     /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            PAL
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     LNDATA
1218    1657  7010            RAR
1219    1660  7200            CLA
1220    1661  1070            TAD     MQDATA
1221    1662  7521            SWP                             /LOAD LINK


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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  5301            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  7013            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*           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
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                                                  /WAS IT SNA?
1741  2102            ISZ     BIT6                /YES.
1742  7440            SZA                         /SNA WOULD HAVE SKIPPED
1743  7410            SKP                         /SNA WOULD NOT HAVE SKIPPED
1744  5324            JMP     OUT                 /SZL?
1745  2047            ISZ     BIT7                /YES
1746  7420            SNL                         /QUALIFIED SKIP
1747  5323            JMP     OUT-1               /SZL WOULD NOT HAVE SKIPPED.
1750  5324            JMP     OUT
1777  2000
      2000    PAGE
              /********************************************************************************
              /GROUP 3 OPERATE SIMULATION
2000  2057    GROUP3, ISZ     SKPPED              /INDICATE NO SKIP
2001  2063            ISZ     BIT4                /CLA?
2002  7200            CLA                         /YES
2003  2064            ISZ     BIT5                /IS IT MQA?
2004  5210            JMP     .+4                 /YES
2005  2047            ISZ     BIT7                /IS IT MQL?
2006  7421            MQL                         /YES
2007  5515            JMP I TEST                  /COMPARE RESULTS
2010  2047            ISZ     BIT7                /IT IS MQA, IS IT ALSO MQL? (SWP)
2011  5214            JMP     DOSWAP              /YES, DO A SWP.
2012  7501            MQA                         /NO, JUST DO MQA.
2013  5515            JMP I TEST                  /COMPARE RESULTS
2014  3062    DOSWAP, DCA     BIT3
2015  7501            MQA                         /MQ TO AC
2016  3063            DCA     BIT4                /SAVE PREVIOUS MQ
2017  1062            TAD     BIT3                /GET PREVIOS AC
2020  7421            MQL                         /PUT IN MQ
2021  1063            TAD     BIT4                /PUT PREVIOUS MQ IN AC.
2022  5515            JMP I TEST                  /TEST RESULTS
              /********************************************************************************
              /COMPARE RESULTS OF SIMULATION TO ACTUAL RESULTS
              /********************************************************************************
              /TEST LINKS
2023  3072    TESTS,  DCA     BIT11               /SAVE SIMULATED AC
2024  7004            RAL                         /LINK TO AC 11
2025  3007            DCA     BIT7                /SAVE SIMULATED LINK
2026  1007            TAD     BIT7                /GET EXPECTED LINK
2027  1056            TAD     LKWAS               /ADD IN LINK OBTAINED
2030  3062            DCA     BIT3                /SET ERROR INDICATOR IF LINKS DIFFERENT
                                                  /CLEAR ERROR INDICATOR IF LINKS SAME

              /********************************************************************************
              /LINKS AGREE, TEST THE AC CONTENTS
2031  1072            TAD     BIT11               /GET EXPECTED AC CONTENTS
2032  7040            CMA
2033  7001            IAC                         /COMPLEMENT IT
2034  1054            TAD     ACWAS               /GET ACTUAL RESULTS
2035  7440            SZA                         /SAME?
2036  3062            DCA     BIT3                /NO, SET ERROR INDICATOR
              /********************************************************************************
              /AC CONTENTS OK, TEST MQ CONTENTS
2037  7521            SWP                         /MQ TO AC
2040  3065            DCA     BIT8                /SAVE MQ
```



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2041  1065            TAD     BIT8
2042  7040            CMA
2043  7001            IAC                         /COMPLEMENT IT
2044  1055            TAD     MQWAS               /COMPARE TO ACTUAL RESULTS
2045  7440            SZA                         /SAME?
2046  3062            DCA     BIT3                /NO, SET ERROR INDICATOR
              /********************************************************************************
              /CHECK FOR SIMULATED INSTRUCTION AND ACTUAL INSTRUCTION TO BOTH HAVE
              /SKIPPED OR BOTH TO HAVE NOT SKIPPED
2047  1057    SKPCHK, TAD     SKPPED              /GET SKIP INDICATOR
2050  7010            RAR                         /AC 11 TO LINK
2051  7200            CLA
2052  7420            SNL                         /BOTH SKIP OR BOTH NOT SKIP?
2053  5255            JMP     SIMERR              /YES, BOTH SKIPPED OR BOTH DIDN'T

2054  4533    SPE1,   CBERR   /THE INSTRUCTION SKIPPED WHEN EXECUTED, AND A
                              /SIMULATION OF THE SAME INSTRUCTION DID NOT, OR VICE VERSA.
              /********************************************************************************
              /TEST FOR ANY SIMULATION DATA ERRORS
2055  1062    SIMERR, TAD     BIT3                /GET ERROR INDICATOR
2056  7450            SNA                         /ANY SIMULATION ERRORS?
2057  5261            JMP     TESTPT              /NO

2060  4533    SPE2,   CBERR                       /OPERATE INSTRUCTION FAILED.

              /********************************************************************************
              /SIMULATION AGREES WITH ACTUAL, SEE IF ALL DATA PATTERNS HAVE
              /BEEN TRIED WITH THIS INSTRUCTION.
2061  2177    TESTPT, ISZ     DATPAT              /ALL PATTERNS TRIED?
2062  5303            JMP     TRNXPT              /NO, TRY NEXT PATTERN
2063  3067            DCA     ACDATA
2064  3070            DCA     MQDATA
2065  3071            DCA     LKDATA
2066  1505            TAD I INSTTR                /GET INSTRUCTION
2067  7010            RAR                         /BIT11 TO LINK
2070  7430            SZL                         /HAS INSTRUCTION BEEN TRIED WITH BIT11=1?
2071  5732            JMP I NXTONN                /YES, DO NEXT INSTRUCTION (JMP TO NXTONE)
2072  2505            ISZ I INSTTR                /UPDATE INSTRUCTION
2073  0045            AND     K200                /MASK OUT MQ TYPE BIT
2074  7450            SNA                         /MQ TYPE?
2075  5733            JMP I TESAGG                /NO, GO DO IT
2076  7200            CLA
2077  1505            TAD I INSTTR
2100  0377            AND     (7721               /MASK OUT BITS NOT ALLOWED(EAE)
2101  3505            DCA I INSTTR
2102  5733            JMP I TESAGG                /JMP TO TESAGN
              /********************************************************************************
              /CREATE NEXT DATA SET UP
2103  7000    TRNXPT, NOP/JMS POINT
2104  1177            TAD     DATPAT
2105  7010            RAR                         /AC BIT TO LINK
2106  7200            CLA
2107  1046            TAD     K2525
2110  7420            SNL                         /AC TO BE SET?
2111  7200            CLA                         /NO
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1386  2112  3067          DCA     ACDATA
1387  2113  1177          TAD     DATPAT
1388  2114  7217          RTR
1389  2115  7206          CLA
1390  2116  1525          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 NXTPTT              /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 TSTNO               /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          CRCRLF
1415  2202  4522          CRPRNT
1416  2203  2210          CPUMES
1417  2204  4522          CRPRNT
1418  2205  2213          TESTMS
1419  2206  4521          CRCRLF
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
```



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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 EXTENSION 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 TESTTTTTTT
3003  0377              AND (0040
3004  7640              SZA CLA
3005  5176'             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              CSERR             /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              CSERR             /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              CSERR
                        /
3033  6221  DF2,        CDF 20            /DF2
3034  6214              RDF
3035  1372              TAD (7757
3036  7040              CMA               /AC=0
3037  7440              SZA
3040  4533              CSERR             /CDF2 OR RDF FAILED
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                        /
3041  6231  DF3,        CDF 30            /DF 3
3042  6214              RDF
3043  1374              TAD (7747
3044  7040              CMA               /AC=0
3045  7440              SZA
3046  4533              CSERR             /CDF 3 OR RDF FAILED.
                        /
3047  6201  DF4,        CDF 00
3050  6214              RDF
3051  7440              SZA
3052  4533              CSERR             /CDF 0 OR RDF FAILED.
3053  6000              SKON              /SKP IF ION, DISABLE INT SYSTEM.
3054  4531              CSERR
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  6841              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  6734              RIB               /READ SF
3067  7440              SZA
3070  4533              CSERR             /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              CSERR             /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              CSERR             /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
```

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1568    3110  7440          SZA
1569    3111  4533          CSERR           /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          CSERR           /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          CSERR           /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          CSERR           /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          CSERR           /DF NOT 0 AFTER PI.
1596    3140  6234          RIB
1597    3141  7440          SZA
1598    3142  4533          CSERR           /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          CSERR           /DF NOT 0.
1606                  /
1607    3151  6234          RIB
1608    3152  1367          TAD (7774
1609    3153  7040          CMA
1610    3154  7440          SZA
1611    3155  4533          CSERR           /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  5630
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    1237  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
```

