

# IDENTIFICATION

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PRODUCT CODE:   MAINDEC-08-DKVTB-A-D  
PRODUCT NAME:   VT78 CPU DIAGNOSTIC  
PRODUCT DATE:   JULY 1977  
MAINTAINER:     DIAGNOSTIC GROUP  
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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 PROCESSOR MODULE CONTAINS A SMALL AMOUNT OF LOGIC WHICH CAN NOT BE TESTED WITHOUT EXTERNAL DEVICES ATTACHED TO THE VT78 PERIPHERAL PORTS. FOR MANUFACTURING PURPOSES, A SPECIAL PERIPHERAL SIMULATOR PACKAGE HAS BEEN DESIGNED TO PLUG INTO THE VT78 PORTS AND PROVIDE DIAGNOSTIC ACCESS TO ALL MODULE LOGIC. THIS DIAGNOSTIC IS COMPATIBLE WITH THE HARDWARE SIMULATOR. ALL OTHER USERS OF THE DIAGNOSTIC WHICH DO NOT HAVE THE HARDWARE SIMULATOR, CAN FULLY TEST THE MODULE BY RUNNING BOTH THIS DIAGNOSTIC AND THE PERIPHERAL DIAGNOSTICS WITH RESPECTIVE PERIPHERALS ATTACHED TO VT78 SYSTEM.

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

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

## 2.0 REQUIREMENTS

### 2.1 HARDWARE

THE FOLLOWING HARDWARE IS REQUIRED FOR EXECUTION OF THIS PROGRAM:

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

OPTIONAL EQUIPMENT INCLUDES THE PERIPHERAL 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 SUCCESSFULLY 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 DKVTBA FOLLOWED BY THE RETURN KEY. THE SYSTEM WILL RESPOND WITH A DISPLAY OF THE PROGRAM NAME, MAINDEC NUMBER, PSEUDO SWITCH REGISTER (PSR), AND HARDWARE CONFIGURATION WORD (HW3) AND WAIT FOR RUN MODE SELECTION BY THE OPERATOR. RUN MODE IS SELECTED BY SETTING THE PSR AND HW3 AS DESCRIBED IN SECTION 5.2.1.

#### 5.1.2 LOADING FROM SLU INTERFACE

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

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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)

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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; LOP=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

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

#### CONTROL G

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

#### EXAMPLE:

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

#### TERMINATING CHARACTERS

-----

#### CARRIAGE RETURN

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

#### EXAMPLE:

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

#### EXAMPLE:

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

## LINE FEED

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

### EXAMPLE:

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

### EXAMPLE:

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

## ILLEGAL CHARACTERS

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

### EXAMPLE:

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

## CONTROL S

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

## CONTROL Q

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

## CONTROL C

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

#### 5.4 EXECUTION TIMES -----

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

#### 6.0 ERROR INFORMATION -----

THE FOLLOWING MESSAGE FORMATS ARE USED IN THIS DIAGNOSTIC.

##### A) NORMAL ERROR DISPLAY

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

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

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

EACH OF THE FOLLOWING MESSAGES ARE DISPLAYED AS EXECUTION 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

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### 7.1.1 CPU TESTS

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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

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TN 0001 -- TEST CDF & PDF. 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

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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

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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

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### (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

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



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/VT78 CPU DIAGNOSTIC

/VT78 CPU DIAGNOSTIC - PART 1 - FIELD 0

/PROGRAMMER: B. S. POLAND

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6143	APTHW3=6143	/LOCATION OF HCW3 IN APT LOADER/MONITOR
7402	HLT=7402	/HALT
7002	BSW=7002	/BYTE SWAP
6203	CDI=6203	
7421	MOQ=7421	/AC TO MQ, 0 TO AC
7501	MOA=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	SRO=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,,
6325	KIE2=6325	/LOAD CONTENT OF AC11 INTO INT EN FF, SLU#2
6234	RIB=6234	/LOAD CONTENT OF AC11 INTO INT EN FF SLU#3
		/READ(INCLUSIVE OR) THE ISF & DSF INTO BITS
		/7=8 L10-11 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

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0000 FIELD 0

\*0

0000 0000

0000 0000

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/FIRST EDITION.

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0001	6244	RWF	
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

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/PDP-9 STANDARDIZED SWITCHES AND HARDWARE DESIGNATOR WORDS

0020	0000	*20	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)

```
111 /
112 / WARNING--POWER MUST BE TURNED OFF
113 / PARALLEL I/O DEVICE!!!
114 / BIT 4=1 PERIPHERAL SIMULATOR ATTACHED.
115 / BIT 5=1 USING EXTERNAL SLU WRAPS ON SLU'S #2 & #3.
116 /-----
117 /*****
118
119      0040      *40
120      /CONSTANTS
121      0040 0000 KSFLG, 0
122      0041 0001 K1, 0001
123      0042 0010 K10, 0010
124      0043 0077 K77, 0077
125      0044 0100 K100, 0100
126      0045 0200 K200, 0200
127      0046 2525 K2525, 2525
128      0047 4000 K4000, 4000
129      0050 5252 K5252, 5252
130      0051 5253 K5253, 5253
131      0052 7700 K7700, 7700
132      0053 7777 K7777, 7777
133
134      /*****
135      /SCRATCH LOCATIONS
136
137      0054 0000 ACWAB, 0
138      0055 0000 MCWAB, 0
139      0056 0000 LKWAB, 0
140      0057 0000 SKPPED, 0
141      0058 0000 SOMSKP, 0
142      0061 0000 SAVFLD, 0 /STORAGE FOR IF AND DF
143      0102 BIT6=POINTD
144      0007 BIT7=0007
145      0072 BIT11=TESLOC
146      0062 7777 BIT3, 7777
147      0063 0000 BIT4, 0
148      0064 0000 BIT5, 0
149      0065 0000 BIT6, 0
150      0066 7402 KSTOP, HLT
151      0067 0000 ACDATA, 0
152      0070 0000 MGDATA, 0
153      0071 0000 LKDATA, 0
154      0072 0000 TESLOC, 0
155      0073 0000 DAT, 0
156      0074 0000 NDF, 0
157      0075 0000 TSTNO, 0
158      0076 0077 POINTR, .+1
159      0077 2526 2526
160      0100 0101 POINTB, POINTC
161      0101 0000 POINTC, 0
162      0102 0000 POINTD, 0
163      0103 1434 POINTF, JMSLOC-1
164      0104 145A POINTF, JMSLOC-2
165      0105 1515 INSTTR, INSTRT
```

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166 0106 4537 XTFLG, TFLG
167 0107 0000 STKS, 0
168 0110 4533 XSTKS, NSTKS
169 0111 5512 JMPD, JMP I XRET
170 0112 4447 XRET, RET
171 0113 0000 RTCTF, 0
172 0114 4635 KFLD0, RTN
173 0115 2923 TEST, TESTS
174 4516 CHKKS=F=JMS I .
175 0116 7111 XCHKKS=F
176 4517 KBCHK=JMS I .
177 0117 2237 CHKKB
178 4524 FIXIL=JMS I .
179 0120 5217 FIXLKG
180 4521 C8CRLF=JMS I .
181 0121 7200 KC8CRLF
182 4522 C8PRNT=JMS I .
183 0122 7423 MESAGX
184 4523 C8PRT4=JMS I .
185 0123 7464 XPRNT4
186 4524 C8SWIT=JMS I .
187 0124 7360 XC8SW
188 4525 LISN=JMS I .
189 0125 7225 XLISN
190 4526 PRNT1=JMS I .
191 0126 7477 XPRNT1
192 4527 TYPE=JMS I .
193 0127 7321 XTYPE
194 4530 PRNT2=JMS I .
195 0130 7153 XPRNT2
196 4531 SPACE2=JMS I .
197 0131 7217 SPACX2
198 4532 C8APT=JMS I .
199 0132 7400 XC8APT
200 4533 C8ERR= JMS I .
201 0133 6600 XC8ERR
202 4534 C8START=JMS I .
203 0134 6716 XC8START
204 4535 INTST=JMS I .
205 0135 2217 TSTIN
206 4536 ENDTST=JMS I .
207 0136 2227 TSTEND
208 4537 C8RC=JMS I .
209 0137 7012 XC8RC
210 4540 C8H3=JMS I .
211 0140 7540 XC8H3
212 4541 CLSKWT=JMS I .
213 0141 5427 WTCLSK
214
215 0177 *177
216 0177 7773 DATPAT, 7773
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217
218      0200 *200
219      /*****
220      /CPU TEST
221      /*****
222
223
224
225
226      /*****
227      /CPU TEST 1 - FIRST OPERATE MICROINSTRUCTION TEST
228      /*****
229      /TEST ALL BASIC SKIPS TO EITHER SKIP OR NOT SKIP WHEN AC=7777.
230      START, C0START /CONSOLE CALL TO ASK SWITCH REG QUESTION.
231      C0REST, CLA CLL /CLEAR TEST NUMBER USED FOR ERROR DISPLAY
232      DCA ISTNO
233      IOF
234      FIXIL /FIX UP INTERRUPT LINKAGE
235      TAD PSR
236      AND (100 /EXECUTE CPU TEST????
237      SZA CLA
238      JMP BEGEXM /NO
239      0210 5776 PCPUM, JMS PCPUMS /YES - PRINT "CPU TESTING" MESSAGE
240      0211 4775 /IF NOT UNDER APT CONTROL.
241
242      0212 4535 CPUT1, INTST
243      0213 6007 CAF
244      0214 7000 NOP
245      0215 7000 NOP
246      0216 7000 SNA
247      0217 7450 SZL
248      0220 7430 CBERR /SNA SKIPS WHEN AC CLEAR, OR SZL DOES NOT SKIP WHEN LINK = 0
249      0221 4533 IOW /ENABLE INTERRUPTS FOR CONSOLE PACKAGE
250      0222 6001 CMA /AC TO 7777
251      0223 7040 SNA
252      0224 7450 CBERR /CMA SKIPPED OR DID NOT COMPLEMENT, OR SNA DID NOT SKIP, OR IOW SKIPPED
253      0225 4533 SZA
254      0226 7440 SKP
255      0227 7410 CBERR /SNA CLEARED AC, OR SZA SKIPPED, OR SKP FAILED
256      0230 4533 SNA
257      0231 7500 CBERR /SZA OR SKP CLEARED AC, OR SNA FAILED TO SKIP
258      0232 4533 SPA
259      0233 7510 SKP
260      0234 7410 CBERR /SNA CLEARED AC, OR SPA SKIPPED WHEN AC=1
261      0235 4533 /*****
262      /TEST CLA CLL TO CLEAR AC AND LINK
263      TSCACL, CLA CLL
264      SNA
265      SZL
266      0236 7300 CBERR /CLA CLL DID NOT CLEAR AC OR LINK, OR SNA SKIPPED
267      0237 7450 /WHEN AC=0000, OR SZL DID NOT SKIP WHEN LINK=0
268      0240 7430 CMA /AC TO 7777
269      0241 4533 /*****
270      /TEST BASIC SKIPS TO SKIP OR NOT SKIP WHEN AC=0000
271      TSBSSK, CMA /AC TO 0000
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272      0244 7440 SZA
273      0245 4533 CBERR /CMA DID NOT COMPLEMENT AC OR SZA FAILED TO SKIP, OR CMA SKIPPED
274      0246 7510 SPA
275      0247 4533 CBERR /SPA FAILED TO SKIP WHEN AC=0
276      0250 7500 SNA
277      0251 7410 SKP
278      0252 4533 CBERR /SNA SKIPPED WHEN AC=0
279      /*****
280      /TEST IAC TO INCREMENT AC TO 0000 AND SET LINK
281      TSTIAC, CLL /THIS INSTRUCTION NOT YET TESTED
282      CMA /AC TO 7777
283      IAC /AC TO 0000, LINK TO 1
284      SZA
285      0253 7100 CBERR /SZA FAILED TO SKIP, OR IAC DID NOT INCREMENT AC TO 0000
286      0254 7040 /*****
287      /TEST TO SEE IF LINK COMPLEMENTED TO A 1 ON A CARRY OUT OF ADDER
288      TSTLCM, SNL
289      0260 7420 CBERR /LINK DID NOT COMPLEMENT ON CARRY OUT, OR CLL FAILED
290      0261 4533 /OR SNL FAILED TO SKIP FOR LINK = 1
291      SZL
292      0262 7430 SKP
293      0263 7410 CBERR /SZL SKIPPED ON LINK=1, OR SNL CLEARED LINK, OR SKIP FAILS WHEN LINK = 1
294      0264 4533 /*****
295      /TEST CLL TO CLEAR LINK
296      TSTCLL, CLL
297      SNL
298      0265 7100 SKP
299      0266 7420 CBERR /CLL FAILED, OR SNL SKIPPED WHEN LINK=0, OR SKP FAILED WHEN LINK=0
300      0267 7410 SZL
301      0270 4533 CBERR /SZL FAILED TO SKIP, OR SNL OR SKP SET LINK
302      /*****
303      /TEST ABILITY OF CML TO SET LINK
304      TSTCML, CML /LINK TO 1
305      SNL
306      0273 7020 CBERR /CML DID NOT SET LINK
307      0274 7420 /*****
308      /TEST ABILITY OF LINK TO COMPLEMENT FROM A 1 TO A 0 ON A CARRY OUT
309      CMA /AC TO 7777, LINK=1
310      IAC /AC TO 0000, CARRY TO LINK, LINK TO 0
311      SZL
312      0300 7430 CBERR /CARRY OUT DID NOT COMPLEMENT LINK TO A 0
313      0301 4533 /*****
314      /TEST ABILITY OF CML TO COMPLEMENT LINK FROM A 0 TO A 1 AND BACK TO A 0
315      CLA
316      0302 7200 CML /LINK TO 1
317      0303 7020 CML /LINK TO 0
318      0304 7020 SZL
319      0305 7430 CBERR /CML DID NOT COMPLEMENT LINK FROM A 1 TO A 0
320      0306 4533 SZA
321      0307 7440 CBERR /CML CHANGED AC
322      0310 4533 /*****
323      /TEST CLA TO CLEAR AC AND NOT CLEAR LINK
324      CML /MAKE LINK A 1
325      CMA /AC TO 7777
326      0311 7020 CLA /AC TO 0000
327      0312 7040
328      0313 7200
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327 0314 7420 SNL
328 0315 4533 CRERR /CLA CLEARED LINK
329 0316 7440 SZA
330 0317 4533 CRERR /CLA DID NOT CLEAR AC
331
332 /*****
333 /TEST NOP TO NOT CHANGE AC OR LINK
334 NOP /AC=0000, LINK=1
335 SNL
336 CRERR /NOP SKIPPED OR CLEARED LINK
337 SZA
338 CRERR /NOP SET AC BIT
339 CMA /AC TO 7777
340 CML /LINK TO 0
341 NOP /AC=7777, LINK=0
342 SZL
343 CRERR /NOP SKIPPED OR SET LINK
344 SNA
345 CRERR /NOP CLEARED AC
346 /*****
347 /TEST RAL TO NOT PICK UP BITS BY SHIFTING ZEROES
348 RAL /AC TO 0000
349 SNA
350 SZL
351 CRERR /RAL OF ZEROES PICKED UP AC BIT OR LINK BIT
352 /*****
353 /TEST RTL TO NOT PICK UP BITS WHEN SHIFTING ALL ZEROES
354 RTL
355 SNA
356 SZL
357 CRERR /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 RAR
361 SNA
362 SZL
363 CRERR /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 RTR
367 SNA
368 SZL
369 CRERR /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 BSW
373 SNA
374 SZL
375 CRERR /BSW PICKED UP BIT IN AC WHEN SWAPPING ALL ZEROES, OR SET LINK
376 ENDTST
377 JMP CPUT2
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382 0400 PAGE
383 /*****
384 /CPU TEST 2 - FIRST TEST OF MRI
385 /*****
386 /TEST TAD TO ADD 7777 TO A CLEAR AC
387 CPUT2, INTST
388 TAD K7777 /AC TO 7777, LINK=0
389 SNA
390 CRERR /TAD DID NOT LOAD AC, OR TAD SKIPPED,
391 SZL
392 CRERR /TAD SET LINK WHEN NO CARRY OUT EXPECTED
393 /*****
394 /TEST TAD TO ADD 1 TO AC=7777 TO PRODUCE AC=0000 AND LINK=1
395 TAD K1 /AC TO 0000, LINK TO 1
396 SZA
397 CRERR /TAD USED INCORRECT VALUE, OR ADDER CARRY CKT
398 /FAULTY OR TAD SKIPPED
399 SNL
400 CRERR /CARRY OUT OF ADDER DID NOT COMPLEMENT LINK
401 /*****
402 /TEST ADDER CARRY STRUCTURE TO GENERATE CARRY THROUGH ALL POSITIONS
403 /UNDER OPPOSITE CONDITIONS FROM PREVIOUS TEST
404 TAD K1 /AC TO 0001, LINK=1
405 TAD K7777 /AC TO 0000, LINK TO 0
406 SNA
407 SZL
408 CRERR /CARRY FAILED TO PROPAGATE ALL THROUGH ADDER TO LINK
409 /*****
410 /TEST ABILITY TO ADD 0000 TO A CLEAR AC TO PRODUCE A CLEAR AC
411 TAD 00 /AC=0000, LINK=0
412 SNA
413 SZL
414 CRERR /ADDING 0000 TO 0000 PRODUCED NON-ZERO RESULT
415 /OR COMPLEMENTED LINK
416 /*****
417 /TEST ADDER'S ABILITY TO PROPAGATE CARRY WHEN ACN=1, MDN=1, AND CARRY IN N=1
418 TAD K7777 /AC TO 7777, LINK=0
419 TAD K7777 /AC TO 7776, LINK TO 1
420 SNL
421 CRERR /CARRY DID NOT PROPAGATE TO LINK
422 IAC /MAKE AC=7777 FOR EASE OF CHECKING RESULT OF PREVIOUS TAD
423 CMA /AC TO 0000
424 STA
425 CRERR /CARRY DID NOT PROPAGATE CORRECTLY
426 /OR TAD USED INCORRECT OPERAND
427 /*****
428 /TEST ADDER'S ABILITY TO GENERATE CARRY WHEN ACN=1, MDN=1, AND CARRY IN N=0 IN ODD NUMBERED BIT POSITIONS
429 TAD K2525 /AC TO 2525, LINK = 1
430 TAD K2525 /AC TO 5252
431 TAD K2525 /AC TO 7777, LINK = 1 (NO CARRY GENERATED TO LINK)
432 CMA /AC TO 0000, LINK = 1
433 SZA
434 CRERR /CARRY FAILED IN AN ODD BIT POSITION
435 SNL
436 CRERR /LINK COMPLEMENTED WHEN NO CARRY OUT EXPECTED
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436 /*****
437 /TEST ADDER'S ABILITY TO GENERATE CARRY WHEN ACN=1,MDN=1, AND CARRY IN N=0 IN ALL EVEN BIT POSITIONS
438 TAD K5252 /AC TO 5252,LINK=1
439 TAD K5252 /AC TO 2524,LINK TO 0
440 TAD K5252 /AC TO 7776,LINK=0
441 IAC /AC TO 7777,LINK=0
442 CMA /AC TO 0000,LINK=0
443 SZA
444 CBPR /CARRY FAILED IN AN EVEN BIT POSITION
445 SZL
446 CBERR /CARRY OUT FAILED TO COMPLEMENT LINK
447 /*****
448 /TEST AND INSTRUCTION TO NOT SET ANY AC BITS WHEN AC =0000
449 AND K7777 /AC=0000,LINK=0
450 SNA
451 SZL
452 CBERR /AND SET BIT WHEN AC INITIALLY CLEAR,OR AND SET LINK
453 /*****
454 /TEST AND INSTRUCTION TO CLEAR ALL AC BITS WHEN USING AN OPERAND OF 0000
455 TAD K7777 /AC TO 7777,LINK = 0
456 AND 0 /AC TO 0000,LINK = 0
457 SNA
458 SZL
459 CBERR /AND FAILED TO CLEAR ALL AC BITS, OR SET LINK
460 /*****
461 /TEST AND INSTRUCTION TO NOT CLEAR ANY AC BITS WHEN AC=7777 AND MD=7777
462 TAD K7777 /AC TO 7777
463 AND K7777 /AC=7777,LINK=0
464 CMA /AC TO 0000,LINK =0
465 SNA
466 SZL
467 CBERR /AND OF 7777 CLEARED AC BIT OR SET LINK
468 /*****
469 /TEST FOR ADJACENT PIN SHORTS IN "AND" CIRCUITRY
470 TAD K2525 /AC TO 2525
471 AND K5252 /AC TO 0000
472 SZA
473 CBERR /"AND" DID NOT CLEAR AC,POSSIBLE ADJACENT PIN SHORTS IN AND CIRCUITRY
474 ENDIST
475 /*****
476 /CPU TEST 3 - TEST ADDER FUNCTION
477 /*****
478 /TEST BIT 11 INPUT TO ADDER=0
479 CPUT3, INTST
480 TAD K1 /AC TO 0001
481 SNA
482 CBERR /ADDER=0 OPEN ON BIT 11 INPUT
483 /*****
484 /TEST BIT 10 INPUT TO ADDER=0
485 CLA /AC TO 0000
486 TAD 0 /AC TO 0002
487 SNA
488 CBERR /ADDER=0 OPEN ON BIT 10 INPUT
489 /*****
490 /TEST BIT 9 INPUT TO ADDER=0
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491 0511 7200 CLA /AC TO 0000
492 0512 1375 TAD 0 /AC TO 0004
493 0513 7450 SNA
494 0514 4533 CBERR /ADDER=0 OPEN ON BIT 9 INPUT
495 /*****
496 /TEST BIT 8 INPUT TO ADDER=0
497 CLA /AC TO 0000
498 TAD K10
499 SNA
500 CBPR /ADDER=0 OPEN ON BIT 8 INPUT
501 /*****
502 /TEST BIT 7 INPUT TO ADDER=0
503 CLA /AC TO 0000
504 TAD 0 /AC TO 0020
505 0523 7450 SNA
506 0524 4533 CBERR /ADDER=0 OPEN ON BIT 7 INPUT
507 /*****
508 /TEST BIT 6 INPUT TO ADDER=0
509 CLA /AC TO 0000
510 TAD 0 /AC TO 0000
511 0527 7450 SNA
512 0530 4533 CBERR /ADDER=0 OPEN ON BIT 6 INPUT
513 /*****
514 /TEST BIT 5 INPUT TO ADDER=0
515 CLA /AC TO 0000
516 0532 1044 TAD K100
517 0533 7450 SNA
518 0534 4533 CBERR /ADDER=0 OPEN ON BIT 5 INPUT
519 /*****
520 /TEST BIT 4 INPUT TO ADDER=0
521 CLA /AC TO 0000
522 0536 1045 TAD K200 /AC TO 0200
523 0537 7450 SNA
524 0540 4533 CBERR /ADDER=0 OPEN ON BIT 4 INPUT
525 /*****
526 /TEST BIT 3 INPUT TO ADDER=0
527 CLA /AC TO 0000
528 0542 1372 TAD 0 /AC TO 0400
529 0543 7450 SNA
530 0544 4533 CBERR /ADDER=0 OPEN ON BIT 3 INPUT
531 /*****
532 /TEST BIT 2 INPUT TO ADDER=0
533 CLA /AC TO 0000
534 0546 1371 TAD 0 /AC TO 1000
535 0547 7450 SNA
536 0550 4533 CBERR /ADDER=0 OPEN ON BIT 2 INPUT
537 /*****
538 /TEST BIT 1 INPUT TO ADDER=0
539 CLA /AC TO 0000
540 0552 1370 TAD 0 /AC TO 0000
541 0553 7450 SNA
542 0554 4533 CBERR /ADDER=0 OPEN ON BIT 1 INPUT
543 /*****
544 /TEST BIT 0 INPUT TO ADDER=0
545 0555 7200 CLA /AC TO 0000
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546 0556 1047 TAD K4000 /AC TO 4000
547 0557 7450 SNA
548 0560 4533 C8ERR /ADDER=0 OPEN ON BIT 0 INPUT
549 0561 4536 ENDTST
550 0562 5767 JMP CPUT4
551 0567 0600
552 0570 2000
553 0571 1300
554 0572 0400
555 0573 0240
556 0574 0020
557 0575 0004
558 0576 0002
559 0577 0000

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PAGE
/*****
/CPU TEST 4 - SECOND OPERATE MICROINSTRUCTION TEST
/*****
/TEST RAR TO ROTATE AND NOT DROP ANY BITS
CPUT4, INTST
TAD K2525 /AC TO 2525
CLI /LINK TO 1
CML /AC TO 5252, LINK=1
RAR
SNL
C8ERR /RAR DID NOT SHIFT AC11 TO LINK
CMA /AC TO 2525, LINK=1
AND K5252 /AC=0000, LINK=1
SZA
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
TAD K2525 /AC TO 2525, LINK=1
RAR /AC TO 5252, LINK=1
AND K2525 /AC TO 0000, LINK=1
SNA
SNL
C8ERR /RAR PICKED UP BIT, POSITION OF BIT PICK UP IS
/INDICATED BY BIT(8) SET IN AC
/*****
/TEST RAL TO SHIFT AND NOT DROP ANY BITS
TAD K5252 /AC TO 5252 LINK=1
RAL /AC TO 2525 LINK=1
SNL
C8ERR /RAL DROPPED LINK BIT
CMA /AC TO 5252 LINK=1
AND K2525 /AC TO 0000 LINK=1
SZA
C8ERR /RAL DROPPED BIT OR DID NOT SHIFT
/FAILING BIT POSITIONS ARE SET IN AC
/*****
/TEST RAL TO NOT PICK UP ANY BITS
TAD K5252 /AC TO 5252 LINK=1
RAL /AC TO 2525 LINK=1

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```

600 0633 0050 AND K5252 /AC TO 0000 LINK=1
601 0634 7440 SZA
602 0635 4533 C8ERR /RAL PICKED UP BIT, BITS SET IN AC INDICATE FAILING POSITIONS
/*****
/TEST RTR TO SHIFT TWICE AND NOT DROP ANY BITS
CLL /CLEAR LINK
TAD (4444 /AC TO 4444 LINK=0
RTP /AC TO 1111 LINK=0
SZL
C8ERR /RTR PICKED UP LINK BIT
CMA /AC TO 6666
AND (1111 /AC TO 0000 LINK=0
SZA
C8ERR /RTR DROPPED BIT OR DID NOT SHIFT TWICE
/BIT SET IN AC INDICATES BIT DROPPED
/*****
/TEST RTR TO NOT PICK UP ANY BITS
TAD (4444 /AC TO 4444
RTR /AC TO 1111
AND (6666 /AC TO 0000
SZA
C8ERR /RTR PICKED UP BIT, BIT SET IN AC INDICATES FAILING POSITION.
/*****
/TEST RTL TO SHIFT AND NOT DROP BITS
TAD (1111
RTL /AC TO 4444 LINK=0
SZL
C8ERR /RTL PICKED UP LINK BIT
CMA /AC TO 3333 LINK=0
AND (4444 /AC TO 0000 LINK=0
SZA
C8ERR /RTL DROPPED BIT OR DID NOT SHIFT
/BIT SET IN AC INDICATES BIT DROPPED
/*****
/TEST RTL TO NOT PICK UP ANY BITS
TAD (1111 /AC TO 1111
RTL /AC TO 4444
AND (3333 /AC TO 0000
SZA
C8ERR /RTL PICKED UP BIT, BIT SET IN AC INDICATES FAILING POSITION
/*****
/TEST BSW TO SWAP AND NOT DROP BITS OR CHANGE LINK
CLL /INITIALIZE LINK TO ZERO
TAD K77 /AC TO 0077 LINK=0
BSW /AC TO 7700 LINK=0
SZL
C8ERR /BSW SET LINK
TAD K100 /AC TO 0000 LINK TO 1
SZA
C8ERR /BSW DID NOT SWAP OR PICKED UP BIT.
/*****
/TEST BSW FOR ADJACENT PIN SHORTS AND DROPPED BITS
TAD K7700 /AC TO 7700 LINK=1
BSW /AC TO 0077 LINK=1
SNL

```

```
655 0704 4533 CBERR /BSW CLEARED LINK
656 0705 7040 CMA /AC TO 7700
657 0706 1044 TAD K100 /AC TO 0000, LINK TO 0
658 0707 7440 SZA
659 0710 4533 CBERR /BSW PICKED UP OR DROPPED BIT(S).
660 0711 4536 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
CBERR /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
CBERR /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
CBERR /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
CBERR /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
CBERR /MQL OR SWP PICKED UP BIT, POSSIBLE ADJACENT PIN SHORT IN MQ.
/ BIT SET IN AC INDICATES POSITION OF FAILURE.
/*****
/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
CBERR /MQA SET LINK
```

```
710 0752 7040 CMA /AC TO 0000 MQ=7777
711 0753 7440 SZA
712 0754 4533 CBERR /MQA DID NOT OR MQ WITH AC
713 0755 7521 SWP /AC TO 7777 MQ TO 0000
714 0756 7450 SNA
715 0757 4533 CBERR /MQA CLEARED MQ
716 0760 5773 JMP CANTST
717 0773 1000
718 0774 3333
719 0775 6666
720 0776 1111
721 0777 4444 1000
PAGE
/*****
/TEST CAM TO CLEAR AC AND MQ
CANTST, SWP /AC TO 0000 MQ TO 7777
CMA /AC TO 7777 MQ=7777
CML /SET LINK
CAM /CLEAR AC AND MQ
SZA
CBERR /CAM DID NOT CLEAR AC
SNL
CBERR /CAM CLEARED LINK
SWP /AC=0000 MQ=0000
SZA
CBERR /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
CBERR /ACL DID NOT LOAD 0000 TO AC
SNL
CBERR /ACL CLEARED LINK
CMA /AC TO 7777
SWP /AC TO 0000 MQ TO 7777
SZA
CBERR /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
CBERR /DCA DID NOT CLEAR AC, OR DCA SKIPPED
SZL
CBERR /DCA SET LINK
TAD TESLOC /AC TO 7777
CMA
SZA
CBERR /DCA DID NOT STORE, OR DCA STORED TO WRONG ADDRESS
```

```
764
765
766 1042 3072
767 1043 1072
768 1044 7440
769 1045 4533
770
771
772
773 1046 2072
774 1047 7440
775 1050 4533
776 1051 7430
777 1052 4533
778 1053 1072
779 1054 1453
780 1055 7440
781 1056 4533
782
783
784 1057 1053
785 1060 3072
786 1061 2072
787 1062 4533
788 1063 7420
789 1064 4533
790 1065 1072
791 1066 7440
792 1067 4533
793
794 1070 4536
795
796
797
798
799 1071 4535
800 1072 1274
801 1073 7410
802 1074 2526
803 1075 1050
804 1076 7440
805 1077 4533
806
807
808 1100 1053
809 1101 3303
810 1102 7410
811 1103 0000
812 1104 1303
813 1105 7040
814 1106 7440
815 1107 4533
816 1110 3303
817
818