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1677    3253  1073            TAD DAT
1678    3254  4533            CHERR           /AC,MQ=ACTUAL DATA READ FROM EXT. FIELD,EXPECTED DATA
1679    3255  2107    UPSTK,  ISZ STKS        /ALL *WEN 0
1680    3256  7410            SKP
1681    3257  5275            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
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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  6341            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            CHERR                   /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,    CHERR                   /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
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1787  3374  5400
1788  3375  2400
1789  3376  6271
1790  3377  0047
            3400    PAGE
1791  3400  2107    CIFOK,  ISZ STKS                /DONE?
1792  3401  5777*           JMP CIFJSL              /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  4536            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 1   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
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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  4536            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
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1995  3605  6005          RTF                     /LOADS IB & DF,EN INT.,SETS INT INH.
1996  3606  5247          JMP .+1                 /INTERRUPT HERE;JMP LOADS IF FROM IB,CLRS INT INH,
1997  3607  4533          CBERR                   /INTERRUPT WAS INHIBITED.
1998  3610  6004          GTF
1999  3611  3264          DCA SFLGS
2000  3612  1264          TAD SFLGS
2001  3613  7041          CIA
2002  3614  1375          TAD (1000               /CHECK FOR LINK=0,INT REQ=1,INT EN=0
2003  3615  7650          SNA CLA
2004  3616  5223          JMP L61                 /CHECK OK
2005  3617  1375          TAD (1000
2006  3620  7421          MQL
2007  3621  1264          TAD SFLGS
2008  3622  4533          CBERR                   /AC,MQ=ACTUAL FLAGS,EXPECTED FLAGS
2009  3623  1374  L61,    TAD (5200
2010  3624  6005          RTF
2011  3625  7240          CLA CMA                 /CHECK FOR JAM ON GTF
2012  3626  6004          GTF                     /EXPECTED BITS ARE LINK=1,INT EN=1
2013  3627  3264          DCA SFLGS
2014  3630  1264          TAD SFLGS
2015  3631  7041          CIA                     /  (NO INT REQ - TTY FLAG BECAUSE
2016  3632  1373          TAD (4200               /  INT INH=1 TILL NEXT JMS OR JMP).
2017  3633  7640          SZA CLA
2018  3634  5253          JMP L62
2019  3635  6005          RTF                     /REPLACE ION,INT INH
2020  3636  7300          CLA CLL
2021  3637  6004          GTF
2022  3640  3264          DCA SFLGS
2023  3641  1264          TAD SFLGS
2024  3642  7041          CIA
2025  3643  1372          TAD (0200               /EXPECTED BITS ARE LINK=0,INT REQ=0 BECAUSE INT INH=1
2026  3644  7640          SZA CLA
2027  3645  5257          JMP RPERR               /SOMETHING WRONG WITH FLAGS
2028  3646  5247          JMP .+1                 /INTERRUPT HERE
2029  3647  4533          CBERR                   /INTERRUPT WAS INHIBITED.
2030  3650  7300  RTFRP,   CLA CLL
2031  3651  4536          ENDTST
2032  3652  5771          JMP EXM77
2033
2034  3653  1373  L62,    TAD (4200
2035  3654  7421          MQL
2036  3655  1264          TAD SFLGS
2037  3656  4533          CBERR                   /AC,MQ=ACTUAL FLAGS,EXPECTED FLAGS
2038  3657  1372  RPERR,   TAD (0200
2039  3660  7421          MQL
2040  3661  1264          TAD SFLGS
2041  3662  4533          CBERR                   /AC,MQ=ACTUAL FLAGS,EXPECTED FLAGS
2042  3663  5250          JMP RTFRP
2043  3664  0000  SFLGS,   0
2044  3771  4000
2045  3772  0200
2046  3773  4200
2047  3774  5200
2048  3775  1000
2049  3776  5400
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2050  3777  2000
            4200          PAGE
2051                      /
2052                      /*****************************************************************************
2053                      /MEMORY EXTENSION TEST 7
2054                      /CONFIDENCE CHECK ON ALL EXISTENT FIELDS,
2055                      /MAKE SURE DCA I AND TAD I ARE TO CORRECT STACK,
2056                      /MAKE SURE JUMP IS TO CORRECT STACK.
2057                      /CHECK ALL COMBINATIONS,
2058                      /FIELDS WILL CONTAIN THEIR DF NUMBER IN LOC.0
2059                      /
2060                      /
2061                      /THIS TEST OVERWRITES LOCATIONS 0,1,2,3, & 7 OF FIELDS 0,1,2, & 3.
2062                      /
2063  4000  4535  EXMT7,   INTST
2064  4001  6002          IOF
2065  4002  3270          DCA NUMX
2066  4003  4510          JMS I XSTKS
2067  4004  1377          TAD (CDF
2068  4005  3206          DCA .+1
2069  4006  6201  FDWRD,   CDF                     /MODIFIED UNDER TEST
2070  4007  4252          JMS FILCOR
2071  4010  2107          ISZ STKS                /ARE ALL STACKS DONE
2072  4011  7410          SKP
2073  4012  5220          JMP CONCHK              /CHECK RESULTS
2074  4013  1042          TAD K10
2075  4014  1206          TAD FDWRD
2076  4015  3206          DCA FDWRD               /UPDATE FIELD CHANGE
2077  4016  2273          ISZ NUMX
2078  4017  5206          JMP FDWRD
2079                      /
2080  4020  7300  CONCHK, CLA CLL
2081  4021  6201          CDF 00
2082  4022  3270          DCA NUMX
2083  4023  4510          JMS I XSTKS
2084  4024  1376          TAD (CIF
2085  4025  3226          DCA .+1                 /START WITH FIELD 0
2086  4026  6202  CONCH,   CIF                     /MODIFIED UNDER TEST
2087  4027  5775          JMP I (0001
2088  4030  3271  RETADD,  DCA SNUMX
2089  4031  1271          TAD SNUMX
2090  4032  7041          CIA                     /RETURN HERE FROM FIELDS
2091  4033  1270          TAD NUMX
2092  4034  7650          SNA CLA
2093  4035  5242          JMP X1                  /GOOD FIELD
2094  4036  1270          TAD NUMX
2095  4037  7421          MQL
2096  4040  1271          TAD SNUMX
2097  4041  4533          CBERR                   /AC,MQ=ACTUAL DATA , EXPECTED DATA
2098  4042  2107  X1,      ISZ STKS
2099  4043  7410          SKP                     /CHECK ALL AVAILABLE STACKS.
2100  4044  5266          JMP XRTF1
2101  4045  1226          TAD CONCH
2102  4046  1042          TAD K10
2103  4047  3226          DCA CONCH               /UPDATE FIELD CHANGE
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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
              4300  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, 633.
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 (3070
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, INITST
 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            ION
 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            CSERR           /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  1400            TAD 0000
 2185    4471  4533            CSERR           /PC FAILED DURING PI
 2186                          /AC,MQ=ACTUAL PC,EXPECTED PC
 2187    4472  6214    L112,   RDF
 2188    4473  6224            RIF
 2189    4474  7448            SZA
 2190    4475  4533            CSERR           /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            CSERR           /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            CSERR           /GOT PI BUT DIDN'T CHANGE FIELDS.
 2219    4530  7410            SKP
 2220    4531  4533    NOPI,   CSERR           /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
```



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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,     CSERR           /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,   CSERR           /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  6047           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           CSERR           /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           CSERR           /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  3005
2339    4773  5406
2340    4774  0004
2341    4775  6202
2342    4776  0003
2343    4777  6701
              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            CHERR           /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            CHERR           /AC,MQ=BAD IOT, AC DATA AFTER IOT EXECUTION,
                              /(AC DATA BEFORE EXECUTION=5252)
2397
2398    5060  5240            JMP NXTIOT
2399    5061  4536    EXIOTL, ENDTST
2400    5062  3375            DCA TSTNO               /CLEAR TEST NUMBER
2401    5063  5770            JMP SEGRTC
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
                            /ROUTINE TO PRINT "MEMORY EXTENSION TESTING" MESSAGE
2445
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  0755
        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  5200
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  5723            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

                PRTCMS, 0
                        CRCRLF
                        CRPRNT
                        RTC"S
                        CRPRNT
                        TESTMS
                        CRCRLF
                        JMP I PRTCMS

                RTCMS,  TEXT    "REAL TIME CLOCK  "

                /**************************************************************************
                /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.
                /**************************************************************************

                RTCT2,  INTST
                        TAD (RTC12      /PATCH INTERRUPT LINKAGE TO RETURN TO THIS
                        DCA 3           /       TEST ON INTERRUPT.
                        CAF
                        ION
                        CLSKWT          /WAIT FOR THE CLOCK FLAG TO SET
                        CRERR           /CLOCK FLAG FAILED TO SET.
                        CLCL            /CLEAR THE CLOCK FLAG
                        SKP CLA
                        CRERR           /CLCL SKIPPED
                        CLSK            /SKIP ON CLOCK FLAG
                        SKP CLA
                        CRERR           /CLCL FAILED TO CLEAR CLOCK FLAG
                RTCT2D, ENDTST
                        JMP RTCT3

                RTCI2,  CRERR           /CAF FAILED TO DISABLE CLOCK INT.
                        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.
                /**************************************************************************

                RTCT3,  INTST
                        TAD (ISZ RTCIF  /FIX UP INT. LINKAGE TO SET REAL TIME CLOCK
```



```
                        DCA 2           /       INTERRUPT FLAG AND RETURN HERE ON INT.
                        TAD (JMP I 0
                        DCA 3
                        DCA RTCIF       /CLEAR CLOCK INT. FLAG
                        CAF             /CLEAR ALL FLAGS
                        ION
                        CLSKWT          /WAIT FOR THE CLOCK FLAG TO SET
                        CRERR           /CLOCK FLAG FAILED TO SET
                        CLCL            /CLEAR CLOCK FLAG AGAIN
                        CLSK            /SKIP ON CLOCK FLAG
                        SKP CLA
                        CRERR           /CLCL FAILED TO CLEAR CLK FLAG
                        CLA CLL IAC     /SET DATA BIT 11 TO A ONE
                        CLLE            /TRY AND SET CLOCK INT. ENABLE
                        SKP CLA
                        CRERR           /CLLE SKIPPED
                        TAD RTCIF
                        SZA CLA
                        CRERR           /PROGRAM INTERRUPTED WITH CLOCK FLAG CLEARED
                        CLSKWT          /WAIT FOR CLOCK FLAG TO SET
                        CRERR           /CLOCK FLAG FAILED TO SET
                        TAD RTCIF
                        SNA CLA
                        CRERR           /CLLE FAILED TO SET CLOCK INT. ENABLE
                                        /       OR NO INTERRUPT OCCURRED.
                        DCA RTCIF       /CLEAR REAL TIME CLOCK INT. FLAG
                        CLLE            /CLEAR CLOCK INT. ENABLE
                        ION             /TURN THE INTERRUPT ON
                        CLA CLL
                        TAD RTCIF       /GET THE REAL TIME CLOCK INT. FLAG
                        SZA CLA         /DID IT INTERRUPT?
                        CRERR           /YES--CLLE FAILED TO CLEAR CLOCK INT. ENABLE
                        CLCL            /CLEAR CLOCK FLAG
                        CLSK            /SKIP ON CLOCK FLAG
                        SKP CLA
                        CRERR           /CLCL FAILED TO CLEAR FLAG
                        ENDTST
                        JMP RTCT4

                        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.
                        /**************************************************************************
```

```
 2629   5620  4535   RTCT4,  INTST
 2630   5621  3113           DCA RTCIF
 2631   5622  6407           CAF             /CLEAR ALL FLAGS
 2632   5623  6001           ION
 2633   5624  4541           CLSKWT          /WAIT FOR THE CLOCK FLAG TO SET
 2634   5625  4533           C8ERR           /CLOCK FLAG FAILED TO SET
 2635   5626  7301           CLA CLL IAC
 2636   5627  6135           CLLE            /SET INTERRUPT ENABLE TO A ONE
 2637   5630  7000           CLA CLL         /SHOULD INTERRUPT HERE
 2638   5631  1113           TAD RTCIF
 2639   5632  7650           SNA CLA
 2640   5633  4533           C8ERR           /PROGRAM FAILED TO INT, WITH CLOCK FLAG SET
 2641                         /       AND CLOCK INT, ENABLED.
 2642   5634  3113           DCA RTCIF       /CLEAR CLOCK FLAG
 2643   5635  6007           CAF             /CLEAR ALL FLAGS AND DISABLE CLK INT,
 2644   5636  6001           ION
 2645   5637  4541           CLSKWT          /WAIT FOR FLAG
 2646   5640  4533           C8ERR           /CLOCK FLAG FAILED TO SET
 2647   5641  1113           TAD RTCIF       /GET THE CLOCK INT, FLAG
 2648   5642  7640           SZA CLA         /DID IT INTERRUPT?
 2649   5643  4533           C8ERR           /CAF FAILED TO CLEAR CLOCK INT, ENABLE
 2650   5644  6136           CLCL            /CLEAR THE CLOCK FLAG
 2651   5645  4536           ENDTST
 2652   5646  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   5647  4535   RTCT5,  INTST
 2660   5650  6136           CLCL
 2661   5651  6001           ION
 2662   5652  7344           CLA CLL CMA RAL /=2
 2663   5653  6135           CLLE            /CLEAR CLOCK INT, ENABLE
 2664   5654  1377           TAD (2
 2665   5655  7440           SZA
 2666   5656  4533           C8ERR           /CLLE CHANGED THE AC
 2667   5657  7240           CLA CMA
 2668   5660  6136           CLCL            /CLEAR CLOCK FLAG
 2669   5661  7001           IAC
 2670   5662  7448           SZA
 2671   5663  4533           C8ERR           /CLCL CHANGED THE AC
 2672   5664  7240           CLA CMA
 2673   5665  6137           CLSK            /SKIP ON CLOCK FLAG
 2674   5666  7000           NOP
 2675   5667  7001           IAC
 2676   5670  7440           SZA
 2677   5671  4533           C8ERR           /CLSK CHANGED THE AC
 2678   5672  7200           CLA
 2679   5673  4536           ENDTST
 2680   5674  5255           JMP RTCT6
 2681
 2682
 2683                 /*************************************************************************
```



```
 2684                 /REAL TIME CLOCK TEST 6 - CHECK CLOCK TIMING
 2685                 /*************************************************************************
 2686
 2687   5675  4535   RTCT6,  INTST
 2688   5676  4520           FIXIL
 2689   5677  1376           TAD (CLKIR      /FIX UP INT, LINKAGE TO RETURN TO THIS TEST ON INT,
 2690   5700  3003           DCA 3
 2691   5701  6136           CLCL            /CLEAR CLOCK FLAG
 2692   5702  3312           DCA CLKCT       /CLEAR CLOCK COUNTER
 2693   5703  6001           ION
 2694   5704  4541           CLSKWT          /WAIT FOR CLOCK FLAG TO SET
 2695   5705  4533           C8ERR           /CLOCK FLAG FAILED TO SET
 2696   5706  6136           CLCL            /CLEAR FLAG
 2697   5707  7301           CLA CLL IAC
 2698   5710  6135           CLLE            /ENABLE CLOCK INTERRUPT
 2699   5711  2312           ISZ CLKCT
 2700   5712  5271           JMP .-1
 2701   5713  4533           C8ERR           /CLOCK FAILED TO TRIGGER INTERRUPT
 2702   5714  1312   CLKIR,  TAD CLKCT
 2703   5715  7041           CIA
 2704   5716  1313           TAD CLCON
 2705   5717  7500           SMA
 2706   5720  5315           JMP CLKERR
 2707   5721  1314           TAD CDELTA
 2708   5722  7510           SPA
 2709   5723  5315           JMP CLKERR
 2710   5724  7300   CONTT,  CLA CLL
 2711   5725  6135           CLLE            /DISABLE CLOCK INTERRUPT
 2712   5726  4536           ENDTST
 2713   5727  3075           DCA TSTNO       /CLEAR TEST NUMBER
 2714   5730  4520           FIXIL           /FIX UP INTERRUPT LINKAGE
 2715   5731  5775*          JMP BEGB8T
 2716
 2717   5732  0000   CLKCT,  0
 2718   5733  1200   CLCON,  1200    /LOWER LIMIT ON EXPECTED CLOCK COUNT
 2719   5734  0010   CDELTA, 10      /ALLOWED RANGE FOR CLOCK COUNT
 2720
 2721   5735  7350   CLKERR, CLA CLL
 2722   5736  1312           TAD CLKCT
 2723   5737  4533           C8ERR           /CLOCK TIMING ERROR - AC = ACTUAL COUNT
 2724                                        /       CONTINUE FOR EXPECTED COUNT,
 2725   5740  7300           CLA CLL
 2726   5741  1313           TAD CLCON
 2727   5742  1314           TAD CDELTA
 2728   5743  7421           MQL
 2729   5744  1313           TAD CLCON
 2730   5745  4533           C8ERR           /EXPECTED TIMING - AC,MQ = LOWER LIMIT,UPPER LIMIT
 2731                                        /                         FOR COUNT,
 2732   5746  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 MCN2                /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               CSCRLF                  /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               CSCRLF
       6031  4522               CSPRNT
       6032  6036               BRSMS
       6033  4522               CSPRNT
       6034  2713               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               CSPRT4                  /SETTING CONTAINS NO DECIMAL DIGITS
                                                        /       PRINT 4 OCTAL DIGITS
       6103  5676               JMP I PRTBRS
       6104  1775       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    PS84,   JMS PRDD                 /PRINT 192
2838    6120  0261            0261
2839    6121  0271            0271
2840    6122  0262            0262
2841    6123  0000            0000
2842    6124  4514            PRNT2                   /PRINT TRAILING 2 ZEROS
2843    6125  5676            JMP I PRTBRS
2844    6126  4350    PS83,   JMS PRDD                /PRINT 96
2845    6127  0271            0271
2846    6130  0266            0266
2847    6131  0000            0000
2848    6132  4514            PRNT2                   /PRINT TRAILING 2 ZEROS
2849    6133  5676            JMP I PRTBRS
2850    6134  4350    PS82,   JMS PRDD                /PRINT 48
2851    6135  0264            0264
2852    6136  0270            0270
2853    6137  0000            0000
2854    6140  4514            PRNT2                   /PRINT TRAILING 2 ZEROS
2855    6141  5676            JMP I PRTBRS
2856    6142  4350    PS81,   JMS PRDD                /PRINT 18
2857    6143  0261            0261
2858    6144  0270            0270
2859    6145  0000            0000
2860    6146  4514            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 1 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    6157  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  3776    SKPCHN, DCA SAVAC                /GET HERE VIA INTERRUPT
2890                                                    /SAVE AC
2891    6201  4516            CHKKSF                  /CHECK FOR CONSOLE PACKAGE INT,
2892    6202  5236            JMP RFINT               /SET=BUT IGNORE
2893    6203  7000            NOP                     /NOT SET
2894    6204  7000            NOP
2895    6205  4533    UEI,    CRERR                   /UNEXPECTED INTERRUPT
2896    6206  1276    RFINI,  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, CRCRLF
2903    6211  4522            CRPRNT
2904    6212  6311            UEIMES
2905    6213  4521            CRCRLF
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            CRCRLF
2915    6225  4522            CRPRNT
2916    6226  6331            FSMES
2917    6227  1371            TAD (CDI
2918    6230  3774            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            CRPRNT                  /SLU #1 XMIT FLAG SET
2926    6237  6317            MXMT1
```

```
 2937  6240  6311  UL1,   TSF1
 2938  6241  5244         JMP UL2
 2939  6242  4522         CRPRNT                  /SLU #2 XMIT FLAG SET
 2940  6243  6342         MXMT2
 2941  6244  6331  UL2,   TSF2
 2942  6245  5250         JMP UL3
 2943  6246  4522         CRPRNT                  /SLU #3 XMIT FLAG SET
 2944  6247  6345         MXMT3
 2945  6250  2040  UL3,   ISZ KSFLG
 2946  6251  5254         JMP UL4
 2947  6252  4522         CRPRNT                  /SLU #1 REC FLAG SET
 2948  6253  6350         MREC1
 2949  6254  6301  UL4,   KSF1
 2950  6255  5260         JMP UL5
 2951  6256  4522         CRPRNT                  /SLU #2 REC FLAG SET
 2952  6257  6353         MREC2
 2953  6260  6321  UL5,   KSF2
 2954  6261  5264         JMP UL6
 2955  6262  4522         CRPRNT                  /SLU #3 REC FLAG SET
 2956  6263  6356         MREC3
 2957  6264  6661  UL6,   PSKF
 2958  6265  5270         JMP UL7
 2959  6266  4522         CRPRNT                  /LA180 PRINTER FLAG SET
 2960  6267  6361         MLAP
 2961  6270  6501  UL7,   LOSK
 2962  6271  5274         JMP VCDI
 2963  6272  4522         CRPRNT                  /LQP PRINT FLAG SET
 2964  6273  6364         MLQP
 2965  6274  6203  VCDI,  CDI 00
 2966  6275  5633         JMP I CKFLG
 2967  6276  0000  SAVAC,  0
 2968  6277  1501  MMID,  TEXT    "MAINDEC-08-DKVTB-A"
       6300  1116
       6301  0405
       6302  0355
       6303  0470
       6304  5504
       6305  1326
       6306  2402
       6307  5501
       6310  0000
 2969  6311  2516  UEIMES, TEXT   "UNEXPECTED INTERRUPT - FIELD "
       6312  0530
       6313  2005
       6314  0324
       6315  0504
       6316  4011
       6317  1621
       6320  0522
       6321  2225
       6322  2024
       6323  4055
       6324  4036
       6325  1105
       6326  1404
```



```
       6327  4060
       6330  0000
 2970  6331  0614  FSMES,  TEXT    "FLAGS SET?"
       6332  0107
       6333  2340
       6334  2305
       6335  2472
       6336  0000
 2971  6337  4040  MXMT1,  TEXT    "  X1"
       6340  3061
       6341  0000
 2972  6342  4040  MXMT2,  TEXT    "  X2"
       6343  3062
       6344  0000
 2973  6345  4040  MXMT3,  TEXT    "  X3"
       6346  3063
       6347  0000
 2974  6350  4040  MREC1,  TEXT    "  R1"
       6351  2261
       6352  0000
 2975  6353  4040  MREC2,  TEXT    "  R2"
       6354  2262
       6355  0000
 2976  6356  4040  MREC3,  TEXT    "  R3"
       6357  2263
       6360  0000
 2977  6361  4040  MLAP,   TEXT    "  LA"
       6362  1401
       6363  0000
 2978  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  6924
                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      MESHDR, 0               /DISPLAY MESSAGE HEADER & PC
3076    6515  4521              C8CRLF
3077    6516  4522              C8PRNT
```

```
6517  5230                LRRMES
6520  4521                CRCRLF
6521  4324                JMS MTN
6522  4332                JMS MPC
6523  5714                JMP I MESHOR

6524  0000      MTN,      0                    /DISPLAY TEST NUMBER
6525  4522                CRPRNT
6526  6565                MESTN
6527  1075                TAD TSTNO
6530  4523                CRPRT4
6531  5724                JMP I MTN

6532  0000      MPC,      0                    /DISPLAY PC
6533  4522                CRPRNT
6534  6660                MESPC
6535  1773'               TAD PCSAVE
6536  4523                CRPRT4
6537  5732                JMP I MPC


6540  4040      MESLK,  TEXT    "  LK:"
6541  1413
6542  7200
6543  4040      MESINS, TEXT    "  INST:"
6544  1116
6545  2324
6546  7200
6547  4040      MESACT, TEXT    "  ACTUAL     "
6550  0103
6551  2425
6552  0114
6553  4040
6554  4040
6555  4000
6556  4040      MESEXP, TEXT    "  EXPECTED   "
6557  0530
6560  2005
6561  0324
6562  0504
6563  4040
6564  4000
6565  4040      MESTN,  TEXT    "  TN:"
6566  2416
6567  7200
```



```
6573  6674
6574  6677
6575  6676
6576  6675
6577  6646
      6600      *6600
                /**********************************************************************************
                /               CONSOLE ROUTINES
                /**********************************************************************************


                /THIS ROUTINE WILL DETERMINE WHAT TO DO WHEN A CSERR IS ENCOUNTERED
                /WILL CHECK IF UNDER APT CONTROL.
                /       CSERR=  JMS XCSERR
                /EX.    CSERR               /GO TO CSERR CALL
                /                           /RETURN IS CALL PLUS ONE AC =0000



6600  0000      XCSERR, 0
6601  6002              IOF
6602  7000      DWAPT,  NOP                 /OVERWRITTEN WITH 'JMP APTER' IF RUNNING UNDER APT CONTROL
6603  3275              DCA     ACSAVE              /SAVE AC
6604  6004              GTF
6605  3277              DCA     FLSAVE              /SAVE THE FLAGS
6606  7501              MQA
6607  3276              DCA     MQSAVE              /SAVE THE MQ
6610  7340              CLA CLL CMA                 /SUBTRACT A 1 FOR TRUE LOCATION
6611  1200              TAD     XCSERR              /GET RETTURN LOCATION
6612  3274              DCA     PCSAVE              /SAVE ADD OF CSERR CALL
6613  6031              KSF                         /SAVE STATE OF SLU #1 REC FLAG FOR USE
6614  7410              SKP                         /  BY UNEXPECTED INT, ROUTINE
6615  7040              CMA                         /KBCHK ROUTINE CLEARS FLAG UNCONDITIONALLY
6616  3040              DCA KSFLG
6617  4517              KBCHK                       /CHECK FOR KEYBOARD INTERVENTION
6620  1777'             TAD TSLOP
6621  3300              DCA TLOOP
6622  1020              TAD PSR                     /INHIBIT ERROR TYPEOUT?
6623  0376              AND (0200                   /MASK BIT 4 = INHIBIT BIT
6624  7640              SZA CLA
6625  5246              JMP IEH                     /NO ERROR PRINTOUT
6626  1274              TAD PCSAVE
6627  7041              CIA
6630  1375              TAD (UEI
6631  7650              SNA CLA
6632  5774'             JMP SERUEI                  /USE UNEXPECTED INT, DISPLAY
6633  1274              TAD PCSAVE
6634  7041              CIA
6635  1373              TAD (SPE1
6636  7650              SNA CLA
6637  5772'             JMP CPUSDIS                 /USE MICROINST SKIP FAILURE DISPLAY
6640  1274              TAD PCSAVE
6641  7041              CIA
6642  1371              TAD (SPE2
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           CBS#IT                  /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  5707           JMP I TLOOP             /LOOP
3171  6655  4303           JMS CBGET               /CONTINUE TEST
3172  6656  7000           NOP                     /LEAVE INTERRUPT SYSTEM DISABLED
3173  6657  5600           JMP I   XCBERR
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    CBGET,  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  1700            TAD XCBERR              /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 CBGET
3198
3199
3200                  /*****************************************************************
3201
3202                  /XCBSTART IS CALLED AT START OF PROGRAM TO PRINT THE MAINDEC NUMBER
3203                  /AND THE SWITCH REGISTER QUESTION.
3204
3205  6716  0000    XCBSTART,       0
3206  6717  4532            CBAPT                   /CHECK FOR APT CONTROL
3207  6720  4521            CRCRLF                  //PRINT A CR LF
3208  6721  4522            CBPRNT
```



```
3209  6722  6277            HMID                    /PRINT ID
3210  6723  4521            CBCRLF
3211  6724  4524            CBSWIT                  /ASK THE SWITCH REGISTER QUESTION
3212  6725  4540            CBHJ                    /ASK THE HCW3 QUESTION
3213  6726  6211            CDF 10
3214  6727  3765            DCA I (PASSNO           /ZERO PASS COUNTER
3215  6730  6201            CDF 00
3216  6731  5716    LXCBST, JMP I   XCBSTART                /EXIT CBSTART
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  4314    HCWIMS, 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  2050
3258  6772  6406
3259  6773  2054
3260  6774  6213
3261  6775  6205
```

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3262    6776  0280
3263    6777  2726
              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  3237            DCA     .+3             /APT/MODIFY NEXT CDF INST,
3275    7005  7240            CLA CMA                 /APT/
3276    7006  1776'           TAD     XCBERR          /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    XCBRC,  0
3287    7013  1612            TAD I XCBRC             /GET MESSAGE PARAMETER
3288    7014  3300            DCA PROPMS
3289    7015  2212            ISZ XCBRC
3290    7016  1612            TAD I XCBRC             /GET THE REGISTER PARAMETER
3291    7017  3302            DCA PROPLC
3292    7020  2212            ISZ XCBRC
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  0401            \                       /CHECK FOR A OCTAL DIGIT
3302    7032  7050    CHGCHR, CHARR0                  /THIS LOCATION WILL GET MODIFIED
3303    7033  7566            =212                    /CHECK FOR LINE FEED
3304    7034  2200            START                   /LINE FEED TYPED= RETURN TO START
3305    7035  7563            =215                    /CHECK FOR CARRAIGE RETURN
3306    7036  7064            RETYPE                  /RETYPE CR 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
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3316    7050  3302    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  XCBRC           /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  XCBRC           /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  2000    PROPLC, 0
3344    7103  0000    SAVCHR, 0
3345    7104  2000    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  5317            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
```

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3371    7124  7575          =203                    /CODE FOR ^C
3372    7125  7125          C8HM                    /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  CNTPLG, C8PRNT                  /PRINT ^G AND CR LF
3386    7142  7317          UPARRG                  /POINTER  TO MESSAGE
3387    7143  477#* SR,     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  5730          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  7160
3421    7171  0277
3422    7172  7335
3423    7173  7054
3424    7174  7050
3425    7175  6520
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3426    7176  6600
3427    7177  6201
              72P0  PAGE
3428                /TYPE A CP 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* LOOP,   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  5730          JMP     .-1
3467    7232  6036          KRB
3468    7233  0376          AND     [177
3469    7234  1845          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
```

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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  5755          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     X10
3509  7304  7510  M270,   SPA                     /IS IT GREATER THAN ZERO?
3510  7305  5273          JMP     LISN2           /NO, SO NOT A NUMBER
3511  7306  5264          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* CONSOLT JMS     CNTRLS          /CONSOLT 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
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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* DCA XCHKKSF
3553  7350  1356          TAD LSAV2
3554  7351  3772* DCA MESAGX
3555  7352  1357          TAD LSAV3
3556  7353  3771* DCA 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  XQSW,   0
3565  7361  4537          CRRC
3566  7362  7312          SRMESG
3567  7363  0020          PSR
3568  7364  5760          JMP I XQSW
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  XQAPT,  0
3584  7401  6002          IOF
```

```
3585  7402  1022          TAD HCW2        /RUN UNDER APT CONTROLS?
3586  7403  7700          SMA CLA
3587  7404  5600          JMP I XCSAPT
3588  7405  1777'         TAD APTOW1      /YES--OVERWRITE CSEHR 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 APTOW1      /OVERWRITE "ERROR" ROUTINE (FLD 1)
3595  7413  3776'         DCA OW1APT
3596  7414  1772          TAD (APTICON    /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  LXCBST
3603
3604                    /PRINT PACKED ASCII TEXT TERMINATED BY
3605                    /SIX-BIT 00
3606
3607  7423  0000    MESAGX, 0
3608  7424  6517          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  5234          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          CRCRLF
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     CBRM            /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    XCSH3,  0
3701    7541  4537          CRRC                    /PRINT QUESTION
3702    7542  6760          HCW3MS
3703    7543  0023          HCW3
3704    7544  5740          JMP I XCSH3
3705
3706
3707
3708    7561  0200
3709    7562  7771
3710    7563  7705
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  1111 0000  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  11000000  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
```



```
                /
                /VT78 CPU DIAGNOSTIC - PART 2 - FIELD 1
                /
                /

                /PROCESSOR INSTRUCTIONS
          6007  CAF=6007                        /CLEAR ALL FLAGS
          7402  HLT=7402
          6244  RMF=6244                        /RESTORE MEMORY FIELD
          6005  RTF=6005
          6004  GTF=6004
          7421  MQL=7421
          7501  MQA=7501
          6661  PSKF=6661
          6500  LQSK=6500

                ////////////////////////////////////////////////////////////////////////////
                //SERIAL LINE UNIT #1
                ////////////////////////////////////////////////////////////////////////////
                /RECEIVER IOTS
          6030  KCF=6030                  /CLEAR RECEIVE FLAG
          6031  KSF=6031                  /SKIP ON RECEIVE FLAG
          6032  KCC=6032                  /CLEAR RECEIVE FLAG AND AC
          6034  KRS=6034                  /"OR" CONTENTS OF RECEIVE BUFFER INTO AC.
          6035  KIE=6035                  /AC 11=1 SET INTERRUPT ENABLE
                                          /AC 11=0 CLEAR INTERRUPT ENABLE
          6036  KRB=6036                  /LOAD CONTENT OF RECEIVE BUFFER INTO AC; CLR REC FLG
          6037  KLB=6037                  /LOAD CONTENT OF AC11 INTO LOOPBACK FLIP FLOP
                                          /SETTING THE LOOPBACK FLIP-FLOP DISCONNECTS ALL
                                          /SERIAL LINE UNITS FROM THEIR RESPECTIVE CONNECTORS
                                          /AND CONNECTS THE OUTPUT OF EACH SLU TRANSMITTER
                                          /TO ITS RECEIVER.
                /TRANSMIT IOTS

          6040  SPF=6040                  /SET TRANSMIT FLAG ENABLE
          6041  TSF=6041                  /SKIP ON TRANSMIT FLAG SET AND ENABLED
          6042  TCF=6042                  /CLEAR THE TRANSMIT FLAG ENABLE
          6043  TSB=6043                  /SET BAUD RATE
          6044  TPC=6044                  /SAME AS TLS
          6045  TSK=6045                  /SKIP IF INT ENABLE SET AND IF
                                          /RECEIVE FLAG IS SET OR IF THE TRANSMIT FLAG
                                          /FLAG AND TRANSMIT FLAG ENABLE ARE BOTH SET.
          6046  TLS=6046                  /LOAD TRANSMIT BUFFER FROM AC4-11 AND SEND CHAR OUT OVER
                                          /SERIAL LINE, SET THE TRANSMIT FLAG ENABLE, AS SOON
                                          /AS A NEW CHARACTER CAN BE LOADED INTO THE
                                          /TRANSMITTER, SET TRANSMIT FLAG.

                ////////////////////////////////////////////////////////////////////////////
                //SERIAL LINE UNIT #2
                ////////////////////////////////////////////////////////////////////////////

                /RECEIVER IOTS
```

```
3778          6340    KCF1=6340               /CLEAR RECEIVE FLAG
3779          6341    KSF1=6341               /SKIP ON RECEIVE FLAG
3780          6342    KCC1=6342               /CLEAR RECEIVE FLAG AND AC
3781          6344    KRS1=6344               /"OR" CONTENTS OF RECEIVE BUFFER INTO AC
3782          6345    KIE1=6345               /AC 11=1 SET INTERRUPT ENABLE
3783                                          /AC 11=0 CLEAR INTERRUPT ENABLE
3784          6346    KRB1=6346               /LOAD CONTENT OF RECEIVE BUFFER INTO AC; CLR RECV FLG
3785          6347    KMD1=6347               /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 TRANSMIT 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 #2
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 TRANSMIT 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
3883          6544    LQSK=6544               /SKIP ON DONE FLAG
3884          6541    LQRB=6541               /IF OUT=0 READ EXTERNAL DEVICE(PRINTER)
3891                                          /IF OUT=1 READ INTERFACE BUFFER
3892          6542    LQMP=6542               /MOVE PAPER
3893          6543    LQMC=6543               /MOVE CARRIAGE
3894          6544    LQPC=6544               /PRINT CHAR
3895          6545    LQRS=6545               /READ STATUS AND CLEAR DONE FLAG
3896          6546    LQLS=6546               /WRITE STATUS AND SET DONE FLAG
3897          6547    LQRE=6547               /RESTORE AND CLEAR DONE FLAG
3898
3899
3900
3901
3902          0000    *0
3903    0000  4454            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          4438            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  7206                    XC1EOP
3945          4444            PRN21=JMS I .
3946    0044  7525                    X1PRN2
3947          4445            CH1KSF=JMS I .
3948    0045  7106                    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  6603                    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            CLRE1F=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  2210                    ERISET
3974          4462            KB1CHK=JMS I .
3975    0062  3324                    CH1KB
3976          4463            MIOT=JMS I .
3977    0063  3424                    XM1OT
3978          4464            WAIT=JMS I .
3979    0064  5553                    XWAIT
3980          4465            GETSR=JMS I .
3981    0065  3312                    XGETSR
3982          4466            GETMM3=JMS I .
3983    0066  6346                    XGMM3
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    2634                    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    2620                    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                    XSPCIF
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    6281            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              SKPICHN
4099    0206  4465              GETSR                   /GET PSEUDO SWITCH REGISTER FROM FIELD B.
4100    0207  0377              AND (002Ø
4101    0210  7540              SZA CLA                 /EXECUTE SLU TEST??????
4102    0211  5776*             JMP PPTEST              /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 BORN8               /SETUP BAUD RATE FOR NORMAL TEST SEQUENCE
4107    0215  4773*             JMS XTOT                /SETUP DEVICE CODE FOR SLU TO TEST
4108    0216  4431              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: INTTIALIZE 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 Ø.
```



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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 Ø
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 Ø
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
                    #400    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
```



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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
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 4327   0534  4573            MTSF                    /SKIP ON SLU XMIT FLAG SET AND ENABLED
 4328   0535  7610            SKP CLA
 4329   0536  4450            ERROR                   /TCF FAILED TO CLEAR XMIT FLAG
 4330   0537  4475            MKSF                    /SKIP ON RECEIVE FLAG
 4331   0540  7610            SKP CLA
 4332   0541  4450            ERROR                   /RECEIVE FLAG SET BY ABOVE CODE
 4333   0542  4447            DONLOP
 4334
 4335   0575  0005
 4336   0576  0004
 4337   0577  0001
                0600    PAGE
 4338
 4339                   /*****************************************************************
 4340                   /TEST 6 - CHECKS THAT TLS WILL CLEAR THE XMIT FLAG AND THEN SET IT WHEN
 4341                   /XMISSION OF CHAR COMPLETE,  THE PROGRAM THEN CLEARS THE XMIT FLAG AND WAITS FOR
 4342                   /RCV DATA  TO SET RECEIVE FLAG,  THE RECEIVE FLAG IS CHECKED TO  CAUSE KSF TO
 4343                   /SKIP AND INTERRUPT AND THEN TO CLEAR BY KCF,
 4344                   /*****************************************************************
 4345
 4346
 4347   0600  1377    PTEST6, TAD (MTLS
 4348   0601  3252            DCA TS60W1
 4349   0602  1377            TAD (MTLS
 4350   0603  3263            DCA TS60W2
 4351   0604  1376            TAD (6                  /SETUP TEST NUMBER FOR ERROR DISPLAY
 4352   0605  3140            DCA TSTNU
 4353   0606  4446    TEST6,  LOOPPC
 4354   0607  1775*           TAD BORATE              /IS BAUD RATE SET = 19200 BITS/SEC ?
 4355   0610  0374            AND (0017
 4356   0611  7640            SZA CLA
 4357   0612  5224            JMP RES60W              /NO-DO FULL INTERRUPT TEST
 4358   0613  1373            TAD (NOP                /YES-REPLACE SOME OF THE IONS WITH NOPS
 4359                          /OTHERWISE THE SECOND RECV FLAG WILL GET
 4360                          /LOST DUE TO PROGRAM TIMING
 4361   0614  3264            DCA TS60W3
 4362   0615  1373            TAD (NOP
 4363   0616  3274            DCA TS60W4
 4364   0617  1373            TAD (NOP
 4365   0620  3301            DCA TS60W5
 4366   0621  1373            TAD (NOP
 4367   0622  3307            DCA TS60W6
 4368   0623  5235            JMP OWSET
 4369   0624  1372    RES60W, TAD (ION                /RESTORE TEST6 TO NORMAL
 4370   0625  3264            DCA TS60W3
 4371   0626  1371            TAD (ERROR
 4372   0627  3274            DCA TS60W4
 4373   0630  1372            TAD (ION
 4374   0631  3301            DCA TS60W5
 4375   0632  1371            TAD (ERROR
 4376   0633  3307            DCA TS60W6
 4377   0634  5235            JMP OWSET
 4378   0635  4455    OWSET,  CLREIF                  /CLEAR EXPECTING INTERRUPT FLAGS,
 4379   0636  4512            CFSLU                   /CLEAR ALL FLAGS BUT SET SLU INT ENA
 4380   0637  4467            LOOP                    /SETUP LOOPAROUND ON ALL SLUS,
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 4381   0640  3136            DCA ECONSI              /INT, CANNOT BE ATTRIBUTED TO CONSOLE PACK REQ
 4382                          /  WHILE LOOPED,
 4383   0641  6001            ION                     /TURN THE INTERRUPT ON
 4384   0642  4460            SETEXI                  /SET EXP XMIT INT FLAG
 4385   0643  4502            MSPF                    /SET THE TRANSMIT FLAG EN
 4386   0644  4503            MTSF                    /SKIP ON XMIT FLAG SET AND EN
 4387   0645  4450            ERROR                   /TRANSMIT FLAG FAILED TO SET BY SPF
 4388   0646  4507            MTSK                    /SKIP ON XMIT FLAG AND INT ENA ON A 1
 4389   0647  4450            ERROR                   /TSK FAILED TO SKIP WITH INT ENA + FLAG SET
 4390   0650  2117            ISZ INTFLG              /DID THE PROGRAM INTERRUPT
 4391   0651  4450            ERROR                   /PROGRAM FAILED TO INTERRUPT WITH XMIT AND INT ENA SET
 4392   0652  4510    TS60W1, MTLS/MTPC               /LOAD TRANSMIT BUFFER, TRANSMIT ,CLEAR XMIT FLAG, SET XMIT EN
 4393   0653  6001            ION                     /TURN THE INTERRUPT ON
 4394   0654  4503            MTSF                    /NOTE; XMIT FUNCTION IN UART IS BUFFERED,
 4395                          /  THE FIRST TLS WILL BRING THE XMIT FLAG BACK
 4396                          /  UP VERY QUICKLY.  THE SECOND TLS MUST WAIT FOR THE
 4397                          /  FIRST CHARACTER TO BE XMITTED BEFORE
 4398                          /  BRINGING UP XMIT FLAG,
 4399   0655  7610            SKP CLA
 4400   0656  5261            JMP .+3
 4401   0657  4451            TSFWAT
 4402   0660  4450            ERROR                   /NO XMIT FLAG
 4403   0661  2117            ISZ INTFLG
 4404   0662  4450            ERROR                   /ERROR, NO INTERRUPT OCCURRED
 4405   0663  4510    TS60W2, MTLS/MTPC
 4406   0664  6001    TS60W3, ION/NOP                 /SKIP ON THE TRANSMIT FLAG
 4407   0665  4503            MTSF
 4408   0666  7610            SKP CLA
 4409   0667  4450            ERROR                   /TLS FAILED TO CLEAR XMIT FLAG
 4410   0670  4461            SETERI                  /SET EXPECTING RECEIVE INTERRUPT FLAG
 4411                          /NOTE;FIRST REC FLAG MAY SET BEFORE SECOND XMIT FLAG
 4412   0671  4451            TSFWAT                  /WAIT FOR TRANSMIT FLAG TO SET
 4413   0672  4450            ERROR                   /TIMEOUT;UART FAILED TO SET XMIT FLAG
 4414   0673  2117            ISZ INTFLG              /DID THE PROGRAM INTERRUPT?
 4415   0674  4450    TS60W4, ERROR/NOP               /ERROR, NO INTERRUPT WITH XMIT AND INT ENA SET
 4416   0675  4507            MTSK                    /SKIP ON XMIT FLAG SET & EN +INT ENA SET,
 4417   0676  4450            ERROR                   /FAILED TO SKIP OR INT ENA OR FLAG GOT CLEARED
 4418   0677  4504            MTCF                    /CLEAR TRANSMIT FLAG ENABLE
 4419   0700  4456            CLREXI                  /CLEAR EXPECTING TRANSMIT INTERRUPT FLAG
 4420   0701  6001    TS60W5, ION/NOP                 /TURN THE INTERRUPT ON
 4421   0702  4452            KSFWAT                  /WAIT FOR THE RECEIVE FLAG TO SET
 4422   0703  4450            ERROR                   /NO SKIP, OR RECEIVE FLAG NOT SET BY RCD DATA AVAILABLE
 4423   0704  4507            MTSK                    /SKIP ON RCV FLAG AND INT ENA
 4424   0705  4450            ERROR
 4425   0706  2117            ISZ INTFLG              /DID RCV AND INT ENA CAUSE AN INTERRUPT?
 4426   0707  4450    TS60W6, ERROR/NOP               /NO, ERROR
 4427   0710  4474            MKCF                    /CLEAR RECEIVE FLAG
 4428   0711  6001            ION                     /TURN THE INTERRUPT ON
 4429   0712  4452            KSFWAT                  /WAIT FOR SECOND CHAR TO BE RECEIVED
 4430   0713  4450            ERROR
 4431   0714  4474            MKCF                    /CLEAR RECEIVE FLAG
 4432   0715  6001            ION
 4433   0716  4475            MKSF                    /SKIP ON RECEIVE FLAG
 4434   0717  7610            SKP CLA
 4435   0720  4450            ERROR                   /KCF FAILED TO CLEAR RECEIVE FLAG
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```
4416  0721  4503          MTSF                    /SKIP ON XMIT FLAG
4417  0722  7610          SKP CLA
4418  0723  4456          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  4536
4437  0771  4450
4438  0772  6401
4439  0773  7000
4440  0774  0017
4441  0775  3124
4442  0776  0006
4443  0777  4513
            1000  PAGE
4444                      /*************************************************************************
4445                      /TEST 10 - CHECKS THAT THE TLS-TCF SEQUENCE WILL CLEAR XMIT FLAG ENABLE
4446                      /PREVENTING THE FOLLOWING INTERRUPT, ALSO CHECKS THAT THE RECEIVE FLAG
4447                      /WILL SET AND THAT IT CAN BE CLEARED BY KCC.
4448                      /*************************************************************************
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  6502          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
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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          ERROR                   /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                 /KCC FAILED TO CLEAR RCV FLAG
4486  1043  4450          ERROR
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
```

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 4525   1102  7610          SKP CLA
 4526   1103  4454          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          ISFWAT                  /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
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 4579   1207  7344          CLA CLL CMA RAL         /SET THE AC TO -2
 4580   1210  4504          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  7010          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  7042          CMA
 4625   1265  7440          SZA
 4626   1266  4450          ERROR                   /TPC CHANGED THE AC
 4627   1267  4451          ISFWAT                  /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
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4634    1276  6507          KTSK            /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  6510          KTLS            /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  6451          TSFWAT          /WAIT FOR THE TRANSMIT FLAG
4644    1310  4450          ERROR           /TRANSMIT FLAG FAILED TO SET
4645    1311  6452          KSFWAT          /WAIT FOR THE RECEIVE FLAG TO SET
4646    1312  4450          ERROR           /ERROR RECEIVE FLAG FAILED TO SET
4647    1313  6504          KTCF            /CLEAR THE TRANSMIT FLAG
4648    1314  6476          KRCC            /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  4513          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  4513          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                  /**********************************************************************
```