/*****
/TEST DCA TO STORE ALL ZEROES
DCA TESLOC /0000 TO LOCATION "TESLOC"
TAD TESLOC /0000 TO AC
SZA
CBERR /DCA DID NOT STORE ALL 0'S, BIT SET IN AC
/INDICATES FAYLING BIT POSITION.
/*****
/TEST ISZ TO INCREMENT WITHOUT SKIPPING
ISZ TESLOC /LOCATION "TESLOC" TO 0001
SZA
CBERR /ISZ SKIPPED WHEN NO OVERFLOW, OR ISZ SET AC BIT
SZL
CBERR /ISZ SET LINK
TAD TESLOC /AC TO 0001 LINK#0
TAD K7777 /AC TO 0000, LINK TO 1
SZA
CBERR /ISZ DID NOT INCREMENT BY 1
/*****
/TEST ISZ TO SKIP ON OVERFLOW
TAD K7777 /AC TO 7777 LINK#1
DCA TESLOC /LOCATION "TESLOC" TO 7777, AC TO 0000
ISZ TESLOC /SHOULD SKIP
CBERR /ISZ DID NOT SKIP ON OVERFLOW
SNL
CBERR /OVERFLOW ON ISZ SET LINK
TAD TESLOC /0000 TO AC
SZA
CBERR /ISZ DID NOT INCREMENT 7777 TO 0000, OR ISZ
/AFFECTED AC ON OVERFLOW
ENDTST
/*****
/CPU TEST 7 - TEST "AND",TAD,ISZ,AND DCA DIRECT ADDRESSING TO SAME PAGE
/*****
/TEST TAD TO ADDRESS SAME PAGE DIRECT
CPUT7, INTST
TAD .+2 /AC TO 2526 LINK#0
SKP
2526 /OPERAND FOR TAD SAME PAGE TEST
TAD K5252 /AC TO 0000, LINK TO 1
SZA
CBERR /TAD TO SAME PAGE DIRECT FAILED
/*****
/TEST DCA TO SAME PAGE DIRECT
TAD K7777 /AC TO 7777
DCA .+2 /AC TO 0000
SKP
0000 /TEST LOCATION FOR DCA TO SAME PAGE TEST
TAD .-1 /AC TO 7777
CMA /AC TO 0000
SZA
CBERR /DCA TO SAME PAGE FAILED
DCA .-5 /CLEAR TEST LOCATION FOR POSSIBLE SECOND PASS
/*****
/TEST ISZ TO SAME PAGE DIRECT TO SKIP
```

```
819 1111 1053
820 1112 3314
821 1113 7410
822 1114 0000
823 1115 2314
824 1116 4533
825
826
827 1117 2314
828 1120 7410
829 1121 4533
830
831
832 1122 1050
833 1123 0325
834 1124 7410
835 1125 2525
836 1126 7440
837 1127 4533
838 1130 4536
839

TAD K7777 /AC TO 7777
DCA .+2 /AC TO 0000
SKP
0000 /ISZ TEST LOCATION
ISZ .-1 /SHOULD SKIP
CBERR /ISZ DID NOT SKIP
/*****
/TEST ISZ TO SAME PAGE DIRECT TO NOT SKIP
ISZ .-3 /SHOULD NOT SKIP
SKP
CBERR /ISZ SKIPPED WHEN NO SKIP EXPECTED
/*****
/TEST "AND" TO SAME PAGE DIRECT TO CLEAR ALL AC BITS
TAD K5252 /AC TO 5252
AND .+2 /AC TO 0000
SKP
2525 /OPERAND FOR AND SAME PAGE TEST
SZA
CBERR /AND TO SAME PAGE DIRECT FAILED
ENDTST
```

```
040
041
042
043
044
045 1131 4535
046 1132 1476
047 1133 1050
048 1134 7440
049 1135 4533
050
051
052 1136 1053
053 1137 3500
054 1140 1101
055 1141 7040
056 1142 7440
057 1143 4533
058
059
060 1144 2500
061 1145 4533
062
063
064 1146 1046
065 1147 3101
066 1150 1053
067 1151 0500
068 1152 1051
069 1153 7440
070 1154 4533
071
072
073
074 1155 1210
075 1156 3072
076 1157 0610
077 1160 1110
078 1161 7041
079 1162 1072
080 1163 7440
081 1164 4533
082 1165 4536
083 1166 5777
084 1177 1200
085
086
087
088
089 1200 4535
090 1201 1603
091 1202 7410
092 1203 0077
093 1204 1050

/*****
/CPU TEST 10 - TEST TAD, "AND", DCA AND ISZ INDIRECT THRU PAGE ZERO
/*****
/TEST OF TAD THRU PAGE ZERO INDIRECT
CPUT10, INTST
TAD I POINTC /AC TO 2526
TAD K5252 /AC TO 0000
SZA
CBERR /TAD INDIRECT THRU PAGE ZERO FAILED, OR AUTO-INDEXED.
/*****
/TEST DCA INDIRECT THRU PAGE ZERO
TAD K7777 /AC TO 7777
DCA I POINTB /7777 TO LOCATION "POINTC", AC TO 0000
TAD POINTC /AC TO 7777
CMA /AC TO 0000
SZA
CBERR /DCA INDIRECT THRU PAGE ZERO FAILED
/*****
/TEST ISZ INDIRECT THRU PAGE ZERO
ISZ I POINTB /LOCATION "POINTC" TO 0000, SKIP
CBERR /ISZ INDIRECT THRU PAGE ZERO FAILED TO SKIP
/*****
/TEST "AND" INDIRECT THRU PAGE ZERO
TAD K2525 /AC TO 2525
DCA POINTC /AC TO 0000
TAD K7777 /AC TO 7777
AND I POINTB /AC TO 2525
TAD K5253 /AC TO 0000
SZA
CBERR /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.
TAD 1010 /GET INITIAL CONTENTS OF 1010
DCA TESLOC /SAVE FOR LATER COMPARISON
AND I 1010 /REFERENCE 1010 INDIRECTLY
TAD 1010 /GET CONTENTS OF 1010
CIA /NEGATE IT
TAD TESLOC /COMPARE TO INITIAL CONTENTS
SZA /FINAL=INITIAL?
CBERR /NO, AUTO INDEX OCCURRED FOR LOCATION 1010
ENDTST
JMP CPUT11

PAGE
/*****
/CPU TEST 11 - TEST TAD, DCA, ISZ, & "AND" INDIRECT THRU SAME PAGE
/*****
/TEST TAD INDIRECT THRU SAME PAGE
CPUT11, INTST
TAD I ,+2 /AC TO 2526
SKP
POINTC+1 /POINTER FOR TAD INDIRECT THRU SAME PAGE
TAD K5252 /AC TO 0000
```

```
094 1205 7440
095 1206 4533
096
097
098 1207 1053
099 1210 3612
100 1211 7410
101 1212 0101
102 1213 1101
103 1214 7040
104 1215 7440
105 1216 4533
106
107
108 1217 2622
109 1220 4533
110 1221 7410
111 1222 0101
112
113
114 1223 1046
115 1224 3101
116 1225 1053
117 1226 0630
118 1227 7410
119 1230 0101
120 1231 1051
121 1232 7440
122 1233 4533
123 1234 4536
124
125
126
127
128 1235 4535
129 1236 1046
130 1237 3010
131 1240 1010
132 1241 1051
133 1242 7440
134 1243 4533
135
136
137 1244 3101
138 1245 1046
139 1246 3102
140 1247 1100
141 1250 3010
142 1251 1410
143 1252 1051
144 1253 7440
145 1254 4533
146
147
148

SZA
CBERR /TAD INDIRECT THRU SAME PAGE FAILED
/*****
/TEST DCA INDIRECT THRU SAME PAGE
TAD K7777 /AC TO 7777
DCA I ,+2 /AC TO 0000
SKP
POINTC /POINTER FOR DCA INDIRECT THRU SAME PAGE
TAD POINTC /AC TO 7777
CMA
SZA
CBERR /DCA INDIRECT THRU SAME PAGE FAILED
/*****
/TEST ISZ INDIRECT THRU SAME PAGE
ISZ I ,+3 /LOCATION "POINTC" TO 0000, SKIP
CBERR /ISZ INDIRECT THRU SAME PAGE FAILED TO SKIP
SKP
POINTC
/*****
/TEST "AND" INDIRECT THRU SAME PAGE
TAD K2525 /AC TO 2525
DCA POINTC /
TAD K7777 /AC TO 7777
AND I ,+2 /AC TO 2525
SKP
POINTC /POINTER FOR "AND" INDIRECT THRU SAME PAGE
TAD K5253 /AC TO 0000
SZA
CBERR /"AND" INDIRECT THRU SAME PAGE FAILED
ENDTST
/*****
/CPU TEST 12 - TEST AUTO-INDEX
/*****
/TEST AUTO-INDEX TO NOT INCREMENT WHEN NOT INDIRECTLY ADDRESSED.
CPUT12, INTST
TAD K2525 /AC TO 2525
DCA 10 /ADDRESS 10 TO 2525
TAD 10 /AC TO 2525
TAD K5253 /AC TO 0000
SZA
CBERR /AUTO-INDEX INCREMENTED WHEN NOT INDIRECTLY ADDRESSED
/*****
/TEST AUTO-INDEX TO INCREMENT WHEN INDIRECTLY ADDRESSED
DCA POINTC /CLEAR LOCATION "POINTC"
TAD K2525 /AC TO 2525
DCA POINTD /LOCATION "POINTD" TO 2525
TAD POINTB
DCA 10 /SET LOCATION 10 TO THE ADDRESS OF "POINTC"
TAD I 10 /LOCATION "POINTD"'S CONTENTS TO AC, AC TO 2525
TAD K5253 /AC TO 0000
SZA
CBERR /AUTO-INDEX FAILED TO INCREMENT
/AUTO-INDEX DECODER OPEN ON INPUT FROM BITS 0-3
/*****
/TEST BIT 8 INPUT OF AUTO-INDEX DECODER BY ADDRESSING LOCATION 0007
```

```
949 /INDIRECTLY AND CHECKING THAT AUTO-INDEXING DID NOT OCCUR
950 DCA 7 /CLEAR LOCATION 0007
951 TAD I 7 /REFERENCE LOCATION 0007 INDIRECTLY
952 CLA /CLEAR AC
953 TAD 7 /GET CONTENTS OF LOCATION 0007
954 SZA /DOES IT STILL CONTAIN 0000?
955 CBERR /NO, LOCATION 0007 AUTO-INDEXED
956 /*****
957 /TEST AUTO-INDEX DECODER INPUT FROM BITS 4 THRU 7, BY REFERENCING
958 /ADDRESS 0030 INDIRECTLY AND CHECKING THAT AUTO-INDEXING DID NOT OCCUR
959 TAD 30 /GET INITIAL CONTENTS OF LOC 0030
960 DCA TESLOC /SAVE IT FOR COMPARISON
961 AND I 30 /REFERENCE 30 INDIRECTLY
962 TAD 30 /GET FINAL CONTENTS OF LOC 30
963 CMA
964 IAC /COMPLEMENT IT FOR COMPARE
965 TAD TESLOC /COMPARE TO INITIAL CONTENTS
966 SZA /WAS LOC 30 AUTO-INDEXED?
967 CBERR /YES, LOC 30 AUTO-INDEXED
968 ENDTST
969 /*****
970 /CPU TEST 13 - TEST INTERNAL IOT INSTRUCTIONS
971 /*****
972 /TEST GTF TO SAVE LINK
973 CPU13, INTST
974 CLL /CLEAR LINK
975 CML /LINK TO 1
976 GTF
977 SMA
978 CBERR /GTF DID NOT SAVE A 1 FOR LINK
979 CLA CLL
980 RDF /GET DATA FIELD
981 RTR
982 RAR /MOVE DF TO AC 9-11
983 RIF /GET INSTRUCTION FIELD
984 DCA SAVFLD
985 /*****
986 /TEST RTF TO RESTORE LINK
987 TAD K4000 /AC TO 4000
988 TAD SAVFLD /GET CORRECT IF AND DF INFORMATION
989 RTF /RESTORE LINK TO 1
990 JMP ,+1 /ENABLE INTERRUPT FOR CONSOLE INTERACTION.
991 SNL
992 CBERR /RTF DID NOT RESTORE LINK TO A 1
993 /*****
994 /TEST GTF TO SAVE A LINK OF 0, AND INT REQUEST AND INT ENABLE OF 0
995 IOF
996 CLA CLL /CLEAR AC AND LINK
997 GTF /GET FLAGS, LINK TO AC0
998 AND K7600 /ELIMINATE SAVE FIELD REGISTER AND USER BIT
999 SZA /LINK, INT REQUEST, AND INT ENABLE ALL ZERO?
1000 CBERR /NO, GTF DID NOT SAVE CORRECTLY.
1001 /IF BIT0=1 LINK WAS SAVED AS 1 INSTEAD OF 0
1002 /IF BIT2=1 INT REQUEST WAS SAVED AS 1 INSTEAD OF 0
1003 /IF BIT4=1 INT ENABLE WAS SAVED AS 1 INSTEAD OF 0
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1004 /*****
1005 /TEST CAF TO CLEAR AC AND LINK
1006 ION
1007 CMA /AC TO 7777
1008 CML /AC=7777 LINK TO 1
1009 CAF /CLEAR ALL FLAGS, CLEARS AC AND LINK, AND INT ENABLE
1010 KIE1 /DISABLE SLU#2
1011 KIE2 /DISABLE SLU#3
1012 SNA
1013 SZL
1014 CBERR /CAF FAILED TO CLEAR AC OR LINK
1015 /*****
1016 /TEST SKON TO NOT SKIP WHEN INTERRUPT ENABLE IS CLEAR
1017 SKON /SHOULD NOT SKIP
1018 SKP
1019 CBERR /SKON SKIPPED WHEN INT ENABLE CLEAR, OR CAF FAILED
1020 /TO CLEAR INT ENABLE
1021 /*****
1022 /TEST SKON TO SKIP ON INTERRUPT ON AND TURN INTERRUPT OFF
1023 ION /INTERRUPT ON,
1024 SKON /SKIP IF INTERRUPT ON, TURN INTERRUPT OFF
1025 CBERR /ION DID NOT ENABLE INTERRUPT, OR SKON FAILED TO SKIP
1026 /*****
1027 /TEST THAT SKON TURNED OFF INTERRUPT
1028 SKON /SHOULD NOT SKIP
1029 SKP
1030 CBERR /SKON DID NOT TURN OFF INT, OR SKON SKIPS WHEN INT OFF
1031 /*****
1032 /TEST IOF TO DISABLE INTERRUPTS
1033 ION /ENABLE INTERRUPTS
1034 NOP /ALLOWS TIME FOR INTERRUPT DELAY TO SET
1035 IOF /TURN OFF INTERRUPT
1036 SKON
1037 SKP
1038 CBERR /IOF DID NOT DISABLE INTERRUPT
1039 JMP INTEN1
1040
1041 PAGE
1042 /*****
1043 /TEST PROPER OPERATION OF INT ENABLE,
1044 INTEN1, ION /INTERRUPT ON
1045 GTF /SHOULD GET A 1 FOR INT ENABLE
1046 AND K200 /MASK OUT INT ENABLE BIT
1047 SNA /SKIP IF INT ENABLE BIT SET
1048 CBERR /ION DID NOT SET INT ENABLE OR GTF DID NOT GET A 1 FOR INT ENABLE
1049 /*****
1050 /TEST RTF TO SET INT ENABLE AND TO CLEAR LINK
1051 IOF /CLEAR INT ENABLE
1052 CLA CLL /SET LINK
1053 CML /GET IF AND DF INFORMATION
1054 TAD SAVFLD /RESTORE FLAGS, LINK TO 0, SET INTERRUPT ENABLE
1055 RTF /ENABLE INTERRUPT FOR CONSOLE INTERACTION.
1056 JMP ,+1
1057 SZL
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1058 1414 4533      CSERR      /RTF DID NOT CLEAR LINK
1059 1415 6000      SKON       /SKIP IF INTERRUPT ON
1060 1416 4533      CSERR      /RTF FAILED TO ENABLE INTERRUPTS
1061
1062
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        /SRQ SKIPPED WHEN NO INTERRUPT, OR ILLEGAL INTERRUPT
1067 1423 4533      CSERR      /CAME UP DURING SRQ INSTRUCTION.
1068
1069 1424 4536      ENDIST
1070
1071
1072
1073
1074 1425 4535      /*****
/CPU TEST 14 - TEST JUMPS AND JMS'S
1075 1426 7300      /*****
1076 1427 1066      /TEST JUMP DIRECT
1077 1430 3000      CPUT14, INTST
1078 1431 5233      CLA CLL     /CLEAR AC AND LINK
1079 1432 4533      TAD        KSTOP
1080
1081
1082 1433 4235      DCA        0      /PUT CSERR IN LOC 0 IN CASE JUMP FAILS TO GATE MD TO PC
1083 1434 4533      JMP        +2     /FIRST JUMP TESTED
1084 1435 0000      CSERR      /JMP FAILED TO JUMP DIRECT
1085 1436 1235      /*****
1086 1437 7040      /TEST JMS DIRECT
1087 1440 7001      JMS        +2     /JMS FAILED TO JUMP
1088 1441 1103      JMSLOC, 0      /JMS ENTRY POINT, PC STORAGE,
1089 1442 7440      TAD        -1     /GET STORED PC
1090 1443 4533      CMA
1091
1092
1093 1444 5646      IAC        /COMPLEMENT IT
1094 1445 4533      TAD        POINTE
1095 1446 1447      SZA
1096
1097
1098 1447 4651      CSERR      /JMS DID NOT STORE PROPER PC
1099 1450 4533      /*****
1100 1451 1452      /TEST JUMP INDIRECT TO JUMP CORRECTLY
1101 1452 0000      JMP I +2
1102 1453 1252      CSERR      /JMP INDIRECT FAILED TO JUMP
1103 1454 7040      +1         /POINTER FOR JMP INDIRECT ABOVE
1104 1455 7001      /*****
1105 1456 1104      /TEST JMS INDIRECT TO JUMP AND STORE PC
1106 1457 7440      JMS I +2
1107 1460 4533      CSERR      /JMS INDIRECT FAILED TO JUMP
1108 1461 4536      +1         /JMS INDIRECT PC STORAGE
1109
1110
1111
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1120 1462 4535      JMSLOC, 0
1121 1463 3101      TAD        -1
1122 1464 7410      CMA
1123 1465 7300      IAC        /COMPLEMENT STORED PC
1124 1466 2101      TAD        POINTF /COMPARE IT TO EXPECTED VALUE
1125 1467 7020      SZA        /WAS IT EQUAL?
1126 1470 1101      CSERR      /NO, JMS INDIRECT STORED INCORRECT PC.
1127 1471 1052      ENDIST
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1120 1462 4535      /FOR EACH OF THE INSTRUCTIONS
1121 1463 3101      /EXECUTED, A TOTAL OF 8 PATTERNS OF AC, MQ, AND LINK CONTENTS ARE USED.
1122 1464 7410      /TO TEST FOR ERRORS IN THE EXECUTED INSTRUCTION A SIMULATION OF THE
1123 1465 7300      /INSTRUCTION IS ALSO PERFORMED, AND THE RESULTS OF THE INSTRUCTION ARE
1124 1466 2101      /COMPARED TO THE SIMULATION.
1125 1467 7020      /*****
1126 1470 1101      /CREATE THE INSTRUCTION TO BE USED. INSTRUCTION RANGE IS 7XX0, 7XX1.
1127 1471 1052      CPUT15, INTST
1128 1472 7700      DCA        POINTC /INITIALIZE INSTRUCTION MAKER
1129 1473 5777      SKP
1130 1474 7300      NXTONE, CLA CLL
1131 1475 1101      ISZ        POINTC
1132 1476 7000      CML
1133 1477 7004      TAD        POINTC
1134 1480 1376      TAD        K7700
1135 1481 3315      SNA CLA      /ALL COMBINATIONS TRIED?
1136 1482 1375      JMP CPUDN    /YES, CPU TEST OVER
1137 1483 3177      CLA CLL
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1277 1741 2102 ISZ BIT6 /WAS IT SNA?
1278 1742 7440 SZA /YES,
1279 1743 7410 SKP /SNA WOULD HAVE SKIPPED
1280 1744 5324 JMP OUT /SNA WOULD NOT HAVE SKIPPED
1281 1745 2047 ISZ BIT7 /SZL?
1282 1746 7420 SNL /YES
1283 1747 5323 JMP OUT-1 /QUALIFIED SKIP
1284 1750 5324 JMP OUT /SZL WOULD NOT HAVE SKIPPED.
1285 1777 2400

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PAGE

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1286 /*****
1287 /GROUP 3 OPERATE SIMULATION
1288 2003 2057 GROUP3, ISZ SKPPED /INDICATE NO SKIP
1289 2001 2063 ISZ BIT4 /CLA?
1290 2002 7200 CLA /YES
1291 2003 2064 ISZ BIT5 /IS IT MQA?
1292 2004 5210 JMP ,+4 /YES
1293 2005 2007 ISZ BIT7 /IS IT MQL?
1294 2006 7421 MQL /YES
1295 2007 5515 JMP I TEST /COMPARE RESULTS
1296 2010 2007 ISZ BIT7 /IT IN MQA, IS IT ALSO MQL? (SWP)
1297 2011 5214 JMP DOSWAP /YES, DO A SWP.
1298 2012 7501 MQA /NO, JUST DO MQA.
1299 2013 5515 JMP I TEST /COMPARE RESULTS
1300 2014 3062 DOSWAP, DCA BIT3 /MQ TO AC
1301 2015 7501 MQA /SAVE PREVIOUS MQ
1302 2016 3063 DCA BIT4 /GET PREVIOUS AC
1303 2017 1062 TAD BIT3 /PUT IN MQ
1304 2020 7421 MQL /PUT PREVIOUS MQ IN AC.
1305 2021 1063 TAD BIT4 /TEST RESULTS
1306 2022 5515 JMP I TEST
1307 /*****
1308 /COMPARE RESULTS OF SIMULATION TO ACTUAL RESULTS
1309 /*****
1310 /TEST LINKS
1311 2023 3072 TESTS, DCA BIT11 /SAVE SIMULATED AC
1312 2024 7004 RAL /LINK TO AC 11
1313 2025 3007 DCA BIT7 /SAVE SIMULATED LINK
1314 2026 1007 TAD BIT7 /GET EXPECTED LINK
1315 2027 1056 TAD LKWS /ADD IN LINK OBTAINED
1316 2030 3062 DCA BIT3 /SET ERROR INDICATOR IF LINKS DIFFERENT
1317 /CLEAR ERROR INDICATOR IF LINKS SAME
1318
1319 /*****
1320 /LINKS AGREE, TEST THE AC CONTENTS
1321 2031 1072 TAD BIT11 /GET EXPECTED AC CONTENTS
1322 2032 7004 CMA /COMPLEMENT IT
1323 2033 7001 IAC /COMPARE TO ACTUAL RESULTS
1324 2034 1054 TAD ACWAS /SAME?
1325 2035 7440 SZA /NO, SET ERROR INDICATOR
1326 2036 3062 DCA BIT3
1327 /*****
1328 /AC CONTENTS OK, TEST MQ CONTENTS
1329 2037 7521 SWP /MQ TO AC
1330 2040 3065 DCA BIT8 /SAVE MQ

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1331 2041 1065 TAD BIT8
1332 2042 7004 CMA
1333 2043 7001 IAC /COMPLEMENT IT
1334 2044 1055 TAD MQWAS /COMPARE TO ACTUAL RESULTS
1335 2045 7440 SZA /SAME?
1336 2046 3062 DCA BIT3 /NO, SET ERROR INDICATOR
1337 /*****
1338 /CHECK FOR SIMULATED INSTRUCTION AND ACTUAL INSTRUCTION TO BOTH HAVE
1339 /SKIPPED OR BOTH TO HAVE NOT SKIPPED
1340 2047 1057 SKPCHK, TAD SKPPED /GET SKIP INDICATOR
1341 2050 7010 RAR /AC 11 TO LINK
1342 2051 7200 CLA
1343 2052 7420 SNL /BOTH SKIP OR BOTH NOT SKIP?
1344 2053 5255 JMP SINERR /YES, BOTH SKIPPED OR BOTH DIDN'T
1345
1346 2054 4533 SPE1, CSERR /THE INSTRUCTION SKIPPED WHEN EXECUTED, AND A
1347 /SIMULATION OF THE SAME INSTRUCTION DID NOT, OR VICE VERSA.
1348 /*****
1349 /TEST FOR ANY SIMULATION DATA ERRORS
1350 2055 1062 SINERR, TAD BIT3 /GET ERROR INDICATOR
1351 2056 7450 SNA /ANY SIMULATION ERRORS?
1352 2057 5261 JMP TESTPT /NO
1353
1354 2060 4533 SPE2, CSERR /OPERATE INSTRUCTION FAILED.
1355 /*****
1356 /SIMULATION AGREES WITH ACTUAL, SEE IF ALL DATA PATTERNS HAVE
1357 /BEEN TRIED WITH THIS INSTRUCTION.
1358 2061 2177 TESTPT, ISZ DATPAT /ALL PATTERNS TRIED?
1359 2062 5303 JMP TRNXPT /NO, TRY NEXT PATTERN
1360 2063 3067 DCA ACDATA
1361 2064 3070 DCA MQDATA
1362 2065 3071 DCA LKDATA
1363 2066 1505 TAD I INSTTR /GET INSTRUCTION
1364 2067 7010 RAR /BIT11 TO LINK
1365 2070 7430 SZL /HAS INSTRUCTION BEEN TRIED WITH BIT11=1?
1366 2071 5732 JMP I NXTONN /YES, DO NEXT INSTRUCTION (JMP TO NXTONE)
1367 2072 2505 ISZ I INSTTR /UPDATE INSTRUCTION
1368 2073 0045 AND K200 /MASK OUT MQ TYPE BIT
1369 2074 7450 SNA /MQ TYPE?
1370 2075 5733 JMP I TESAGG /NO, GO DO IT
1371 2076 7200 CLA
1372 2077 1505 TAD I INSTTR /MASK OUT BITS NOT ALLOWED(EAE)
1373 2100 0377 AND (7721
1374 2101 3505 DCA I INSTTR /JMP TO TESAGN
1375 2102 5733 JMP I TESAGG
1376 /*****
1377 /CREATE NEXT DATA SET UP
1378 /*****
1379 2103 7000 TRNXPT, NOP/JMS POINT
1380 2104 1177 TAD DATPAT
1381 2105 7010 RAR /AC BIT TO LINK
1382 2106 7200 CLA
1383 2107 1046 TAD K2525
1384 2110 7420 SNL /AC TO BE SET?
1385 2111 7200 CLA /NO

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1386 2112 3867 DCA ACDATA
1387 2113 1177 TAD DATPAT
1388 2114 7012 RTR
1389 2115 7200 CLA
1390 2116 1505 TAD I INSTTR
1391 2117 7420 SNL /NO TO BE SET?
1392 2120 7200 CLA /NO
1393 2121 3870 DCA MODATA
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 3871 DCA LKDATA
1400 2130 5731 JMP I NXTPTT /JMP TO NXTPAT
1401 2131 1504 NXTPTT, NXTPAT
1402 2132 1465 NXTONN, NXTONE
1403 2133 1502 TESAGO, TESAGN
1404 2134 4530 CPUDN, ENDTST
1405 2135 3875 DCA TSTNO /CLEAR TEST NUMBER
1406 2136 5776 JMP BEGEXM
1407
1408
1409 2176 3800
1410 2177 7721
1411 2200
1412 PAGE
1413 /ROUTINE TO PRINT "CPU TESTING" MESSAGE
1414 PCPUMS, 0
1415 C8CRLF
1416 C8PRNT
1417 CPUMES
1418 C8PRNT
1419 TESTMS
1420 C8CRLF
1421 JMP I PCPUMS
1422 CPUMES, TEXT "CPU "
1423
1424 2211 2540
1425 2212 0000
1426 2213 2405 TESTMS, TEXT "TESTING"
1427 2214 2324
1428 2215 1116
1429 2216 0700
1430
1431 /ROUTINE TO INITIALIZE FOR TEST
1432 TSTIN, 0
1433 CLA CLL
1434 ISZ TSTNO /INCREMENT TEST NUMBER
1435 NOP
1436 TAD TSTIN /GET TEST LOOP ADDRESS
1437 DCA TSLOP /SAVE TEST LOOP ADDRESS
1438 JMP I TSTIN
1439 TSLOP, 0
1440

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1435 /ROUTINE TO HANDLE SCOOP LOOPING AT END OF TEST IF ERROR OCCURRED
1436 TSTEND, 0
1437 CLA CLL
1438 KRCHK /CHECK FOR CONSOLE REQUEST
1439 TAD PSR /CHECK PSEUDO SWITCH REGISTER
1440 RTL /FOR BIT 2=1 TEST LOOP
1441 SWA CLA /SKIP IF SET
1442 JMP I TSTEND /CONTINUE TO NEXT TEST
1443 JMP I TSLOP /LOOP ON CURRENT TEST
1444
1445 /ROUTINE TO CHECK FOR KEYBOARD INTERVENTION
1446 CHKKB, 0
1447 CLA CLL
1448 KIE /DISABLE KEYBOARD INTERRUPTS
1449 CHKKSF /CHECK FOR KEYBOARD FLAG
1450 NOP
1451 CLA IAC
1452 KIE /ENABLE KEYBOARD INTERRUPTS
1453 CLA CLL
1454 JMP I CHKKB
1455
1456
1457

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1458
1459          3000 *3000
1460          /*****
1461          /MEMORY EXTENSION TEST
1462          /*****
1463
1464
1465
1466
1467
1468
1469          /*****
1470          /MEMORY EXTENSION TEST 1
1471          /TEST CDF AND RDF, USE CDF TO SET THE DATA
1472          /FIELD AND RDF TO READ THE DATA FIELD.
1473          /DO ALL COMBINATIONS 0 TO 3 & 7.
1474          /
1475          BEGEXM, CLA CLL
1476          IOP
1477          TAD PSR          /EXECUTE MEMORY EXTENSION TEST??????
1478          AND (0040)
1479          SZA CLA
1480          JMP BEGRTC      /NO
1481          FIXIL           /FIXUP INTERRUPT LINKAGE
1482          JMS PHMES       /PRINT MEMORY EXTENSION TESTING MESSAGE
1483                          /IF NOT UNDER APT CONTROL.
1484
1485          3010 4535 EXMT1, INTST
1486          3011 6007 CAF
1487          3012 6001 ION
1488          /
1489          DF0, CDF 00      /DF 0
1490          RDF
1491          SZA
1492          CBERR           /ERROR, CDF OR RDF FAILED.
1493          /
1494          DF7, CDF 70      /DF 7
1495          RDF
1496          TAD (7747)
1497          CMA            /AC = 0
1498          SZA
1499          CBERR           /ERROR, CDF OR RDF FAILED.
1500          /
1501          DF1, CDF 10      /DF 10
1502          RDF
1503          TAD (7767)
1504          CMA            /AC=0
1505          SZA
1506          CBERR
1507          /
1508          DF2, CDF 20      /DF2
1509          RDF
1510          TAD (7757)
1511          CMA            /AC=0
1512          SZA
1513          CBERR           /CDF2 OR RDF FAILED
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1513          /
1514          DF3, CDF 30      /DF 3
1515          RDF
1516          TAD (7747)
1517          CMA            /AC=0
1518          SZA
1519          CBERR           /CDF 3 OR RDF FAILED.
1520          /
1521          DF4, CDF 00      /DF 0
1522          RDF
1523          SZA
1524          CBERR           /CDF 0 OR RDF FAILED.
1525          SKON            /SKP IF ION, DISABLE INT SYSTEM.
1526          CBERR
1527          ENDTST
1528          /*****
1529          /CONSOLE PACKAGE REQUESTS ARE INHIBITED FROM HERE TO END OF EXT, MEMORY TESTS.
1530          /*****
1531          /MEMORY EXTENSION TEST 2
1532          /NOW TEST SAVE FIELD BITS 9-11 WITH
1533          /RIB, PI IS ENABLED, TELEPRINTER FLAG IS
1534          /USED FOR INTERRUPT, DO ALL COMBINATIONS 0 TO 3 & 7.
1535          /
1536          /THIS TEST OVERWRITES LOCATIONS 0 & 1 IN FIELD 0.
1537          /
1538          3056 4535 EXMT2, INTST
1539          3057 6201 CDF 00      /DF0
1540          3060 1376 TAD (JMP I 0
1541          3061 3001 DCA 1      /C(1)=JMP I 0
1542          3062 6041 TSF        /TEST TTY FLAG
1543          3063 4506 JMS I XTFLG /SET FLAG
1544          /
1545          IB0, ION          /ENABLE PI
1546          CLA              /AN INTERRUPT SHOULD OCCUR AFTER THIS INST IS EXECUTED.
1547          RIB              /READ SF
1548          SZA
1549          CBERR           /RIB FAILED.
1550          /
1551          IB1, CDF 10      /DF 1
1552          ION
1553          CLA              /INTERRUPT HERE
1554          PDF              /DF SHOULD BE 0 AFTER A PI
1555          SZA
1556          CBERR           /DF NOT CLEARED, OR NO PI.
1557          /
1558          RIB              /READ SF
1559          TAD (7776)
1560          CMA              /AC=0
1561          SZA
1562          CBERR           /RIB OR SF FAILED.
1563          /
1564          IB2, CDF 20      /DF 2
1565          ION
1566          CLA              /INTERRUPT HERE
1567          RDF              /SHOULD BE 0 AFTER PI
```

```
1560 3110 7440 SZA
1569 3111 4533 CBERR /DF NOT CLEARED, OR NO PI,
1570 /
1571 3112 1370 TAD (7775
1572 3113 6234 /AC=7777
1573 3114 7940 CMA /#0
1574 3115 7440 SZA
1575 3116 4533 CBERR /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 CBERR /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 CBERR /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 CBERR /DF NOT 0 AFTER PI,
1596 3140 6234 RIB
1597 3141 7440 SZA
1598 3142 4533 CBERR /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 CBERR /DF NOT 0,
1606 /
1607 3151 6234 RIB
1608 3152 1367 TAD (7774
1609 3153 7940 CMA
1610 3154 7440 SZA
1611 3155 4533 CBERR /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 3167 7774
1617 3170 7775
1618 3171 7776
1619 3172 7757
1620 3173 7767
1621 3174 7747
1622 3175 5200
```

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1623 3176 5400
1624 3177 0040 3200
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 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 5225 JMP DNF7 /NOT READY FOR FIELD 7 YET,
1650 3221 1376 TAD (CDF 70 /DO FIELD 7,
1651 3222 3207 DCA DFLO
1652 3223 1377 TAD (0007
1653 3224 3074 DCA NDF
1654 3225 5207 JMP DFLO
1655 3226 1042 DNF7, TAD K10
1656 3227 1207 TAD DFLO /INCR, CDF IOT
1657 3230 3207 DCA DFLO
1658 3231 2074 ISZ NDF
1659 3232 5207 JMP DFLO
1660 /
1661 3233 4510 TADI, JMS I XSTKS /RESET UP STKS,
1662 3234 7001 IAC
1663 3235 3074 DCA NDF /DF#=-1 AGAIN
1664 3236 1300 TAD CCDF /6201
1665 3237 1042 TAD K10
1666 3240 3241 DCA ,+1
1667 3241 6201 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 CSERR /AC,MQ=ACTUAL DATA READ FROM EXT. FIELD,EXPECTED DATA
1679 3255 2107 UPSTK, ISZ STKS /ALL WHEN 0
1680 3256 7410 SKP
1681 3257 5276 JMP IBSF /NEXT TEST
1682 3260 1107 TAD STKS /IF STKS=-1 CHECK FIELD 7.
1683 3261 7040 CMA
1684 3262 7640 SZA CLA
1685 3263 5271 JMP TNF7 /NOT READY FOR FIELD 7 YET.
1686 3264 1376 TAD (CDF 70 /CHECK FIELD 7.
1687 3265 3241 DCA TFLD
1688 3266 1377 TAD (0007
1689 3267 3074 DCA NDF
1690 3270 5241 JMP TFLD
1691 3271 1042 TNF7, TAD K10
1692 3272 1241 TAD TFLD /CDF IOT + 10
1693 3273 3241 DCA TFLD
1694 3274 2074 ISZ NDF
1695 3275 5241 JMP TFLD
1696 3276 4536 IBSF, ENDIST
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 IS 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 CDF, 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 LCDP
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 LCDP, CDF 00
1749 3331 6241 TSF
1750 3332 4506 JMS I XTFLG /ENSURE TIO FLAG SET.
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 /UNDEP TEST.
1764 3347 6001 ION
1765 3350 7000 NOP
1766 3351 5352 JMP ,+1 /INTERRUPT SHOULD OCCUR AFTER THIS JMP.
1767 3352 4533 CSERR /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
1775 3362 6234 RIB /LOAD MQ
1776 3363 4533 CAD, CSERR /ERROR. I.B. TO I.F. TRANSFER
1777 /
1778 /FAILED AFTER CIF-JMP. BAD
1779 /I.F. IN AC, GOOD I.F. IN MQ.
1780 3364 5771 JMP CIFOK
1781 3365 0000 CIFCK, 0
1782 3366 3347 CAB, CIFJMP+1
1783 3367 3422 CAC, CIFJMS+1
1784 3371 3400
1785 3372 6202
1786 3373 7402
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1787 3374 5430
1788 3375 2400
1789 3376 6271
1790 3377 0007
1791 3400 2147
1792 3401 5777
1793 3402 7230
1794 3403 6201
1795 3404 6441
1796 3405 4506
1797 3406 1376
1798 3407 3221
1799 3410 3244
1800 3411 4510
1801 3412 2107
1802 3413 1221
1803 3414 1442
1804 3415 3221
1805 3416 1244
1806 3417 1042
1807 3420 3244
1808 3421 6202
1809
1810 3422 6001
1811 3423 7000
1812 3424 4225
1813 3425 0000
1814 3426 4533
1815 3427 6234
1816 3430 7041
1817 3431 1244
1818 3432 7650
1819 3433 5240
1820 3434 1244
1821 3435 7421
1822 3436 6234
1823 3437 4533
1824
1825
1826 3440 2107
1827 3441 5213
1828 3442 4536
1829 3443 5245
1830 3444 0000
1831
1832
1833
1834
1835
1836
1837
1838
1839 3445 4535
1840 3446 4510

PAGE
CIFOK, ISZ STKS /DONE?
JMP CIFJPL /NO, DO NEXT FIELD
18SF1, CLA /TEST CIF-JMS
CDF 00 /ENSURE TTO FLAG SET.
TSF
JMS I XTFLG /INIT. TO CIF 00.
(CIF
DCA CIFJMS /INIT. I.F. CHECK TO 0.
DCA CIFCK1 /INITIALIZE STKS.
JMS I XSTKS /FIELD 0 NOT TESTED.
ISZ STKS
CIFJSL, TAD CIFJMS
TAD K10
DCA CIFJMS
TAD CIFCK1
TAD K10
DCA CIFCK1
CIFJMS, CIF 00 /MODIFIED TO CURRENT FIELD
/UNDER TEST.
ION
NOP
JMS ,+1 /INTERRUPT SHOULD OCCUR AFTER THIS JMS.
0
CBERR /ERROR. NO PI OR INHIBIT PI.
RIB
CIA
TAD CIFCK1
SNA CLA
JMP CIFOK1
TAD CIFCK1
MOL
RIB
CAE, CBERR /ERROR. I.B. TO I.F. TRANSFER
/FAILED AFTER CIF-JMS. BAD
/I.F. IN AC, GOOD I.F. IN MO.
CIFOK1, ISZ STKS /DONE?
JMP CIFJSL /NO, DO NEXT FIELD.
ENDTST /YES, GO ON TO NEXT TEST
JMP EXMT5
CIFCK1,0
/
/*****
/MEMORY EXTENSION TEST 5
/TEST GTF FOR FLAG AND SAVE FIELDS
/GET SAVE FIELDS AFTER INTERRUPT
/CHECK INTERRUPT INHIBIT, DO ALL
/COMBINATIONS 0 TO 3.
/
EXMT5, INTST
JMS I XSTKS
```

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1841 3447 1375
1842 3450 3001
1843 3451 1374
1844 3452 3261
1845 3453 1761
1846 3454 0373
1847 3455 7120
1848 3456 7010
1849 3457 7012
1850 3460 3310
1851 3461 6201
1852 3462 6441
1853 3463 4506
1854 3464 6001
1855 3465 7340
1856 3466 6024
1857 3467 3311
1858 3470 1311
1859 3471 7041
1860 3472 1310
1861 3473 7650
1862 3474 5301
1863 3475 1310
1864 3476 7421
1865 3477 1311
1866 3500 4533
1867 3501 1042
1868 3502 1261
1869 3503 3261
1870 3504 2107
1871 3505 5253
1872 3506 4536
1873 3507 5772
1874 3510 0000
1875 3511 0000
1876
1877 3572 3600
1878 3573 0070
1879 3574 6201
1880 3575 5400
1881 3576 6202
1882 3577 3340
1883
1884
1885
1886
1887
1888
1889
1890 3600 4535
1891 3601 1377
1892 3602 3001
1893 3603 1376
1894 3604 3002

TAD (JMP I 0 /SET FOR RETURN
DCA 1
TAD (CDF
DCA XSDF
MGTF, TAD XSDF /GET FIRST FIELD
AND (0070 /INT REQUEST FLAG.
STL
RAR
RTR
DCA XSAV
XSDF, CDF 00 /ENSURE TTY FLAG SET.
TSF
JMS I XTFLG
ION
CLA CLL CMA /INTERRUPT HERE,CHECK FOR JAM ON GTF
GTF /GET THE FLAGS
DCA FSAV
TAD FSAV
CIA
TAD XSAV /TTY + CURRENT FIELD
SNA CLA
JMP CKMF
TAD XSAV
MOL
TAD FSAV
CKMF, TAD K10 /AC,MQ=ACTUAL FLAGS,EXPECTED FLAGS
TAD XSDF
DCA XSDF
ISZ STKS /MORE FIELDS TO CHECK
JMP MGTF
ENDTST /YES, GO TO NEXT TEST
JMP EXMT6
XSAV, 0
FSAV, 0
/
PAGE
/*****
/MEMORY EXTENSION TEST 6
/TEST ION AND LINK FROM RTF
/TEST INTERRUPT INHIBIT BEFORE JMP
/GET THE FLAGS WITH GTF.
/
/THIS TEST OVERWRITES LOCATIONS 1 & 2 IN FIELD 0,
EXMT6, INTST /TTY FLAG SET BEFORE ENTRY TO TEST.
TAD (ISZ 0
DCA 1
TAD (JMP I 0
DCA 2
```



```
1895 3605 6005 RTF /LOADS IS & DF,EN INT.,SETS INT INH.
1896 3606 5207 JMP .+1 /INTERRUPT HERE;JMP LOADS IF FROM IS,CLRS INT INH.
1897 3607 4533 CSERR /INTERRUPT WAS INHIBITED.
1898 3610 6004 GTF
1899 3611 3264 DCA SFLGS
1900 3612 1264 TAD SFLGS
1901 3613 7041 CIA
1902 3614 1375 TAD (1000 /CHECK FOR LINK=0,INT REQ=1,INT EN=0
1903 3615 7650 SNA CLA
1904 3616 5223 JMP L61 /CHECK OK
1905 3617 1375 TAD (1000
1906 3620 7421 MQL
1907 3621 1264 TAD SFLGS
1908 3622 4533 CSERR /AC,M0=ACTUAL FLAGS,EXPECTED FLAGS
1909 3623 1374 TAD (5200
1910 3624 6005 RTF
1911 3625 7240 CLA CMA /CHECK FOR JAM ON GTF
1912 3626 6004 GTF /EXPECTED BITS ARE LINK=1,INT EN=1
1913 3627 3264 DCA SFLGS
1914 3630 1264 TAD SFLGS
1915 3631 7041 CIA
1916 3632 1373 TAD (4200 / (NO INT REQ - TTY FLAG BECAUSE
1917 3633 7640 SZA CLA / INT INH=1 TILL NEXT JMS OR JMP).
1918 3634 5253 JMP L62
1919 3635 6005 RTF /REPLACE ION,INT INH
1920 3636 7300 CLA CLL
1921 3637 6004 GTF
1922 3640 3264 DCA SFLGS
1923 3641 1264 TAD SFLGS
1924 3642 7041 CIA
1925 3643 1372 TAD (0200 /EXPECTED BITS ARE LINK=0,INT REQ=0 BECAUSE INT INH=1
1926 3644 7640 SZA CLA
1927 3645 5257 JMP RPERR /SOMETHING WRONG WITH FLAGS
1928 3646 5247 JMP .+1 /INTERRUPT HERE
1929 3647 4533 CSERR /INTERRUPT WAS INHIBITED.
1930 3650 7300 RTFRP, CLA CLL
1931 3651 4536 ENDTST
1932 3652 5771 JMP EXMT7
1933
1934 3653 1373 L62, TAD (4200
1935 3654 7421 MQL
1936 3655 1264 TAD SFLGS
1937 3656 4533 CSERR /AC,M0=ACTUAL FLAGS,EXPECTED FLAGS
1938 3657 1372 RPERR, TAD (0200
1939 3660 7421 MQL
1940 3661 1264 TAD SFLGS
1941 3662 4533 CSERR /AC,M0=ACTUAL FLAGS,EXPECTED FLAGS
1942 3663 5250 JMP RTFRP
1943 3664 0000 SFLGS, 0
1944 3771 4000
1945 3772 0200
1946 3773 4200
1947 3774 5200
1948 3775 1000
1949 3776 5400
```

```
1950 3777 2000 PAGE
1951 4000 /
1952 /*****
1953 /MEMORY EXTENSION TEST 7
1954 /CONFIDENCE CHECK ON ALL EXISTENT FIELDS.
1955 /MAKE SURE DCA 1 AND TAD 1 ARE TO CORRECT STACK.
1956 /MAKE SURE JUMP IS TO CORRECT STACK.
1957 /CHECK ALL COMBINATIONS.
1958 /FIELDS WILL CONTAIN THEIR DF NUMBER IN LOC.0
1959 /
1960 /THIS TEST OVERWRITES LOCATIONS 0,1,2,3, & 7 OF FIELDS 0,1,2, & 3.
1961 /
1962
1963 4000 4535 EXMT7, INTST
1964 4001 6002 IOF
1965 4002 3270 DCA NUNX
1966 4003 4510 JMS I XSTKS
1967 4004 1377 TAD (CDF
1968 4005 3206 DCA .+1
1969 4006 6201 FDWRD, CDF /MODIFIED UNDER TEST
1970 4007 4252 JMS FILCOR
1971 4010 2107 ISZ STKS /ARE ALL STACKS DONE
1972 4011 7410 SKP
1973 4012 5220 JMP CONCHK /CHECK RESULTS
1974 4013 1042 TAD K10
1975 4014 1206 TAD FDWRD
1976 4015 3206 DCA FDWRD /UPDATE FIELD CHANGE
1977 4016 2273 ISZ NUNX
1978 4017 5206 JMP FDWRD
1979 /
1980 4020 7300 CONCHK, CLA CLL
1981 4021 6201 CDF 00
1982 4022 3270 DCA NUNX
1983 4023 4510 JMS I XSTKS
1984 4024 1376 TAD (CIF
1985 4025 3226 DCA .+1 /START WITH FIELD 0
1986 4026 6202 CONCH, CIF /MODIFIED UNDER TEST
1987 4027 5775 JMP I (0001
1988 4030 3271 RETADD, DCA SNUMX
1989 4031 1271 TAD SNUMX
1990 4032 7041 CIA /RETURN HERE FROM FIELDS
1991 4033 1270 TAD NUNX
1992 4034 7650 SNA CLA
1993 4035 5242 JMP X1 /GOOD FIELD
1994 4036 1270 TAD NUNX
1995 4037 7421 MQL
1996 4040 1271 TAD SNUMX
1997 4041 4533 CSERR /AC,M0=ACTUAL DATA , EXPECTED DATA
1998 4042 2107 X1, ISZ STKS /CHECK ALL AVAILABLE STACKS.
1999 4043 7410 SKP
2000 4044 5266 JMP XRTF1
2001 4045 1226 TAD CONCH
2002 4046 1042 TAD K10
2003 4047 3226 DCA CONCH /UPDATE FIELD CHANGE
```

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2004 4050 2270 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, ENDIST
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
2036 4230
2037
2038
2039
2040
2041
2042
2043
2044
2045
2046 4200 4535
2047 4201 4510
2048 4202 4506
2049 4203 1377
2050 4204 3001
2051 4205 1376
2052 4206 3002
2053 4207 3275
2054 4210 1275
2055 4211 6005
2056 4212 5213
2057 4213 4533

```

PAGE  
 /\*\*\*\*\*  
 /MEMORY EXTENSION TEST 10  
 /TEST DF + IF FROM SAVE FIELD AFTER PI  
 /USE RTF TO SET IS & DF REG AND GTF TO GET THE FLAGS  
 /DO FIELD COMBINATIONS 00,11,22, 433.  
 /TEST CDI TO CHANGE DATA & INST FIELDS  
 /  
 /THIS TEST OVERWRITES LOCATIONS 0,1, & 2 IN FIELD 0.  
 /  
 /  
 EXMT10, INTST  
 JMS I XSTKS  
 JMS I XTFLG /SET TTY FLAG  
 TAD (ISZ 0  
 DCA 1  
 TAD (JMP I 0  
 DCA 2  
 DCA XTOR  
 XSRTF, TAD XTOR  
 RTF /MAKE DF XX + IF XX  
 JMP ,+1 /INTERRUPT HERE  
 CRERR /INTERRUPT WAS INHIBITED.

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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 MOL
2069 4227 1276 TAD SFLDS
2070 4230 4533 CRERR /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 DF XX + IF XX
2076 4236 4510 JMS I XSTKS
2077 4237 3275 DCA XTOR /CDI TEST
2078 4240 1275 XCDIL, TAD XTOR
2079 4241 0373 AND (0070
2080 4242 1372 TAD (CDI
2081 4243 3244 DCA ,+1
2082 4244 0000 ICDI, 0000 /CHANGE DATA AND INST FIELD TO XX
2083 4245 6001 ION
2084 4246 7000 NOP
2085 4247 5250 JMP ,+1 /INTERRUPT HERE
2086 4250 4533 CRERR /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 MOL
2098 4264 1276 TAD SFLDS
2099 4265 4533 CRERR /CDI FAILED TO SET DF & IF PROPERLY
2100
2101 4266 1275 L102, TAD XTOR /AC,MQ=ACTUAL DF & IF,EXPECTED DF & IF
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 ENDIST
2107 4274 5771 JMP EXMT11
2108 4275 0000 XTOR, 0
2109 4276 0000 SFLDS, 0
2110 4371 4400
2111 4372 6203
2112 4373 0070

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2113 4374 0011
2114 4375 0077
2115 4376 5400
2116 4377 2000 4400
2117
2118
2119
2120
2121
2122
2123
2124
2125
2126
2127 4400 4535
2128 4401 4510
2129 4402 2107
2130 4403 1377
2131 4404 3211
2132 4405 7001
2133 4406 3324
2134 4407 1376
2135 4410 3010
2136 4411 0000
2137 4412 7300
2138 4413 1211
2139 4414 6005
2140 4415 6002
2141 4416 7300
2142 4417 1324
2143 4420 3410
2144 4421 1375
2145 4422 3410
2146 4423 1374
2147 4424 3410
2148 4425 1373
2149 4426 3410
2150 4427 1372
2151 4430 3410
2152 4431 1371
2153 4432 3410
2154 4433 1370
2155 4434 3410
2156 4435 1367
2157 4436 3410
2158 4437 1366
2159 4440 3410
2160 4441 1365
2161 4442 3246
2162 4443 1111
2163 4444 3001
2164 4445 5646
2165 4446 0000
2166 4447 3325

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PAGE  
/\*\*\*\*\*  
/MEMORY EXTENSION TEST 11  
/TEST PROGRAM INTERRUPT IN ALL EXTENDED FIELDS  
/USE RTF, GTF, RDF AND RIF FOR CHECK  
/CHECK PC, AC, SF AND FLAGS AFTER PI  
/THIS TEST OVERWRITES LOCATIONS 0 & 1 IN FIELD 0; ALSO  
/LOCATIONS 0 - 10 IN FIELDS 1,2, & 3.  
/  
EXMT11, INTST  
JMS I XSTKS  
ISZ STKS /FIELD 0 NOT TESTED  
TAD (0011  
DCA IFDF  
IAC  
DCA XDATA  
TAD (7777  
DCA 0010  
IFDF, /SET TO CURRENT FIELD UNDER TEST  
CLA CLL  
TAD IFDF  
RTF /SET FIELDS AND TURN ION  
IOF  
CLA CLL  
TAD XDATA  
DCA I 0010  
TAD (ISZ 10  
DCA I 0010  
TAD (JMP 5  
DCA I 0010  
TAD (ION  
DCA I 0010 /ION FOR THAT FIELD  
TAD (1000  
DCA I 0010 /TAD FOR THAT FIELD  
TAD (CDF 00  
TAD (CIF 00  
DCA I 0010  
TAD (JMP I 10  
DCA I 0010  
TAD (FRET-1 /REMEMBER AUTO INDEX  
DCA I 0010  
TAD (0003  
DCA ADPS  
TAD JMPIR  
DCA 0001 /SET LOC 1 FOR RETURN AFTER PI  
JMP I ,+1 /GO TO THAT FIELD  
ADRS, 0000  
RET, DCA SDATA

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2167 4450 1325
2168 4451 7041
2169 4452 1324
2170 4453 7650
2171 4454 5261
2172 4455 1324
2173 4456 7421
2174 4457 1325
2175 4460 4533
2176
2177 4461 1000
2178 4462 7041
2179 4463 1364
2180 4464 7650
2181 4465 5272
2182 4466 1364
2183 4467 7421
2184 4470 1000
2185 4471 4533
2186
2187 4472 6214
2188 4473 6224
2189 4474 7440
2190 4475 4533
2191
2192 4476 6004
2193 4477 0363
2194 4500 3325
2195 4501 1325
2196 4502 7041
2197 4503 1211
2198 4504 7650
2199 4505 5312
2200 4506 1211
2201 4507 7421
2202 4510 1325
2203 4511 4533
2204
2205 4512 2107
2206 4513 7410
2207 4514 5322
2208 4515 7300
2209 4516 1377
2210 4517 1211
2211 4520 3211
2212 4521 5207
2213 4522 4536
2214 4523 5762
2215 4524 0000
2216 4525 0000
2217 4526 5331
2218 4527 4533
2219 4530 7410
2220 4531 4533
2221 4532 5312

```

L111, TAD 0000  
CIA  
TAD (0005  
SNA CLA  
JMP L111  
TAD XDATA  
MQL  
TAD SDATA  
CRERR /AC DATA FAILED DURING PI  
/AC,MQ=ACTUAL AC DATA,EXPECTED AC DATA  
TAD 0000  
CIA  
TAD (0005  
SNA CLA  
JMP L112  
TAD (0005  
MQL  
TAD 0000  
CRERR /PC FAILED DURING PI  
/AC,MQ=ACTUAL PC,EXPECTED PC  
L112, RDF  
RIF  
SEA  
CRERR /I,F, SHOULD BE 0 AFTER A PI  
/AC=ACTUAL I,F.  
GTF  
AND (0077  
DCA SDATA  
TAD SDATA  
CIA  
TAD IFDF  
SNA CLA  
JMP CONTDG  
TAD IFDF  
MQL  
TAD SDATA  
CRERR /GTF,RTF, OR SF FAILED  
/AC,MQ=ACTUAL FIELDS,EXPECTED FIELDS  
CONTDG, ISZ STKS  
SKP  
JMP XSFIB  
CLA CLL  
TAD (0011  
TAD IFDF  
DCA IFDF /SET FOR NEXT FIELD  
JMP IFDF-2  
XSFIB, ENDTST  
JMP EXMT12  
0  
SDATA, 0  
JMP NOPI /ERROR RETURN FROM EXTENDED FIELD,  
CRERR /GOT PI BUT DIDN'T CHANGE FIELDS.  
SKP  
NOPI, CRERR /NO PI  
JMP CONTDG

2222  
2223 4533 8000  
2224 4534 1361  
2225 4535 3107  
2226 4536 5733  
2227  
2228  
2229  
2230 4537 8000  
2231 4540 7200  
2232 4541 6040  
2233 4542 6041  
2234 4543 5342  
2235 4544 7200  
2236 4545 5737  
2237 4561 7774  
2238 4562 4600  
2239 4563 8077  
2240 4564 8005  
2241 4565 8003  
2242 4566 4525  
2243 4567 5410  
2244 4570 6202  
2245 4571 6201  
2246 4572 1000  
2247 4573 6001  
2248 4574 5005  
2249 4575 2010  
2250 4576 7777  
2251 4577 0011  
2252 4600

NSKTS, 0  
TAD (-4  
DCA SKTS  
JMP I NSKTS  
/SET TTY FLAG  
TFLG, 0  
CLA /SET OUTPUT FLAG ENABLE  
SPF  
TSF  
JMP ,=1  
CLA  
JMP I TFLG /EXIT

PAGE

2253  
2254  
2255  
2256  
2257  
2258  
2259  
2260  
2261  
2262  
2263  
2264  
2265 4600 4535  
2266 4601 6041  
2267 4602 4506  
2268 4603 6211  
2269 4604 1377  
2270 4605 3776  
2271 4606 1375  
2272 4607 3774  
2273 4610 1373  
2274 4611 3772  
2275 4612 1371  
EXMT12, INTST  
TSF /SEE IF FLAG IS SET.  
JMS I XTFLG /SET IT  
CDF 10 /DF=FIELD 1  
TAD (CDF 00 /SETUP RETURN FROM FIELD 1  
DCA I (0003 /IN CASE INST FAILS.  
TAD (CIF 00  
DCA I (0004  
TAD (JMP I 6  
DCA I (0005  
TAD (KKRTN

2276 4613 3770  
2277 4614 6201  
2278 4615 1367  
2279 4616 3776  
2280 4617 1366  
2281 4620 3001  
2282 4621 1365  
2283 4622 3002  
2284  
2285  
2286  
2287 4623 6001  
2288 4624 7000  
2289 4625 4533  
2290 4626 5235  
2291  
2292  
2293  
2294 4627 7200  
2295 4630 6211  
2296 4631 6212  
2297 4632 6244  
2298 4633 5776  
2299  
2300 4634 4533  
2301 4635 4536  
2302  
2303  
2304  
2305  
2306  
2307  
2308  
2309 4636 4535  
2310 4637 6042  
2311 4640 6241  
2312 4641 6244  
2313 4642 1660  
2314  
2315 4643 6201  
2316 4644 7440  
2317 4645 4533  
2318 4646 6241  
2319 4647 7300  
2320 4650 6005  
2321 4651 6002  
2322 4652 1660  
2323 4653 6201  
2324 4654 7440  
2325 4655 4533  
2326 4656 4536  
2327 4657 5764  
2328 4660 4661  
2329 4661 8000  
2330

DCA I (0006  
CDF 00 /DF=0  
TAD (JMP I KFLD0  
DCA I (0003  
TAD (JMP I 2  
DCA 1  
TAD (KRTN  
DCA 2  
/BEGIN TEST  
ION /ENABLE PI  
NOP  
CAG, CSERR /ERROR NO PI  
JMP RTRN  
/RETURN HERE AFTER PI  
KRTN, CLA  
CDF 10 /DF=FIELD1  
CIF 10 /IB=FIELD1  
RMF /IB SHOULD=FIELD0  
JMP I (0003 /IF SHOULD=FIELD0  
/KKRTN, CSERR /JMP WENT TO FIELD 1.  
RTRN, ENDTST  
/\*\*\*\*\*  
/MEMORY EXTENSION TEST 13  
/CHECK THAT RMF AND RTF INSTRUCTIONS ZERO MOST SIGNIFICANT BIT  
/OF DATA FIELD REGISTER.  
EXMT13, INTST  
TCF /CLEAR TTY OUTPUT FLAG ENABLE.  
CDF 40  
RMF  
TAD I KTEST /IF MOST SIGN BIT OF DF REG IS NOT ZERO  
/THEN THE INDIRECT WILL NOT OCCUR  
CDF 00  
SZA  
CSERR /RMF FAILED TO ZERO MOST SIGN. BIT OF DF REG.  
CDF 40  
CLA CLL  
RTF  
IOF  
TAD I KTEST  
CDF 00  
SZA  
CSERR /RTF FAILED TO ZERO MOST SIGN. BIT OF DF REG  
ENDTST  
JMP EXMT14  
KTEST, KTEST1  
KTEST1, 0

2331  
2332 4764 5000  
2333 4765 4627  
2334 4766 5402  
2335 4767 5514  
2336 4770 0000  
2337 4771 4634  
2338 4772 0005  
2339 4773 5406  
2340 4774 0004  
2341 4775 6202  
2342 4776 0003  
2343 4777 6201  
5000

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/MEMORY EXTENSION TEST 14 (UNUSED IOT TEST)  
/VERIFY THAT ALL UNUSED IOTS HAVE NO EFFECT ON SYSTEM  
/

2344  
2345  
2346  
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 3230 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 CBERR /IOT CAUSED INST SKIP  
2391 /AC,MQ=BAD IOT,AC DATA  
2392 5053 5240 JMP NXTIOT  
2393 5054 1320 ACCERR, TAD ACAIOT  
2394 5055 7421 MQL  
2395 5056 1230 TAD TSTIOT  
2396 5057 4533 CBERR /AC,MQ=BAD IOT, AC DATA AFTER IOT EXECUTION,  
2397 /((AC DATA BEFORE EXECUTION=5252)  
2398 5060 5240 JMP NXTIOT  
2399 5061 4536 EXIOTL, ENDTST  
2400 5062 3075 DCA TSTNO  
2401 5063 5770\* JMP BEGRTC /CLEAR TEST NUMBER  
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 0600 0600  
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  
2445 5200

PAGE  
/ROUTINE TO PRINT "MEMORY EXTENSION TESTING" MESSAGE

2446  
2447 5200 0000  
2448 5201 4521  
2449 5202 4522  
2450 5203 5210  
2451 5204 4522  
2452 5205 2713  
2453 5206 4521  
2454 5207 5600  
2455  
2456 5210 1505  
5211 1517  
5212 2231  
5213 4005  
5214 3024  
5215 5640  
5216 0000

PMEMES, 0  
C8CRLF  
C8PRNT  
MEMES  
C8PRNT  
TESTMS  
C8CRLF  
JMP I PMEMES

MEMES, TEXT "MEMORY EXT. "

2457  
2458  
2459  
2460 5217 0000  
2461 5220 1377  
2462 5221 3001  
2463 5222 1227  
2464 5223 3002  
2465 5224 1376  
2466 5225 3003  
2467 5226 5617  
2468 5227 5403  
2469  
2470 5230 0413  
5231 2624  
5232 0255  
5233 0140  
5234 0601  
5235 1114  
5236 0504  
5237 5440  
5240 0611  
5241 0514  
5242 0440  
5243 6040  
5244 4000

/ROUTINE TO RESTORE INTERRUPT LINKAGE TO NORMAL

FIXLKG, 0  
TAD (RMF  
DCA 1  
TAD KJMP3  
DCA 2  
TAD (SKPCHN  
DCA 3  
JMP I FIXLKG  
KJMP3, JMP I 3

ERRMES, TEXT "DKVTS=A FAILED, FIELD 0 "

2471  
2472  
2473

2474  
2475 5376 6200  
2476 5377 6244  
2477 5400

\*5400

\*\*\*\*\*  
/REAL TIME CLOCK TEST  
\*\*\*\*\*

2478  
2479  
2480  
2481  
2482  
2483  
2484  
2485  
2486  
2487  
2488  
2489 5400 7300  
2490 5401 6002  
2491 5402 1020  
2492 5403 0377  
2493 5404 7640  
2494 5405 5776  
2495 5406 4520  
2496 5407 4242  
2497 5410 4535  
2498 5411 1375  
2499 5412 3003  
2500 5413 6007  
2501 5414 6001  
2502 5415 4541  
2503 5416 4533  
2504 5417 6007  
2505 5420 6137  
2506 5421 7610  
2507 5422 4533  
2508 5423 4536  
2509 5424 5263  
2510  
2511 5425 4533  
2512 5426 5223  
2513  
2514  
2515  
2516 5427 0000  
2517 5430 3241  
2518 5431 6137  
2519 5432 7410  
2520 5433 5237  
2521 5434 2241  
2522 5435 5231  
2523 5436 7410  
2524 5437 2227  
2525 5440 5627  
2526 5441 0000  
2527

\*\*\*\*\*  
/REAL TIME CLOCK TEST 1 - CHECKS THAT CLOCK FLAG WILL SET AND  
/ THAT CAF WILL CLEAR IT, THE TEST IS  
/ CHECKED NOT TO INTERRUPT.  
\*\*\*\*\*

BEGRTC, CLA CLL  
IOF  
TAD PSR /EXECUTE REAL TIME CLOCK TEST?  
AND (0002  
SZA CLA  
JMP BEGBST /NO  
FIXIL /FIXUP INTERRUPT LINKAGE  
JMS PRTCHS /PRINT REAL TIME CLOCK TESTING MESSAGE  
RTCT1, INTST  
TAD (RTCI1 /PATCH INTERRUPT LINKAGE TO RETURN TO THIS  
DCA 3 / TEST ON INTERRUPT.  
CAF  
ION  
CLSKWT /WAIT FOR THE CLOCK FLAG TO SET  
CBERR /CLOCK FLAG FAILED TO SET  
CAF /CLEAR THE CLOCK FLAG  
CLSK /SKIP ON THE CLOCK FLAG  
CBERR /CAF FAILED TO CLEAR CLOCK FLAG OR CLSK SKIPPED  
RTCT1D, ENDTST  
JMP RTCT2

RTCI1, CBERR /CAF FAILED TO DISABLE CLOCK INT.  
JMP RTCT1D

/ROUTINE TO WAIT FOR THE REAL TIME CLOCK FLAG

WTCLSK, 0  
DCA RCNT  
CLSK /WAS THE CLOCK FLAG SET  
SKP /NO  
JMP ,+4 /YES  
ISZ RCNT  
JMP ,+4  
SKP  
ISZ WTCLSK  
JMP I WTCLSK  
RCNT, 0