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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  4513          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  #125
4706    1371  #252
4707    1372  #16
4708    1373  #377
4709    1374  #15
4710    1375  2513
4711    1376  #014
4712    1377  #013
              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  4513          CFSLU                   /CLEAR ALL SLU FLAGS AND EN SLU INT.
4724    1405  7301  OTZ,    CLA CLL IAC
4725    1406  3125          DCA SLUXMT
4726    1407  4453          SLUDAT
4727    1410  4454          SLUDER
4728    1411  1126          TAD SLUXMT
4729    1412  #376          AND (#200
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  #375          AND (#377
4737    1422  3126          DCA SLUXMT
4738    1423  4453          SLUDAT
4739    1424  4454          SLUDER
4740    1425  1126          TAD SLUXMT
4741    1426  #376          AND (#200
4742    1427  7650          SNA CLA
```

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4743  1430  5235          JMP DONT17
4744  1431  7126          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          CLREIF                  /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  7320          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  7320          CLA CLL
4807  1513  5347          JMP CLUPEX
4808  1514  7740  INTRTN, CLA CMA                 /RETURN FROM EXPECTED XMIT INTERRUPT
4809  1515  1773          TAD BORATE
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
                    5608  PAGE
4848                      /SERIAL LINE UNIT TIMING VERIFICATION TABLES
4849
4850  1600  0003  SLUMST, 0003                  /BAUD RATE =    50    MOST SIGN COUNT WORD
4851  1601  0027          0027                  /               75
```

```
1602  0001              0001          /               110
1603  0001              0001          /               134.5
1604  0001              0001          /               150
1605  0000              0000          /               300
1606  0000              0000          /               600
1607  0000              0000          /               1200
1610  0000              0000          /               1800
1611  0000              0000          /               2000
1612  0000              0000          /               2400
1613  0000              0000          /               3600
1614  0000              0000          /               4800
1615  0000              0000          /               7200
1616  0000              0000          /               9600
1617  0000              0000          /               19200


1620  1275    SLULSL, 1275            /BAUD RATE -    50    LEAST SIGN COUNT WORD,LOWER LIMIT
1621  0720              0720          /               75
1622  3415              3415          /               110
1623  1330              1330          /               134.5
1624  0345              0345          /               150
1625  4160              4160          /               300
1626  2060              2060          /               600
1627  1025              1025          /               1200
1630  0540              0540          /               1800
1631  0475              0475          /               2000
1632  0410              0410          /               2400
1633  0255              0255          /               3600
1634  0200              0200          /               4800
1635  0124              0124          /               7200
1636  0076              0076          /               9600
1637  0033              0033          /               19200


1640  1302    SLULSU, 1302            /BAUD RATE -    50    LEAST SIGN COUNT WORD,UPPER LIMIT
1641  0726              0726          /               75
1642  3421              3421          /               110
1643  1334              1334          /               134.5
1644  0352              0352          /               150
1645  4163              4163          /               300
1646  2067              2067          /               600
1647  1032              1032          /               1200
1650  0546              0546          /               1800
1651  0502              0502          /               2000
1652  0413              0413          /               2400
1653  0261              0261          /               3600
1654  0203              0203          /               4800
1655  0126              0126          /               7200
1656  0100              0100          /               9600
1657  0035              0035          /               19200


                      /ROUTINE TO SET MODE FOR SLU #2

1660  0000    XMODE2, 0
```



```
1661  7300            CLA CLL
1662  1660            TAD I XMODE2            /GET MODE REQUEST
1663  6307            KMDI                    /ISSUE MODE SETTING IOT
1664  7300            CLA CLL
1665  2260            ISZ XMODE2
1666  5660            JMP I XMODE2

                      /VARIABLE DELAY ROUTINE - DELAY IS APPROX. 15.3 MICRO SEC PER REQUEST COUNT

1667  0000    XVDLY,  0
1670  7300            CLA CLL
1671  1667            TAD I XVDLY
1672  7041            CIA
1673  3300            DCA VDCTR
1674  2267            ISZ XVDLY
1675  2300            ISZ VDCTR
1676  5275            JMP .-1
1677  5667            JMP I XVDLY
1700  0000    VDCTR,  0

                      /*****************************************************************************
                      /TEST 21 - VERIFY EIA DRIVERS ON SIGNAL DISTRIBUTION BOARD
                      /          (EXCEPT FOR SLU #1 WHICH IS NOT AVVAILABLE ON
                      /           ON AN EXTERNAL CONNECTOR FOR EXTERNAL LOOPAROUND)
                      /*****************************************************************************

1701  4446    TEST21, LOOPPC
1702  1377            TAD (21
1703  3140            DCA TSTNU               /SETUP TEST NUMBER FOR ERROR DISPLAY.
1704  6002            IOF
1705  4466            GETHW3                  /GET HARDWARE WORD 3
1706  0376            AND (0200
1707  7650            SNA CLA                 /PERIPHERAL SIMULATOR ATTACHED?
1710  5330            JMP T21DN               /NO-SKIP THIS TEST
1711  1775'           TAD IOT0                /SLU #1 BEING TESTED
1712  7041            CIA
1713  1374            TAD (KCF
1714  7650            SNA CLA
1715  5330            JMP T21DN               /YES--SKIP THIS TEST
1716  6507            LORE                    /YES-LOOP SLU'S EXTERNALLY
                                              /       VIA SIMULATOR (RESTORE)
1717  4455            CLREIF                  /CLEAR EXPECTING INTERRUPT FLAGS
1720  4512            CFSLU                   /CLEAR ALL SLU FLAGS & EN SLU INT.
1721  1373            TAD (0252
1722  3126            DCA SLUXMT              /SET UP THE WORD TO BE TRANSMITTED - 252
1723  1372            TAD (RLOOP
1724  3771'           DCA DLOP                /MODIFY SLUDAT ROUTINE - INHIBIT THE
                                              /       INTERNAL LOOPAROUND.
1725  4453            SLUDAT                  /GO TRANSMIT,READ AND COMPARE
1726  4454            SLUDER                  /DATA ERROR - FAULTY EIA DRIVER
1727  6007            CAF                     /REMOVE EXTERNAL LOOPAROUND
1730  4447    T21DN,  DONLOP


1771  2423
```

```
 4962    1772  4514
 4963    1773  0752
 4964    1774  6030
 4965    1775  2001
 4966    1776  0240
 4967    1777  0221
               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 SLUER           /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 (-10            /(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 YMODE
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 3100
2171 7400
2172 7774
2173 0040
2174 0006
2175 6300
2176 2671
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 TESTFI
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  1757            TAD LLLD              /SLU TESTING IN PROGRESS?
5160    2245  7041            CIA
5161    2246  1767            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  0721    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
```



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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  1430            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    WAITSF, 0
5233    2334  7300            CLA     CLL
5234    2335  6580            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 OPONKI            /CHECK TO SEE IF INT EN
5239    2342  6583            MTSF
5240    2343  4357            JMS     ADDTIM        /GO ADD ONE TO THE COUNTER
5241    2344  2333            ISZ     WAITSF
5242    2345  5733            JMP  I  WAITSF        /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  6475            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  7146          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  2370  2471
5271  2371  7777
5272  2372  2321
5273  2373  0214
5274  2374  3112
5275  2375  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     RETIADD         /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     RETIADD
5291  2414  3620          DCA  I  SAVLOC
5292  2415  5600          JMP  I  RETURN
5293
5294  2416  0000    K0,     0
5295  2417  0200    RETIADD,        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  4455          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
```



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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  4520          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 (MCW2               /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
```

```
5371
5372                    /REPORT TO APT DURING VARIABLE BAUD RATE SEQUENCE OF TESTING WHEN
5373                    /       BAUD RATE FOR TEST REACHES A PRESET VALUE.
5374
5375    2513  0000      APTP,   0
5376    2514  1772'             TAD BDRATE              /GET CURRENT SETTING(+1)
5377    2515  7371              AND (0003               /LOOK AT ONLY 2 LEAST SIGNIF. BITS
5378    2516  7041              CIA
5379    2517  1323              TAD RPTBR               /AGREE WITH PRESET VALUE?
5380    2520  7650              SNA CLA
5381    2521  4515              APTREP                  /YES--REPORT TO APT
5382    2522  5713              JMP I APTP
5383    2523  0002      RPTBR,  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
              2600      PAGE
5394                    /*************************************************************************
5395                    /SUBROUTINES TO ISSUE SLU IOTS
5396                    /*************************************************************************
5397
5398    2600  0000      XMKCF,  0
5399    2601  6031      IOT1,   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  6046      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 (0010
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  3000  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  7200          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  0030
              3000  PAGE
5529                /SETUP IOTS FOR PARTICULAR SLU UNDER TEST
5530
5531  3000  0000  XIOT,   0
5532  3001  6007          IDF
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
```

```
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  0307            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  5312            ISZ XBAUD
5630    3123  5712            JMP I XBAUD
5631    3124  6400    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
```



```
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  0016
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 BURNS
5700
5701                  /RESTORE BAUD RATES AND LOOPAROUND TO STATES EXPECTED BY DIAGNOSTIC
5702
5703    3214  0000    RESTBR, 0
5704    3215  1826            TAD BDR1
5705    3216  6043            TSB                     /SLU#1 BAUD RATE RESTORED
5706    3217  7300            CLA CLL
5707    3220  1827            TAD BDR2
5708    3221  6313            TSB1                    /SLU#2 BAUD RATE RESTORED
5709    3222  7300            CLA CLL
5710    3223  1830            TAD BDR3
5711    3224  6333            TSB2                    /SLU#3 BAUD RATE RESTORED
5712    3225  7300            CLA CLL
5713    3226  1831            TAD LOOPA
5714    3227  6037            KLB                     /LOOPAROUND RESTORED
5715    3230  7300            CLA CLL
5716    3231  4477            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  3831            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  3831            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  7006            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  2425    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    XGETSP, 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 CHKB
5007
5008
5009
5010
5011                        /**********************
5012            3331        $LUEND=.                /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  3030
3377  0003
      3430    *3430

              /**************************************************************************
              /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 ECONST              /SET FLAG INDICATING THAT A CONSOLE INTERRUPT IS POSSIBLE NOW.
3407  1775'           TAD KJILD
3410  3774'           DCA LLLD
3411  4773'   PRIM,   JMS PPIMES              /PRINT PARALLEL I/O INTERF TESTING MESSAGE
                                              /IF NOT UNDER APT CONTROL.
3412  6037            CAF                     /CLEAR ALL FLAGS & DISABLE PARALLEL I/O SIMULATION
                                              /        STROBE DECODER.
3413  4141            JMS PATCH               /SETUP INTERRUPT SERVICE LINKAGE
3414  6200            SKP1CHN
3415  5712'           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 T1L0                /NO PARALLEL INTERFACE DEVICE CABLED TO SYSTEM
3432  4466            GETHW3
3433  0367            AND (400
3434  7640            SZA CLA
3435  5770'           JMP T1L0

              /**************************************************************************
              /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 LOOP MODE,
5946    3521  7326            CLA CLL CML RTL /IN CASE SIMULATOR IS IN USE SWITCH MODE BACK TO LA
5947                                          / & CLEAR FLAGS, THIS LOOS INST. HAS NO EFFECT
5948                                          / IF SIMULATOR IS NOT IN USE,
5949    3522  6596            LOLS
5950    3523  6662            PCLF
5951    3524  6001            ION
5952    3525  4472            SETEPI          /SET EXPECTING PRINTER INT,
5953    3526  6666            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  2757
5985    3561  2267
5986    3562  5400
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  6604            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  6601            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
6050  3652  7410          SKP
6051  3653  4450          ERROR           /PCLP FAILED TO CLEAR FLAG
6052  3654  7240          STA
6053  3655  6667          PRDB            /READ WORD BACK
6054  3656  7440          SZA
6055  3657  4450          ERROR           /DATA READ NOT = DATA WRITTEN
6056                                      /AC CONTAINS WORD READ
6057                                      /WORD WRITTEN=0
6060  3660  7240          STA
6061  3661  6666          PCLP            /LOAD ALL ONES INTO BUFFER
6062  3662  7200          CLA
6063  3663  6667          PRDB            /READ WORD BACK
6064  3664  7040          CMA
6065  3665  7440          SZA
6066  3666  4450          ERROR           /DATA READ NOT = DATA WRITTEN
6067                                      /AC CONTAINS COMPLEMENT OF WROD READ
6070                                      /WORD WRITTEN=7777
6071  3667  4447          DONLOP
6072
6073                      /*************************************************************************
6074                      /TEST 6 - CHECK THAT PSSF,PSKF,PCLF,PSTB,PCIE AND PCLP LEAVE ACC
6075                      /               UNCHANGED, ALSO CHECK THAT PSSF,PSKF,PCLF,PCIE PRDB
6076                      /               LEAVE INTERFACE REGISTER UNCHANGED,
6077                      /*************************************************************************
6100  3670  4446  T6LA:   LOOPPC
6101  3671  6002          IOF
6102  3672  1377          TAD (5252
6103  3673  6664          PSTB            /LOAD INTERFACE BUFFER
6104  3674  1376          TAD (-5252
6105  3675  7440          SZA
6106  3676  4450          ERROR           /PSTB CHANGED AC CONTENTS
6107  3677  1377          TAD (5252
6110  3700  6660          PSSF
6111  3701  1376          TAD (-5252
6112  3702  7440          SZA
6113  3703  4450          ERROR           /PSSF CHANGED AC CONTENTS
6114  3704  1377          TAD (5252
6115  3705  6661          PSKF
6116  3706  7000          NOP
6117  3707  1376          TAD (-5252
6120  3710  7440          SZA
6121  3711  4450          ERROR           /PSKF CHANGED AC CONTENTS
6122  3712  1377          TAD (5252
6123  3713  6665          PCIE
6124  3714  1376          TAD (-5252
6125  3715  7440          SZA
6126  3716  4450          ERROR           /PCIE CHANGED AC CONTENTS
6127  3717  1377          TAD (5252
6130  3720  6662          PCLF
6131  3721  1376          TAD (-5252
6132  3722  7440          SZA
```



```
6133  3723  4450          ERROR           /PCLF CHANGED AC CONTENTS
6134  3724  6667          PRDB            /READ INTERFACE BUFFER
6135  3725  1376          TAD (-5252
6136  3726  7440          SZA
6137  3727  4450          ERROR           /INTERFACE BUFFER CHANGED SINCE LOAD BY PSTB ABOVE
6140  3730  6667          PRDB
6141  3731  1376          TAD (-5252
6142  3732  7440          SZA
6143  3733  4450          ERROR           /PRDB CHANGED INTERFACE BUFFER CONTENTS
6144  3734  4447          DONLOP
6145  3735  5775*         JMP T7LA
6146
6147  3775  4000
6150  3776  2526
6151  3777  5252
      4000  PAGE
6152                      /*************************************************************************
6153                      /TEST 7 - CHECK OUT PRINTER INTERFACE BUFFER REGISTER
6154                      /               (ONE THROUGH A FIELD OF ZEROS AND VICE VERSA)
6155                      /*************************************************************************
6156
6157  4000  1377  T7LA:   TAD (NOP
6160  4001  3776*         DCA T70W1
6161  4002  1377          TAD (NOP
6162  4003  3775*         DCA T70W2
6163  4004  5774*         JMP T7LQ
6164
6165
6166
6167
6170
6171
6172                      /*************************************************************************
6173                      /PARALLEL I/O DEVICE CODE = 50
6174                      /*************************************************************************
6175
6176
6177
6200                      /*************************************************************************
6201                      /TEST  1 - CHECK THAT LORE AND LORS CLEAR DONE FLAG AND THAT
6202                      /               LQLS SETS DONE FLAG,  CHECK USING LQSK,
6203                      /*************************************************************************
6204
6205  4005  4446  T1LQ:   LOOPPC
6206  4006  6002          IOF
6207  4007  6505          LQRS            /READ STATUS AND CLEAR DONE FLAG
6210  4010  7410          SKP
6211  4011  4450          ERROR           /LQRS SKIPPED
6212  4012  6500          LQSK            /SKIP ON DONE FLAG
6213  4013  7410          SKP
6214  4014  4450          ERROR           /LQRS FAILED TO CLEAR DONE FLAG OR
6215                                      /       LQSK SKIPPED,
6216  4015  7300          CLA CLL
6217  4016  6506          LQLS            /WRITE STATUS (CLEAR LIFT RIBBON & INT EN)
6220                                      /       AND SET DONE FLAG
```

```
6155  4017  7414          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  6520          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
```



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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  6520          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  7230          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  1200
6259  4173  0003
6260  4174  4400
6261  4175  4446
6262  4176  4421
6263  4177  7000
      4200  PAGE
```

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6264
6265                    /*************************************************************************
6266                    /TEST 4 = CHECK THAT LOMP,LOMC,LOPC,AND LOPE LOAD INTERFACE BUFFER
6267                    /               AND THAT LORB READS INTERFACE BUFFER, NOTE: DATA IS
6268                    /               INVERTED BEFORE BEING STORED IN INTERFACE BUFFER.
6269                    /*************************************************************************
6270
6271    4200  4446    T4LO,   LOOPPC
6272    4201  4471            CLREPI
6273    4202  1377            TAD (LQ4TAB
6274    4203  3251            DCA LQTAB
6275    4204  5232            JMP INITL
6276    4205  6506    IN&L1,  LOLS            /DISABLE LQP INTERRUPTS AND SET DONE FLAG
6277    4206  6001            ION
6278    4207  6502    LQ11,   LOMP/LOMC/LOPC/LORE             /AC=-11 TO INTERFACE BUFFER,CLEAR AC, CLEAR DONE FLAG
6279    4210  7410            SKP
6280    4211  4450            ERROR           /LQXX SKIPPED-DETERMINE LQXX FROM LOCATION LQ11
6281    4212  6500            LOSK
6282    4213  7410            SKP
6283    4214  4450            ERROR           /LQXX FAILED TO CLEAR DONE FLAG
6284    4215  6501            LORB            /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
                                              /AC CONTAINS WORD READ BACK FROM INT BUFFER
                                              /WORD WRITTEN = 0; EXPECTED READ DATA=7777
6290
6291                            STA
6292    4223  7240    LQI2,   LOMP/LOMC/LOPC/LORE     /AC=-11 TO INTERF, BUFFER,CLEAR AC,CLEAR DONE FLAG
6293    4224  6502            STA
6294    4225  7240            LORB            /READ INTERFACE BUFFER
6295    4226  6501            SZA
6296    4227  7440            ERROR           /DATA READ NOT = EXPECTED READ DATA
6297    4230  4450                            /AC CONTAINS WORD READ BACK FROM INTERF BUFFER
6298                                          /WORD WRITTEN=7777; EXPECTED READ DATA = 0000
6299                            ISZ LQTAB       /PERFORM SAME CHECKS ON LOMC,LOPC,AND LORE
6300    4231  2251
6301    4232  1651    INITL,  TAD I LQTAB
6302    4233  7450            SNA
6303    4234  5241            JMP TABDON
6304    4235  3207            DCA LQ11
6305    4236  1651            TAD I LQTAB
6306    4237  3224            DCA LQI2
6307    4240  5205            JMP IN&L1
6308    4241  7300    TABDON, CLA CLL         /CHECK THAT LORB DOES NOT CLEAR DONE FLAG
6309    4242  4513            XLSIM           /DISABLE PARALLEL I/O SIMULATOR IF IN USE.
6310    4243  6506            LOLS            /SET DONE FLAG
6311    4244  6501            LORB
6312    4245  6500            LOSK
6313    4246  4450            ERROR           /LQRB CLEARED DONE FLAG
6314    4247  4447            DONLOP
6315    4250  5257            JMP T5LO
6316
6317    4251  F000    LQTAB,  0
6318    4252  6502    LQ4TAB, LOMP
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```
6319    4253  6503            LOMC
6320    4254  6501            LOPC
6321    4255  6507            LORE
6322    4256  0000            0
6323
6324
6325
6326
6327                    /*************************************************************************
6328                    /TEST 5 = CHECK THAT LOMP,LOMC,LOLS AND LOPC CLEAR AC.
6329                    /*************************************************************************
6330
6331    4257  4446    T5LO,   LOOPPC
6332    4260  4471            CLREPI
6333    4261  6002            IOF
6334    4262  1376            TAD (7775       /IN CASE SIMULATOR IS IN USE DON'T SET LIFT
                                              / RIBBON = THIS WOULD SWITCH MODES TO LA.
6335
6336    4263  6506            LOLS
6337    4264  7440            SZA
6338    4265  4450            ERROR           /LQLS FAILED TO CLEAR AC
6339    4266  6506            LOLS            /DISABLE LQP INTERRUPTS AND SET DONE FLAG
6340    4267  6001            ION
6341    4270  7040            CMA
6342    4271  6502            LOMP
6343    4272  7440            SZA
6344    4273  4450            ERROR           /LQMP FAILED TO CLEAR AC
6345    4274  7040            CMA
6346    4275  6503            LOMC
6347    4276  7440            SZA
6348    4277  4450            ERROR           /LQMC FAILED TO CLEAR AC
6349    4300  7040            CMA
6350    4301  6504            LOPC
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 LOSK,AND LORE LEAVE AC UNCHANGED, ALSO CHECKS
6358                    /               THAT LOSK,LORB,LORS, AND LOLS LEAVE INTERFACE BUFFER
6359                    /               REGISTER UNCHANGED.
6360                    /*************************************************************************
6361
6362    4305  4446    T6LO,   LOOPPC
6363    4306  6002            IOF
6364    4307  1375            TAD (5252
6365    4310  6503            LOMC            /LOAD INTERFACE BUFFER
6366    4311  1375            TAD (5252
6367    4312  6500            LOSK
6368    4313  7000            NOP
6369    4314  1374            TAD (-5252
6370    4315  7440            SZA
6371    4316  4450            ERROR           /LOSK CHANGED AC
6372    4317  6505            LORS
6373    4320  6501            LORB
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6374    4321  7200          CLA
6375    4322  6501          LQRA            /READ INTERFACE BUFFER
6376    4323  1333          TAD (5253
6377    4324  7440          SZA
6378    4325  4458          ERROR           /LQSR,LQRB,LQRS OR LQLS CHANGED INTERFACE BUFFER
6379    4326  1375          TAD (5252
6380    4327  6507          LQRE
6381    4330  1374          TAD (-5252
6382    4331  7440          SZA
6383    4332  4458          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  3778'         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  2201    PIMES,  TEXT    "PARALLEL I/O INTERFACE "
        4353  2241
        4354  1414
        4355  0514
        4356  4011
        4357  5717
        4360  4011
        4361  1624
        4362  0522
        4363  2601
        4364  0305
        4365  4000
6404
6405
6406    4367  4400
6407    4370  4446
6408    4371  4421
6409    4372  7442
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
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SEQ 0144

```
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  7440    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  6505          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  5674          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
6505                      /AC,MQ = ACTUAL WORD READ, WORD WRITTEN
6506                      /NOTE; WHEN TESTING WITH LQ DEVICE CODES DATA
6507                      /READ SHOULD BE THE COMPLEMENT OF DATA WORD WRITTEN
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 T70W1       /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  6742
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  6526          LQLS            /CLEAR LIFT RIBBON FLOP - SHOULD ALREADY BE CLEAR
6566  4604  6527          LQRE            /ENABLE PARALLEL I/O SIMULATOR
6567  4605  6524          LQPC            /ZERO INTERFACE BUFFER AND SWITCH IN/OUT
6568  4606  6523          LQMC            /       TO LOW BY SETTING ALL
6569  4607  7040          CMA             /       SIMULATOR STROBE FLOPS.
6570  4610  6522          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  6527          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
```

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6581  4622  4450          ERROR           /IN/OUT FAILED TO ENABLE INTERFACE BUFFER OUTPUT.
6582  4623  6545          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
```



```
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
```

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6691
6692
6693    4771  4072
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 I / 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              CIFOP             /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              SKP!CHN
6728    5011  4345      PFN,    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 ERROR.
6737    5016  7300              CLA CLL           /ENABLE PARALLEL I/O SIMULATOR AND SETUP FLOPPY
6738    5017  6502              LOMP              /TO NORMAL  "UNCABLED" STATE(1>DONE,1>XFER RQSTL
6739                            /1>OUTL,1>ERRORL,1>RXDATAL).
6740    5020  7300              CLA CLL
6741    5021  4466              GETH#3                    /SETUP RXHERE
6742    5022  0374              AND (2200
6743    5023  3133              DCA RXHERE                /RXHERE=0 IF RX01 IS CABLED TO INTERFACE.
6744    5024  6753              STP
```



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6745    5025  7410              SKP
6746    5026  4456      E0PRE,  ERROR             /UNEXPECTED TRANSFER REQUEST FLAG
6747    5027  6794              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              GETH#3                    /IS DRIVE 0 READY?
6774    5041  6373              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       6       7       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
```

```
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                        /
```



```
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            CICRLF
6938  5147  4434            CIPRNT
6939  5150  5242            FLMES
6940  5151  4434            CIPRNT
6941  5152  3306            TESMES
6942  5153  4432            CICRLF
6943  5154  5745            JMP I PFMES
6944
6945
6946
6947  5155  5200
6948  5156  7600
6949  5157  0200
6950  5160  0177
6951  5161  0000
6952  5162  0277
6953  5163  6002
6954  5164  2202
6955  5165  2257
6956  5166  2267
6957  5167  0010          PAGE
                  5200    /TEST 4 - FLAG DETECTION PART III / " C " LINES VERIFICATION PART III
6958                    /
6959                    /       THE SETTING OF THE MAINTENANCE FLIP-FLOP SHOULD "DIRECT SET" ALL
6960                    /       FLAGS (DONE, TRANSFER REQUEST, AND ERROR).
6961                    /
6962                    /
6963  5203  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          SER
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          SER
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          SER
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  1024
      5247  0522
      5250  6601
      5251  0305
      5252  0000
```

```
                        /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  4452      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  7100              CLL RTL
5302  7005              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  4456  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  F53,    ERROR                           /IOT SDN DIDN'T SKIP AND CLEAR


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 7134   5342  6753          STR
 7135   5343  4452  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

```
7188                    /
7189                    /TECHNICAL NOTE:
7190                    /
7191                    /ALL FLAGS SHOULD REMAIN SET
7192                    /IF ANY FLAG IS MISSING,
7193                    /THEN IT IS ASSUMED THAT IOT "INTR" 6756 CLEARED THE FLAG(S)
7194                    /
7195    5415  6751              LCD                             /MAINTENANCE MODE <OFF>
7196    5416  6756              INTR                            /DISABLE THE INTERRUPT ENABLE F/F
7197    5417  6755              SDN
7198    5420  4450    E61,      ERROR                           /MISSING DONE FLAG
7199    5421  6753              SIR
7200    5422  4450    E62,      ERROR                           /MISSING TRANSFER REQUEST FLAG
7201    5423  6754              SER
7202    5424  4450    E63,      ERROR                           /MISSING ERROR FLAG
7203    5425  4447              DONLOP
7204                    /
7205                    /TEST 10 - INTERRUPT TEST PART II
7206                    /
7207                    /INTERRUPT TEST PART II   (AN INTERRUPT SHOULD OCCUR IN THIS TEST),
7208                    /
7209                    /THE MAINTENANCE FLIP-FLOP HAS PREVIOUSLY BEEN VERIFIED TO DIRECT
7210                    / SET ALL FLAGS AND THE INTERFACE IOT =SKIP ON DONE= "SDN" 6755 WAS
7211                    /FOUND TO "SKIP AND CLEAR" SUCCESSFULLY,
7212                    /
7213                    /FIRST SET THE MAINTENANCE FLIP-FLOP
7214                    /WHICH SHOULD DIRECT SET THE DONE FLAG,
7215                    /THEN BY SETTING THE RX01 INTERRUPT ENABLE
7216                    /BY ISSUING THE IOT "INTR" 6756 WITH THE AC = 1,
7217                    /
7218                    /AN INTERRUPT REQUEST SHOULD BE ASSERTED,
7219                    /
7220                    /THE PROGRAM IS EXPECTING AN INTERRUPT,
7221                    /
7222                    /TECHNICAL NOTE:
7223                    /
7224                    /IF AN INTERRUPT DOES NOT OCCUR, THEN IT IS ASSUMED THAT ISSUING THE IOT
7225                    / "INTR" 6756 DID NOT SET THE RX0 INTERRUPT ENABLE, OR INTERRUPT REQUEST
7226                    /
7227    5426  4446    T10,      LOOPPC
7228    5427  6002              IOF
7229    5430  4141              JMS PATCH                       /SETUP INT, LINKAGE TO RETURN TO THIS TEST
7230    5431  5444              T70K
7231    5432  6035              KIE                             /DISABLE CONSOLE PACKAGE INT,
7232    5433  1377              TAD (200)
7233    5434  6751              LCD                             /MAINTENANCE <ON>
7234    5435  6001              ION
7235    5436  7201              CLA IAC
7236    5437  6756              INTR                            /RX01 INTERRUPT ENABLE <ON>
7237    5440  7000              NOP
7238    5441  7000              NOP
7239    5442  7000              NOP
7240    5443  4450    E70,      ERROR                           /MISSING INTERRUPT
7241    5444  4447    T70K,     DONLOP
7242
```


SEQ 0160

```
7243
7244
7245
7246                    /TEST 11
7247                    /
7248                    /INTERRUPT TEST (PART III)  (NO INT, SHOULD OCCUR DURING THIS TEST),
7249                    /
7250                    /IOT INTR 6756 SHOULD CLEAR THE INTERRUPT ENABLE FLIP-FLOP, THEN
7251                    /
7252                    /WITH ALL FLAGS SET, NO INTERRUPTS SHOULD OCCUR
7253                    /
7254                    /TECHNICAL NOTE:
7255                    /
7256                    /IF AN UNEXPECTED PROGRAM INTERRUPT OCCURS FROM APPROXIMATELY THIS PC
7257                    /THEN THE RX PROGRAM INTERRUPT REQUEST TOOK TO LONG TO SET
7258                    /FROM THE PREVIOUS TEST,
7259                    /
7260                    /
7261    5445  4446    T11,      LOOPPC
7262    5446  6002              IOF
7263    5447  4141              JMS PATCH                       /SETUP INT, LINKAGE TO RETURN TO THIS TEST
7264    5450  5460              E100
7265    5451  6035              KIE                             /DISABLE CONSOLE PACKAGE INT,
7266    5452  6756              INTR                            /DISABLE RX8 INTERRUPT ENABLE
7267    5453  6001              ION
7268    5454  1377              TAD (200)
7269    5455  6751              LCD
7270    5456  7000              NOP
7271    5457  7410              SKP
7272    5460  4450    E100,     ERROR                           /UNEXPECTED INTERRUPT
7273    5461  4447              DONLOP
7274
7275
7276
7277
7278                    /TEST 12
7279                    /
7280                    /INTERRUPT TEST (PART IV)   (NO INT, SHOULD OCCUR DURING THIS TEST),
7281                    /
7282                    /*****************************************************************************
7283                    /*****************************************************************************
7284                    /
7285                    /TOGGLING THE MAINTENANCE MODE <ON> / <OFF> SETS ALL FLAGS AND
7286                    /
7287                    /PERMITS IOT SDN TO CLEAR THE DONE FLAG
7288                    /
7289                    /THEREFORE NO INTERRUPTS SHOULD OCCUR (ONLY DONE FLAG RAISES AN INTERRUPT REQUEST)
7290                    /
7291    5462  4446    T12,      LOOPPC
7292    5463  6002              IOF
7293    5464  4141              JMS PATCH                       /SETUP INTERRUPT LINKAGE TO RETURN TO THIS TEST
7294    5465  5503              E110
7295    5466  6035              KIE                             /DISABLE CONSOLE PACKAGE INT,
7296    5467  1377              TAD (200)
7297    5470  6751              LCD
```

```
                        LCD                     /MAINTENANCE <ON> / <OFF>
                        SDN
                        NOP
                        NOP                     /CLEAR THE DONE FLAG
                        ION
                        CLA IAC
                        INTR                    /RX01 INTERRUPT ENABLE <ON>
                        NOP
                        NOP
                        SKP
E110,                   ERROR                           /UNEXPECTED INTERRUPT
                        INTR                            /RX01 INT. EN <OFF>
                        DONLOP
                        JMP T13

                /TEST 13 - INITIALIZE TEST PART II INIT / INTERRUPT TEST PART V
                /
                /*****************************************************************************
                /*****************************************************************************
                /
                /IF AN RX01 IS CABLED TO THE RX8 THEN DON'T EXECUTE THIS TEST
                /
T13,            LOOPPC
                TAD RXHERE
                SNA CLA
                JMP FLOON
                /*****************************************************************************
                /*****************************************************************************
                /
                /INTERRUPT TEST PART V / INITIALIZE TEST PART II
                /  (NO INTERRUPTS SHOULD OCCUR DURING THIS TEST).
                /
                /THE PURPOSE OF THIS TEST IS TO VERIFY THAT IOT INIT CLEARS THE INTERRUPT
                /ENABLE FLIP-FLOP WHEN SET
                /
                        IOF
                        JMS PATCH               /SETUP INT. LINKAGE TO RETURN TO THIS TEST
                        E124
                        KIE                     /DISABLE CONSOLE PACKAGE INTERRUPTS
                        ION
                        CLA IAC
                        INTR                    / SET THE RX8 INTERRUPT ENABLE F/F
                        INIT
                /...BUT AN INTERRUPT SHOULD NOT OCCUR
                /
                /IF AN INTERRUPT OCCURS THEN IOT INIT FAILED TO CLEAR
                /
                /THE RX8 INTERRUPT ENABLE FLIP-FLOP
                /
                        TAD (200)
                        LCD
                        LCD                     / MAINTENANCE MODE <ON> / <OFF>
                /
                /THE DONE FLAG SHOULD BE SET, BUT NO INTERUPTS SHOULD OCCUR
                /
```



```
                        SKP
                /
                /RETURN TO HERE IF AN INTERRUPT OCCURED
                /
E124,           ERROR                           /UNEXPECTED INT.
                /
                /IOT "INIT" 6757 SHOULD CLEAR THE
                /MAINTENANCE FLIP-FLOP, AND ALL FLAGS (DONE, TRANSFER REQUEST, AND ERROR).
                /
                        STA
                        LCD                     /ALL 1'S TO TRANSFER REGISTER
                        INIT                    / IOT 6757
                        SDN
                        SKP
E120,           ERROP                           /UNEXPECTED DONE FLAG
                        STR
                        SKP
E121,           ERROR                           /UNEXPECTED TRANSFER REQUEST FLAG
                        SER
                        SKP
E122,           ERROR                           /UNEXPECTED ERROR FLAG
                        DONLOP
FLOON,          GETHW3                          /IS THE FLOPPY SIMULATOR IN USE?
                        AND (0200
                        SZA CLA
                        JMP T14S                /YES-CONTINUE WITH FLOPPY INTERFACE TESTING.
                        DCA TSTNU               /CLEAR TEST NUMBER
                        CLEOP

                /WAIT FOR FLAG ROUTINE

XWAIT,          0
                        ISZ H1
                        JMP I XWAIT
                        ISZ HANGER
                        JMP I XWAIT
                        TAD XWAIT
                        ERROR                   /FLAG NEVER SET
                        TAD XWAIT
                        TAD (2
                        DCA XWAIT
                        JMP I XWAIT
H1,             0
HANGER,         0


                        PAGE
                /THE REMAINING FLOPPY INTERFACE TESTS REQUIRE A SPECIAL HARDWARE
                /       SIMULATOR CONNECTED TO THE EXTERNAL FLOPPY PORT.