```
2528 /ROUTINE TO PRINT "REAL TIME CLOCK TESTING" MESSAGE
2529
2530 PRTCMS, 0
2531 C8CRLF
2532 C8PRNT
2533 RTCMS
2534 C8PRNT
2535 TESTMS
2536 C8CRLF
2537 JMP I PRTCMS
2538
2539 RTCMS, TEXT "REAL TIME CLOCK "
2540
2541
2542
2543 /*****
2544 /REAL TIME CLOCK TEST 2 - CHECKS THAT CLOCK FLAG WILL SET AND THAT
2545 / IT CAN BE CLEARED BY CLCL. THE TEST IS
2546 / CHECKED NOT TO INTERRUPT.
2547 /*****/
2548
2549 RTCT2, INTST
2550 TAD (RTCI2
2551 DCA 3 /PATCH INTERRUPT LINKAGE TO RETURN TO THIS
2552 CAF / TEST ON INTERRUPT.
2553 ION
2554 CLSKWT /WAIT FOR THE CLOCK FLAG TO SET
2555 CBERR /CLOCK FLAG FAILED TO SET.
2556 CLCL /CLEAR THE CLOCK FLAG
2557 SKP CLA
2558 CBERR /CLCL SKIPPED
2559 CLSK /SKIP ON CLOCK FLAG
2560 SKP CLA /CLCL FAILED TO CLEAR CLOCK FLAG
2561 CBERR
2562 RTCT2D, ENDTST
2563 JMP RTCT3
2564
2565 RTCI2, CBERR /CAF FAILED TO DISABLE CLOCK INT.
2566 JMP RTCT2D
2567
2568 /*****
2569 /REAL TIME CLOCK TEST 3 - CHECK THAT CLOCK INT. ENABLE CAN BE SET
2570 / AND CLEARED BY DATA BIT 11 AND CLLE USING
2571 / THE CLOCK FLAG TO INTERRUPT ON.
2572 /*****/
2573
2574 RTCT3, INTST
2575 TAD (ISZ RTCIF /FIX UP INT. LINKAGE TO SET REAL TIME CLOCK
```

```
2576 DCA 2 / INTERRUPT FLAG AND RETURN HERE ON INT.
2577 TAD (JMP I 0
2578 DCA 3
2579 DCA RTCIF /CLEAR CLOCK INT. FLAG
2580 CAF /CLEAR ALL FLAGS
2581 ION
2582 CLSKWT /WAIT FOR THE CLOCK FLAG TO SET
2583 CBERR /CLOCK FLAG FAILED TO SET
2584 CLCL /CLEAR CLOCK FLAG AGAIN
2585 CLSK /SKIP ON CLOCK FLAG
2586 SKP CLA
2587 CBERR /CLCL FAILED TO CLEAR CLK FLAG
2588 CLA CLL IAC /SET DATA BIT 11 TO A ONE
2589 CLLE /TRY AND SET CLOCK INT. ENABLE
2590 SKP CLA
2591 CBERR /CLLE SKIPPED
2592 TAD RTCIF
2593 SZA CLA
2594 CBERR /PROGRAM INTERRUPTED WITH CLOCK FLAG CLEARED
2595 CLSKWT /WAIT FOR CLOCK FLAG TO SET
2596 CBERR /CLOCK FLAG FAILED TO SET
2597 TAD RTCIF
2598 SNA CLA
2599 CBERR /CLLE FAILED TO SET CLOCK INT. ENABLE
2600 / OR NO INTERRUPT OCCURRED.
2601 DCA RTCIF /CLEAR REAL TIME CLOCK INT. FLAG
2602 CLLE /CLEAR CLOCK INT. ENABLE
2603 ION /TURN THE INTERRUPT ON
2604 CLA CLL
2605 TAD RTCIF /GET THE REAL TIME CLOCK INT. FLAG
2606 SZA CLA /DID IT INTERRUPT?
2607 CBERR /YES--CLLE FAILED TO CLEAR CLOCK INT. ENABLE
2608 CLCL /CLEAR CLOCK FLAG
2609 CLSK /SKIP ON CLOCK FLAG
2610 SKP CLA
2611 CBERR /CLCL FAILED TO CLEAR FLAG
2612 ENDTST
2613 JMP RTCT4
2614
2615
2616
2617
2618
2619
2620
2621
2622
2623 PAGE
2624 /*****
2625 /REAL TIME CLOCK TEST 4 - CHECK THAT CLOCK INT. ENABLE CAN BE SET
2626 / AND THAT CAF WILL CLEAR IT USING THE CLOCK
2627 / FLAG TO INTERRUPT ON.
2628 /*****/
```

```

2629 5600 4535 RTCT4, INTST
2630 5601 3113 DCA RTCIF
2631 5602 6407 CAF /CLEAR ALL FLAGS
2632 5603 6001 ION
2633 5604 4541 CLSKWT /WAIT FOR THE CLOCK FLAG TO SET
2634 5605 4533 CBERR /CLOCK FLAG FAILED TO SET
2635 5606 7301 CLA CLL IAC
2636 5607 6135 CLLE /SET INTERRUPT ENABLE TO A ONE
2637 5610 7300 CLA CLL /SHOULD INTERRUPT HERE
2638 5611 1113 TAD RTCIF
2639 5612 7650 SWA CLA
2640 5613 4533 CBERR /PROGRAM FAILED TO INT, WITH CLOCK FLAG SET
2641 / AND CLOCK INT, ENABLED,
2642 5614 3113 DCA RTCIF /CLEAR CLOCK FLAG
2643 5615 6007 CAF /CLEAR ALL FLAGS AND DISABLE CLK INT,
2644 5616 6001 ION
2645 5617 4541 CLSKWT /WAIT FOR FLAG
2646 5620 4533 CBERR /CLOCK FLAG FAILED TO SET
2647 5621 1113 TAD RTCIF /GET THE CLOCK INT, FLAG
2648 5622 7640 SWA CLA /DID IT INTERRUPT?
2649 5623 4533 CBERR /CAF FAILED TO CLEAR CLOCK INT, ENABLE
2650 5624 6136 CLCL /CLEAR THE CLOCK FLAG
2651 5625 4536 ENDTST
2652 5626 5227 JMP RTCT5

```

```

/*****
/REAL TIME CLOCK TEST 5 - CHECK THAT THE THREE REAL TIME CLOCK IOTS
/ DON'T AFFECT THE AC.
/*****/

```

```

2659 5627 4535 RTCT5, INTST
2660 5630 6136 CLCL
2661 5631 6001 ION
2662 5632 7344 CLA CLL CMA RAL /-2
2663 5633 6135 CLLE /CLEAR CLOCK INT, ENABLE
2664 5634 1377 TAD (2
2665 5635 7440 SWA
2666 5636 4533 CBERR /CLLE CHANGED THE AC
2667 5637 7240 CLA CMA
2668 5640 6136 CLCL /CLEAR CLOCK FLAG
2669 5641 7001 IAC
2670 5642 7440 SWA
2671 5643 4533 CBERR /CLCL CHANGED THE AC
2672 5644 7240 CLA CMA
2673 5645 6137 CLSK /SKIP ON CLOCK FLAG
2674 5646 7000 NOP
2675 5647 7001 IAC
2676 5650 7440 SWA
2677 5651 4533 CBERR /CLSK CHANGED THE AC
2678 5652 7200 CLA
2679 5653 4536 ENDTST
2680 5654 5255 JMP RTCT6

```

```

/*****

```

```

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

```



```

2736
2737 5775 6400
2738 5776 5674
2739 5777 0002
      6000
2740
2741 /*****
2742 /BAUD RATE SWITCH TEST
2743 /*****
2744
2745 /THIS TEST READS BAUD RATE SWITCH AND DISPLAYS SETTING.
2746 /OPERATOR CAN CHANGE SWITCH SETTING &PRESS ANY KEY (EXCEPT RETURN)
2747 /      TO DISPLAY NEW SETTING.
2748 /OPERATOR EXITS TEST BY PRESSING THE RETURN KEY.
2749
2750 6000 7300  BEGBST, CLA CLL
2751 6001 6002      IOF
2752 6002 1022      TAD HCN2          /RUNNING UNDER APT CONTROL?
2753 6003 7710      SPA CLA
2754 6004 5225      JMP DOSLU        /YES-DON'T EXECUTE THIS TEST-CONTINUE
2755
2756 6005 1020      TAD PSR          /WITH SLU TESTING.
2757 6006 0377      AND (0001        /NO-IS BAUD SWITCH TEST REQUESTED?
2758 6007 7650      SNA CLA          /CHECK PSR BIT 11)
2759 6010 5225      JMP DOSLU        /NO-CONTINUE WITH SLU TESTING
2760 6011 4227      JMS PBRMS        /YES-PRINT BAUD RATE SWITCH TESTING MESSAGE
2761 6012 7300  BSTLP, CLA CLL
2762 6013 7604      LAS              /GET CURRENT SWITCH SETTING
2763 6014 0376      AND (0017        /MASK OFF UNWANTED BITS
2764 6015 1375      TAD (BASEP      /INDEX INTO BAUD RATE TABLE
2765 6016 3275      DCA TBLPTR
2766 6017 4521      C0CRLF          /PRINT A CARRIAGE RETURN & LINE FEED
2767 6020 4276      JMS PRIBRS        /PRINT DECIMAL SETTING
2768 6021 4247      JMS LISNSR        /LISTEN FOR A CHARACTER
2769 6022 1374      TAD (-015        /IS IT A CARRIAGE RETURN?
2770 6023 7640      SZA CLA
2771 6024 5212      JMP BSTLP        /NO-DISPLAY NEW SETTING
2772 6025 6213  DOSLU, CDI 10        /YES-EXIT TO SLU TESTING IN FIELD 1
2773 6026 5773      JMP CIREST
2774
2775 /ROUTINE TO PRINT "BAUD RATE SWITCH TESTING" MESSAGE
2776
2777 6027 0000  PBRMS, 0
2778 6030 4521      C0CRLF
2779 6031 4522      C0PRNT
2780 6032 6036      BRMS
2781 6033 4522      C0PRNT
2782 6034 2213      TESTMS
2783 6035 5627      JMP I PBRMS
2784
2785 6036 0201  BRMS, TEXT  "BAUD RATE SWITCH "
      6037 2504
      6040 4022
      6041 0124
      6042 0540

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      6043 2327
      6044 1124
      6045 0310
      6046 4000
2786
2787 /ROUTINE TO LISTEN FOR A KEYBOARD CHARACTER
2788
2789 6047 0000  LISNSR, 0
2790 6050 6031      KSF              /WAIT FOR KEYBOARD FLAG
2791 6051 5250      JMP ,=1
2792 6052 6036      KRB              /READ THE CHARACTER TYPED
2793 6053 0372      AND (177        /MASK TO 7 BIT ASCII
2794 6054 5647      JMP I LISNSR    /RETURN WITH CHAR IN AC
2795
2796 /BAUD RATE SWITCH TABLE
2797
2798 6055 0050  BASEP, 0050
2799 6056 0075      0075
2800 6057 0110      0110
2801 6060 0134      0134
2802 6061 0150      0150
2803 6062 0300      0300
2804 6063 0600      0600
2805 6064 1200      1200
2806 6065 0000  SD1, 0000          /1000
2807 6066 2000      2000
2808 6067 2400      2400
2809 6070 3600      3600
2810 6071 0000  SD2, 0000          /4000
2811 6072 7200      7200
2812 6073 0000  SD3, 0000          /9600
2813 6074 0000  SD4, 0000          /19200
2814
2815 6075 0000  TBLPTR, 0000
2816
2817 /ROUTINE TO PRINT BAUD RATE SETTING-DECIMAL NUMBER
2818
2819 6076 0000  PRIBRS, 0
2820 6077 1675      TAD I TBLPTR      /GET PRINT SETTING FROM TABLE
2821 6100 7450      SNA
2822 6101 5304      JMP DECPRT        /SETTING=0 - INDICATES DECIMAL #
2823 6102 4523      C0PRT4          /SETTING CONTAINS NO DECIMAL DIGITS
2824
2825 6103 5676      JMP I PRIBRS      /      PRINT 4 OCTAL DIGITS
2826 6104 1275  DECPRT, TAD TBLPTR    /SETTING CONTAINS A DECIMAL DIGIT
2827 6105 7041      CIA              /DETERMINE WHICH SETTING SHOULD BE PRINTED
2828 6106 1371      TAD (SD1
2829 6107 7450      SNA
2830 6110 5342      JMP PSS1          /PRINT 1000
2831 6111 1370      TAD (4
2832 6112 7450      SNA
2833 6113 5334      JMP PSS2          /PRINT 4000
2834 6114 1367      TAD (2
2835 6115 7650      SNA CLA
2836 6116 5326      JMP PSS3          /PRINT 9600

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2837 6117 4354 PSS4, JMS PRDD /PRINT 192
2838 6123 0261 0261
2839 6121 0271 0271
2840 6122 0262 0262
2841 6123 0000 0000
2842 6124 4530 PRNT2 /PRINT TRAILING 2 ZEROS
2843 6125 5676 JMP I PRTBRS
2844 6126 4354 PSS3, JMS PRDD /PRINT 96
2845 6127 0271 0271
2846 6130 0266 0266
2847 6131 0000 0000
2848 6132 4530 PRNT2 /PRINT TRAILING 2 ZEROS
2849 6133 5676 JMP I PRTBRS
2850 6134 4350 PSS2, JMS PRDD /PRINT 48
2851 6135 0264 0264
2852 6136 0270 0270
2853 6137 0000 0000
2854 6140 4530 PRNT2 /PRINT TRAILING 2 ZEROS
2855 6141 5676 JMP I PRTBRS
2856 6142 4350 PSS1, JMS PRDD /PRINT 18
2857 6143 0261 0261
2858 6144 0270 0270
2859 6145 0000 0000
2860 6146 4530 PRNT2 /PRINT TRAILING 2 ZEROS
2861 6147 5676 JMP I PRTBRS
2862
2863 6150 0000 PRDD, 0 /PRINT ASCII DIGITS FOLLOWING CALL
2864 6151 1750 TAD I PRDD
2865 6152 7450 SNA
2866 6153 5750 JMP I PRDD /DIGIT#0 = RETURN
2867 6154 4527 TYPE
2868 6155 2350 ISZ PRDD
2869 6156 5351 JMP PRDD+1
2870
2871
2872

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2873
2874
2875 6167 0002
2876 6170 0004
2877 6171 6065
2878 6172 6177
2879 6173 0200
2880 6174 7763
2881 6175 6055
2882 6176 0017
2883 6177 0001
2884 6200
2885
2886
2887
2888
2889 6200 3276 SKPCHN, DCA SAVAC /GET HERE VIA INTERRUPT
2890
2891 6201 4516 CHKKSF /SAVE AC
2892 6202 5236 JMP RFIN /CHECK FOR CONSOLE PACKAGE INT.
2893 6203 7000 NOP /SET-BUT IGNORE
2894 6204 7000 NOP /NOT SET
2895 6205 4533 UEI, CERR /UNEXPECTED INTERRUPT
2896 6206 1276 RFIN, 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, CCRRLF
2903 6211 4522 C0PRNT
2904 6212 6311 UEIMES
2905 6213 4521 CCRRLF
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 CCRRLF
2915 6225 4522 C0PRNT
2916 6226 6331 F0MES
2917 6227 1371 TAD (CDI
2918 6230 3274 DCA VCDI
2919 6231 4233 JMS CKFLG /DISPLAY FLAGS SET
2920 6232 5770 JMP IEH
2921
2922 6233 0000 CKFLG, 0
2923 6234 6041 TSF
2924 6235 5240 JMP UL1
2925 6236 4522 C0PRNT
2926 6237 6337 MXMT1 /SLU #1 XMIT FLAG SET

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2927 6240 6311 UL1, TSF1
2928 6241 5244 JMP UL2
2929 6242 4522 C8PRNT /SLU #2 XMIT FLAG SET
2930 6243 6342 MXMT2
2931 6244 6331 UL2, TSF2
2932 6245 5250 JMP UL3
2933 6246 4522 C8PRNT /SLU #3 XMIT FLAG SET
2934 6247 6345 MXMT3
2935 6250 2040 UL3, ISZ KSFLG
2936 6251 5254 JMP UL4
2937 6252 4522 C8PRNT /SLU #1 REC FLAG SET
2938 6253 6350 MREC1
2939 6254 6301 UL4, KSF1
2940 6255 5260 JMP UL5
2941 6256 4522 C8PRNT /SLU #2 REC FLAG SET
2942 6257 6353 MREC2
2943 6260 6321 UL5, KSF2
2944 6261 5264 JMP UL6
2945 6262 4522 C8PRNT /SLU #3 REC FLAG SET
2946 6263 6356 MREC3
2947 6264 6661 UL6, PSKF
2948 6265 5270 JMP UL7
2949 6266 4522 C8PRNT /LA100 PRINTER FLAG SET
2950 6267 6361 MLAP
2951 6270 6500 UL7, LOSK
2952 6271 5274 JMP VCD1
2953 6272 4522 C8PRNT /LQP PRINT FLAG SET
2954 6273 6364 MLQP
2955 6274 6203 VCD1, CDI 00
2956 6275 5633 JMP I CKFLG
2957 6276 0000 SAVAC, 0
2958 6277 1501 NMID, TEXT "MAINDEC-00-DKVTB-A"
        6300 1116
        6301 0405
        6302 0355
        6303 6070
        6304 5504
        6305 1326
        6306 2402
        6307 5501
        6310 0000
2959 6311 2516 UEIMES, TEXT "UNEXPECTED INTERRUPT - FIELD 0"
        6312 0530
        6313 2005
        6314 0324
        6315 0504
        6316 4011
        6317 1624
        6320 0522
        6321 2225
        6322 2024
        6323 4055
        6324 4006
        6325 1105
        6326 1404

```

```

        6327 4060
        6330 0000
2960 6331 0614 FSNES, TEXT "FLAGS SET:"
        6332 0107
        6333 2340
        6334 2305
        6335 2472
        6336 0000
2961 6337 4040 MXMT1, TEXT " X1"
        6340 3061
        6341 0000
2962 6342 4040 MXMT2, TEXT " X2"
        6343 3062
        6344 0000
2963 6345 4040 MXMT3, TEXT " X3"
        6346 3063
        6347 0000
2964 6350 4040 MREC1, TEXT " R1"
        6351 2261
        6352 0000
2965 6353 4040 MREC2, TEXT " R2"
        6354 2262
        6355 0000
2966 6356 4040 MREC3, TEXT " R3"
        6357 2263
        6360 0000
2967 6361 4040 MLAP, TEXT " LA"
        6362 1401
        6363 0000
2968 6364 4040 MLQP, TEXT " LQ"
        6365 1421
        6366 0000

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2969      6370 6646
2970      6371 6703
2971      6372 6472
2972      6373 6456
2973      6374 6675
2974      6375 6532
2975      6376 6674
2976      6377 6524
2977      6400
2978      *6400
2979      /*****
2980      /ERROR DISPLAY FORMAT ROUTINES
2981      /*****
2982
2983      /NORMAL DISPLAY = IN,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

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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 1047      TAD BIT7
3033      6452 3071      DCA LKDATA
3034      6453 4306      JMS MLK
3035      6454 4521      C8CRLF
3036      6455 5777*      JMP IEH
3037
3038      /SUBROUTINES FOR DISPLAY ROUTINES
3039
3040      6456 0000 MAC, 0      /DISPLAY AC MESSAGE
3041      6457 4522      C8PRNT
3042      6460 6663      MESAC
3043      6461 1776*      TAD ACSAVE
3044      6462 4523      C8PRT4
3045      6463 5656      JMP I MAC
3046
3047      6464 0000 MMQ, 0      /DISPLAY MQ MESSAGE
3048      6465 4522      C8PRNT
3049      6466 6666      MESMQ
3050      6467 1775*      TAD MQSAVE
3051      6470 4523      C8PRT4
3052      6471 5664      JMP I MMQ
3053
3054      6472 0000 MFL, 0      /DISPLAY FLAGS MESSAGE
3055      6473 4522      C8PRNT
3056      6474 6671      MESFL
3057      6475 1774*      TAD FLSAVE
3058      6476 4523      C8PRT4
3059      6477 5672      JMP I MFL
3060
3061      6500 0000 MINS, 0      /DISPLAY OCTAL INSTRUCTION
3062      6501 4522      C8PRNT
3063      6502 6543      MESINS
3064      6503 1505      TAD I INSTTR
3065      6504 4523      C8PRT4
3066      6505 5700      JMP I MINS
3067
3068      6506 0000 MLK, 0      /DISPLAY LINK MESSAGE
3069      6507 4522      C8PRNT
3070      6510 6540      MESLK
3071      6511 1071      TAD LKDATA
3072      6512 4523      C8PRT4
3073      6513 5706      JMP I MLK
3074
3075      6514 0000 MESHDP, 0      /DISPLAY MESSAGE HEADER & PC
3076      6515 4521      C8CRLF
3077      6516 4522      C8PRNT

```

```

3070 6517 5230 LRRMES
3079 6520 4521 C9CPLF
3080 6521 4324 JMS MTN
3081 6522 4332 JMS MPC
3082 6523 5714 JMP I MESHDR
3083
3084 6524 0000 MTN, 0 /DISPLAY TEST NUMBER
3085 6525 4522 C9PRNT
3086 6526 6565 MESTN
3087 6527 1075 TAD TSTNO
3088 6530 4523 C9PRT4
3089 6531 5724 JMP I MTN
3090
3091 6532 0000 MPC, 0 /DISPLAY PC
3092 6533 4522 C9PRNT
3093 6534 6660 MESPC
3094 6535 1773 TAD PCSAVE
3095 6536 4523 C9PRT4
3096 6537 5732 JMP I MPC
3097
3098
3099 6540 4040 MESLK, TEXT " LK;"
3100 6541 1413
3100 6542 7200
3100 6543 4040 MESINS, TEXT " INST;"
3100 6544 1116
3100 6545 2324
3100 6546 7200
3101 6547 4040 MESACT, TEXT " ACTUAL "
3101 6550 0103
3101 6551 2425
3101 6552 0114
3101 6553 4040
3101 6554 4040
3101 6555 4000
3102 6556 4040 MESEXP, TEXT " EXPECTED "
3102 6557 0530
3102 6560 2005
3102 6561 0324
3102 6562 0504
3102 6563 4040
3102 6564 4000
3103 6565 4040 MESTN, TEXT " TN;"
3103 6566 2416
3103 6567 7200
3104
3105
3106
3107

```

```

3108 6573 6674
3109 6574 6677
3110 6575 6676
3111 6576 6675
3112 6577 6646
3113 6600
3114 /*****
3114 / CONSOLE ROUTINES
3115 /*****
3116
3117
3118 /THIS ROUTINE WILL DETERMINE WHAT TO DO WHEN A C9ERR IS ENCOUNTERED
3119 /WILL CHECK IF UNDER APT CONTROL.
3120 / C9ERR= JMS XC9ERR
3121 /EX. C9ERR /GO TO C9ERR CALL
3122 / /RETURN IS CALL PLUS ONE AC =0000
3123
3124
3125
3126 6600 0000 XC9ERR, 0
3127 6601 6002 IOF
3128 6602 7000 OWAPT, NOP /OVERWRITTEN WITH 'JMP APTER' IF RUNNING UNDER APT CONTROL
3129 6603 3275 DCA ACSAVE /SAVE AC
3130 6604 6004 GTF
3131 6605 3277 DCA FLSAVE /SAVE THE FLAGS
3132 6606 7501 MQA
3133 6607 3276 DCA MQSAVE /SAVE THE MQ
3134 6610 7340 CLA CLL CMA /SUBTRACT A 1 FOR TRUE LOCATION
3135 6611 1200 TAD XC9ERR /GET RETURN LOCATION
3136 6612 3274 DCA PCSAVE /SAVE ADD OF C9ERR CALL
3137 6613 6031 KSF /SAVE STATE OF SLU #1 REC FLAG FOR USE
3138 6614 7410 SKP / BY UNEXPECTED INT. ROUTINE
3139 6615 7040 CMA /KBCHK ROUTINE CLEARS FLAG UNCONDITIONALLY
3140 6616 3040 DCA KSFLG
3141 6617 4517 KBCHK /CHECK FOR KEYBOARD INTERVENTION
3142 6620 1777 TAD TSLUP
3143 6621 3300 DCA TLOOP
3144 6622 1020 TAD PSR /INHIBIT ERROR TYPEOUT?
3145 6623 0376 AND 0200 /MASK BIT 4 = INHIBIT BIT
3146 6624 7640 SZA CLA
3147 6625 5246 JMP IEH /NO ERROR PRINTOUT
3148 6626 1274 TAD PCSAVE
3149 6627 7041 CIA
3150 6630 1375 TAD (UEI
3151 6631 7650 SNA CLA
3152 6632 5774 JMP SERUEI /USE UNEXPECTED INT. DISPLAY
3153 6633 1274 TAD PCSAVE
3154 6634 7041 CIA
3155 6635 1373 TAD (SPE1
3156 6636 7650 SNA CLA
3157 6637 5772 JMP CPUSDIS /USE MICROINST SKIP FAILURE DISPLAY
3158 6640 1274 TAD PCSAVE
3159 6641 7041 CIA
3160 6642 1371 TAD (SPE2
3161 6643 7650 SNA CLA

```

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/VT70 CPU DIAGNOSTIC  PAL10  V142A  2-AUG-77  7130  PAGE 9-1  SEQ 0079

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 EROR HALT?
3165  6647  7700  S'4A CLA  /TEST BIT 0
3166  6650  4524  C8SWIT  /NO - GO TO THE INQUIRE ROUTINE
3167  6651  1020  TAD PSR  /LOOP ON EROR?
3168  6652  7004  RAL  /TEST BIT 1
3169  6653  7710  SPA CLA
3170  6654  5703  JMP I TLOOP  /LOOP
3171  6655  4303  JMS C8GET  /CONTINUE TEST
3172  6656  7000  NOP  /LEAVF INTERRUPT SYSTEM DISABLED
3173  6657  5600  JMP I  XC8ERR
3174  6660  4040  MESPC, TEXT  " PC1"
      6661  2003
      6662  7200
3175  6663  4040  MESAC, TEXT  " AC1"
      6664  0103
      6665  7200
3176  6666  4040  MESMQ, TEXT  " MQ1"
      6667  1521
      6670  7200
3177  6671  4040  MESFL, TEXT  " FL1"
      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
3188  6703  0000  C8GET, 0
3189  6704  1276  TAD MQSAVE
3190  6705  7421  MCL  /RESTORE THE MQ
3191  6706  1277  TAD FLSAVE  /RESTORE THE LINK
3192  6707  7004  RAL
3193  6710  7200  CLA
3194  6711  1200  TAD XC8ERR  /RESTORE AC IF IN CPU TEST, OTHERWISE CLEAR AC
3195  6712  1366  TAD (-2400
3196  6713  7710  SPA CLA
3197  6714  1275  TAD ACSAVE  /RESTORE THE AC
3198  6715  5703  JMP I C8GET
3199
3200
3201
3202  /*****
3203  /XC8START IS CALLED AT START OF PROGRAM TO PRINT THE MAINDEC NUMBER
3204  /AND THE SWITCH REGISTER QUESTION.
3205  6716  0000  XC8START, 0
3206  6717  4532  C8APT  /CHECK FOR APT CONTROL
3207  6720  4521  C8CRLF  //PRINT A CR LF
3208  6721  4522  C8PRNT