T14S,           JMS INTUN               /INITIALIZE PROG UNIT VARIABLES FOR UNIT A
                LOOPPC
```

```
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,INT,ENB=OFF,
7410                                         /       RUNL=FALSE,FLAGS CLEARED,PARITY FLOP=CLEARED,
7411    5604  6547           LOAD            /CLEAR PARALLEL I/O STROBE FLOPS AND ENABLE
7412                                         /       THE PARALLEL I/O SIMULATOR & THE FLOPPY
7413                                         /       RXDATA=1 TO ERROR 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 LOP 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           LORS            /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           LORS            /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           LORS            /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  6000   SHIFTO, 0/LORE/LOPC     /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      /0 = CHECK MODE
7451    5642  7510           SPA
7452    5643  5255           JMP SMORE       /<0 = TEST CURRENT RXDATA BIT & SHIFT,
7453    5644  1365           TAD (-4
7454    5645  7640           SZA CLA
7455    5646  5255           JMP SMORE       /0<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
7460    5651  7041           CIA
7461    5652  1764*          TAD DLCD8
7462    5653  7650           SNA CLA
7463    5654  5257           JMP TSTPC       /8 BIT MODE = TEST PARITY BIT
```



```
7464    5655  4763*  SMORE,  JMS TSTDAB      /TEST CURRENT RXDATA
7465    5656  5233           JMP SHIFTO      /SHIFT OUT AGAIN
7466    5657  4763*  TSTPC,  JMS TSTDAB      /TEST PARITY BIT=DONE WITH SHIFTING
7467    5660  3774*          DCA SHFTCT      /ZERO SHIFT COUNTER
7470    5661  4762*          JMS SHINDA      /SETUP SHIFT IN DATA
7471    5662  6006   SHIFTI, 0/LORE/LOPC     /SHIFT IN FLOPPY INTERFACE REGISTER
7472    5663  2774*          ISZ SHFTCT      /UPDATE SHIFT COUNTER
7473                                         /SHIFTL=RESTORE,SHIFT1L=CHAR STROBE,
7474    5664  7300           CLA CLL
7475    5665  1774*          TAD SHFTCT      /NO OF SHIFTS ISSUED?
7476    5666  1366           TAD (-10
7477    5667  7450           SNA
7500    5670  5277           JMP CKIMOD      /0 = CHECK MODE
7501    5671  7510           SPA
7502    5672  5261           JMP SHIFTI-1    /<0 = SHIFT AGAIN
7503    5673  1365           TAD (-4
7504    5674  7640           SZA CLA
7505    5675  5261           JMP SHIFTI-1    /0<SHIFT COUNT<12 - SHIFT AGAIN
7506    5676  5301           JMP CKINDA      /DONE SHIFTING IN, CHECK DATA WORD THAT
7507                                         /       GOT SHIFTED IN,
7510    5677  1761*  CKIMOD, TAD XORDATA     /CHECK FOR 8 OR 12 BIT MODE,
7511    5700  7041           CIA
7512    5701  1760*          TAD DXOR8
7513    5702  7640           SZA CLA
7514    5703  5261           JMP SHIFTI-1    /12 BIT MODE - CONTINUE SHIFTING
7515                  /DONE SHIFTING IN - CHECK DATA WORD IN INTERFACE REG,
7516
7517    5704  6753   CKINDA, STR             /TRANSFER REQUEST FLAG SHOULD BE CLEAR
7520    5705  7410           SKP
7521    5706  4450           ERROR           /TRANSFER REQUEST FLAG FALSELY SET
7522    5707  1370           TAD (0017
7523    5710  1767*          TAD UDONE       /CHANGE XFER RQSTL TO 0 FOR PROPER UNIT,
7524    5711  1757*          TAD UOUT
7525    5712  1756*          TAD UXFR
7526    5713  6502           LOMP
7527    5714  6753           STR
7530    5715  4450           ERROR           /CHANGING XFER RQSTL TO 0 FAILED TO SET FLAG
7531    5716  6752           XDR             /READ INTERFACE REGISTER INTO AC,
7532    5717  7421           MQL             /SAVE READ DATA IN MQ FOR ERROR DISPLAY
7533    5720  7701           ACL             /RESTORE DATA TO AC FROM MQ
7534    5721  7041           CIA
7535    5722  1761*          TAD XORDATA     /COMPARE WITH EXPECTED DATA
7536                                         /EXPECTED DATA=0525 FOR 12 BIT MODE
7537                                         /   "       "  =0242 FOR 8 BIT MODE
7540    5723  7440           SZA
7541    5724  4450           ERROR           /BAD SHIFT IN - MQ CONTAINS ACTUAL DATA
7542                                         /       SHIFTED IN,
7543    5725  6535           LORS            /VERIFY THAT XDR SETS RUNL TO TRUE
7544                                         /       PAPER RDY FLAG=CLEAR
7545    5726  0372           AND (400
7546    5727  7640           SZA CLA
7547    5730  4450           ERROR           /XDR FAILED TO CHANGE RUNL TO TRUE,
7550    5731  1370           TAD (0017       /CHANGE XFR REQ L TO 1 & OUTL TO 1,
7551    5732  1767*          TAD UDONE
7552    5733  6502           LOMP
```

```
7517  5734  6505          LQPS            /VERIFY THAT RUNL GOES FALSE
7516  5735  7355          SNA CLA I SPA   /NOTE:FOR UNIT B TESTING CHAR STROBE GETS SET
7519                      /               BY LQPC USED IN SHIFTING ABOVE.
7520  5736  7650          SNA CLA
7521  5737  4450          EPROP           /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          SUN
7525  5743  4450          EPROP           /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          CLEOP
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  0000
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 MRCON
7561  6004  7650            SNA CLA
7562  6005  5212            JMP ALRBM       /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            MRCON
7566  6011  5600            JMP I CHGMOD
7567  6012  2200    ALRBM,  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
```

```
7626
7627                    /UNIT 0 CONSTANTS
7628
7629                    UNBCON,
7630    6064  0001              0001
7631    6065  4000              4000
7632    6066  0400              0400
7633    6067  0020              0020
7634    6070  0100              0100
7635
7636                    /MODE VARIABLES
7637
7638                    MODVAR,
7639    6071  0000      LCDATA, 0
7640    6072  0000      XDRDATA,0               /DATA EXPECTED TO READ FROM INTERFACE REG AFTER SHIFT IN,
7641    6073  0000      SLCDTA, 0
7642    6074  0000      SXDRDA, 0               /DATA TO  BE SHIFTED INTO INTERFACE REG
7643    6075  0000              0
7644
7645                    /MODE 12 CONSTANTS
7646
7647                    M12CON,
7648    6076  0452              0452
7649    6077  0525              0525
7650    6100  0452              0452
7651    6101  7252              7252
7652    6102  0000              0000
7653
7654                    /MODE 8 CONSTANTS
7655
7656                    M8CON,
7657    6103  0125      DLCD8,  0125
7658    6104  0242      DXDR8,  0242
7659    6105  6500              6500
7660    6106  2720              2720
7661    6107  0000              0000
7662
7663    6110  0000      SHFTCT, 0       /SHIFT COUNTER
7664
7665                    /ROUTINE TO CHECK FOR PROPER DATA AT RXDATA PRIOR TO EACH SHIFT
7666                    /       OUT PULSE, NOTE: RXDATAL IS LOOPED TO ERRORL VIA SIMULATOR
7667
7668    6111  0000      TSTDAB, 0               /INITIALLY (WHEN SHIFT COUNT=0) SLCDTA CONTAINS
7669                                            /       LCDATA BITS(EXCEPT BIT 0) CONCATENATED
7670    6112  7300              CLA CLL         /       WITH PARITY.
7671    6113  1273              TAD SLCDTA      /AC(0) CONTAINS CURRENT RXDATA H BIT
7672    6114  7004              RAL
7673    6115  3273              DCA SLCDTA      /LINK CONTAINS EXPECTED DATA BIT
7674    6116  1310              TAD SHFTCT      /LOAD AC WITH SHIFT POSITION FOR ERROR DISPLAY
7675    6117  7420              SNL
7676    6120  5325              JMP ZEXP
7677    6121  6754              SER
7678    6122  4450              ERROR           /EXPECTED RXDATAH BIT=1,ACTUAL=0
7679                                            /       AC CONTAINS SHIFT COUNT
7680                                            /NOTE: DATA AT RXDATAL IS INVERTED.
```



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7681    6123  7300              CLA CLL
7682    6124  5711              JMP I TSTDAB
7683    6125  6754      ZEXP,   SER
7684    6126  7610              SKP CLA
7685    6127  4450              ERROR           /EXPECTED RXDATAH BIT=0,ACTUAL = 1
7686                                            /       AC CONTAINS SHIFT COUNT.
7687                                            /NOTE: DATA AT RXDATAL IS INVERTED.
7688    6130  5711              JMP I TSTDAB
7689
7690                    /ROUTINE TO SETUP RXDATA PRIOR TO EACH SHIFT IN PULSE.
7691
7692    6131  0000      SHINDA, 0
7693    6132  7300              CLA CLL         /INITIALLY (BEFORE ANY IN SHIFTING) SXDRDA CONTAINS
7694                                            /       XDRDATA.
7695    6133  1274              TAD SXDRDA      /AC(0) CONTAINS NEXT DATA BIT TO BE
7696                                            /       SHIFTED IN.
7697    6134  7004              RAL
7698    6135  3274              DCA SXDRDA      /SAVE SHIFTED DATA IN
7699    6136  7630              SZL CLA
7700    6137  1255              TAD UDATA       /FORM PARALLEL I/O WORD FOR PROPER SHIFT IN
7701    6140  1373              TAD (0017       /       DATA ON RXDATAL.
7702    6141  1756              TAD UOUT        /AT SAME TIME CHANGE OUTL TO 0.
7703    6142  1753              TAD UDONE
7704    6143  5731              JMP I SHINDA
7705
7706                    /ROUTINE TO COPY A SET OF 5 CONSTANTS INTO 5 VARIABLES.
7707
7708    6144  0000      FILVAR, 0
7709    6145  1744              TAD I FILVAR    /GET VARIABLE LOCATION
7710    6146  3364              DCA VAR
7711    6147  2344              ISZ FILVAR
7712    6150  1744              TAD I FILVAR    /GET CONSTANT LOCATION
7713    6151  3365              DCA CONST
7714    6152  2344              ISZ FILVAR
7715    6153  1372              TAD (-5
7716    6154  3366              DCA FVLCT       /SET A LOOP COUNTER
7717    6155  1765      FVLOOP, TAD I CONST     /COPY CONSTANT INTO VARIABLE
7718    6156  3764              DCA I VAR
7719    6157  2365              ISZ CONST
7720    6160  2364              ISZ VAR
7721    6161  2366              ISZ FVLCT
7722    6162  5355              JMP FVLOOP      /REPEAT FOR EACH OF 5 CONSTANTS
7723    6163  5744              JMP I FILVAR
7724
7725    6164  0000      VAR,    0
7726    6165  0000      CONST,  0
7727    6166  0000      FVLCT,  0
7728
7729
7730
```

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7731
7732
7733    6172  7773
7734    6173  0017
7735    6174  6507
7736    6175  5667
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  6231              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 EXMIII              /EXPECTING A XMIT INT?
7751    6206  7640              SZA CLA
7752    6207  5224              JMP CKXMFG              /YES-VERIFY XMIT FLAG SET
7753    6210  1121      CRA,    TAD ENECI               /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,   EPROR                   /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,  CHKSF                   /CHECK FOR CONSOLE REQ
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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              UNEIMS
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              F81MES
7817    6275  1367              TAD (CDI 10
7818    6276  6201              CDF 00
7819    6277  3760              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      UNEIMS, TEXT    "UNEXPECTED INTERRUPT - FIELD 1"
        6304  0530
        6305  2005
        6306  0324
        6307  0524
        6310  4011
        6311  1624
        6312  0522
        6313  2225
        6314  2024
        6315  4055
        6316  4006
        6317  1105
        6320  1404
        6321  4061
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          6322  0000
 7826     6323  0614    FS1MES, TEXT    "FLAGS SET1*
          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  0041
          6336  1114
          6337  0504
          6340  5440
          6341  0611
          6342  0514
          6343  0440
          6344  6100
          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
```



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 7839
 7840     6354  0023
 7841     6355  0055
 7842     6356  6274
 7843     6357  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            MESIAC
 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  6704          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  7370          AND (0030
 7933  6474  7450          SNA
 7934  6475  5707          JMP UX
 7935  6476  1367          TAD (-10
 7936  6477  7040          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 ISTNU
 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  2421
       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
```

```
 7979
 7980
 7981    6566  7025
 7982    6567  7710
 7983    6570  6030
 7984    6571  2742
 7985    6572  6712
 7986    6573  6711
 7987    6574  6710
 7988    6575  6707
 7989    6576  2470
 7990    6577  6655
               6000    *6600
 7991                  /*************************************************************************************
 7992                  /            CONSOLE ROUTINES
 7993                  /*************************************************************************************
 7994
 7995
 7996                  /THIS ROUTINE WILL DETERMINE WHAT TO DO WHEN A ERROR IS ENCOUNTERED
 7997                  /WILL CHECK IF UNDER APT CONTROL.
 7998
 7999
 8000
 8001    6600  0000    XC1ERR, 0
 8002    6601  6002            IOF
 8003    6602  7000    OW1APT, NOP             /OVERWRITTEN WITH *JMP APT1ER* IF RUNNING UNDER APT CONTROL
 8004    6603  3310            DCA     AC1SAVE         /SAVE AC
 8005    6604  6004            GTF
 8006    6605  3312            DCA     FL1SAVE         /SAVE THE FLAGS
 8007    6606  7501            MQA
 8008    6607  3311            DCA     MQ1SAVE         /SAVE THE MQ
 8009    6610  7340            CLA CLL CMA             /SUBTRACT A 1 FOR TRUE LOCATION
 8010    6611  1200            TAD     XC1ERR          /GET RETURN LOCATION
 8011    6612  3307            DCA     PC1SAVE         /SAVE ADD OF ERROR CALL
 8012    6613  6031            KSF                     /CHECK FOR SLU #1 REC FLAG
 8013    6614  7414            SKP                     /SAVE STATE OF FLAG IS KSFLG (FLG 0)
 8014    6615  7040            CMA                     /KB1CHK CLEARS FLAG
 8015    6616  6201            CDF 00                  /KSFLG USED BY UNEXPECTED INT, DISPLAY
 8016    6617  3777            DCA I (KSFLG
 8017    6620  6211            CDF 10
 8018    6621  4462            KB1CHK
 8019    6622  1124            TAD TESTF1
 8020    6623  3275            DCA TLOOP1
 8021    6624  4465            GETSR                   /GET PSR FROM FIELD 0
 8022    6625  0376            AND (0200               /INHIBIT ERROR TYPEOUT?
 8023    6626  7640            SZA CLA
 8024    6627  5255            JMP IEH1                /NO ERROR PRINTOUT
 8025    6630  6037            KLS                     /REMOVE LOOP AROUND ON SLU
 8026    6631  1375            TAD (0016               /SET SLU#1 BAUD RATE TO 9600 BITS/SEC
 8027    6632  6043            TSB
 8028    6633  4474            DELAY           /WAIT FOR BAUD RATE CHANGE TO TAKE EFFECT
 8029    6634  7300            CLA CLL
 8030    6635  6032            KCC             /CLEAR OUT REC FLAG-MAY BE SET IF ENTERING FROM A SLU ERROR.
 8031    6636  7307            TAD PC1SAVE
 8032    6637  7041            CIA
```



```
 8033    6640  1374            TAD (UNEI
 8034    6641  7650            SNA CLA
 8035    6642  5773*           JMP SUNEI       /USE UNEXPECTED INTERRUPT DISPLAY
 8036    6643  1307            TAD PC1SAVE
 8037    6644  7041            CIA
 8038    6645  1372            TAD (SPE3
 8039    6646  7650            SNA CLA
 8040    6647  5771*           JMP SSLUDIS     /USE SPECIAL SLU DISPLAY FORMAT
 8041    6650  1307            TAD PC1SAVE
 8042    6651  1370            TAD (-SLUEND
 8043    6652  7710            SPA CLA
 8044    6653  5767*           JMP SLUDIS      /USE SLU DISPLAY FORMAT
 8045    6654  5766*           JMP NORDIS      /USE NORMAL DISPLAY FORMAT
 8046    6655  4465    IEH1,   GETSR                   /INHIBIT ERROR HALT?
 8047    6656  7710            SPA CLA
 8048    6657  5262            JMP     C1BY2           /LEAVE
 8049    6660  4765*           JMS SETSDR              /NO-SET BAUD RATES IN ALL SLUS IN CASE OPERATOR LEAVES DIAGNOSTIC
 8050    6661  4436            C1BWIT                  /GO TO THE INQUIRE ROUTINE
 8051    6662  4764*   C1BY2,  JMS RESTBR              /RESTORE BAUD RATES IN ALL SLUS TO
 8052                                                  /  STATES PRIOR TO ERROR.
 8053    6663  4465            GETSR                   /LOOP ON ERROR?
 8054    6664  7004            RAL                     /TEST BIT 1
 8055    6665  7710            SPA CLA
 8056    6666  5675            JMP I TLOOP1            /LOOP
 8057    6667  4315            JMS C1GET               /RESTORE MQ AND LINK,CLEAR AC
 8058    6670  7000            NOP                     /LEAVE INT, SYS DISABLED
 8059                                                  /NEXT TEST WILL EN IT
 8060    6671  5600            JMP I   XC1ERR
 8061    6672  4042    MES1PC, TEXT    "  PC:"
         6673  2003
         6674  7200
 8062    6675  0000    TLOOP1,0
 8063    6676  4040    MES1AC, TEXT    "  AC:"
         6677  0103
         6700  7200
 8064    6701  4044    MES1MQ, TEXT    "  MQ:"
         6702  1521
         6703  7200
 8065    6704  4046    MES1FL, TEXT    "  FL:"
         6705  0614
         6706  7200
 8066    6707  7777    PC1SAVE,7777
 8067    6710  7777    AC1SAVE,7777
 8068    6711  7777    MQ1SAVE,7777
 8069    6712  7777    FL1SAVE,7777
 8070    6713  5716    AP1OW1, JMP I .+1
 8071    6714  7000            APT1ER
 8072
 8073
 8074    6715  0000    C1GET,  0
 8075    6716  7200            CLA
 8076    6717  1311            TAD MQ1SAVE
 8077    6720  7421            MQL                     /RESTORE THE MQ
 8078    6721  1312            TAD FL1SAVE
 8079    6722  7004            RAL                     /RESTORE THE LINK
```

```
0080  6723  7200          CLA
0081  6724  5715          JMP I C1GET
0082
0083
0084
0085
0086
0087
0088                      /*************************************************************************
0089
0090                      /APT/   ROUTINE TO NOTIFY APT THAT THE PROGRAM IS RUNNING OK.
0091  6725  0000  APTOK1, 0                        /APT/
0092  6726  6002          IOF                     /APT/
0093  6727  7200          CLA                     /APT/
0094  6730  1347          TAD     APTIM1          /APT/DELAY 100MS.
0095  6731  3351          DCA     APTCT1          /APT/
0096  6732  1350          TAD     APTIM2          /APT/
0097  6733  3352          DCA     APTCT2          /APT/
0098  6734  2352          ISZ     APTCT2          /APT/
0099  6735  5334          JMP     .-1             /APT/
0100  6736  2351          ISZ     APTCT1          /APT/
0101  6737  5332          JMP     .-5             /APT/
0102  6740  6224          RIF                     /APT/AC=IF.
0103  6741  1343          TAD     (6201           /APT/CREATE A CDF INST.
0104  6742  3343          DCA     .+1             /APT/MODIFY NEXT CDF INST.
0105  6743  6201          CDF     (MODIFIED CDF)  /APT/(MODIFIED CDF) DF=IF.
0106  6744  6272          CIF     70              /APT/IF=FIELD 7.
0107  6745  4762*         JMS     6500            /APT/CALL APT = 'PROG OK'.
0108  6746  5725          JMP I   APTOK1          /APT/RTN FROM APT - RTN TO CALL+1.
0109
0110  6747  7776  APTIM1, -2                      /APT/
0111  6750  0000  APTIM2, 0                       /APT/
0112  6751  0000  APTCT1, 0                       /APT/
0113  6752  0000  APTCT2, 0                       /APT/
0114
0115
0116  6762  6500
0117  6763  6201
0118  6764  3214
0119  6765  3150
0120  6766  6430
0121  6767  6406
0122  6770  4447
0123  6771  6410
0124  6772  2466
0125  6773  6256
0126  6774  6222
0127  6775  0016
0128  6776  6200
0129  6777  0040
            7400  PAGE
0130
0131                      /*************************************************************************
0132
0133
```



```
0134                      /APT/   ROUTINE TO HANDLE ERRORS UNDER APT CONTROL.
0135
0136  7000  6002  APTIER, IOF                     /APT/
0137  7001  7200          CLA                     /APT/
0138  7002  6037          KLB                     /APT/ REMOVE LOOP AROUND ON SLU'S
0139  7003  6224          RIF                     /APT/AC=IF.
0140  7004  1377          TAD     (6201           /APT/CREATE A CDF INST.
0141  7005  3216          DCA     .+3             /APT/MODIFY NEXT CDF INST.
0142  7006  7240          CLA CMA                 /APT/
0143  7007  1770*         TAD     XC1ERR          /APT/AC=ERROR PC.
0144  7010  6201          CDF     (MODIFIED CDF)  /APT/(MODIFIED CDF) DF=IF.
0145  7011  6272          CIF     70              /APT/IF=FIELD 7.
0146  7012  5775*         JMP     6520            /APT/CALL APT = 'ERROR'.
0147
0148
0149
0150
0151                      /ROUTINE USED FOR CONSOLE SWITCH REGISTER CHANGES
0152
0153  7013  0000  XC1SW,  0
0154  7014  7200          CLA
0155  7015  4434  SR1QEST,C1PRNT                  /PRINT SR QUESTION
0156  7016  7343          SR1MESG                 /POINTER TO MESSAGE
0157  7017  4465          GETSR                   /GET PSR FORM FIELD 0
0158  7020  4435          C1PRT4                  /PRINT THE 4 DIGITS
0159  7021  7346          CLA CLL CMA RTL         /SETUP A COUNTER TO ACCEPT 4 DIGITS
0160  7022  3301          DCA     TTY1CNT         /SAVE THE COUNTER
0161  7023  1374          TAD     (CH1R0          /GET POINTER FOR FIRST CHARACTER
0162  7024  3227          DCA     CHG1CHR         /SAVE THE POINTER FOR DIGITS
0163  7025  4437          LISNF1                  /WAIT FOR KEYBOARD INPUT
0164  7026  0001          1                       /CHECK FOR A OCTAL DIGIT
0165  7027  7045  CHG1CHR,CH1R0                   /THIS LOCATION WILL GET MODIFIED
0166  7030  7566          -212                    /CHECK FOR LINE FEED
0167  7031  7337          COMPST                  /LINE FEED TYPED- RETURN TO START
0168  7032  7563          -215                    /CHECK FOR CARRAIGE RETURN
0169  7033  7465          RE1TYPE                 /RETYPE SR AND CONT IF DIGITS TYPED
0170  7034  7575          -203                    /CHECK FOR A CONTROL C
0171  7035  7102          C1RM                    /CONTROL C TYPED -RETURN TO MONITOR
0172  7036  7555          -223                    /CHECK FOR A CONTROL S
0173  7037  7144          CTRS1                   /WAS CONTROL S WAIT FOR "Q OR "C
0174  7040  0000          0                       /NONE OF ABOVE CHARACTERS-ILLEGAL CHAR
0175  7041  7042          .+1                     /GO TO NEXT ADDRESS TO PRINT ?
0176  7042  4434          C1PRNT                  /GO PRINT ?
0177  7043  7346          QES1MK                  /POINTER TO ? MESSAGE
0178  7044  5215          JMP     SR1QEST         /RETURN AND ASK QUESTION AGAIN
0179  7045  6201  CH1R0,CDF 00           /SAVE THE LEAST SIGNIFICANT BIT
0180  7046  3773          DCA I (PSR
0181  7047  6211          CDF 10
0182  7050  1372          TAD     (CH1R1          /UPDATA POINTER FOR CHARACTERS 2 3 4
0183  7051  3227          DCA     CHG1CHR         /SAVE THE POINTER ADDRESS
0184  7052  5225          JMP     CHG1CHR-2       /RETURN FOR NEXT CHARACTER INPUT
0185  7053  3300  CH1P1,DCA      SAV1CHR         /SAVE THE CHARACTER TYPED
0186  7054  4465          GETSR                   /GET THE VALUE OF SR
0187  7055  7106          CLL     RTL             /MOVE IT INTO NEXT POSITION
0188  7056  7004          RAL
```

SEQ 0179

```
8189    7057  1300          TAD     SAV1CHR         /ADD NEW CHARACTER TO IT
8190    7060  6201          CDF 00
8191    7061  3373          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 SISUBL              /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  2306  NORF,   IS2 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  6701
              7700  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
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```
8298    7214  0000    XORS1,  0
8299
8300                    /PRINT 2 SPACES
8301
8302    7215  0020    SPAC2,  0       /CALL BY "SPAC2)"
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  7519            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  4923    SP1MESG,        TEXT    "1&R#"
        7344  2275
```

```
        7345  0000
        7346  7743     QESIMK, TEXT    "?#"
        7347  0000
        7350  3607     UPARR1, TEXT    "^G!"
        7351  4300
        7364  0701
        7365  0400
        7366  0010
        7367  7510
        7370  7555
        7371  7775
        7372  7560
        7373  0200
        7374  0177
        7375  0212
        7376  7151
        7377  0215
              7400     PAGE

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

                       /TYPE THE ASCII CHARACTER IN THE AC

        7400  0000     X1TYPE, 0                        /CALL BY "TYPE"
        7401  3213             DCA     CHAR1            /SAVE THE CHARACTER
        7402  7000     TYOUT1, NOP/JMP I X1TYPE         /OVERWRITTEN IF RUNNING UNDER APT CONTROL,
        7403  4273             JMS     CNTR1S           /CONSOLE ACTIVE-CHECK FOR CONTROL S
        7404  1213             TAD     CHAR1            /GET THE CHARACTER SAVED AND PRINT
        7405  6046             TLS
        7406  7200             CLA
        7407  6041             TSF
        7410  5207             JMP     .-1
        7411  6042             TCF
        7412  5600             JMP I   X1TYPE
              5600     APT1CON=JMP I X1TYPE

        7413  0000     CHAR1,  0

                       /PRINT PACKED ASCII TEXT TERMINATED BY
                       /SIX-BIT 00

        7414  0000     MESAG,  0                        /CALL BY "MESAGE"
        7415  7200             CLA
        7416  4462             KB1CHK
        7417  1614             TAD I   MESAG
        7420  3252             DCA     FOR1OCK
```



```
        7421  2214             ISZ     MESAG            /SET UP RETURN
        7422  1652             TAD I FOR1OCK
        7423  7012             RTR
        7424  7012             RTR
        7425  7012             RTR
        7426  4233             JMS     MES1F
        7427  1652             TAD I FOR1OCK
        7430  4233             JMS     MES1F
        7431  2252             ISZ     FOR1OCK
        7432  5222             JMP     .-10
        7433  0000     MES1F,  0
        7434  0377             AND     (77
        7435  7450             SNA                      /TERMINATOR (00)?
        7436  5614             JMP I   MESAG            /YES
        7437  1376             TAD     (-43
        7440  7450             SNA                      /CRLF?
        7441  5250             JMP     .+7              /YES
        7442  1375             TAD     (3
        7443  7510             SPA                      /200 OR 300
        7444  1374             TAD     (100             /300
        7445  1373             TAD     (240             /200
        7446  4442             TYPE1
        7447  5633             JMP I MES1F
        7450  4432             C1CRLF
        7451  5633             JMP I   MES1F

        7452  0000     FOR1OCK,0

                       /PRINT FOUR OCTAL NUMBERS IN AC 11 THRU 0 FOLLOWED
                       /BY TWO SPACES

        7453  0000     X1PRN4, 0                        /CALL BY "PRNT4"
        7454  3252             DCA     FOR1OCK
        7455  1252             TAD     FOR1OCK
        7456  7012             RTR
        7457  7012             RTR
        7460  7012             RTR
        7461  4444             PRN21
        7462  1252             TAD     FOR1OCK
        7463  4444             PRN21
        7464  4440             SPAC21
        7465  5653             JMP I   X1PRN4
                       /

        7466  0000     X1PRN1, 0                        /CALL BY "PRN11"
        7467  0372             AND     (7
        7470  1371             TAD     (260
        7471  4442             TYPE1
        7472  5666             JMP I   X1PRN1
```

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  CNTRIS, 0
7474  6031          KSF                     /SKIP ON CONSOLE KEYBOARD FLAG
7475  5673          JMP  I  CNTRIS          /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  CNTRIS          /NO=RETURN WITH KEYBOARD FLAG STILL SET
7503  6032          KCC                     /CLEAR KEYBOARD FLAG FROM ^S
7504  4306          JMS     WAIT10C         /WAIT FOR CONTROL Q OR C
7505  5673          JMP  I  CNTRIS          /RETURN TO PRINT MESSAGE BEING TYPED

7506  0000  WAIT10C,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  1368          TAD     (-3             /CHECK FOR A CONTROL C
7514  7450          SNA                     /WAS IT A CONTROL C?
7515  5765*         JMP     CIRM            /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     WAIT10C+1       /NO=WAIT FOR APPROPRIATE KEY
7524  5706          JMP  I  WAIT10C         /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  3353          DCA X1PRN4
7556  5747          JMP I R1SUBL

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

7562  7100
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
```

SEQ 0187

```
0000  10001110  PJ000000  0K001111  11111111  11111111  11111111  11111111  11111111
0100  11111110  11111111  11111111  11111111  11111111  11111111  11111110  00000001

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111110  00003000  00000000  00000000  00000000  00000000  00000000  01111111

0400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0500  11111111  11111111  11111111  11111111  11130003  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  11101111  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
```


SEQ 0188

```
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  11000000  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          2700    *200
8596
8597                  $$$$
```