```

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/VT70 CPU DIAGNOSTIC  PAL10  V142A  2-AUG-77  7130  PAGE 9-2  SEQ 0080

3209  6722  6277  HMID  /PRINT ID
3210  6723  4521  C8CRLF
3211  6724  4524  C8SWIT  /ASK THE SWITCH REGISTER QUESTION
3212  6725  4540  C8H3  /ASK THE HCW3 QUESTION
3213  6726  6211  CDF 10
3214  6727  3765  DCA 1 (PASSNO  /ZERO PASS COUNTER
3215  6730  6201  CDF 00
3216  6731  5716  LXCRST, JMP I  XC8START  /EXIT C8START
3217
3218
3219
3220
3221
3222  /*****
3223
3224  /APT/  ROUTINE TO NOTIFY APT THAT THE PROGRAM IS RUNNING OK.
3225  APTOK, 0  /APT/
3226  IOF  /APT/
3227  CLA  /APT/
3228  TAD  APTIMX  /APT/DELAY 100MS.
3229  DCA  APTICTX  /APT/
3230  TAD  APTIMY  /APT/
3231  DCA  APTICTY  /APT/
3232  ISZ  APTICTY  /APT/
3233  JMP  ,+1  /APT/
3234  ISZ  APTICTX  /APT/
3235  JMP  ,+5  /APT/
3236  RIF  /APT/AC=IF.
3237  TAD  (6201  /APT/CREATE A CDF INST.
3238  DCA  ,+1  /APT/MODIFY NEXT CDF INST.
3239  CDF  /APT/(MODIFIED CDF) DF=IF.
3240  CIF  70  /APT/IF=FIELD 7.
3241  JMS  6500  /APT/CALL APT = 'PROG OK'.
3242  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  APTICTX, 0  /APT/
3247  6757  0000  APTICTY, 0  /APT/
3248
3249  6760  4310  HCW3MS, TEXT  "HCW3="
      6761  2763
      6762  7500
3250
3251  6763  6500
3252  6764  6201
3253  6765  0137
3254  6766  5400
3255  6767  6400
3256  6770  6422
3257  6771  2060
3258  6772  6406
3259  6773  2054
3260  6774  6213
3261  6775  6205

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```

3262 6776 0200
3263 6777 2226
3264 7000
3265 7001
3266 7002
3267 7003
3268 7004
3269 7005
3270 7006
3271 7007
3272 7008
3273 7009
3274 7010
3275 7011
3276 7012
3277 7013
3278 7014
3279 7015
3280 7016
3281 7017
3282 7018
3283 7019
3284 7020
3285 7021
3286 7022
3287 7023
3288 7024
3289 7025
3290 7026
3291 7027
3292 7028
3293 7029
3294 7030
3295 7031
3296 7032
3297 7033
3298 7034
3299 7035
3300 7036
3301 7037
3302 7038
3303 7039
3304 7040
3305 7041
3306 7042
3307 7043
3308 7044
3309 7045
3310 7046
3311 7047
3312 7048
3313 7049
3314 7050
3315 7051

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PAGE

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/APT/ ROUTINE TO HANDLE ERRORS UNDER APT CONTROL.

```

APTR, IOF          /APT/
      CLA          /APT/
      RIF          /APT/AC=IF.
      TAD (6201    /APT/CREATE A CDF INST.
      OCA .+3      /APT/MODIFY NEXT CDF INST.
      CLA CMA      /APT/
      TAD XCERR    /APT/AC=ERROR PC.
      CDF          /APT/(MODIFIED CDF) DF=IF.
      CIF 70       /APT/IF=FIELD 7.
      JMP 6520     /APT/CALL APT = 'ERROR'.

```

/ROUTINE USED FOR CONSOLE REGISTER CHANGES

```

XC8RC, 0
      TAD I XC8RC  /GET MESSAGE PARAMETER
      DCA PROPM5
      ISZ XC8RC
      TAD I XC8RC  /GET THE REGISTER PARAMETER
      DCA PROPLC
      ISZ XC8RC
      JMS PPRMS    /PRINT REG QUESTION
      TAD I PROPLC /GET THE VALUE OF THE REGISTER
      C8PRT4      /PRINT THE 4 DIGITS
      CLA CLL CMA RTL /SETUP A COUNTER TO ACCEPT 4 DIGITS
      DCA TTYCNT   /SAVE THE COUNTER
      TAD (CHARR0  /GET POINTER FOR FIRST CHARACTER
      DCA CHGCHR   /SAVE THE POINTER FOR DIGITS
      LISN        /WAIT FOR KEYBOARD INPUT
      I           /CHECK FOR A OCTAL DIGIT
      CHGCHR, CHARR0 /THIS LOCATION WILL GET MODIFIED
      -212        /CHECK FOR LINE FEED
      START       /LINE FEED TYPED- RETURN TO START
      -215        /CHECK FOR CARRIAGE RETURN
      RETYPE      /RETYPE SR AND CONT IF DIGITS TYPED
      -203        /CHECK FOR A CONTROL C
      C8RM        /CONTROL C TYPED-RETURN TO MONITOR
      -223        /CHECK FOR A CONTROL S
      CNTRS       /WAS CONTROL S WAIT FOR "Q OR "C
      0           /NONE OF ABOVE CHARACTERS-ILLEGAL CHAR
      .+1         /GO TO NEXT ADDRESS TO PRINT ?
      C8PRNT      /GO PRINT ?
      QESTMK      /POINTER TO ? MESSAGE
      JMP RQEST   /RETURN AND ASK QUESTION AGAIN

```

```

3316 7050 3702
3317 7051 1373
3318 7052 3232
3319 7053 5230
3320 7054 3303
3321 7055 1702
3322 7056 7106
3323 7057 7004
3324 7058 1333
3325 7059 3702
3326 7060 2304
3327 7061 5230
3328 7062 1374
3329 7063 7041
3330 7064 1232
3331 7065 7650
3332 7066 5612
3333 7067 4276
3334 7068 1702
3335 7069 4523
3336 7070 4521
3337 7071 5612
3338 7072 0000
3339 7073 4522
3340 7074 0000
3341 7075 5676
3342 7076 0000
3343 7077 0000
3344 7078 0000
3345 7079 0000
3346 7080 0000
3347 7081 0000
3348 7082 0000
3349 7083 0000
3350 7084 0000
3351 7085 0000
3352 7086 0000
3353 7087 0000
3354 7088 0000
3355 7089 0000
3356 7090 0000
3357 7091 0000
3358 7092 0000
3359 7093 0000
3360 7094 0000
3361 7095 0000
3362 7096 0000
3363 7097 0000
3364 7098 0000
3365 7099 0000
3366 7100 0000
3367 7101 0000
3368 7102 0000
3369 7103 0000
3370 7104 0000

```

CHARR0, DCA I PROPLC /SAVE THE LEAST SIGNIFICANT BIT

TAD (CHARR1 /UPDATA POINTER FOR CHARACTERS 2 3 4

DCA CHGCHR /SAVE THE POINTER ADDRESS

JMP CHGCHR-2 /RETURN FOR NEXT CHARACTER INPUT

CHARR1, DCA SAVCHR /SAVE THE CHARACTER TYPED

TAD I PROPLC /GET THE VALUE OF REG

CLL RTL /MOVE IT INTO NEXT POSITION

RAL

TAD SAVCHR /ADD NEW CHARACTER TO IT

DCA I PROPLC /SAVE THE NEW VALUE

ISZ TTYCNT /DONE ALL 4 CHARACTERS

JMP CHGCHR-2 /NO GET NEXT INPUT FROM KEYBOARD

RETYPE, TAD (CHARR0 /GET POINTER TO SEE IF REG ECHOED

CIA /NEGATE THE POINTER

TAD CHGCHR /GET THE POINTER STORED

SNA CLA /ECHO VALUE OF REG?

JMP I XC8RC /NO-ONLY CR WAS TYPED-USE ORIGINAL VALUE

JMS PPRMS /RE-ECHO VALUE TYPED

TAD I PROPLC /GET VALUE OF REG

C8PRT4 /PRINT THE 4 OCTAL DIGITS

C8CRLF /ISSUE A CR AND LF

JMP I XC8RC /RETURN TO PROGRAM

PPRMS, 0 /PRINT REGISTER MESSAGE

C8PRNT

PROPM5, 0

JMP I PPRMS

PROPLC, 0

SAVCHR, 0

TTYCNT, 0

C8RM, CAF

CDF CIF /CHANGE INST AND DATA FIELD TO 0

JMP I .+1 /GOTO 7600 OF THAT FIELD

7600 /MONITOR STARTING ADDRESS

\*\*\*\*\*

/ROUTINE TO CHECK FOR CONSOLE RECEIVE FLAG

XCHKKSF, 0

KSF /SKIP ON CONSOLE RECEIVE FLAG

JMP NOCRF /RECEIVE FLAG NOT SET RETURN TO PROGRAM

TAD HCW2 /CHECK TO SEE IF CONSOLE WAS ACTIVE

AND K4000 /VERSUS APT IN CONTROL,

SNA CLA

JMP .+3 /ACTIVE CONSOLE-CHECK FOR "C OR "G

KCC /APT ACTIVE,CLEAR CONSOLE RECEIVE FLAG

JMP I XCHKKSF /RETURN TO PROGRAM

JMS SSUBLK /SAVE SUBROUTINE LINKAGE

LISN /CHECK THE KEYBOARD CHARACTER

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/VT78 CPU DIAGNOSTIC      PAL10  VI42A  2-AUG-77      7130  PAGE 9-5
3371  7124  7575          -203          /CODE FOR "C
3372  7125  7125          CRRM          /WAS A CONTROL C-EXIT TO MONITOR
3373  7126  7571          -207          /CODE FOR "G
3374  7127  7141          CNTRLG        /WAS "G ECHO CHAR-ENTER SR QUESTION
3375  7130  7555          -223          /CHECK FOR A CONTROL S
3376  7131  7147          CNTRSI        /WAS A CONTROL S WAIT FOR "Q OR "C
3377  7132  6420          0             /CHAR WAS NOT "C OR "G
3378  7133  7134          ,+1           /ECHO CHAR AND QUESTION MARK
3379  7134  1371          TAD (277       /PRINT ?
3380  7135  4527          TYPE
3381  7136  5350          JMP RLK        /RETURN TO PROGRAM
3382  7137  2311          NOCRF, ISZ XCHKKSF
3383  7140  5711          JMP I XCHKKSF
3384
3385  7141  4522          CNTRLG, C8PRNT  /PRINT "G AND CR LF
3386  7142  7317          UPARRG        /POINTER TO MESSAGE
3387  7143  4770          JMS XC8SW      /GO ASK THE SR QUESTION
3388  7144  5350          JMP RLK        /RETURN TO THE PROGRAM
3389
3390  7145  4767          CNTRS, JMS WAITQC /GO WAIT FOR A CONTROL Q OR C
3391  7146  5230          JMP CHGCHR-2  /GO WAIT FOR NEXT CHAR
3392
3393  7147  4767          CNTRSI, JMS WAITQC /WAIT FOR A CONTROL Q OR C
3394  7150  4766          RLK, JMS RSUBLK  /RESTORE SUBROUTINE LINKAGE
3395  7151  5711          JMP I XCHKKSF   /RETURN TO PROGRAM
3396  7152  0004          FILLER,0004    /SET TO NUMBER OF FILLERS REQUIRED,
3397
3398
3399
3400
3401
3402          /PRINT THE TWO OCTAL NUMBERS IN THE AC 6 THRU 11
3403
3404  7153  0000          XPRNT2, 0        /CALL BY "PRNT2"
3405  7154  3364          DCA TWOOCK
3406  7155  1364          TAD TWOOCK
3407  7156  7012          RTR
3408  7157  7010          RAR
3409  7160  4526          PRNT1
3410  7161  1364          TAD TWOOCK
3411  7162  4526          PRNT1
3412  7163  5753          JMP I XPRNT2
3413
3414  7164  0000          TWOOCK, 0
3415
3416
3417
3418  7166  7345
3419  7167  7521
3420  7170  7360
3421  7171  0277
3422  7172  7335
3423  7173  7054
3424  7174  7050
3425  7175  6520

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/VT78 CPU DIAGNOSTIC      PAL10  VI42A  2-AUG-77      7130  PAGE 9-6
3426  7176  6600
3427  7177  6201
3428          7200
3429
3430          /TYPE A CR AND LF WITH NUMBER OF FILLERS
3431          /AS DETERMINED BY LOCATION "FILLER"
3432          XC8CRLF,0          /CALL BY "CRLF"
3433          CLA
3434          TAD K215
3435          TYPE
3436          TAD FILLER
3437          CMA
3438          DCA XORS
3439          TAD K212
3440          TYPE
3441          XORS
3442          ISZ AC=0
3443          JMP I XC8CRLF
3444
3445  7214  0000          XORS, 0
3446  7215  0215          K215,215
3447  7216  0212          K212,212
3448
3449          /PRINT 2 SPACES
3450
3451  7217  0000          SPACK2, 0        /CALL BY "SPACE2"
3452  7220  4522          C8PRNT
3453  7221  7223          ,+2
3454  7222  5617          JMP I SPACK2
3455  7223  4040          4040
3456  7224  0000          0000
3457
3458          /COMPARE INPUT TO LIST FOLLOWING CALL
3459          /INPUT ONE CHARACTER IF AC=0
3460          /USE LAST INPUT IF AC NON ZERO
3461
3462  7225  0000          XLISN, 0          /CALL BY "LISN"
3463  7226  7640          SZA CLA
3464  7227  5255          JMP LISN1        /USE LAST INPUT SINCE AC NOT ZERO
3465  7230  6031          KSF
3466  7231  5230          JMP ,+1
3467  7232  6036          KRB
3468  7233  0376          AND (177
3469  7234  1045          TAD K200
3470  7235  3311          DCA CH1REC
3471  7236  1311          TAD CH1REC
3472  7237  1310          TAD M212
3473  7240  7450          SNA
3474  7241  5245          JMP ,+4          /IS IT A LF?
3475  7242  1307          TAD M3          /YES
3476  7243  7640          SZA CLA          /IS IT A CR?
3477  7244  5247          JMP ,+3          /NO
3478  7245  4521          C8CRLF
3479  7246  5255          JMP LISN1

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SEQ 0084



```

3480 7247 1311 TAD CH1REC /GET THE CHAR
3481 7250 1375 TAD (-223 /CHECK FOR A CONTROL S
3482 7251 7650 SNA CLA /WAS IT A CONTROL S
3483 7252 5255 JMP LISN1 /YES-DO NOT ECHO CHARACTER
3484 7253 1311 TAD CH1REC
3485 7254 4527 TYPE /PRINT THE CHARACTER
3486 7255 1625 LISN1, TAD I XLISN /GET COMPARE VALUE
3487 7256 2225 ISZ XLISN
3488 7257 7450 SNA /EXIT?
3489 7260 5266 JMP LISN3 /YES
3490 7261 7500 SNA
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 SNA
3507 7302 5273 JMP LISN2 /IS IT LESS THAN 8?
3508 7303 1042 TAD K10 /NO, SO NOT AN OCTAL NUMBER
3509 7304 7510 M270, SPA
3510 7305 5273 JMP LISN2 /IS IT GREATER THAN ZERO?
3511 7306 5266 JMP LISN3 /NO, SO NOT A NUMBER
3512 7307 7775 M3, -3
3513 7310 7566 M212, 7566
3514 7311 0000 CH1REC, 0
3515
3516
3517 7312 4323 SRMSG, TEXT "SR="
3518 7313 2275
3519 7314 0000
3519 7315 7743 QESTMK, TEXT "?"
3519 7316 0000
3519 7317 3687 UPARRG, TEXT "G"
3519 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 7800 TYOUT, NOP/JMP I XTYPE /OVERWRITTEN IF RUNNING UNDER APT CONTROL,
3525 7324 4774 JMS CNTRL /CONSOLE ACTIVE-CHECK FOR CONTROL S
3526 7325 1334 TAD CHAR /GET THE CHARACTER SAVED AND PRINT
3527 7326 6046 TIS
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 XC8SW, 0
3565 7361 4537 C8RC
3566 7362 7312 SRMSG
3567 7363 0020 PSR
3568 7364 5760 JMP I XC8SW
3569
3570 7371 7464
3571 7372 7423
3572 7373 7111
3573 7374 7506
3574 7375 7555
3575 7376 0177
3576 7377 7152
3577 PAGE
3578
3579
3580
3581 /*****
3582
3583 7400 0000 XC8APT, 0
3584 7401 6002 IOF

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3585 7402 1022 TAD HCW2 /RUN UNDER APT CONTROLS?
3586 7403 1720 SMA CLA
3587 7404 5600 JMP I XC8APT
3588 7405 1777 TAD APT0W1 /YES--OVERWRITE C8ERR ROUTINE (FLD 2)
3589 7406 3776 DCA 0WAPT
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 APT0W1 /OVERWRITE 'ERROR' ROUTINE (FLD 1)
3595 7413 3776 DCA 0W1APT
3596 7414 1372 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 LAC8ST
3603
3604 /PRINT PACKED ASCII TEXT TERMINATED BY
3605 /SIX-BIT 00
3606
3607 7423 0000 MESAGX, 0
3608 7424 4517 K9CHK /CHECK FOR KEYBOARD INTERVENTION
3609 7425 1623 TAD I MESAGX
3610 7426 3263 DCA FOROCK
3611 7427 2223 ISZ MESAGX /SET UP RETURN
3612 7430 1663 TAD I FOROCK
3613 7431 7012 RTR
3614 7432 7012 RTR
3615 7433 7012 RTR
3616 7434 4241 JMS MESAGF
3617 7435 1663 TAD I FOROCK
3618 7436 4241 JMS MESAGF
3619 7437 2263 ISZ FOROCK
3620 7440 5230 JMP ,+10
3621 7441 0000 MESAGF, 0
3622 7442 0043 AND K77
3623 7443 7450 SNA /TERMINATOR (00)?
3624 7444 5623 JMP I MESAGX /YES
3625 7445 1260 TAD M43
3626 7446 7450 SNA /CRLF?
3627 7447 5256 JMP ,+7 /YES
3628 7450 1261 TAD K3
3629 7451 7510 SPA /200 OR 300
3630 7452 1044 TAD K100 /300
3631 7453 1262 TAD K240 /200
3632 7454 4527 TYPE
3633 7455 5641 JMP I MESAGF
3634 7456 4521 C8CRLF
3635 7457 5641 JMP I MESAGF
3636 7460 7735 M43, 7735
3637 7461 0003 K3, 0003
3638 7462 0240 K240,240
3639 7463 0000 FOROCK, 0

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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
3672 7510 5706 JMP I CNTRLs /SKIP ON CONSOLE KEYBOARD FLAG
3673 7511 6034 KRS /RETURN TO TYPE ROUTINE-FLAG NOT SET
3674 7512 0366 AND (177 /READ THE CHARACTER STATICALLY
3675 7513 1365 TAD (-23 /MASK TO 7 BIT ASCII
3676 7514 7640 SZA /CHECK FOR A CONTROL S
3677 7515 5706 JMP I CNTRLs /WAS IT A CONTROL S
3678 7516 6032 KCC /NO-RETURN WITH KEYBOARD FLAG STILL SET
3679 7517 4321 JMS WAITQC /CLEAR KEYBOARD FLAG FROM "S
3680 7520 5706 JMP I CNTRLs /WAIT FOR CONTROL Q OR C
3681 /RETURN TO PRINT MESSAGE BEING TYPED
3682 7521 0000 WAITQC, 0
3683 7522 6031 KSF /ROUTINE TO WAIT FOR CONTROL Q OR C
3684 7523 5322 JMP ,+1 /WAIT FOR A CONTROL Q OR C TO EXIT
3685 7524 6036 KRR /
3686 7525 0366 AND (177 /READ THE CHARACTER TYPED
3687 7526 1364 TAD (-3 /MASK TO 7 BIT ASCII
3688 7527 7450 SNA /CHECK FOR A CONTROL C
3689 7530 5763 JMP C8RM /WAS IT A CONTROL C?
3690 7531 1362 TAD (-7 /YES-RESTORE MONITOR AND RETURN
3691 7532 7450 SNA /CHECK FOR A LINE FEED CHARACTER
3692 7533 5761 JMP START /WAS IT A LINE FEED
3693 7534 1362 TAD (-7 /YES GO RESTART THE PROGRAM
3694 7535 7640 SZA CLA /CHECK FOR A CONTROL Q "Q
/WAS IT A CONTROL Q

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/VT78 CPU DIAGNOSTIC  PAL10  V142A  2-AUG-77  7:30  PAGE 9-11
3695 7536 5322 JMP WAITQC+1 /NO-WAIT FOR APPROPRIATE KEY
3696 7537 5721 JMP I WAITQC /RETURN TO WHENCE IT CAME
3697
3698 /ASK HCW3 QUESTION (HCW3=HARDWARE OPTION WORD 3 = LOC 23)
3699
3700 7540 0000 XC8H3, 0
3701 7541 4537 CARC /PRINT QUESTION
3702 7542 6760 HCW3MS
3703 7543 0023 HCW3
3704 7544 5740 JMP I XC8H3
3705
3706
3707
3708 7561 0200
3709 7562 7771
3710 7563 7105
3711 7564 7775
3712 7565 7755
3713 7566 6177
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 FIELD 1

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SEQ 0089

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/VT78 CPU DIAGNOSTIC  PAL10  V142A  2-AUG-77  7:30  PAGE 9-12

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SEQ 0090

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0000 11111111 11111110 11110000 00000000 11111111 11111111 11111111 11111111
0100 11111111 11111111 11111111 11111111 11000000 00000000 00000000 00000001
0200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
0300 11111111 11111111 11111111 11111111 11111111 11111111 11100000 00001111
0400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
0500 11111111 11111111 11111111 11111111 11111111 11111111 11100001 11111111
0600 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
0700 11111111 11111111 11111111 11111111 11111111 11111111 10000000 00011111
1000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
1100 11111111 11111111 11111111 11111111 11111111 11111111 11111110 00000001
1200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
1300 11111111 11111111 11111111 11111111 11111111 11111100 00000000 00000011
1400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
1500 11111111 11111111 11111110 00000000 00000000 00000000 00000000 00001111
1600 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
1700 11111111 11111111 11111111 11111111 11111111 10000000 00000000 00000001
2000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
2100 11111111 11111111 11111111 11111110 00000000 00000000 00000000 00000011
2200 11111111 11111111 11111111 11111111 11111111 00000000 00000000 00000000
2300 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
2400
2500
2600
2700
3000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
3100 11111111 11111111 11111111 11111111 11111111 11111111 10000001 11111111
3200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
3300 11111111 11111111 11111111 11111111 11111111 11111111 11111111 01111111
3400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
3500 11111111 11000000 00000000 00000000 00000000 00000000 00000000 00111111
3600 11111111 11111111 11111111 11111111 11111111 11111111 11110000 00000000
3700 00000000 00000000 00000000 00000000 00000000 00000000 00000000 01111111

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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 11110000 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 11110111 11111111

7200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
7300 11111111 11111111 11111111 11111111 11111111 11111111 11110000 01111111

7400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
7500 11111111 11111111 11111111 11111111 11110000 00000000 01111111 11111111

7600
7700

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

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

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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

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3888
3889      6500      LQSK=6500      /SKIP ON DONE FLAG
3890      6501      LQRB=6501      /IF OUT=0 READ EXTERNAL DEVICE(PRINTER)
3891
3892      6502      LQMP=6502      /IF OUT=1 READ INTERFACE BUFFER
3893      6503      LQMC=6503      /MOVE PAPER
3894      6504      LQPC=6504      /MOVE CARRIAGE
3895      6505      LQRS=6505      /PRINT CHAP
3896      6506      LQLS=6506      /READ STATUS AND CLEAR DONE FLAG
3897      6507      LQRE=6507      /WRITE STATUS AND SET DONE FLAG
3898      /RESTORE AND CLEAP DONE FLAG
3899
3900
3901
3902      0000      0000      *0
3903      0000      4450      ERROR
3904      /LOCATIONS 0-10 GET DESTROYED BY MEMORY EXTENSION
3905      /TESTING FROM FIELD 0.
3906
3907      0004      0004      *4
3908      0004      7000      NOP
3909      0005      7000      NOP
3910      0006      7000      NOP
3911      /LEAVE LOCs 4,5, & 6 OPEN FOR ODT
3912
3913
3914
3915      0024      0024      *24
3916      0024      0016      NSQBDR, 16
3917      /BAUD RATE USED FOR NORMAL TEST SEQUENCE
3918
3919      0025      0000      SDEV, 0
3920      0026      0016      BDR1, 16
3921      0027      0016      BDR2, 16
3922      0030      0016      BDR3, 16
3923      0031      0000      LOOPA, 0
3924      /STATUS OF LOOPAROUND (1=LOOPED,0=NOT LOOPED)
3925
3926      4432
3927      0032      7200      CICRLF=JMS I.
3928      4433      XCICRLF
3929      0033      1600      SLU2MC=JMS I.
3930      4434      XMODE2
3931      0034      7414      C1PRNT=JMS I.
3932      4435      MFSAG
3933      0035      7453      C1PRT4=JMS I.
3934      4436      X1PRN4
3935      0036      7013      C1SWIT=JMS I.
3936      4437      XC1SW
3937      0037      7223      LTSNF1=JMS I.
3938      4440      XLISM1
3939      0040      7215      SPAC21=JMS I.
3940      4441      SPAC2
3941      0041      7466      PRN11=JMS I.
3942      4442      X1PRN1
3943      0042      7400      TYPE1=JMS I.
3944      4443      X1TYPE

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3943      4443      C1EOP=JMS I.
3944      0043      7306      XC1EOP
3945      4444      PRN21=JMS I.
3946      0044      7525      X1PRN2
3947      4445      CHKSPF=JMS I.
3948      0045      7106      XCHKSPF
3949
3950
3951      4446      LOOPPC=JMS I.
3952      0046      2200      PCLOOP
3953      4447      DONLOP=JMS I.
3954      0047      2742      LOPDON
3955      4450      ERROR=JMS I.
3956      0050      6600      XC1ERR
3957      4451      TSFWAT=JMS I.
3958      0051      2333      WATTSF
3959      4452      KSFWAT=JMS I.
3960      0052      2346      WATKSF
3961      4453      SLUDAT=JMS I.
3962      0053      2421      DATSLU
3963      4454      SLUDER=JMS I.
3964      0054      2462      DERSLU
3965      4455      CLREIF=JMS I.
3966      0055      2234      E1FCLR
3967      4456      CLREXI=JMS I.
3968      0056      2214      EXICLR
3969      4457      CLRERI=JMS I.
3970      0057      2220      ERICLR
3971      4460      SETEXI=JMS I.
3972      0060      2274      EXISET
3973      4461      SETERI=JMS I.
3974      0061      2230      EPISET
3975      4462      KB1CHK=JMS I.
3976      0062      3320      CM1KB
3977      4463      MIOT=JMS I.
3978      0063      3024      XM1OT
3979      4464      WAIT=JMS I.
3980      0064      5553      XWAIT
3981      4465      GETSR=JMS I.
3982      0065      3312      XGETSR
3983      4466      GETHW3=JMS I.
3984      0066      6346      XGHW3
3985      4467      LOOP=JMS I.
3986      0067      3233      SLOOPA
3987      4470      DELAY=JMS I.
3988      0070      3245      XDELAY
3989      4471      CLREPI=JMS I.
3990      0071      4475      XCLEPI
3991      4472      SETEPI=JMS I.
3992      0072      4501      XSEPI
3993      4473      VDELAY=JMS I.
3994      0073      1667      XVDLY
3995
3996
3997

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3998      4474      MKCF=JMS I .
3999      0074 2620      XMKCF
4000      4475      MKSF=JMS I .
4001      0075 2625      XMSF
4002      4476      MKCC=JMS I .
4003      0076 2612      XMKCC
4004      4477      MKPS=JMS I .
4005      0077 2617      XMKPS
4006      4500      MKIE=JMS I .
4007      0100 2624      XMKIE
4008      4501      MKRB=JMS I .
4009      0101 2631      XMKRB
4010      4502      MSPF=JMS I .
4011      0102 2636      XMSPF
4012      4503      MTSF=JMS I .
4013      0103 2643      XMTSF
4014      4504      MTCF=JMS I .
4015      0104 2650      XMTCF
4016      4505      MTSB=JMS I .
4017      0105 2655      XMTSB
4018      4506      MTPC=JMS I .
4019      0106 2707      XMTPC
4020      4507      MTSK=JMS I .
4021      0107 2714      XMTSK
4022      4510      MTLB=JMS I .
4023      0110 2721      XMTLB
4024      4511      SLUCAF=JMS I .
4025      0111 3252      XSCAF
4026      4512      CFSLU=JMS I .
4027      0112 3265      XCFSLU
4028      4513      KLSIM=JMS I .
4029      0113 4511      XKLSIM
4030      4514      RLOOP=JMS I .
4031      0114 3240      CLOOPA
4032      4515      APTREP=JMS I .
4033      0115 2502      REPAPT
4034      4516      SPCIE=JMS I .
4035      0116 3544      XSPCIE
4036
4037
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```

/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

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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
4063
4064