```
        AC      6255            BIT7    0007            CHGCHR  7032            CONTT   5704
        AC%SAV  6710            BIT8    0065            CHGMOD  6000            CPUDIS  6422
        ACAIOT  5120            BLANK   0130            CHGUNI  6014            CPUDN   2134
        ACCERR  5054            BRSMS   6036            CHKKB   2237            CPUMES  2210
        ACDATA  0057            BSTLP   6012            CHKKSP  4516            CPUSDI  6406
        ACL     7701            BSW     7002            CIFCK   3365            CPUT1   0212
        ACSAVE  6675            C1BY2   6562            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   3408            CPUT15  1462
        ALRBP   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            CKINOD  5677            CPUT6   1026
        APT3CK  2726            C8CRLF  4521            CKINDA  5704            CPUT7   1071
        APTCON  7313            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    5135            DATSLU  2421
        APTHW3  6143            C8REST  0201            CLCON   5713            DDERSL  2470
        APTIM1  6747            C8RM    7105            CLKCT   5712            DECPRT  6104
        APTIM2  6750            C8STAR  4534            CLXERR  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            CLREIP  4465            DF1     3025
        APTOW1  6701            CAE     3437            CLREPI  4471            DF2     3033
        APTR    2513            CAF     6007            CLRERI  4457            DF3     3041
        APTREP  4515            CAG     4625            CLREXI  4486            DF4     3047
        ATIMLS  1466            CAM     7621            CLSK    6137            DF7     3017
        ATIMMS  1467            CANTST  1000            CLSKNT  4541            DFLD    3207
        BASEP   6055            CCDF    3300            CLUPEX  1547            DLCD8   6103
        BDR1    0026            CDELTA  5714            CNT     0122            DLOP    2413
        BDR2    0027            CDI     6203            CNT1    0123            DNF7    3226
        BDR3    0030            CFSLU   4512            CNT181  7146            DONLOP  4447
        BDRATE  3124            CH1KB   3328            CNTR1G  7140            DONT17  1435
        BDRNS   3200            CH1KBF  4445            CNTR18  7473            DOSIMU  1656
        BDRSQ   2322            CH1RB   7045            CNTRLG  7141            DOSLU   6025
        BDTA    4505            CH1R1   7053            CNTRLS  7508            DOSNAP  2014
        BEGBST  6000            CH1REC  7311            CNTRS   7145            DVCTAB  3045
        BEGEXM  3000            CHAR    7334            CNTRS1  7147            DXDR8   6104
        BEGRTC  5400            CHAR1   7413            COMP    0134            E8      5106
        BIT11   0072            CHAREC  7305            COMPST  7337            E8PRE   5026
        BIT3    0062            CHARLP  2015            CONCH   4026            E1      5111
        BIT4    0063            CHARR0  7050            CONCHK  4028            E10     5142
        BIT5    0064            CHARR1  7054            CONST   6165            E100    5460
        BIT6    0102            CHG1CH  7027            CONTDG  4512            E11     5126
```

E110	5503	EXTSET	2224	HLTS	3314	JMSLOC	1435
E120	5535	EXTSA	4561	IA0	3004	K0	2416
E121	5546	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	4100	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	7506
E24	5214	EXMT4	3277	IFDF	4411	K3	7461
E25	5216	EXMT5	3445	IIE0	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	0145	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	FORDCK	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	FVLC7	6166	IOT12	2715	KIOT	5117
ECONSI	0136	FVLOOP	6155	IOT13	2722	KISZTT	2270
EIFCLR	2234	GETHW3	4466	IOT2	2613	KJILD	2267
END$LU	3131	GETSK	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
EPRMES	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	ISSTSS	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	NXTONM	2132
KSFWAT	4452	LSAV1	7355	MLAP	6361	NXTPAT	1504
KSTOP	0006	LSAV2	7356	MLK	6506	NXTPIT	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	6576	MREC3	6356	PCLP	6666
LISN1	7255	MES1F	7433	MSHDR	6457	PCPUK	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	MESMDR	6514	NDF	0074	POINTF	0104
LLXB	3125	MESINS	6543	NOCRF	7137	POINTR	0076
LOC1	0164	MESLK	6540	NOPI	4531	PPIN	3411
LOOP	4467	MESMQ	6666	NORDIS	6400	PPIMES	4342
LOOPA	0031	MESPC	6660	NORF	7136	PPRMS	7076
LOOPEC	4446	MESPC	6546	NORMD1	6400	PRDB	6567
LOPDON	2242	MESSLU	6557	NORMS0	2276	PROD	6150
LQ4TAB	4252	MESTN	6565	NORSLU	6446	PRETES	5000
LQI1	4207	MESXM	6537	NORX01	5053	PRN11	4441
LQI2	4224	MFL	6472	NOSIM0	3425	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	PRTBAS	6076
LQRE	6507	MKIE	4500	NXTDC	0214	PRTCMS	5442
LQRS	6505	MKRB	4501	NXTIOT	5040	PRTEST	3400
LQSK	6500	MKRS	4477	NXTONE	1465	PSKF	6061

PA:CS	0277	RXBERR	0133	SLULSW	1640	T21DN	1730
SR	0020	S1SUBL	7547	SLUMES	3303	T2LA	3457
PSS1	6142	SAVICH	7100	SLUMST	1600	T2LQ	4001
PSS2	6134	SAVAC	6276	SLUREC	0177	T3	5131
PSS3	6176	SAVCHR	7103	SLUXMT	0126	T3LA	3524
PSS4	6117	SAVFLD	0061	SMES	0213	T3LQ	4133
PSSF	6660	SAVLOC	2430	SMOPE	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	5251
QES1MK	7346	SD1	6065	SPAC21	4440	T5B	5260
QESTMK	7315	SD2	6071	SPACE2	4531	T5LA	3641
R1LK	7147	SD3	6073	SPACX2	7217	T5LQ	4253
R1SUBL	7547	SD4	6074	SPCIE	4516	T6	5326
RCNT	5441	SDATA	4525	SPE1	2054	T6LA	3670
RDF	6214	SDEVC	0025	SPE2	2260	T6LQ	4305
RDY	5047	SDN	6755	SPE3	2466	T7	5400
RE1TYP	7065	SEL	6750	SPF	6040	T70K	5446
REPAPT	2502	SER	6754	SPF1	6310	T7LA	4000
RES60W	0624	SEPUEI	6210	SPF2	6330	T7LQ	4400
RESTBR	3214	SETBDR	3150	SR1MES	7343	T70W1	6421
RET	4447	SETEPI	4472	SR1QES	7015	T70W2	4445
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	6110	STAB	2746	TCF2	6332
RIF	6224	SHIFTI	5662	START	0200	TESAGG	2134
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	SLCDTA	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	TWO1OC	7536	XC1SW	7013	XSEPI	4501
TESTF1	0124	TWOOCK	7164	XC0APT	7400	XSFIB	4522
TESTMS	2213	TYOUT	7323	XCBCRL	7200	XSPCIE	3544
TESTPT	2061	TYOUT1	7402	XCBERR	6600	XSRTF	4210
TESTS	2023	TYPE	4527	XCBHJ	7540	XSTKS	0110
TFLD	3241	TYPE1	4442	XCBRC	7012	XTFLG	0106
TFLG	4537	U1	6502	XCBSTR	6716	XTOR	4275
TIMERR	1474	UDATA	6055	XCBSW	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	XGHN3	6346		
TS60W1	0652	UNBCON	6064	XIOT	3000		
TS60W2	0663	UNEI	6222	XKLSIM	4511		
TS60W3	0664	UNEINT	6221	XLCTR	2144		
TS60W4	0674	UNETMB	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: 14 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#											
AIRBU	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	4769	4775	4782#	4792	4827	4832							
ATIMMS	4769	4777	4783#	4794	4822								
BASEF	2764	2798#											
BDR1	3919#	5471	5643	5693	5704	7952							
BDR2	3920#	5029	5467	5640	5696	5707							
BDR3	3921#	5463	5645	5698	5710								
BDRATE	4334	4809	5376	5461	5465	5469	5472	5608	5622	5627	5631#	5633	
BDRPS	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	1260	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

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BITS      1494    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    4891#
C1RM      8171    8211#   8237    8529
C1RST     8396#
C1SWIT    3933#   8050
CBAPT      198#   3206
CBCRLF     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
CBERR      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
          2096    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
CBGET     3171    3187#   3197
CBH3       210#   3212
CBPRNT     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
CBPRT4     184#   2823    3044    3051    3058    3065    3072    3088    3095    3295    3335
CBRC       208#   3565    3701
CBREST     231#   8391    8397
CBRM      3308    3348#   3372    3689
CBSTAR     202#    230
CBSWIT     186#   3166    3211
CAB       1740    1781#
CAC       1742    1787#
CAD       1776#
CAE       1823#
CAF         38#    243    1009    1405    2350    2500    2504    2551    2579    2631    2643    3348    3730#   4957
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CAG       2289#
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CAM         21#    727    1148
CAMTST     716     724#
CCDF      1637    1664    1714#
CDELTA    2707    2719#   2727
CDI         18#   2080    2772    2917    2955    7817    7820    8212    8390    8393    8396
CFSLU     4020#   4359    4659    4676    4694    4723    4765    4949    4977    5028
CH1KB     3975    5798#   5806
CH1KSF    3947#   5801    7784
CH1P0     8161    8165    8179#   8195
CH1P1     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    1788#
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#
CKBRSG    5176    5184#
CKCON     7761    7784#
CKFLG     2919    2922#   2956    7821
CKIMOD    7474    7482#
CKINDA    7486    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#   2580    2601    2636    2663    2698    2711
CLOOPA    4031    5730#   5734
CLREIF    3964#   1125    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    3960#   4477    4516    4553    5321
CLREXI    3966#   4244    4290    4399    4460    4511    4545    5313
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INSTIR     165#  1183   1364   1368   1373   1375   1390   3064
INTEN1    1039   1044#
INTFLG    4042#  4249   4253   4296   4298   4370   4383   4394   4405   4463   4480   4508   4520   4546
          4554   5151   5307   5314   5322   5924   5959   6218   7791
INTMOD    7407   7591#  7595
INTP      3868#  7177   7196   7236   7266   7304   7309   7339
INTRET    7793   7795   7797#
INTRIN    4767   4808#
INTSI      204#   241    386    479    564    665    752    799    845    889    928    973   1074   1120
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          2573   2629   2659   2687
INTUN     7405   7599#  7607
IOF         28#   233    995   1035   1051   1476   1964   2140   2321   2490   2751   3127   3226   3270
          3584   4091   4124   4760   4936   5010   5532   5649   5840   6075   6144   6238   6333   6363
          6475   6723   7170   7228   7262   7292   7333   8002   8092   8136   8376
ION         27#   249   1006   1023   1033   1044   1063   1486   1545   1552   1565   1578   1591   1601
          1764   1810   1854   2083   2148   2287   2351   2501   2552   2580   2602   2632   2644   2661
          2693   4150   4207   4235   4254   4280   4300   4349   4353   4363   4373   4386   4400   4408
          4412   4457   4468   4483   4502   4513   4523   4539   4550   4557   4578   4774   5306   5318
          5326   5908   5927   5951   5961   6042   6187   6223   6243   6277   6340   6424   7174   7234
          7267   7302   7337
IOT0      4941   4978   5399#  5584
IOT1      5405#  5585
IOT10     5454   5474#  5596   7931
IOT11     5481#  5597
IOT12     5487#  5598
IOT13     5493#  5599
IOT2      5411#  5586
IOT3      5417#  5587
IOT4      5423#  5588
IOT5      5430#  5589
IOT7      5436#  5593
IOT8      5442#  5594
IOT9      5448#  5595
IOTADD    5562   5563   5566   5570#
IOTLP     2356#  2369   2385
IOTREC    5540   5584#
IOTTA     5558   5559   5567   5569#
IOTXMT    5547   5593#
ISSTSB    5464   5468   5472#
ITOLOC    4067   4087#
JMPIA      169#  2162
JMPRET    2014   2025#
JMSLO2     164   1181#
JMSLOC     163   1084#
K0        5281   5294#
K1         122#   394    403    480   1238   1738
K10        123#   498   1638   1655   1665   1691   1734   1757   1760   1803   1806   1867   1974   2002
          3508
K100       125#   516    647    657   3630
K200       126#   522   1046   1369   3469
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K217      3438   3446#
K215      3433   3445#
K240      3631   3638#
K2525      127#   428    429    430    470    565    578    580    592    685    689    695    864    914
           929    938   1383
K260      3659   3663#
K3        3628   3637#
K4000      128#   546    987   3364
K5252      129#   438    439    440    471    572    587    598    600    698    803    832    847    893
K5253      130#   868    920    932    943
K7        3658   3664#
K7600      998   1145#
K77        124#   643   3622
K7700      131#   652   1127
K7777      132#   387    404    417    418    449    455    462    463    668    754    779    784    808
           819    852    866    898    916
KB1CHK    3974#  5164   8018   8448
KBCHK      170#  1439   3141   3608
KCC       3367   3678   3747#  5411   8030   8232   8518
KCC1      3783#
KCC2      3809#
KCDF      4074   4077#  5284
KCF       3745#  4943   5399   5766
KCF1      3778#  4984   5768
KCF2      3807#  5770
KFLD0      172#  2278
KIE       1450   1454   3749#  5423   5774   5800   5804   7173   7231   7265   7295   7336
KIE1        32#  1010   3782#  5775
KIE2        34#  1011   3811#  5776
KIOT      2352   2432#
KISZTT    5182#  5013
KJILD     5161   5181#  5652   5843   6730
KJMP3     2463   2468#
KKRTN     2275   2300#
KLB       3752#  5042   5046   5714   5724   5732   8025   8138
KLSTM     4028#  6172   6227   6309   6384
KMD1      3785#  4909
KNOP      1717   1765#
KRB       2792   3467   3685   3751#  5430   8319   8525
KRB1      3784#  5020   5049
KRB2      3813#
KRS       3673   3748#  5417   8513
KRS1      3781#
KRS2      3810#
KRTN      2282   2294#
KSF       2790   3137   3361   3465   3671   3683   3746#  5405   7772   8012   8224   8317   8511   8523
KSF1        39#  2939   3779#
KSF2        40#  2943   3808#
KSFLG      121#  2935   3140   8016
KSFWAT    3958#  4401   4409   4475   4514   4551   4629   4645   5018   5047   5319
KSTOP      150#  1076
KTEST     2313   2322   2328#
KTEST1    2328   2329#
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L101    2466    2071#
L102    2095    2101#
L111    2171    2177#
L112    2191    2187#
L1SAV1  8559    8560    8576#
L1SAV2  8560    8570    8577#
L1SAV3  8562    8572    8578#
L201    4989    4991#
L61     1904    1909#
L62     1918    1934#
LCD     3863#   6869    6911    6918    6965    7047    7057    7123    7124    7176    7195    7233    7269    7297
        7298    7348    7349    7363    7430
LCDATA  7429    7457    7639#
LCDF    1733    1748#
LENBAS  4996    5080#
LIS1NU  8343    8355#
LISN    188#    3300    3370
LISN1   3464    3479    3483    3486#   3502
LISN11  8316    8331    8335    8338#   8354
LISN2   3494    3504#   3507    3510
LISN21  8346    8352#   8359    8362
LISN3   3489    3495#   3511
LISN31  8341    8347#   8363
LISNF1  3935#   8163    8235
LISNSR  2768    2789#   2794
LISNUM  3491    3503#
LKDATA   153#   1143    1217    1363    1399    3021    3033    3071
LKWAS   139#    1159    1315    3020
LL1     6426#   6445
LL2     6447#   6467
LLLD    5159    5170#   5189    5614    5653    5944    6731
LLXB    5625    5633#
LOC1    4068    4085#
LOOP    3984#   4360    4456    4501    4538    4577    5302    5303
LOOPA   3922#   5713    5725    5733
LOOPPC  3950#   4121    4145    4202    4230    4274    4333    4451    4496    4533    4572    4655    4671    4690
        4719    4757    4933    4973    5878    5903    5938    5996    6039    6074    6143    6181    6236    6271
        6331    6362    6420    6562    6592    6611    6630    6649    6669    6732    6847    6908    6963    7045
        7111    7169    7227    7261    7291    7320    7406
LOPDON  3953    5157#   5181
LQ4TAB  6273    6318#
LQI1    6278#   6304
LQI2    6293#   6306
LQLS    3896#   5949    6153    6164    6183    6192    6199    6209    6221    6240    6276    6310    6336    6339
        6423    6476    6544    6565
LQMC    3893#   6319    6346    6365    6568    6612    6651
LQMP    3892#   6279    6293    6318    6342    6570    6593    6650    6670    6730    7418    7437    7496    7516
        7523
LQPC    3894#   6320    6350    6431    6452    6567    6631    6671    7581    7583
LQRB    3899#   6284    6295    6311    6373    6375    6434    6455    6571    6579
LQRF    3897#   4946    6166    6226    6321    6380    6566    6577    6600    6619    6639    6658    6678    7411
        7603    7605
LQRS    3895#   6145    6159    6186    6202    6213    6245    6372    6477    6527    6582    6596    6601    6615

        6620    6634    6639    6654    6669    6674    6679    7422    7431    7438    7509    7517
LQSK     44#    2951    3738#   3809#   6148    6157    6160    6169    6224    6281    6312    6367    6585    6594    SEQ 0206
        6634    6643    6623    6632    6642    6652    6662    6672    6682    7776
LQTAB   6274    6300    6301    6305    6317#
LSAV1   3541    3551    3558#
LSAV2   3543    3553    3559#
LSAV3   3545    3555    3560#
LXC85T  3216#   3602
M12CON  7594    7647#
M1AC    7812    7860    7808#   7893    7911
M1FL    7813    7862    7902#   7907    7913
M1MQ    7861    7895#   7900    7912
M1PC    7809    7925    7966#   7971
M1TN    7906    7926    7959#   7964
M212    3472    3513#
M270    3505    3509#
M3      3475    3512#
M43     3625    3636#
MBCON   7560    7565    7656#
MBC     2912    2986    2999    3016    3028    3040#   3045
MBR     7915    7949#   7957
MEMES   2450    2456#
MEQ#    1482#
MES1AC  7890    8053#
MES1F   8456    8458    8461#   8473    8475
MES1FL  7901    8065#
MES1MQ  7897    8064#
MES1PC  7968    8061#
MES1TN  7961    7976#
MESAC   3042    3175#
MESACT  3013    3101#
MESAG   3930    8446#   8449    8451    8464    8559    8571
MESAGF  3616    3618    3621#   3633    3635
MESAGX   183    3542    3554    3607#   3609    3611    3624
MESBR   7951    7978#
MESEXP  3025    3102#
MESFL   3056    3177#
MESHDR  2985    2994    3009    3075#   3082
MESINS  3063    3100#
MESLK   3078    3099#
MESMQ   3049    3176#
MESPC   3093    3174#
MESPC   7881    7975#
MESSLU  7930    7977#
MESTN   3086    3103#
MESXM   7877    7974#
MFL     2913    2980    3054#   3059
MGIF    1845#   1871
MINS    2995    3010    3061#   3066
MIOT    3976#   5539    5546
MXCC    4002#   4482    4585    4648
MXCF    3998#   4407    4411    4603    4632
MXIE    4306#   6154    4208    4252    4279    4289    4299    4580    5234    5354
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MKRB     4003#  4522   4589   5124
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   2968#
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   3001   3091#  3096
MQ1SAV   7898   8008   8068#  8076
MQA       20#    70#   1298   1301   3132   3736#  8007
MQDATA   152#   1146   1220   1362   1393   3000
MQL       19#    66#    686    696    706   1294   1304   1676   1774   1821   1864   1906   1935   1939
         1995   2068   2097   2173   2183   2201   2308   2394   2728   3189   3735#  4793   4798   4803
         5071   5089   6428   6449   6801   6926   7084   7500   8077
MQSAVE   3001   3018   3030   3050   3133   3188#  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   4268   4306   4398   4466   4510   4548   4613   4631   4647   5316
MTLS     4022#  4327   4329   4372   4388   4465   4505   4542   4639   4770   4773   5310
MTN      2986   3008   3084#  3089
MTPC     4018#  4426   4428   4623
MTSR     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#  1038   1641   1653   1658   1663   1672   1675   1689   1694
NOCRF    3362   3382#
NOPI     2217   2220#
NORDIS   7859#  8045
NORF     8225   8247#
NORMD1   2985#  3163
NORMSQ   5194#  5611   5634
NORSLU   7868   7875   7909#  7917
NORX01   6759   6779   6799#
NOSIM0   5858#  6526
NOSIM1   6401#  6536   6688
NSQBDR   3916#  5089   5695   5697


NSIKS     168   2223#  2226
NUMX     1965   1977   1982   1991   1994   2004   2008   2022#                                        SEQ 0208
NUOK     5118   5121#
NXTDC    4106#  5185
NXTIOT   2300#  2392   2398
NXTONE   1123#  1402
NXTONN   1367   1402#
NXTPAT   1104#  1401
NXTPIT   1400   1401#
ODT1       6#
ODT2       8#
ODT3       2#
OEMR     5026   5063#  5067
OFONKI   5230   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   8035   8041   8066#
PCIK     3901#  5758   5974   6093   6473
PCLP     3978#  5879   5892   5912   5926   5948   5958   5960   6015   6098   6471
PCLOOP   3951   5112#  5116   5121   5123
PCLP     3083#  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
PINES    6397   6403#
PMEMES   1482   2447#  2454
PMODE    5034   5036#  5056   5060   5061   5070
POINTB    100#   953    960    967    968
POINTC    160    161#   854    965    981    982    911    915    919    937   1121   1124   1126   1131
POINTD    143    162#   939
POINTE    163#   1088
POINTF    164#   1105
POINTR    158#   846    892
PPIM     5845#
PPIMES   5845   6394#  6401
PPRMS    3293   3333   3338#  3341
PRDS     3984#  6006   6022   6026   6051   6059   6102   6106   6433   6454
PRDD     2837   2844   2850   2856   2863#  2864   2866   2868   2869
PRCIES   5839   6481   6719#
PRN1S    3939#  8546   8548
PRN2S    3945#  8490   8492
PRNTS     193#  3409   3411
PRNT2     194#  2842   2848   2854   2860   3650   3652
PROPLC   3291   3294   3316   3321   3325   3334   3343#
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SLUDIS    7869#   8044
SLUEND    5114    5812#   8042
SLULER    5002    5087#   5095
SLULSL    4815    4968#
SLULSU    4818    4986#
SLUMES    4181    5784#
SLUMST    4812    4850#
SLUREC    4052#   4938    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     1988    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      3799#
SPF2      3817#
SR1MES    8156    8231    8399#
SR1OES    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#
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T14S      7378    7405#
T15LS     6669#
T1LA      5878#   6545
T1LQ      5861    5865    6143#   6531
T2        6847#
T21DA     4943    4945    4959#
T2LA      5903#
T2LQ      6181#
T3        6850    6900#
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    6398    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    5795#   6399    6941
TEST       173#   1242    1270    1295    1299    1306
TEST1     4121#   5194
TEST10    4451#   5201
TEST11    4496#   5202
TEST12    4533#   5203
TEST13    4572#   5204    5350
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
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X1TYPE   3942    0423#   8433    8434
XBAUD    5104    5621#   5629    5630    5636
XC1CKL   3926    8285#   8296
XC1LOP   3944    0175#
XC1EPR   3955    0001#   0010    0060    0143
XC1SW    3934    0153#   0199    0205    0252
XC8APT    199    3583#   3587
XC8CRL    181    3431#   3442
XC8ERR    201    3126#   3135    3173    3193    3276
XC8H3     211    3700#   3704
XC8PC     209    3206#   3287    3289    3290    3292    3332    3337
XC8SIA    203    3205#   3216
XC8SW     187    3387    3564#   3568
XCDIL    2078#   2105
XCFSLU   4027    5765#   5780
XCH1KS   3948    0223#   0233    0247    0249    0260    0557    0569
XCHKKS    175    3300#   3308    3382    3383    3395    3540    3552
XCLEPI   3989    6489#   6492
XDATA    2133    2142    2169    2172    2215#
XDELAY   3987    5737#   5740
XDR      3864#   6902    6919    7072    7125    7499
XDRDAT   7482    7503    7640#
XGETSR   3981    5789#   5794
XGHW3    3983    7031#   7036
XIOT     4107    5531#   5550
XKL&IM   4029    6513#   6519
XLCTR    5012    5016    5077#
XLISN     189    3462#   3486    3487    3496    3497    3499    3501
XLI&N1   3936    8314#   8338    8339    8348    8349    8351    8353
XMIOT    3977    5554#   5556    5557    5561
XMKCC    4003    5410#   5412    5414
XMKCF    3999    5398#   5400    5402
XMK1E    4007    5422#   5425    5427
XMKRH    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
XMICF    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    3460    3444#   3495    3498
XORS1    0291    8294    8298#   8347    8350
XPRNT1    191    3657#   3661
XPRNT2    195    3404#   3412
XPRNT4    185    3544    3556    3644#   3654
XR       7750#
XRET      169     170#
XR&TAD   2016    2024#
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XRTF1    2000    2026#
XSAV     1856    1860    1863    1874#
XSCAF    4025    5747#   5759
XSDF     1844    1845    1851#   1868    1869
X5EP1    3991    6494#   6497
X8FIL    2207    2213#
X8PC1E   4035    5972#   5976
XSRTF    2054#   2075
XSTKS     168#   1634    1661    1731    1754    1800    1840    1966    1983    2047    2076    2120
XTFLG     166#   1543    1750    1794    1853    2048    2267
XTOF     2053    2054    2064    2067    2071    2073    2077    2078    2093    2096    2101    2103    2108#
XTYPE     193    3522#   3532
XVDLY    3993    4910#   4918    4921    4924
XWAIT    3979    7384#   7386    7388    7389    7391    7393    7394
ZEXF     7676    7603#
ZTO      4731    4735#   4747
.L0177   4060    8594#
.L0371   4146    4189#
.L0372   4122    4190#
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