```

/ROUTINE TO SETUP FIELD 0 TO HANDLE INTERRUPTS FROM ANOTHER FIELD

```

4065      0141 0000      PATCH, 0
4066      0142 1541      TAD I PATCH
4067      0143 3166      DCA ITOLOC
4068      0144 1177      TAD (LOC1-1
4069      0145 3010      DCA 10
4070      0146 3011      DCA 11
4071      0147 7346      CLA CLL CMA RTL
4072      0150 3123      DCA CNT1
4073      0151 6224      RIF
4074      0152 1155      TAD KCDF
4075      0153 3157      DCA ,+4
4076      0154 1410      TAD I 10
4077      0155 6201      CDF 00
4078      0156 3411      DCA I 11
4079      0157 6201      CDF
4080      0160 2123      ISZ CNT1
4081      0161 5154      JMP ,+5
4082      0162 2141      ISZ PATCH
4083      0163 5541      JMP I PATCH
4084
4085      0164 6244      LOC1, RMF
4086      0165 5403      JMP I 3
4087      0166 0000      ITOLOC, 0

```

/GET THE INTERRUPT SERVICE ADDRESS

/SETUP AUTO INDEX 10  
 /CLEAR AUTO INDEX 11  
 /SETUP MOVE COUNTER TO -3  
 /SAVE THE MOVE COUNTER  
 /READ THIS INSTRUCTION FIELD  
 /MAKE CDF INSTR TO THIS FIELD  
 /SAVE THE CDF INSTRUCTION  
 /GET FIRST CONTENTS TO TRANSFER  
 /CHANGE DATA FIELD TO FIELD 0  
 /SAVE THE CONTENTS IN ADDRESSES 1-3  
 /CHANGE DATA FIELD BACK TO PROGRAM FIELD  
 /DONE  
 /NO-GO MOVE NEXT CONTENTS FROM 1-3  
 /BUMP RETURN  
 /RETURN TO THE PROGRAM

```

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
4095
4096
4097      0204  4141  JMS PATCH
4098      0205  6200  SKPICHN
4099      0206  4465  GETSR
4100      0207  0377  AND (0020
4101      0210  7640  SZA CLA
4102      0211  5776  JMP PRTEST
4103      0212  4775  JMS INIT1
4104      0213  4277  SMES, JMS PSMES
4105
4106      0214  4774  NXTDC, JMS BORNS
4107      0215  4773  JMS XIOT
4108      0216  4433  SLU2MC
4109      0217  0027  MODE1
4110      0220  4515  APTREP
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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  CLRIF
4126      0226  4511  SLUCAF      /CLEAR 'EXPECTING INTERRUPT' FLAGS,
4127      0227  4475  MKSF      /INITIALIZE THE MODULE - CAF SETS INT ENA ON SLU
4128      0230  7410  SKP      /SKIP ON RECEIVE FLAG
4129      0231  4450  ERROR
4130      0232  4503  MTSF      /RECEIVE FLAG SET OR KSF SKIPPED
4131      0233  7410  SKP      /SKIP ON TRANSMIT FLAG SET AND ENABLED
4132      0234  4450  ERROR
4133      0235  4507  MTSK      /TRANSMIT FLAG SET AND ENABLED OR TSP SKIPPED
4134      0236  7410  SKP      /SKIP ON XMIT/RECEIVE + INT ENA
4135      0237  4450  ERROR
4136      0240  4447  DONLOP      /TRANSMIT FLAG SET & ENABLED OR MTSK SKIPPED
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/*****
/INITIALIZATION TEST
/TEST 1 - CHECKS THAT CAF (INITIALIZE) WILL CLEAR THE RECEIVE FLAG AND DISABLE XMIT FLAG.
/NOTE: INITIALIZE SETS THE SERIAL LINE UNIT'S INTERRUPT ENABLE.
/*****

```

```

/SETUP LOOPING ADDRESS
/SETUP TEST NUMBER FOR ERROR DISPLAY
/CLEAR 'EXPECTING INTERRUPT' FLAGS,
/INITIALIZE THE MODULE - CAF SETS INT ENA ON SLU
/SKIP ON RECEIVE FLAG
/RECEIVE FLAG SET OR KSF SKIPPED
/SKIP ON TRANSMIT FLAG SET AND ENABLED
/TRANSMIT FLAG SET AND ENABLED OR TSP SKIPPED
/SKIP ON XMIT/RECEIVE + INT ENA
/TRANSMIT FLAG SET & ENABLED OR MTSK SKIPPED
/CHECK FOR LOOP ON TEST

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/*****
/TEST 2 - TRY TO CLEAR SLU INT ENA BY ISSUING A KIE COMMAND. THEN TEST THE SLU XMIT
/FLAG EN TO SET BY SPF AND CLEAR BY TCF. THE FLAG IS CHECKED WITH TSP AND TSK, IF AN
/INTERRUPT OCCURRED, IT MAY BE DUE TO INT ENA NOT BEING CLEARED BY KIE AND DATA BIT 11 ON A 0.

```

```

4143
4144
4145      0241  4446  TEST2, LOOPPC
4146      0242  1371  TAD (2      /SETUP TEST NUMBER FOR ERROR DISPLAY
4147      0243  3140  DCA TSTNU
4148      0244  4455  CLRIF
4149      0245  4511  SLUCAF      /CLEAR EXPECTING INTERRUPT FLAGS
4150      0246  6001  ION      /CLEAR ALL FLAGS + SET SLU INT ENA
4151      0247  4475  MKSF      /TURN THE INTERRUPT ON
4152      0250  7610  SKP CLA      /CHECK TO SEE IF RECEIVE FLAG IS A 0
4153      0251  4450  ERROR
4154      0252  4500  MKIE
4155      0253  4502  MSPF
4156      0254  4503  MTSF
4157      0255  4450  ERROR
4158      0256  4507  MTSK
4159      0257  7410  SKP
4160      0260  4450  ERROR
4161      0261  4475  MKSF
4162      0262  7410  SKP
4163      0263  4450  ERROR
4164      0264  4504  MTCF
4165      0265  4503  MTSF
4166      0266  7410  SKP
4167      0267  4450  ERROR
4168      0270  4507  MTSK
4169      0271  7610  SKP CLA
4170      0272  4450  ERROR
4171      0273  4475  MKSF
4172      0274  7610  SKP CLA
4173      0275  4450  ERROR
4174      0276  4447  DONLOP
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/*****
/SETUP TEST NUMBER FOR ERROR DISPLAY
/CLEAR EXPECTING INTERRUPT FLAGS
/CLEAR ALL FLAGS + SET SLU INT ENA
/TURN THE INTERRUPT ON
/CHECK TO SEE IF RECEIVE FLAG IS A 0
/RECEIVE FLAG SET OR KSF SKIPPED
/CLEAR SLU INT ENA
/SET XMIT FLAG ENABLE
/SKIP ON XMIT FLAG SET AND ENABLED
/SPF FAILED TO SET XMIT FLAG OR NO SKIP OCCURRED
/SKIP ON XMIT/RECEIVE + INT ENA ON A 1
/TSK SKIPPED OR KIE AND DATA 11 L FAILED TO CLEAR INT ENA
/SKIP ON RECEIVE FLAG
/RECEIVE FLAG SET BY ABOVE CODE
/CLEAR TRANSMIT FLAG ENABLE
/SKIP ON XMIT FLAG SET AND ENABLED
/TCF FAILED TO CLEAR XMIT FLAG ENABLE
/SKIP ON XMIT/RECEIVE + INT ENA ON A 1
/TSK SKIPPED WITH XMIT FLAG + INT ENA A 0
/SKIP ON RECEIVE FLAG
/RECEIVE FLAG GOT SET BY ABOVE CODE

```

```

/PRINT "SLU TESTING MESSAGE"

```

```

PSMES, 0
CICRLF
CIPRNT
SLUMES
CIPRNT
TESMES
CICRLF
JMP I PSMES

```



```
4197 /*****
4198 /TEST 3 - CHECKS THAT CAF WILL CLEAR THE TRANSMIT FLAG EN, THE PROGRAM
4199 /CHECKS THAT NO INTERRUPTS OCCURRED.
4200 /*****
4201
4202 0400 4446 TEST3, LOOPPC
4203 0401 1377 TAD (3 /SETUP TEST NUMBER FOR ERROR DISPLAY
4204 0402 3140 DCA TSTNU
4205 0403 4455 CLRIF /CLEAR EXPECTING INTERRUPT FLAGS,
4206 0404 4511 SLUCAF
4207 0405 6001 ION /TURN THE INTERRUPT ON
4208 0406 4500 MKIE /CLEAR SLU INT ENA
4209 0407 4502 MSPF /SET THE TRANSMIT FLAG ENABLE
4210 0410 4503 MTSF /SKIP ON THE XMIT FLAG SET AND ENABLED
4211 0411 4450 ERROR /SPF FAILED TO SET THE XMIT FLAG
4212 0412 4507 MTSK /SKIP ON XMIT/RECEIVE + INT ENA
4213 0413 7410 SKP
4214 0414 4450 ERROR /TSK SKIPPED WITHOUT INT ENA SET OR KIE FAILED
4215 0415 4511 SLUCAF /CLEAR ALL FLAGS
4216 0416 4503 MTSF /SKIP ON THE TRANSMIT FLAG SET AND ENABLED
4217 0417 7410 SKP
4218 0420 4450 ERROR /FAILED TO CLEAR XMIT FLAG
4219 0421 4475 MKSF /SKIP ON RECEIVE FLAG
4220 0422 7610 SKP CLA
4221 0423 4450 ERROR /RECEIVE FLAG SET BY ABOVE CODE
4222 0424 4447 DONLOP
4223
4224 /*****
4225 /TEST 4 - CHECK THAT CAF WILL SET SLU INT ENABLE AND THAT KIE
4226 /AND DATA 11 ON A 0 WILL CLEAR IT USING XMIT FLAG TO INTERRUPT ON,
4227 /TSK IS CHECKED TO SKIP AND NOT TO SKIP.
4228 /*****
4229
4230 0425 4446 TEST4, LOOPPC
4231 0426 1376 TAD (4 /SETUP TEST NUMBER FOR ERROR DISPLAY
4232 0427 3140 DCA TSTNU
4233 0430 4455 CLRIF /CLEAR EXPECTING INTERRUPT FLAGS,
4234 0431 4511 SLUCAF /CLEAR ALL FLAGS BUT SET SLU INTERRUPT ENABLE
4235 0432 6001 ION /TURN THE INTERRUPT ON
4236 0433 4503 MTSF /SKIP ON XMIT FLAG SET AND ENABLED
4237 0434 7410 SKP
4238 0435 4450 ERROR /XMIT FLAG ENABLE SET AFTER A CAF
4239 0436 4507 MTSK /SKIP ON XMIT/RECEIVE AND INT ENA ON A 1
4240 0437 7410 SKP
4241 0440 4450 ERROR /TSK SKIPPED WITH INT ENA SET AND NO FLAG
4242 0441 4460 SETEXI /SET EXPECTING XMIT INTERRUPT FLAG
4243 0442 4502 MSPF /SET THE TRANSMIT FLAG ENABLE
4244 0443 4450 CLRIF /CLEAR EXPECTING XMIT INTERRUPT FLAG
4245 0444 4503 MTSF /SKIP ON THE TRANSMIT FLAG SET AND ENABLED
4246 0445 4450 ERROR /TFL FAILED TO SET THE XMIT FLAG
4247 0446 4507 MTSK /SKIP ON XMIT FLAG AND INT ENA ON A 1
4248 0447 4450 ERROR /CAF FAILED TO SET SLU INT ENA OR TSK DIDN'T SKIP
4249 0450 2117 ISZ INTFLG /DID THE PROGRAM INTERRUPT WITH XMIT + INT ENA
4250 0451 4450 ERROR /PROGRAM FAILED TO INTERRUPT WITH XMIT + INT ENA SET
4251 0452 7200 CLA /CLEAR THE ACCUMULATOR
```

```
4252 0453 4500 MKIE /CLEAR INT ENA ON SLU
4253 0454 3117 DCA INTFLG /CLEAR PROGRAM INTERRUPT FLAG.
4254 0455 6001 ION /TURN THE INTERRUPT BACK ON
4255 0456 4503 MTSF /SKIP ON TRANSMIT FLAG SET AND ENABLED
4256 0457 4450 ERROR /XMIT FLAG EN GOT CLEARED
4257 0460 4507 MTSK /SKIP ON XMIT AND INT ENA ON A 1
4258 0461 7410 SKP
4259 0462 4450 ERROR /KIE AND DATA 11 FAILED TO CLEAR INT ENA
4260 0463 4504 MTSF /CLEAR XMIT FLAG ENABLE
4261 0464 4503 MTSF /SKIP ON TRANSMIT FLAG SET AND ENABLED
4262 0465 7410 SKP
4263 0466 4450 ERROR /TSK FAILED TO CLEAR XMIT FLAG
4264 0467 4475 MKSF /SKIP ON RECEIVE FLAG
4265 0470 7410 SKP
4266 0471 4450 ERROR /RECEIVE FLAG GOT SET BY ABOVE CODE
4267 0472 4447 DONLOP
4268
4269 /*****
4270 /TEST 5 - CHECKS THAT SLU INT ENA CAN BE SET AND CLEARD BY KIE
4271 /AND DATA BIT 11 USING THE XMIT FLAG TO INTERRUPT ON,
4272 /*****
4273
4274 0473 4446 TEST5, LOOPPC
4275 0474 1375 TAD (5 /SETUP TEST NUMBER FOR ERROR DISPLAY
4276 0475 3140 DCA TSTNU
4277 0476 4455 CLRIF /CLEAR EXPECTING INTERRUPT FLAGS,
4278 0477 4511 SLUCAF /CLEAR ALL FLAGS
4279 0500 4500 MKIE /CLEAR SLU INTERRUPT ENABLE
4280 0501 6001 ION /TURN THE INTERRUPT ON
4281 0502 4502 MSPF /SET THE TRANSMIT FLAG ENABLE
4282 0503 4503 MTSF /SKIP ON TRANSMIT FLAG SET AND EN
4283 0504 4450 ERROR /SPF FAILED TO SET TRANSMIT FLAG
4284 0505 4507 MTSK /SKIP ON XMIT/RECEIVE + INT ENA ON A 1
4285 0506 7610 SKP CLA
4286 0507 4450 ERROR /ERROR, INT ENA SET OR KIE FAILED TO CLEAR INT ENA
4287 0510 4460 SETEXI /SET EXPECTING TRANSMIT INT FLAG
4288 0511 7301 CLA CLL IAC /SET DATA 11 TO A 1
4289 0512 4500 MKIE /SET INT ENA
4290 0513 4456 CLRIF /CLEAR EXP XMIT INT FLAG
4291 0514 4503 MTSF /SKIP ON TRANSMIT FLAG SET AND ENABLED
4292 0515 4450 ERROR /XMIT FLAG GOT CLEARED
4293 0516 4507 MTSK /SKIP ON XMIT + INT ENA ON A 1
4294 0517 4450 ERROR /KIE AND DATA 11 ON A 1 FAILED TO SET INT ENA
4295 0520 7200 CLA
4296 0521 2117 ISZ INTFLG
4297 0522 4450 ERROR /PROGRAM FAILED TO INTERRUPT WITH INT ENA + XMIT FLAG
4298 0523 3117 DCA INTFLG
4299 0524 4500 MKIE /CLEAR INTERRUPT ENABLE
4300 0525 6001 ION /TURN THE INTERRUPT ON
4301 0526 4503 MTSF /SKIP ON XMIT FLAG SET AND ENABLED
4302 0527 4450 ERROR /XMIT FLAG CLEARED
4303 0530 4507 MTSK /SKIP ON XMIT + INT ENA ON A 1
4304 0531 7610 SKP CLA
4305 0532 4450 ERROR /KIE + DATA 11 ON A 0 FAILED TO CLEAR INT ENA
4306 0533 4504 MTSF /CLEAR THE XMIT FLAG ENABLE
```

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4307 0534 4523      MTSF      /SKIP ON SLU XMIT FLAG SET AND ENABLED
4308 0535 7610      SKP CLA
4309 0536 4450      ERROR      /TCF FAILED TO CLEAR XMIT FLAG
4310 0537 4475      MMSF      /SKIP ON RECEIVE FLAG
4311 0540 7616      SKP CLA
4312 0541 4450      ERROR      /RECEIVE FLAG SET BY ABOVE CODE
4313 0542 4447      DONLOP
4314
4315 0575 0005
4316 0576 0004
4317 0577 0003
4318 0600
PAGE
4319
4320 /*****
4321 /TEST 6 - CHECKS THAT TLS WILL CLEAR THE XMIT FLAG AND THEN SET IT WHEN
4322 /XMISSION OF CHAR COMPLETE, THE PROGRAM THEN CLEARS THE XMIT FLAG AND WAITS FOR
4323 /RCV DATA TO SET RECEIVE FLAG, THE RECEIVE FLAG IS CHECKED TO CAUSE KSF TO
4324 /SKIP AND INTERRUPT AND THEN TO CLEAR BY KCF,
4325 /*****
4326
4327 0600 1377      PTEST6, TAD (MTLS
4328 0601 3252      DCA TS60W1
4329 0602 1377      TAD (MTLS
4330 0603 3763      DCA TS60W2
4331 0604 1376      TAD (6
4332 0605 3140      DCA TSTNU
4333 0606 4446      LOUPPC
4334 0607 1775      TAD BORATE
4335 0610 0374      AND (0017
4336 0611 7640      SZA CLA
4337 0612 5224      JMP RES60W
4338 0613 1373      TAD (NOP
4339
4340
4341 0614 3264      DCA TS60W3
4342 0615 1373      TAD (NOP
4343 0616 3274      DCA TS60W4
4344 0617 1373      TAD (NOP
4345 0620 3301      DCA TS60W5
4346 0621 1373      TAD (NOP
4347 0622 3307      DCA TS60W6
4348 0623 5235      JMP OWSET
4349 0624 1372      RES60W, TAD (ION
4350 0625 3264      DCA TS60W3
4351 0626 1371      TAD (ERROR
4352 0627 3274      DCA TS60W4
4353 0630 1372      TAD (ION
4354 0631 3301      DCA TS60W5
4355 0632 1371      TAD (ERROR
4356 0633 3347      DCA TS60W6
4357 0634 5235      JMP OWSET
4358 0635 4455      OWSET, CLREIF
4359 0636 4512      CFSLU
4360 0637 4467      LOOP

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4361 0644 3136      DCA ECON61
4362
4363 0641 6001      ION
4364 0642 4464      SETEXI
4365 0643 4502      MMSF
4366 0644 4503      MTSF
4367 0645 4450      ERROR
4368 0646 4507      MTSK
4369 0647 4450      ERROR
4370 0650 2117      ISZ INTFLG
4371 0651 4450      ERROR
4372 0652 4510      TS60W1, HTLS/MTPC
4373 0653 6001      ION
4374 0654 4503      MTSF
4375
4376
4377
4378
4379 0655 7610      SKP CLA
4380 0656 5261      JMP .+3
4381 0657 4451      TSFWAT
4382 0660 4450      ERROR
4383 0661 2117      ISZ INTFLG
4384 0662 4450      ERROR
4385 0663 4510      TS60W2, HTLS/MTPC
4386 0664 6001      TS60W3, ION/NOP
4387 0665 4503      MTSF
4388 0666 7610      SKP CLA
4389 0667 4450      ERROR
4390 0670 4461      SETERI
4391
4392 0671 4451      TSFWAT
4393 0672 4450      ERROR
4394 0673 2117      ISZ INTFLG
4395 0674 4450      TS60W4, ERROR/NOP
4396 0675 4507      MTSK
4397 0676 4450      ERROR
4398 0677 4504      MTCF
4399 0700 4456      TS60W5, CLREXI
4400 0701 6001      ION/NOP
4401 0702 4452      KSFWAT
4402 0703 4450      ERROR
4403 0704 4507      MTSK
4404 0705 4450      ERROR
4405 0706 2117      TS60W6, ISZ INTFLG
4406 0707 4450      ERROR/NOP
4407 0710 4474      MKCF
4408 0711 6001      ION
4409 0712 4452      KSFWAT
4410 0713 4450      ERROR
4411 0714 4474      MKCF
4412 0715 6001      ION
4413 0716 4475      MMSF
4414 0717 7610      SKP CLA
4415 0720 4450      ERROR

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/VT78 CPU DIAGNOSTIC  PAL10  VI42A  2-AUG-77  7:30  PAGE 11-6  SEQ 0105

4416 0721 4503 MTSF /SKIP ON XMIT FLAG
4417 0722 7610 SKP CLA
4418 0723 4450 ERROR /TRANSMIT FLAG GOT RESET BY ABOVE CODE
4419 0724 4447 DONLOP

/*****
/TEST 7 - CHECKS THAT TPC PRODUCES SAME RESULTS AS TLS.
/REEXECUTE TEST 6 WITH TLS REPLACED WITH TPC.
/*****/

4426 0725 1370 TEST7, TAD (MTPC
4427 0726 3252 DCA TS60W1
4428 0727 1370 TAD (MTPC
4429 0730 3263 DCA TS60W2
4430 0731 1367 TAD (7
4431 0732 3140 DCA TSTNU
4432 0733 5206 JMP TEST6
4433
4434
4435 0767 0007
4436 0770 4506
4437 0771 4450
4438 0772 6001
4439 0773 7000
4440 0774 0017
4441 0775 3124
4442 0776 0006
4443 0777 4510
4444 1000

PAGE

/*****
/TEST 10 - CHECKS THAT THE TLS-TCF SEQUENCE WILL CLEAR XMIT FLAG ENABLE
/PREVENTING THE FOLLOWING INTERRUPT, ALSO CHECKS THAT THE RECEIVE FLAG
/WILL SET AND THAT IT CAN BE CLEARED BY KCC.
/*****/

4451 1000 4446 TEST10, LOOPPC
4452 1001 1377 TAD (10
4453 1002 3140 DCA TSTNU
4454 1003 4455 CLREIF /CLEAR EXPECTING INTERRUPT FLAGS
4455 1004 4511 SLUCAF /CLEAR ALL FLAGS BUT SET INT ENABLE
4456 1005 4467 LOOP /SETUP LOOPAROUND ON SLU'S
4457 1006 6001 ION /TURN THE INTERRUPT ON
4458 1007 4460 SETEXI /SET EXPECTING TRANSMIT INTERRUPT FLAG
4459 1010 4502 MSPF /SET THE TRANSMIT FLAG ENABLE
4460 1011 4456 CLRFXI /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 MTL5
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

/VT78 CPU DIAGNOSTIC  PAL10  VI42A  2-AUG-77  7:30  PAGE 11-7  SEQ 0106

4470 1023 7410 SKP
4471 1024 4450 ERROR /TLS - TCF FAILED TO CLEAR XMIT FLAG ENABLE
4472 1025 4451 TSFWAT /WAIT FOR XMIT FLAG + EN TO SET (SHOULD NOT)
4473 1026 7410 SKP /TIMEOUT AS EXPECTED.
4474 1027 4450 ERROR /XMIT FLAG + EN =1
4475 1030 4452 KSFNAT /WAIT FOR RECEIVE FLAG TO SET
4476 1031 4450 ERROR /RECEIVE FLAG FAILED TO SET
4477 1032 4457 CLRERI /CLEAR EXPECTING INTERRUPT FLAG
4478 1033 4507 MTSK /SKIP ON RCV FLAG AND INT ENA
4479 1034 4450 ERROR /FAILED TO SKIP
4480 1035 2117 ISZ INTFLG /DID THE PROGRAM INTERRUPT
4481 1036 4450 ERROR /FAILED TO INTERRUPT WITH RCV AND INT ENA SET
4482 1037 4476 MKCC /CLEAR THE RECEIVE FLAG
4483 1040 6001 ION /TURN THE INTERRUPT ON
4484 1041 4475 MKSF /SKIP ON RECEIVE FLAG
4485 1042 7610 SKP CLA
4486 1043 4450 ERROR /KCC FAILED TO CLEAR RCV FLAG
4487 1044 4447 DONLOP
4488
4489
4490
/*****
/TEST 11 - CHECKS THAT KRB WILL CLEAR THE RCV FLAG. THE RCV FLAG
/IS SET BY ISSUING TLS COMMAND.
/*****/

4496 1045 4446 TEST11, LOOPPC
4497 1046 1376 TAD (11
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 MTL5 /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 CLRFXI /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 KSFNAT /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 4501 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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/VT78 CPU DIAGNOSTIC    PAL10    V142A    2-AUG-77    7130    PAGE 11-8
                                                                    SEQ 0107

4525    1102    7610    SKP CLA
4526    1103    4454    ERROR
4527    1104    4447    DONLOP
4528
4529
4530
4531
4532
4533    1105    4446    TEST12, LOOPPC
4534    1106    1375    TAD (12
4535    1107    3140    DCA TSTNU
4536    1110    4455    CLRERIF
4537    1111    4511    SLUCAF
4538    1112    4467    LOOP
4539    1113    6001    ION
4540    1114    7000    NOP
4541    1115    4460    SETEXI
4542    1116    4510    HTLS
4543    1117    4451    TSFWAT
4544    1120    4450    ERROR
4545    1121    4456    CLRERI
4546    1122    2117    ISZ INTFLG
4547    1123    4450    ERROR
4548    1124    4504    MTCF
4549    1125    4461    SETERI
4550    1126    6001    ION
4551    1127    4452    KSFNAT
4552    1130    4450    ERROR
4553    1131    4457    CLRERI
4554    1132    2117    ISZ INTFLG
4555    1133    4450    ERROR
4556    1134    4511    SLUCAF
4557    1135    6001    ION
4558    1136    4475    MKSF
4559    1137    7610    SKP CLA
4560    1140    4450    ERROR
4561    1141    4447    DONLOP
4562
4563    1175    0012
4564    1176    0011
4565    1177    0010
4566    1200
4567
4568
4569
4570
4571
4572    1200    4446    TEST13, LOOPPC
4573    1201    1377    TAD (13
4574    1202    3140    DCA TSTNU
4575    1203    4455    CLRERIF
4576    1204    4511    SLUCAF
4577    1205    4467    LOOP
4578    1206    6001    ION

/*****
/TEST 12 - CHECKS THAT CAF WILL CLEAR RCV FLAG
/*****

/SETUP TEST NUMBER FOR ERROR DISPLAY
/CLEAR EXPECTING INTERRUPT FLAGS
/CLEAR ALL FLAGS
/SETUP LOOPAROUND ON ALL SLU'S
/TURN THE INTERRUPT ON
/SET EXPECTING TRANSMIT INTERRUPT FLAG
/TRANSMIT, SET XMIT EN, CLEAR XMIT FLAG
/WAIT FOR XMIT FLAG
/XMIT FLAG FAILED TO SET
/CLEAR EXPECTING TRANSMIT INTERRUPT FLAG
/DID THE PROGRAM INTERRUPT?
/PROGRAM FAILED TO INTERRUPT
/CLEAR TRANSMIT FLAG EN
/SET EXPECTING RECEIVE INTERRUPT FLAG
/WAIT FOR RECEIVE FLAG
/RECEIVE FLAG FAILED TO SET
/CLEAR EXPECTING RECEIVE INTERRUPT
/DID THE PROGRAM INTERRUPT
/PROGRAM FAILED TO INTERRUPT
/CLEAR ALL FLAGS
/TURN THE INTERRUPT BACK ON
/SKIP ON RECEIVE FLAG
/INITIALIZE FAILED TO CLEAR RECEIVE FLAG

PAGE

/*****
/TEST 13 - CHECKS THE EFFECT OF THE SLU IOT'S UPON THE AC
/*****

/SETUP TEST NUMBER FOR ERR DISPLAY
/CLEAR EXPECTING INTERRUPT FLAGS
/CLEAR ALL FLAGS
/SETUP LOOPAROUND ON SLU'S
/TURN THE INTERRUPT ON

/VT78 CPU DIAGNOSTIC    PAL10    V142A    2-AUG-77    7130    PAGE 11-9
                                                                    SEQ 0108

4579    1207    7344    CLA CLL CMA RAL
4580    1210    4500    MKIE
4581    1211    7050    CMA RAR
4582    1212    7420    SNL
4583    1213    4450    ERROR
4584    1214    7240    CLA CMA
4585    1215    4476    MKCC
4586    1216    7440    SZA
4587    1217    4450    ERROR
4588    1220    7240    CLA CMA
4589    1221    4501    MKRB
4590    1222    7510    SPA
4591    1223    4450    ERROR
4592    1224    7240    CLA CMA
4593    1225    4477    MKRS
4594    1226    7040    CMA
4595    1227    7440    SZA
4596    1230    4450    ERROR
4597    1231    7340    CLA CLL CMA
4598    1232    4475    MKSF
4599    1233    7010    CMA
4600    1234    7440    SZA
4601    1235    4450    ERROR
4602    1236    7240    CLA CMA
4603    1237    4474    MKCF
4604    1240    7040    CMA
4605    1241    7440    SZA
4606    1242    4450    ERROR
4607    1243    7240    CLA CMA
4608    1244    4502    MSPF
4609    1245    7040    CMA
4610    1246    7440    SZA
4611    1247    4450    ERROR
4612    1250    7240    CLA CMA
4613    1251    4504    MTCF
4614    1252    7040    CMA
4615    1253    7440    SZA
4616    1254    4450    ERROR
4617    1255    7240    CLA CMA
4618    1256    4503    MTSF
4619    1257    7040    CMA
4620    1260    7440    SZA
4621    1261    4450    ERROR
4622    1262    7240    CLA CMA
4623    1263    4506    MTPC
4624    1264    7040    CMA
4625    1265    7440    SZA
4626    1266    4450    ERROR
4627    1267    4451    TSFWAT
4628    1270    4450    ERROR
4629    1271    4452    KSFNAT
4630    1272    4450    ERROR
4631    1273    4504    MTCF
4632    1274    4474    MKCF
4633    1275    7240    CLA CMA

/SET THE AC TO -2
/CLEAR SLU INTERRUPT ENABLE
/KIE CHANGED THE AC
/CLEAR RECEIVE FLAG AND AC
/KCC FAILED TO CLEAR THE AC
/CLEAR AC AND READ RECEIVE BUFFER
/KRB FAILED TO CLEAR AC
/READ RECEIVE BUFFER - INCLUSIVE OR WITH AC
/SET THE AC BACK TO 0
/KRS CHANGED THE AC
/SKIP ON RECEIVE FLAG
/KSF CHANGED THE AC
/CLEAR RECEIVE FLAG
/KCF CHANGED THE AC
/SET TRANSMIT FLAG ENABLE
/TFL CHANGED THE AC
/CLEAR THE TRANSMIT FLAG EN
/TCF CHANGED THE AC
/SKIP ON TRANSMIT FLAG SET AND ENABLED
/TSF CHANGED THE AC
/LOAD TRANSMIT BUFFER AND TRANSMIT
/TPC CHANGED THE AC
/WAIT FOR THE TRANSMIT FLAG
/TRANSMIT FLAG FAILED TO SET
/WAIT FOR THE RECEIVE FLAG
/RECEIVE FLAG FAILED TO SET
/CLEAR THE XMIT FLAG EN
/CLEAR THE RECEIVE FLAG

```

```

4634 1276 4507 MTSK /SKIP IF XMIT/RCV FLAG SET AND INT ENA SET
4635 1277 7000 CMA
4636 1300 7440 SZA
4637 1301 4450 ERROR /TSK CHANGED THE AC
4638 1302 7240 CLA CMA
4639 1303 4510 MTS /LOAD TRANSMIT BUFFER, TRANSMIT + CLEAR FLAG, SET XMIT EN
4640 1304 7000 CMA
4641 1305 7440 SZA
4642 1306 4450 ERROR /TLS CHANGED THE AC
4643 1307 4451 TSFWAT /WAIT FOR THE TRANSMIT FLAG
4644 1310 4450 ERROR /TRANSMIT FLAG FAILED TO SET
4645 1311 4452 KSWAT /WAIT FOR THE RECEIVE FLAG TO SET
4646 1312 4450 ERROR /ERROR RECEIVE FLAG FAILED TO SET
4647 1313 4500 MTCF /CLEAR THE TRANSMIT FLAG
4648 1314 4476 MKCC /CLEAR AC AND RECEIVE FLAG
4649 1315 4447 DONLOP

```

```

*****
/TEST 14 - CHECKS THAT ALL ZEROES CAN BE TRANSMITTED AND READ BACK IN
*****

```

```

TEST14, LOOPPC
TAD (14 /SETUP TEST NUMBER FOR ERROR DISPLAY
DCA TSTNU
CLREIF /CLEAR EXPECTING INT FLAGS
CFSLU /CLEAR ALL SLU FLAGS AND EN SLU INT.
DCA SLUXMT /CLEAR THE WORD TO BE TRANSMITTED
SLUDAT /GO TRANSMIT, READ AND COMPARE THE WORD
SLUDER /DATA ERROR-WORD WAS NON ZERO BEING READ BACK
DONLOP

```

```

*****
/TEST 15 - CHECKS THAT ALL ONES CAN BE TRANSMITTED AND READ BACK
*****

```

```

TEST15, LOOPPC
JMS APTR /CHECK FOR APT CONTROL AND OK REPORT TO APT
TAD (15 /SETUP TEST NUMBER FOR ERROR DISPLAY
DCA TSTNU
CLREIF /CLEAR EXPECTING INT FLAGS
CFSLU /CLEAR ALL SLU FLAGS AND EN SLU INT.
TAD (377
DCA SLUXMT /SET THE WORD TO BE TRANSMITTED TO ALL ONE'S
SLUDAT /GO TRANSMIT, READ AND COMPARE
SLUDER /DATA ERROR - WORDS DO NOT COMPARE
DONLOP

```

```

*****
/TEST 16 - CHECKS THAT A COMPLEMENTING PATTERN (252-125) CAN BE
/TRANSMITTED AND READ BACK.
*****

```

```

4689 1342 4446 TEST16, LOOPPC
4690 1343 1372 TAD (16 /SETUP TEST NUMBER FOR ERROR DISPLAY
4691 1344 3140 DCA TSTNU
4692 1345 4455 CLREIF /CLEAR EXPECTING INT FLAGS
4693 1346 4512 CFSLU /CLEAR ALL SLU FLAGS AND EN SLU INT.
4694 1347 1371 TAD (252
4695 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

```

PAGE

```

*****
/TEST 17 - CHECKS FOR LOADING AND READING A ONE THROUGH A FIELD
/ OF ZEROS AND A ZERO THROUGH A FIELD OF ONES PATTERNS.
*****

```

```

4713 1400 4446 TEST17, LOOPPC
4719 1401 1377 TAD (17 /SETUP TEST NUMBER FOR ERROR DISPLAY
4720 1402 3140 DCA TSTNU
4721 1403 4455 CLREIF /CLEAR EXPECTING INTERRUPT FLAGS
4722 1404 4512 CFSLU /CLEAR ALL SLU FLAGS AND EN SLU INT.
4723 1405 7301 OTZ, CLA CLL IAC
4724 1406 3126 DCA SLUXMT
4725 1407 4453 SLUDAT
4726 1410 4454 SLUDER
4727 1411 1126 TAD SLUXMT
4728 1412 0376 AND (0200
4729 1413 7640 SZA CLA
4730 1414 5220 JMP ZTO
4731 1415 1126 TAD SLUXMT
4732 1416 7104 CLL RAL
4733 1417 5206 JMP OTZ+1
4734 1420 7144 ZTO, CLL CMA RAL
4735 1421 0377 AND (0377
4736 1422 3126 DCA SLUXMT
4737 1423 4453 SLUDAT
4738 1424 4454 SLUDER
4739 1425 1126 TAD SLUXMT
4740 1426 0376 AND (0200
4741 1427 7650 SNA CLA

```

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/VT78 CPU DIAGNOSTIC    PAL10  V142A  2-AUG-77    7130    PAGE 11-12    SEQ 0111

4743  1430  5235    JMP DONT17
4744  1431  1126    TAD SLUXMT
4745  1432  7120    STL
4746  1433  7004    RAL
4747  1434  5221    JMF ZTO+1
4748  1435  4447    DONT17, DONLOP
4749
4750
4751
4752
4753    /*****
4754    /TEST 20 - CHECKS THE TIMING OF THE SERIAL LINE UNIT FROM 50 BAUD TO
4755    / 19200 BAUD.
4756    /*****
4757  1436  4446    TEST20, LOOPPC
4758  1437  1374    TAD (20
4759  1440  3140    DCA TSTNU
4760  1441  6002    LOF
4761  1442  4455    CLRIF
4762  1443  4433    SLU2MC
4763  1444  0027    MODE1
4764  1445  4514    RLOOP
4765  1446  4512    CFSLU
4766  1447  4141    JMS PATCH
4767  1450  1514    INTRN
4768  1451  3266    DCA ATIMLS
4769  1452  3267    DCA ATIMMS
4770  1453  4510    MTL5
4771  1454  4501    MTSF
4772  1455  5254    JMP .-1
4773  1456  4510    MTL5
4774  1457  6001    ION
4775  1460  2266    ISZ ATIMLS
4776  1461  5260    JMP .-1
4777  1462  2267    ISZ ATIMMS
4778  1463  5260    JMP .-3
4779  1464  4450    ERROR
4780  1465  5347    JMP CLUPEX
4781
4782  1466  0000    ATIMLS, 0
4783  1467  0000    ATIMMS, 0
4784  1470  0000    SVBDC, 0
4785  1471  0000    ETIMMS, 0
4786
4787  1472  0000    ETIMLL, 0
4788
4789  1473  0000    ETIMLU, 0
4790
4791
4792  1474  1266    TIMERR, TAD ATIMLS
4793  1475  7421    MQL
4794  1476  1267    TAD ATIMMS
4795  1477  4450    ERROR
4796  1500  7300    CLA CLL
4797  1501  1672    TAD I ETIMLL

/SETUP TEST NUMBER FOR ERROR DISPLAY
/CLEAR EXPECTING INTERRUPT FLAGS
/SET SLU # 2 MODE
/8 BIT, NO PARITY, 1 STOP BIT
/REMOVE SLU LOOPAROUND
/CLEAR ALL SLU FLAGS AND EN SLU INT.
/SETUP INTERRUPT LINKAGE TO RETURN TO LOCATION 'INTRN'
/CLEAR ACTUAL TIME COUNTERS
/LOAD TRANSMIT REGISTER
/LOAD TRANSMIT BUFFER
/ENABLE XMIT FLAG TO TRIGGER INT
/   WHEN TRANSMISSION OF CHAR IS COMPLETE
/COUNT TILL INTERRUPT
/TIMEOUT-EXPECTED INT DID NOT OCCUR
/ACTUAL TIME COUNT, LEAST SIGN WORD
/   , MOST SIGN WORD
/ADDRESS OF EXPECTED TIME COUNT
/   MOST SIGNIFICANT WORD
/ADDRESS OF EXPECTED TIME COUNT
/   LOWER LIMIT ON LEAST SIGN WORD
/ADDRESS OF EXPECTED TIME COUNT
/   UPPER LIMIT ON LEAST SIGN WORD
/TIMING PROBLEM
/AC,MO=ACTUAL TIME COUNT - CONTINUE (RETURN)
/   DIAGNOSTIC FOR EXPECTED TIME COUNT

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/VT78 CPU DIAGNOSTIC    PAL10  V142A  2-AUG-77    7130    PAGE 11-13    SEQ 0112

4798  1502  7421    MQL
4799  1503  1671    TAD I ETIMMS
4800  1504  4450    ERROR
4801  1505  7300    CLA CLL
4802  1506  1673    TAD I ETIMLU
4803  1507  7421    MQL
4804  1510  1671    TAD I ETIMMS
4805  1511  4450    ERROR
4806  1512  7300    CLA CLL
4807  1513  5347    JMP CLUPEX
4808  1514  7248    INTRN, CLA CMA
4809  1515  1773    TAD BDRATE
4810  1516  3270    DCA SVBDC
4811  1517  1270    TAD SVBDC
4812  1520  1372    TAD (SLUMST
4813  1521  3271    DCA ETIMMS
4814  1522  1270    TAD SVBDC
4815  1523  1371    TAD (SLULSL
4816  1524  3272    UCA ETIMLL
4817  1525  1270    TAD SVBDC
4818  1526  1370    TAD (SLULSU
4819  1527  3273    DCA ETIMLU
4820  1530  1671    TAD I ETIMMS
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
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    SZA SZA CLA
4834  1546  5274    JMP TIMERR
4835  1547  4141    CLUPEX, JMS PATCH
4836  1550  6000    SKP1CHN
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  0000
4847  1577  0017
4848
4849
4850  1600  0003    SLUMST, 0003
4851  1601  0002    0002

/RESTORE INTERRUPT LINKAGE AND EXIT
/BAUD RATE - 50
/   75
/   MOST SIGN COUNT WORD

```

PAGE  
/SERIAL LINE UNIT TIMING VERIFICATION TABLES

```

4852 1602 0001 0001 / 110
4853 1603 0001 0001 / 134,5
4854 1604 0001 0001 / 150
4855 1605 0000 0000 / 300
4856 1606 0000 0000 / 600
4857 1607 0000 0000 / 1200
4858 1610 0000 0000 / 1800
4859 1611 0000 0000 / 2000
4860 1612 0000 0000 / 2400
4861 1613 0000 0000 / 3600
4862 1614 0000 0000 / 4800
4863 1615 0000 0000 / 7200
4864 1616 0000 0000 / 9600
4865 1617 0000 0000 / 19200
4866
4867
4868 1620 1275 SLULSL, 1275 /BAUD RATE = 50 LEAST SIGN COUNT WORD, LOWER LIMIT
4869 1621 0720 0720 / 75
4870 1622 3415 3415 / 110
4871 1623 1330 1330 / 134,5
4872 1624 0345 0345 / 150
4873 1625 4160 4160 / 300
4874 1626 2060 2060 / 600
4875 1627 1025 1025 / 1200
4876 1630 0540 0540 / 1800
4877 1631 0475 0475 / 2000
4878 1632 0410 0410 / 2400
4879 1633 0255 0255 / 3600
4880 1634 0200 0200 / 4800
4881 1635 0124 0124 / 7200
4882 1636 0076 0076 / 9600
4883 1637 0033 0033 / 19200
4884
4885
4886 1640 1302 SLULSU, 1302 /BAUD RATE = 50 LEAST SIGN COUNT WORD, UPPER LIMIT
4887 1641 0720 0720 / 75
4888 1642 3421 3421 / 110
4889 1643 1334 1334 / 134,5
4890 1644 0352 0352 / 150
4891 1645 4163 4163 / 300
4892 1646 2067 2067 / 600
4893 1647 1032 1032 / 1200
4894 1650 0546 0546 / 1800
4895 1651 0502 0502 / 2000
4896 1652 0413 0413 / 2400
4897 1653 0261 0261 / 3600
4898 1654 0203 0203 / 4800
4899 1655 0126 0126 / 7200
4900 1656 0100 0100 / 9600
4901 1657 0035 0035 / 19200
4902
4903
4904 /ROUTINE TO SET MODE FOR SLU #2
4905
4906 1660 0200 XMODE2, 0

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4907 1661 7330 CLA CLL
4908 1662 1660 TAD I XMODE2
4909 1663 6307 KMDI /GET MODE REQUEST
4910 1664 7330 CLA CLL /ISSUE MODE SETTING IOT
4911 1665 2260 ISZ XMODE2
4912 1666 5660 JMP I XMODE2
4913
4914 /VARIABLE DELAY ROUTINE - DELAY IS APPROX. 15,3 MICRO SEC PER REQUEST COUNT
4915
4916 1667 0000 XVDLY, 0
4917 1670 7330 CLA CLL
4918 1671 0667 TAD I XVDLY
4919 1672 7041 CIA
4920 1673 3300 OCA VDCTR
4921 1674 2267 ISZ XVDLY
4922 1675 2300 ISZ VDCTR
4923 1676 5275 JMP , -1
4924 1677 5667 JMP I XVDLY
4925 1700 0000 VDCTR, 0
4926
4927 /*****
4928 /TEST 21 - VERIFY EIA DRIVERS ON SIGNAL DISTRIBUTION BOARD
4929 / (EXCEPT FOR SLU #1 WHICH IS NOT AVAILABLE ON
4930 / ON AN EXTERNAL CONNECTOR FOR EXTERNAL LOOPAROUND)
4931 /*****
4932
4933 1701 4446 TEST21, LOOPPC
4934 1702 1377 TAD (21
4935 1703 3140 DCA TSTNU /SETUP TEST NUMBER FOR ERROR DISPLAY.
4936 1704 6002 IOF
4937 1705 4466 GETHW3 /GET HARDWARE WORD 3
4938 1706 0376 AND (0200
4939 1707 7650 SNA CLA /PERIPHERAL SIMULATOR ATTACHED?
4940 1710 5330 JMP T21DN /NO-SKIP THIS TEST
4941 1711 1775 TAD IOT0 /SLU #1 BEING TESTED
4942 1712 7041 CIA
4943 1713 1374 TAD (KCF
4944 1714 7650 SNA CLA
4945 1715 5330 JMP T21DN
4946 1716 6507 LGRE
4947
4948 1717 4455 CLREIF
4949 1720 4512 CFSLU
4950 1721 1373 TAD (0252
4951 1722 3126 DCA SLUXMT /SET UP THE WORD TO BE TRANSMITTED - 252
4952 1723 1372 TAD (RLOOP
4953 1724 3771 DCA DLOP /MODIFY SLUDAT ROUTINE - INHIBIT THE
4954 / INTERNAL LOOPAROUND.
4955 1725 4453 SLUDAT /GO TRANSMIT, READ AND COMPARE
4956 1726 4454 SLUDER /DATA ERROR - FAULTY EIA DRIVER
4957 1727 6007 CAF /REMOVE EXTERNAL LOOPAROUND
4958 1730 4447 T21DN, DONLOP
4959
4960
4961 1771 2423

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4962 1772 4514
4963 1773 0752
4964 1774 0030
4965 1775 2601
4966 1776 0200
4967 1777 0021
4968 2000
4969
4970
4971
4972
4973 2000 4446
4974 2001 1377
4975 2002 3140
4976 2003 4455
4977 2004 4512
4978 2005 1776
4979 2006 7041
4980 2007 1375
4981 2010 7640
4982 2011 5345
4983 2012 7040
4984 2013 3126
4985 2014 3216
4986 2015 4433
4987 2016 0000
4988 2017 4453
4989 2020 5223
4990 2021 1127
4991 2022 4450
4992
4993 2023 1216
4994 2024 0374
4995 2025 7110
4996 2026 1346
4997 2027 3362
4998 2030 1762
4999 2031 7041
5000 2032 1127
5001 2033 7640
5002 2034 4353
5003 2035 2216
5004 2036 1216
5005 2037 0373
5006 2040 7650
5007 2041 5215
5008 2042 4433
5009 2043 0027
5010 2044 0002
5011 2045 1372
5012 2046 3344
5013 2047 6116
5014 2050 6311
5015 2051 5250

PAGE
/*****
/TEST 22 - VERIFY PROGRAMMABLE MODES OF SLU #2 & AND STATUS ERROR BITS
/*****

TEST22, LOOPPC
TAD (22
/SETUP TEST NUMBER FOR ERROR DISPLAY
DCA TSTNU
CLKEIF /CLEAR EXPECTING INTERRUPT FLAGS
CFSLU /CLEAR ALL SLU FLAGS AND EN SLU INT,
TAD IOT0 /SLU #2 BEING TESTED?
CIA
TAD (KCF1
SZA CLA
JMP EXS17 /NO-SKIP TEST 17
CMA
DCA SLUXMT /SETUP XMIT WORD TO ALL ONES
DCA VMODE /CLEAR MODE CONTROL WORD
SLU2MC /SET MODE IN SLU#2
CHARLP,
VMODE, 0000
SLUDAT /TRANSMIT CHAR AND READ REC'D CHAR
JMP L211 /REC'D CHAR NOT XMIT WORD (AS EXPECTED)
TAD SLUREC
ERROR /REC'D CHAR CONTAINS 12 ONES - ALL FOUR ERROR
/ BITS ARE SET, AC=RECEIVED CHARACTER

L211, TAD VMODE
AND (0000 /ISOLATE CHAR LENGTH BITS IN VMODE
CLL RAR
TAD LENBAS
DCA PTED /SETUP POINTER TO EXPECTED RECV DATA
TAD I PTED
CIA
TAD SLUREC /COMPARE REC'D DATA WITH EXPECTED DATA
SZA CLA
JMS SLULER /NOT EQUAL
ISZ VMODE /EQUAL - WORK ON NEXT MODE
TAD VMODE
AND (0040
SNA CLA
JMP CHARLP
SLU2MC /ALL MODES TESTED
MODE1 /RESTORE SLU #2 TO NORMAL MODE
IOF
TAD (-4 /CHECK FOR SLU#2 OVERRUN ERROR
DCA XLCTR
XNC, TSL1 /XMIT FOUR CHARACTERS BEFORE UNLOADING RECEIVE BUFFER REGISTER
TSF1
JMP ,-1

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5016 2052 2344
5017 2053 5247
5018 2054 4452
5019 2055 4450
5020 2056 6306
5021 2057 3127
5022 2060 1127
5023 2061 0371
5024 2062 1370
5025 2063 7640
5026 2064 4330
5027 2065 4470
5028 2066 4512
5029 2067 1027
5030 2070 1367
5031 2071 7640
5032 2072 5345
5033 2073 1374
5034 2074 3276
5035 2075 4433
5036 2076 0000
5037 2077 6316
5038 2100 6311
5039 2101 5300
5040 2102 4473
5041 2103 0010
5042 2104 0037
5043 2105 4473
5044 2106 0004
5045 2107 7201
5046 2110 0037
5047 2111 4452
5048 2112 4450
5049 2113 6306
5050 2114 3127
5051 2115 1127
5052 2116 0371
5053 2117 1366
5054 2120 7640
5055 2121 4335
5056 2122 1276
5057 2123 1365
5058 2124 7642
5059 2125 5345
5060 2126 2276
5061 2127 5275
5062
5063 2130 0000
5064 2131 1127
5065 2132 4450
5066 2133 7300
5067 2134 5730
5068
5069 2135 0000
5070 2136 1776

ISZ XLCTR
JMP XNC
KSWAT
ERROR /FOUR CHAR HAVE BEEN XMITTED-WAIT FOR REC FLAG
KRB1 /NO RECEIVE FLAG
DCA SLUREC /CLEAR AC AND REC FLAG AND READ BUFFER
TAD SLUREC /SAVE REC'D STATUS
AND (7400 /MASK OFF STATUS BITS
TAD (-4400 /EXPECTED 0E=4400
SZA CLA
JMS OEPR
DELAY /DELAY AND THEN CLEANUP RECEIVER
CFSLU /CLEAR ALL SLU FLAGS AND EN SLU INT.
TAD BDR2 /SKIP PARITY CHECK IF BAUD RATE IS NOT 9600.
TAD (-16 /DELAYS ARE SET FOR 9600 BAUD RATE ONLY)
SZA CLA
JMP EXS17
TAD (MODE2 /CHECK FOR PARITY ERROR USING ODD PARITY MODE
DCA PMODE
SLU2MC
PMODE, 0000
TSL1 /XMIT AN ALL ZERO CHAR
TSF1
JMP ,-1
VDELAY /PRE-DELAY LET FIRST FEW BITS OF CHAR BE XMITTED
0010
KLB /REMOVE LOOPAROUND LONG ENOUGH TO MESS UP REC DATA AND
VDELAY / CAUSE A PARITY ERROR.
0004
CLA IAC /RESTORE LOOPAROUND
KLB
KSWAT /WAIT FOR RECEIVE FLAG
ERROR /NO RECEIVE FLAG
KRB1 /CLEAR AC AND REC FLAG AND READ BUFFER
DCA SLUREC /SAVE REC'D STATUS
TAD SLUREC
AND (7400 /MASK OFF STATUS BITS
TAD (-6000 /EXPECTED PE=6000
SZA CLA
JMS PEPR
TAD PMODE
TAD (-MODE2
SZA CLA
JMP EXS17
ISZ PMODE /PERFORM SAME PARITY ERROR CHECK USING EVEN PARITY MODE
JMP PMODE-1
OERR, 0
TAD SLUREC
ERROR /AC=REC'D DATA AND STATUS-OVERRUN SHOULD HAVE OCCURRED
CLA CLL
JMP I OEPR
PERR, 0
TAD PMODE

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5071 2137 7421 MQL
5072 2140 1127 TAD SLURFC
5073 2141 4450 ERROR /AC,MO=REC'D DATA AND STATUS,MODE
5074 / PARITY ERROR SHOULD HAVE OCCURRED
5075 2142 7300 CLA CLL
5076 2143 5735 JMP I PERR
5077 2144 0000 XLCTR, 0
5078 2145 4447 EXS17, DONLOP
5079
5080 2146 2147 LENBAS, +1
5081 2147 0037 /EXPECTED DATA - CHAR LENGTH= 5 BITS
5082 2150 0077 / 6
5083 2151 0177 / 7
5084 2152 0377 / 8
5085
5086
5087 2153 0000 SLULER, 0 /ERROR DISPLAY ROUTINE
5088 2154 1127 TAD SLUREC
5089 2155 7421 MQL
5090 2156 1216 TAD VMODE
5091 2157 4450 ERROR /AC,MO=MODE,REC'D DATA
5092 /EXPECTED DATA=ALL 1'S FOR CHAR LENGTH
5093 /DESIGNATED BY MODE
5094 2160 7300 CLA CLL /NOTE:AC BITS 0,1,2,3 ARE THE SLU2 ERROR BITS
5095 2161 5753 JMP I SLULER
5096 2162 0000 PTED, 0
5097

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5098 2165 7772
5099 2166 2000
5100 2167 7762
5101 2170 3400
5102 2171 7400
5103 2172 7774
5104 2173 0040
5105 2174 0006
5106 2175 6300
5107 2176 2601
5108 2177 0022
5109
5110 /ROUTINE TO SETUP # OF PASSES/TEST AND TO STORE THE RETURN ADDRESS FOR SCOPE LOOPING
5111
5112 2200 0000 PCLOOP, 0
5113 2201 7300 CLA CLL
5114 2202 1377 TAD (SLUEND
5115 2203 7041 CIA
5116 2204 1200 TAD PCLOOP
5117 2205 7710 SPA CLA
5118 2206 5211 JMP NUOK
5119 2207 2140 ISZ TSTNU /UPDATE TEST NUMBER PROVIDE SLU TESTING IS NOT BEING DONE
5120 2210 7000 NOP
5121 2211 1700 NUOK, TAD PCLOOP
5122 2212 3124 DCA TESTFI
5123 2213 5000 JMP I PCLOOP
5124
5125 /EXPECTED INTERRUPT ROUTINES
5126
5127 2214 0000 EXICLR, 0 /CLEAR EXPECTING TRANSMIT INT FLAG
5128 2215 7300 CLA CLL
5129 2216 3120 DCA EXMITI
5130 2217 5014 JMP I EXICLR
5131
5132 2220 0000 ERICLR, 0 /CLEAR EXPECTING RECEIVE INTERRUPT FLAG
5133 2221 7300 CLA CLL
5134 2222 3121 DCA ERECI
5135 2223 5020 JMP I ERICLR
5136
5137 2224 0000 EXISRT, 0 /SET EXPECTING XMIT INTERRUPT FLAG
5138 2225 7240 CLA CMA
5139 2226 3120 DCA EXMITI
5140 2227 5024 JMP I EXISRT
5141
5142 2230 0000 ERISRT, 0 /SET EXPECTING RECV INT FLAG
5143 2231 7240 CLA CMA
5144 2232 3121 DCA ERECI
5145 2233 5030 JMP I ERISRT
5146
5147 2234 0000 EIFCLR, 0 /CLEAR ALL EXPECTING INT FLAGS
5148 2235 7300 CLA CLL
5149 2236 3120 DCA EXMITI
5150 2237 3121 DCA ERECI
5151 2240 3117 DCA INTFLG /CLEAR PROGRAM INT FLAG

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5152 2241 5034      JMP I EIFCLR
5153
5154
5155      /DONE TEST ROUTINE
5156
5157 2242 0000      LOPDON, 0
5158 2243 7300      CLA CLL
5159 2244 1257      TAD LLLD      /SLU TESTING IN PROGRESS?
5160 2245 7041      CIA
5161 2246 1267      TAD KJILD
5162 2247 7640      SZA CLA
5163 2250 5253      JMP GSR      /YES
5164 2251 4462      KBICLK      /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
5172      /LOCATION LLLD CONTAINS 'ISZ TESTAB' WHEN EXECUTING SLU TESTS
5173      /AND 'JMP I LOPDON' WHEN EXECUTING PARALLEL I/O
5174 2260 1665      TAD I TESTAB /AND FLOPPY TESTS.
5175 2261 7450      SNA      /ANY TESTS REMAINING?
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 (BORSQ-1) /MORE BAUD RATES YET TO BE TESTED
5187
5188 2274 3265      DCA TESTAB /SETUP TESTAB WITH BEGINNING OF BAUD RATE TEST SEQ TABLE
5189 2275 5257      JMP LLLD
5190
5191      /NORMAL TEST SEQUENCE
5192      /BAUD RATE FIXED=(NSQBDP)
5193
5194 2276 0221      NORMSQ, TEST1
5195 2277 0241      TEST2
5196 2300 0400      TEST3
5197 2301 0425      TEST4
5198 2302 0473      TEST5
5199 2303 0600      PTEST6
5200 2304 0725      TEST7
5201 2305 1000      TEST10
5202 2306 1045      TEST11
5203 2307 1105      TEST12
5204 2310 1200      TEST13
5205 2311 1316      TEST14
5206 2312 1327      TEST15

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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      BORSQ, 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      WATTSF, 0
5233 2334 7300      CLA CLL
5234 2335 4500      MKIE      /CLEAR INTERRUPT ENABLE F/F
5235 2336 1373      TAD (7777
5236 2337 3123      DCA CNT1
5237 2340 3122      DCA CNT
5238 2341 4772      JMS OFONKI /CHECK TO SEE IF INT EN
5239 2342 4503      MTSF
5240 2343 4357      JMS ADDTIM /GO ADD ONE TO THE COUNTER
5241 2344 2333      ISZ WATTSF
5242 2345 5733      JMP I WATTSF /RETURN TO THE PROGRAM-GOT THE FLAG
5243
5244
5245      /ROUTINE TO WAIT FOR THE SERIAL LINE UNIT RECEIVE FLAG
5246
5247 2346 0000      WATKSF, 0
5248 2347 7300      CLA CLL
5249 2350 1373      TAD (7777
5250 2351 3123      DCA CNT1
5251 2352 3122      DCA CNT
5252 2353 4475      MKSF
5253 2354 4357      JMS ADDTIM /SKIP ON SLU RECEIVE FLAG
5254 2355 2346      ISZ WATKSF /GO ADD A ONE TO THE COUNTER
5255 2356 5746      JMP I WATKSF /RETURN TO THE PROGRAM-GOT THE FLAG
5256
5257
5258      /ROUTINE TO WAIT FOR THE FLAG
5259 2357 0000      ADDTIM, 0
5260 2360 2122      ISZ CNT /EACH INCREMENT ON CNT = APP, 67.5 MICROSEC
5261 2361 7610      SKP CLA

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5262 2362 2123  ISZ CNT1      /EACH INCREMENT ON CNT1 = APP. 210 MILLISEC
5263 2363 7346  CLA CLL CMA RTL
5264 2364 7001  IAC
5265 2365 1357  TAD ADDTIM
5266 2366 3357  DCA ADUTIM
5267 2367 5757  JMP I ADDTIM
5268
5269
5270 2372 2471
5271 2373 7777
5272 2374 2321
5273 2375 0214
5274 2376 3112
5275 2377 3331
5276 2400

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## PAGE

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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 0000 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 LOOP AROUND 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 MTL5 /LOAD AND TRANSMIT IT AND CLEAR THE FLAG
5311 2433 4451 ISFWAT /WAIT FOR THE TRANSMIT FLAG
5312 2434 4450 EPROR /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 EPROR /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 EPROR /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 EPROR /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, EPROR /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
5349 2472 1124 TAD TESTF1 /ROUTINE TO TURN INT ENA OFF OR ON
5350 2473 1376 TAD (-TEST13=1 /GET THE TEST BEING EXECUTED
5351 2474 7640 SZA CLA
5352 2475 7301 CLA CLL IAC /NO, SET THE AC TO 0001
5353 2476 1375 TAD (2 /
5354 2477 4500 MKIE /ENABLE OR DISABLE SLU INT ENA
5355
5356 2500 7200 CLA /ENABLE SLU 2 STATUS BITS
5357 2501 5671 JMP I OFONKI /CLEAR THE AC BIT IF SET
5358 /RETURN
5359
5360 /ROUTINE TO CHECK IF UNDER APT CONTROL--IF SO REPORT OK STATUS TO APT.
5361 2502 0000 REPAPT, 0
5362 2503 7300 CLA CLL
5363 2504 6201 CDF 00
5364 2505 1774 TAD I (NCW2 /UNDER APT CONTROL?
5365 2506 6211 CDF 10
5366 2507 7700 SZA 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

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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 APT, 0
5376 2514 1777 TAD BDRATE /GET CUPRENT SETTING(+1)
5377 2515 0371 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 APTPEP /YES--REPORT TO APT
5382 2522 5713 JMP I APTR
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
5394 2600 PAGE
5395 /*****
5396 /SUBROUTINES TO ISSUE SLU IOTS
5397 /*****
5398 2600 0000 XMKCF, 0
5399 2601 6030 IOT0, KCF /CLEAR RECEIVE FLAG
5400 2602 5600 JMP I XMKCF
5401 2603 4450 ERROR /KCF SKIPPED
5402 2604 5600 JMP I XMKCF
5403
5404 2605 0000 XMKSF, 0
5405 2606 6031 IOT1, KSF /SKIP ON RECEIVE FLAG
5406 2607 5605 JMP I XMKSF /RECV FLAG NOT SET
5407 2610 2205 ISZ XMKSF
5408 2611 5605 JMP I XMKSF /RECV FLAG SET - SKIP OCCURRED
5409
5410 2612 0030 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
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5425 2626 5624 JMP I XMKIE
5426 2627 4450 ERROR /KIE SKIPPED
5427 2630 5624 JMP I XMKIE
5428
5429 2631 0000 XMKRB, 0
5430 2632 6036 IOT5, KRB /LOAD CONTENT OF REC BUFFER INTO AC,CLR REC FLAG
5431 2633 5631 JMP I XMKRB
5432 2634 4450 ERROR /KRB SKIPPED
5433 2635 5631 JMP I XMKRB
5434
5435 2636 0000 XMSPF, 0
5436 2637 6040 IOT7, SPF /SET XMIT FLAG ENABLE
5437 2640 5636 JMP I XMSPF
5438 2641 4450 ERROR /SPF SKIPPED
5439 2642 5636 JMP I XMSPF
5440
5441 2643 0000 XMTSF, 0
5442 2644 6041 IOT8, TSF /SKIP ON XMIT FLAG SET AND ENABLED
5443 2645 5643 JMP I XMTSF /XMIT FLAG NOT SET
5444 2646 2243 ISZ XMTSF
5445 2647 5643 JMP I XMTSF /XMIT FLAG SET - SKIP OCCURRED
5446
5447 2650 0000 XMTCF, 0
5448 2651 6042 IOT9, TCF /CLEAR XMIT FLAG ENABLE
5449 2652 5650 JMP I XMTCF
5450 2653 4450 ERROR /TCF SKIPPED
5451 2654 5650 JMP I XMTCF
5452
5453 2655 0000 XMTSB, 0
5454 2656 1302 TAD IOT10 /DETERMINE WHICH SLU IS BEING WORKED ON.
5455 2657 0377 AND (0030)
5456 2660 7450 SNA
5457 2661 5275 JMP SBDRI
5458 2662 1376 TAD (-10)
5459 2663 7650 SNA CLA
5460 2664 5275 JMP SBDRI
5461 2665 1775 SBDRI, 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 SBDRI, 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 SBDRI, 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
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5480 2707 0000 XMTPC, 0
5481 2710 6044 IOT11, TPC /SAME AS TLS
5482 2711 5707 JMP I XMTPC
5483 2712 4454 ERROR /TPC SKIPPED
5484 2713 5707 JMP I XMTPC

5485
5486 2714 0000 XMTSK, 0
5487 2715 6045 IOT12, TSK /SKIP ON INT EN & REC FLAG OR INT EN & XMIT FLAG & XMIT EN
5488 2716 5714 JMP I XMTSK /NO SKIP
5489 2717 2314 ISZ XMTSK
5490 2720 5714 JMP I XMTSK /SKIP OCCURRED

5491
5492 2721 0000 XMTLS, 0
5493 2722 6046 IOT13, TLS /LOAD XMIT BUFFER,XMIT,EN XMIT FLAG
5494 2723 5721 JMP I XMTLS
5495 2724 4450 ERROR /TLS SKIPPED
5496 2725 5721 JMP I XMTLS

5497
5498 /DON'T TEST SLU #3 IF RUNNING UNDER APT CONTROL - CAN'T LOOP AROUND
5499 /SLU#3 WHEN RUNNING UNDER APT.
5500

5501 2726 0000 APT3CK, 0
5502 2727 1773 TAD TABADD /GET REC DEV CODE FROM TABLE
5503 2730 3346 DCA STAB
5504 2731 1746 TAD I STAB
5505 2732 0372 AND (0770
5506 2733 1371 TAD (-320
5507 2734 7640 SZA CLA /NEXT SLU TO BE TESTED = 3?
5508 2735 5726 JMP I APT3CK /NO
5509 2736 6201 CDF 00 /YES
5510 2737 1770 TAD I (HCW2 /RUNNING UNDER APT CONTROL?
5511 2740 6211 CDF 10
5512 2741 7700 SMA CLA
5513 2742 5726 JMP I APT3CK /NO
5514 2743 2773 ISZ TABADD /YES=SKIP TESTING OF THIS SLU
5515 2744 2773 ISZ TABADD
5516 2745 5726 JMP I APT3CK

5517
5518 2746 0000 STAB, 0
5519
5520
5521 2770 3222
5522 2771 7460
5523 2772 0770
5524 2773 3055
5525 2774 6017
5526 2775 3124
5527 2776 7770
5528 2777 6030
5529 3300
5530
5531 3000 0000 XIOT, 0
5532 3001 6002 IOF
5533 3002 4514 HLOOP /CLEAR LOOP AROUND,

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```

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 XIOT, 0
5555 3025 3025 DCA SDEVIC /SAVE DEVICE CODE
5556 3026 1624 TAD I XIOT
5557 3027 2224 ISZ XIOT
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 XIOT /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 SDEVIC /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 2600 IOT1
5586 3060 2613 IOT2
5587 3061 2620 IOT3
5588 3062 2625 IOT4

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5589 3063 2632 IOTS
5590 3064 6227 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 CKXMF8
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 (OVCTAB /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 DUNLOP 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 2312 ISZ XBAUD
5630 3123 5712 JMP I XBAUD
5631 3124 0000 BDRATE, 0
5632
5633 3125 3324 LLXB, DCA BDRATE
5634 3126 1373 TAD (NORMSQ-1
5635 3127 3772 DCA TESTAB
5636 3130 5712 JMP I XBAUD
5637
5638
5639 /SET BAUD RATES BEFORE LEAVING SLU DIAGNOSTIC; REMOVE LOOPAROUND
5640
5641 3131 4352 ENDSL, JMS SETBDR /SET BAUD RATES-SLU1 & 3 = 9600, SLU2 PER SW
5642 3132 1366 TAD (16
5643 3133 3026 DCA BDR1

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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 DUNLOP 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 TS82 /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 3045
5682 3175 7007
5683 3176 0770
5684 3177 2720
5685 3200
5686 /SET BAUD RATE IN ALL 3 SLUS TO NORMAL TEST SEQUENCE
5687 / BAUD RATE (PRESET TO 9600)
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

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5698 3212 3030 DCA BDR1
5699 3213 5000 JMF I BDRNS
5700
5701 /RESTORE BAUD RATES AND LOOPAROUND TO STATES EXPECTED BY DIAGNOSTIC
5702
5703 3214 0000 RESTBR, 0
5704 3215 1026 TAD BDR1
5705 3216 6043 TSB
5706 3217 7300 CLA CLL /SLU#1 BAUD RATE RESTORED
5707 3220 1027 TAD BDR2
5708 3221 6313 TSB1 /SLU#2 BAUD RATE RESTORED
5709 3222 7300 CLA CLL
5710 3223 1030 TAD BDR3
5711 3224 6333 TSB2 /SLU#3 BAUD RATE RESTORED
5712 3225 7300 CLA CLL
5713 3226 1031 TAD LOOPA
5714 3227 6037 KLB /LOOPAROUND RESTORED
5715 3230 7300 CLA CLL
5716 3231 4470 DELAY /WAIT FOR BAUD RATE CHANGES TO TAKE EFFECT
5717 3232 5014 JMP I RESTBR
5718
5719
5720 /SETUP LOOPAROUND ON ALL SLU'S
5721
5722 3233 0000 SLOOPA, 0
5723 3234 7301 CLA CLL IAC
5724 3235 6037 KLB
5725 3236 3031 DCA LOOPA
5726 3237 5033 JMP I SLOOPA
5727
5728 /CLEAR LOOPAROUND ON ALL SLU'S
5729
5730 3240 0000 CLOOPA, 0
5731 3241 7300 CLA CLL
5732 3242 6037 KLB
5733 3243 3031 DCA LOOPA
5734 3244 5040 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 5045 JMP I XDELAY
5741 3251 0000 DELAY1, 0
5742
5743
5744 /CLEAR ALL FLAGS ROUTINE FOR SLU TESTING.
5745
5746
5747 3252 0000 XSCAF, 0
5748 3253 6007 CAF /CLEAR ALL FLAGS & EN INT, FROM SLUS.
5749 3254 7000 NOP/CLA CLL
5750 3255 7000 NOP/KIE /DISABLE INT, FROM SLU1
5751 3256 7000 NOP/KIE1 /DISABLE INT, FROM SLU2
5752 3257 7000 NOP/KIE2 /DISABLE INT, FROM SLU3

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5753 3260 7000 NOP/IAC
5754 3261 7000 NOP/KIE /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 6065 PCIE /DISABLE INT, FROM PARALLEL INTERFACE
5759 3264 5052 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 6330 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/KIE1 /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 5065 JMP I XCFSLU
5781
5782
5783 /SLU TESTING MESSAGE
5784 3303 2314 SLUMES, TEXT "SLU "
5785 3304 2540
5786 3305 0000
5787 3306 2405 TESMES, TEXT "TESTING"
5788 3307 2324
5789 3310 1116
5790 3311 0700
5791
5792 /GET PSEUDO SWITCH REGISTER FROM LOCATION 20 IN FIELD 0
5793
5794 3312 0000 XGETSR, 0
5795 3313 7300 CLA CLL
5796 3314 6201 CDF 00
5797 3315 1776 TAD I (PSP
5798 3316 6211 CDF 10
5799 3317 5712 JMP I XGETSR
5800
5801 /ROUTINE TO CHECK FOR KEYBOARD INTERVENTION
5802
5803 3320 0000 CHIKB, 0
5804 3321 7300 CLA CLL
5805 3322 6035 KIE /DISABLE INTERRUPTS FROM KEYBOARD
5806 3323 4445 CHIKSF /CHECK FOR KEYBOARD FLAG
5807 3324 7000 NOP

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5803 3325 7201 CLA IAC
5804 3326 6235 KIE /ENABLE INTERRUPTS FROM KEYBOARD
5805 3327 7300 CLA CLL
5806 3330 5720 JMP I CH1KB
5807
5808
5809
5810
5811
5812 3331 /***** SLUEND. /END MARKER FOR SLU TESTS-THIS MARKER MUST ALWAYS
5813 / BE LOCATED AFTER LAST SLU TEST LOOP
5814 / USED BY LOOPPC & ERROR ROUTINE.
5815
5816
5817 /*****
5818 /WARNING
5819 3347 *3347 /LOCATION DESTROYED BY MEMORY EXTENSION TESTING
5820 / FROM FIELD 0 (MEM EXT TEST 4)
5821
5822
5823
5824
5825

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5826
5827 /SLU TESTING COMPLETE - DIAGNOSE PARALLEL I/O INTERFACE

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5828
5829 3376 8020
5830 3377 8023
5831 3426 *3426
5832
5833 /*****
5834 /PARALLEL INTERFACE DIAGNOSTIC
5835 /*****
5836 3400 4465 PRIEST, GETSR /GET PSEUDO SWITCH REGISTER FROM FIELD 0.
5837 3401 0377 AND (0004
5838 3402 7640 SZA CLA /EXECUTE PARALLEL INTERFACE TEST????
5839 3403 5776 JMP PRETEST /NO
5840 3404 6022 IOF
5841 3405 7240 CLA CMA
5842 3406 3136 DCA ECONST /SET FLAG INDICATING THAT A CONSOLE INTERRUPT IS POSSIBLE NOW.
5843 3407 1775 TAD KILLD
5844 3410 3774 DCA LLLD
5845 3411 4773 PPIH, JMS PPIMES /PRINT PARALLEL I/O INTERF TESTING MESSAGE
5846 /IF NOT UNDER APT CONTROL,
5847 3412 6027 CAF /CLEAR ALL FLAGS & DISABLE PARALLEL I/O SIMULATION
5848 / STROBE DECODER,
5849 3413 4141 JMS PATCH /SETUP INTERRUPT SERVICE LINKAGE
5850 3414 6200 SKPICHN
5851 3415 5772 JMS SIMCK0 /CHECK FOR SIMULATOR IN USE
5852
5853 /*****
5854 /WARNING
5855 /LOCATION 3422 & LOCATION 3425 GET DESTROYED BY MEM EXT TEST 4
5856 3426 *3426
5857
5858 3426 4466 NOSIM0, GETHW3
5859 3427 0371 AND (1000
5860 3430 7640 SZA CLA
5861 3431 5770 JMP TILQ /NO PARALLEL INTERFACE DEVICE CABLED TO SYSTEM
5862 3432 4466 GETHW3
5863 3433 0367 AND (400
5864 3434 7640 SZA CLA
5865 3435 5770 JMP TILQ
5866
5867 /*****
5868 /PARALLEL I/O DEVICE CODE = 60
5869 /*****
5870 /
5871 /
5872 /
5873 /*****
5874 /TEST 1 - CHECK FOR PCLF TO CLR PRINT FLAG AND PSSF TO SET
5875 / PRINT FLAG, USE PSKF TO VERIFY.
5876 /*****
5877
5878 3436 4446 TILA, LOOPPC
5879 3437 6662 PCLF /CLEAR PRINT FLAG
5880 3440 7410 SKP
5881 3441 4450 ERROR /PCLF SKIPPED

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5882 3442 6661 PSKF /SKIP ON FLAG
5883 3443 7410 SKP
5884 3444 4450 ERROR /EITHER PCLF FAILED TO CLEAR FLAG
5885 / OR PSKF SKIPPED ON NO FLAG.
5886 3445 6660 PSSF /SET PRINT FLAG
5887 3446 7410 SKP
5888 3447 4450 ERROR /PSSF SKIPPED
5889 3450 6661 PSKF /SKIP ON FLAG
5890 3451 4450 ERROR /EITHER PSSF FAILED TO SET FLAG OR
5891 / PSKF FAILED TO SKIP.
5892 3452 6662 PCLF /CLEAR THE KNOWN SET FLAG.
5893 3453 6661 PSKF /SKIP ON FLAG.
5894 3454 7410 SKP
5895 3455 4450 ERROR /PCLF FAILED TO CLEAR FLAG.
5896 3456 4447 DONLOP
5897
5898
5899 /*****
5900 /TEST 2 - CHECK THAT PCIE WILL SET AND CLEAR INTERRUPT ENABLE.
5901 /*****
5902
5903 3457 4446 T2LA, LOOPPC
5904 3460 4471 CLREPI /CLEAR EXPECTING PRINTER INTERRUPTS.
5905 3461 4516 PCIE /CLEAR PRINTER INT, ENABLE
5906 3462 7410 SKP
5907 3463 4450 ERROR /PCIE SKIPPED.
5908 3464 6001 ION
5909 3465 6660 PSSF /SET PRINTER FLAG
5910 3466 6661 PSKF
5911 3467 4450 ERROR /FLAG FAILED TO SET
5912 3470 6662 PCLF /CLEAR FLAG
5913 3471 6661 PSKF
5914 3472 7410 SKP
5915 3473 4450 ERROR /FLAG FAILED TO CLEAR
5916 3474 7201 CLA IAC
5917 3475 4516 PCIE /SET INT, ENABLE
5918 3476 4472 SETEPI /SET EXPECTING PRINTER INT.
5919 3477 6660 PSSF /SET PRINTER FLAG
5920 3500 7000 NOP
5921 3501 4471 CLREPI /CLEAR EXPECTING PRINTER INT.
5922 3502 6661 PSKF
5923 3503 4450 ERROR /FLAG FAILED TO SET OR NO SKIP
5924 3504 2117 ISZ INTFLG /PROGRAM FAILED TO INT.
5925 3505 4450 ERROR
5926 3506 6662 PCLF
5927 3507 6001 ION
5928 3510 6661 PSKF
5929 3511 7410 SKP
5930 3512 4450 ERROR /FLAG FAILED TO CLEAR
5931 3513 4447 DONLOP
5932
5933
5934 /*****
5935 /TEST 3 - CHECK THAT CAF ENABLES PRINTER INTERRUPTS & CLEARS FLAGS
5936 /*****

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5937
5938      3514 4446      T4LA,  LOOPPC
5939      3515 4471      CLREPI      /CLEAR EXPECTING PRINTER INT.
5940      3516 6662      PCLF        /CLEAR PRINT FLAG
5941      3517 4510      SPCIE      /DISABLE PRINTER INT.
5942      3520 6407      CAF        /ENABLE PRINTER INTERRUPTS & CLEAR FLAGS
5943
5944
5945
5946      3521 7326      CLA CLL CML RTL /NOTE! CAF CLEARS LIFT RIBBON, IF THE SIMULATOR
5947
5948
5949      3522 6526      LQLS        / IS IN USE CLEARING LIFT RIBBON SWITCHES THE
5950      3523 6662      PCLF        / PARALLEL INTERFACE TO THE LQP MODE,
5951      3524 6001      ION         /IN CASE SIMULATOR IS IN USE SWITCH MODE BACK TO LA
5952      3525 4472      SETIEPI     / & CLEAR FLAGS, THIS LQLS INST. HAS NO EFFECT
5953      3526 6000      PSSF        / IF SIMULATOR IS NOT IN USE.
5954      3527 7000      NOP
5955      3530 4771      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      EPROR      /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 9300      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
5978      3565 0002
5979      3566 3600
5980      3567 0400
5981      3570 4005
5982      3571 1000
5983      3572 4520
5984      3573 4342
5985      3574 2257
5986      3575 2267
5987      3576 5000
5988      3577 0004
5989
5990      3600
PAGE
/*****

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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 4510      SPCIE      /DISABLE PRINTER INTERRUPTS
5999      3603 6600      PSSF      /SET PRINTER FLAG
6000      3604 6664      PSTB      /LOAD 0 INTO PRINTER INTERFACE BUFFER
6001      3605 7410      SKP
6002      3606 4450      ERROR      /PSTB SKIPPED
6003      3607 6661      PSKF
6004      3610 4450      ERROR      /PSTB CLEARED FLAG
6005      3611 7240      STA
6006      3612 6667      PRDB      /READ WORD BACK
6007      3613 7410      SKP
6008      3614 4450      ERROR      /PRDB SKIPPED
6009      3615 6661      PSKF
6010      3616 4450      ERROR      /PRDB CLEARED FLAG
6011      3617 7440      SZA
6012      3620 4450      ERROR      /DATA READ NOT = DATA WRITTEN
6013
6014
6015      3621 6662      PCLF        /AC CONTAINS WORD READ
6016      3622 7240      STA        /WORD WRITTEN=0
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
6031
6032      3640 4447      DONLOP      /AC CONTAINS COMPLEMENT OF WORD READ
6033
6034
6035
6036
6037      /TEST 5 - CHECK THAT PCLP LOADS PRINTER INTERFACE BUFFER AND CLEARS FLAG.
6038      /*****
6039      3641 4446      T4LA,  LOOPPC
6040      3642 4471      CLREPI
6041      3643 4510      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

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

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6101 3723 4450 ERROR /PCLF CHANGED AC CONTENTS
6102 3724 6667 PRDB /READ INTERFACE BUFFER
6103 3725 1376 TAD (-5252
6104 3726 7440 SZA
6105 3727 4450 ERROR /INTERFACE BUFFER CHANGED SINCE LOAD BY PSR ABOVE
6106 3730 6667 PRDB
6107 3731 1376 TAD (-5252
6108 3732 7440 SZA
6109 3733 4450 ERROR /PRDB CHANGED INTERFACE BUFFER CONTENTS
6110 3734 4447 DONLOP
6111 3735 5775 JMP T7LA
6112
6113 3775 4000
6114 3776 2526
6115 3777 5252
6116 4000
6117
6118
6119
6120
6121 4000 1377 T7LA, TAD (NOP
6122 4001 3776 DCA T70W1
6123 4002 1377 TAD (NOP
6124 4003 3775 DCA T70W2
6125 4004 5774 JMP T7LQ
6126
6127
6128
6129
6130
6131
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6139
6140
6141
6142
6143 4005 4446 TILQ, LOOPPC
6144 4006 6002 IOF
6145 4007 6505 LQRS /READ STATUS AND CLEAR DONE FLAG
6146 4010 7410 SKP
6147 4011 4450 ERROR /LQRS SKIPPED
6148 4012 6500 LQSK /SKIP ON DONE FLAG
6149 4013 7410 SKP
6150 4014 4450 EPROR /LQRS FAILED TO CLEAR DONE FLAG OR
6151 / LQSK SKIPPED.
6152 4015 7300 CLA CLL
6153 4016 6506 LQLS /WRITE STATUS (CLEAR LEFT RIBBON & INT EN)
6154 / AND SET DONE FLAG

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6155 4317 7410 SKP
6156 4020 4450 ERROR /LQLS SKIPPED
6157 4021 6520 LQSA /SKIP ON DONE FLAG
6158 4022 4450 ERROR /LQLS FAILED TO SET DONE FLAG
6159 4023 6505 LQFS /CLEAR KNOWN SET DONE FLAG
6160 4024 6520 LQSK /SKIP ON DONE FLAG
6161 4025 7410 SKP
6162 4026 4450 ERROR /LQFS FAILED TO CLEAR DONE FLAG
6163 4027 7300 CLA CLL
6164 4030 6506 LQLS /WRITE STATUS (CLEAR LIFT RIBBON & INT EN,)
6165 / AND SET DONE FLAG
6166 4031 6507 LQRE /RESTORE AND CLEAR DONE FLAG
6167 4032 7410 SKP
6168 4033 4450 ERROR /LQRE SKIPPED
6169 4034 6500 LQSK /SKIP ON DONE FLAG
6170 4035 7410 SKP
6171 4036 4450 ERROR /LQRE FAILED TO CLEAR DONE FLAG
6172 4037 4513 KLSIM /DISABLE PARALLEL I/O SIMULATOR IF IN USE.
6173 4040 4447 DONLOP
6174
6175
6176
6177 /*****
6178 /TEST 2 - CHECK THAT LQLS WRITES STATUS AND LQRS READS STATUS.
6179 / ALSO CHECKS INTERRUPT ENABLE FUNCTION.
6180 /*****
6181 4041 4446 T2LQ, LOOPPC
6182 4042 4471 CLRPEI
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 7040 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, SETPEI /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 CLRPEI
6213 4074 6505 LQRS /READ STATUS AND CLEAR DONE FLAG
6214 4075 0373 AND (0003
6215 4076 1366 TAD (-0001
6216 4077 7440 SZA
6217 4100 4450 ERROR /STATUS WRITE FAILED
6218 4101 2117 ISZ INTFLG
6219 4102 4450 ERROR /PROGRAM FAILED TO INT. WITH FLAG
6220 / SET AND ENABLED.
6221 4103 6506 LQLS /WRITE STATUS (CLEAR LIFT RIBBON AND INT. EN)
6222 / SET DONE FLAG
6223 4104 6001 ION
6224 4105 6500 LQSK
6225 4106 4450 ERROR /LQLS FAILED TO SET DONE FLAG
6226 4107 6507 LQRE /CLEAR DONE FLAG
6227 4110 4513 KLSIM /DISABLE PARALLEL I/O SIMULATOR IF IN USE.
6228 4111 4447 DONLOP
6229
6230
6231
6232 /*****
6233 /TEST 3 - CHECK THAT CAF DISABLES LQI INTERRUPTS & CLEAR LIFT RIBBON
6234 /*****
6235
6236 4112 4446 T3LQ, LOOPPC
6237 4113 4471 CLRPEI
6238 4114 6002 IOF
6239 4115 1366 TAD (7777
6240 4116 6506 LQLS /WRITE STATUS (SET INT EN & SET LIFT RIBBON)
6241 / SET DONE FLAG
6242 4117 6007 CAF /SHOULD CLEAR INT. EN & LIFT RIBBON
6243 4120 6001 ION
6244 4121 7200 CLA
6245 4122 6505 LQRS /READ STATUS AND CLEAR DONE FLAG
6246 4123 0365 AND (0337 /VERIFY ALSO THAT UNUSED STATUS BITS RETURN AS 0.
6247 4124 7440 SZA
6248 4125 4450 ERROR /CAF FAILED TO CLEAR INT. EN AND/OR LIFT RIBBON.
6249 4126 4447 DONLOP
6250 4127 5764 JMP T4LQ
6251
6252 4164 4200
6253 4165 0337
6254 4166 7777
6255 4167 0001
6256 4170 7776
6257 4171 0002
6258 4172 0700
6259 4173 0003
6260 4174 4400
6261 4175 4446
6262 4176 4421
6263 4177 7000
6200
PAGE

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6264
6265
6266
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6270
6271 4200 4446 T4LQ, LOOPPC
6272 4201 4471 CLREPI
6273 4202 1377 TAD (LQ4TAB
6274 4203 3251 DCA LQ4TAB
6275 4204 5232 JMP INITL
6276 4205 6506 INSL1, LOLS /DISABLE LQI INTERRUPTS AND SET DONE FLAG
6277 4206 6081 ION
6278 4207 6502 LQI1, LQMP/LQMC/LQPC/LQRE /AC0=11 TO INTERFACE BUFFER,CLEAR AC, CLEAR DONE FLAG
6279 4210 7410 SKP
6280 4211 4450 ERROR /LQXX SKIPPED-DETERMINE LQXX FROM LOCATION LQI1
6281 4212 6500 LQSK
6282 4213 7410 SKP
6283 4214 4450 ERROR /LQXX FAILED TO CLEAR DONE FLAG
6284 4215 6501 LQRB /READ INTERFACE BUFFER
6285 4216 7410 SKP
6286 4217 4450 ERROR /LQRB SKIPPED
6287 4220 7040 CMA
6288 4221 7440 SZA
6289 4222 4450 ERROR /DATA READ NOT = EXPECTED READ DATA
6290 /AC CONTAINS WORD READ BACK FROM INT BUFFER
6291 /WORD WRITTEN = 0; EXPECTED READ DATA=7777
6292 4223 7240 STA
6293 4224 6502 LQI2, LQMP/LQMC/LQPC/LQRE /AC0=11 TO INTERF. BUFFER,CLEAR AC,CLEAR DONE FLAG
6294 4225 7240 STA
6295 4226 6501 LQRB /READ INTERFACE BUFFER
6296 4227 7440 SZA
6297 4230 4450 ERROR /DATA READ NOT = EXPECTED READ DATA
6298 /AC CONTAINS WORD READ BACK FROM INTERF BUFFER
6299 /WORD WRITTEN=7777; EXPECTED READ DATA = 0000
6300 /PERFORM SAME CHECKS ON LQMC,LQPC,AND LQRE
6301 4231 2251 ISZ LQ4TAB
6302 4232 1651 TAD I LQ4TAB
6303 4233 7450 SNA
6304 4234 5241 JMP TABDON
6305 4235 3207 DCA LQI1
6306 4236 1651 TAD I LQ4TAB
6307 4237 3224 DCA LQI2
6308 4240 5245 JMP INSL1
6309 4241 7300 TABDON, CLA CLL /CHECK THAT LQRB DOES NOT CLEAR DONE FLAG
6310 4242 4513 KLSIM /DISABLE PARALLEL I/O SIMULATOR IF IN USE,
6311 4243 6506 LOLS /SET DONE FLAG
6312 4244 6501 LQRB
6313 4245 6506 LQSK
6314 4246 4450 ERROR /LQRB CLEARED DONE FLAG
6315 4247 4447 DONLOP
6316 4250 5257 JMP T5LQ
6317 4251 6000 LQ4TAB, 0
6318 4252 6502 LQMP

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

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6374 4321 7200 CLA
6375 4322 6501 LQRR /READ INTERFACE BUFFER
6376 4323 1373 TAD (5253
6377 4324 7440 SZA
6378 4325 4452 EPROR /LQSK,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 4450 ERROR /LQRE CHANGED AC
6384 4333 4513 KLSIM /DISABLE PARALLEL I/O SIMULATOR IF IN USE,
6385 4334 4447 DONLOP
6386 4335 1372 TAD (CMA /RESTORE TEST 7 FOR LQ MODE
6387 4336 3771 DCA T7OW1
6388 4337 1372 TAD (CMA
6389 4340 3770 DCA T7OW2
6390 4341 5767 JMP T7LQ
6391
6392 /ROUTINE TO PRINT "PARALLEL I/O INTERFACE TESTING"
6393
6394 4342 0000 PPIMES, 0
6395 4343 4432 C1CRLF
6396 4344 4434 C1PRNT
6397 4345 4352 PIMES
6398 4346 4434 C1PRNT
6399 4347 3306 TESMES
6400 4350 4432 C1CRLF
6401 4351 5742 JMP I PPIMES
6402
6403 PIMES, TEXT "PARALLEL I/O INTERFACE "
4352 2001
4353 2201
4354 1414
4355 0514
4356 4011
4357 5717
4360 4011
4361 1624
4362 0522
4363 0601
4364 0305
4365 4000
6404
6405
6406 4367 4400
6407 4370 4440
6408 4371 4421
6409 4372 7440
6410 4373 5253
6411 4374 2526
6412 4375 5252
6413 4376 7775
6414 4377 4252
4400
6415
6416 PAGE
/*****
/TEST 7 = CHECK OUT PRINTER INTERFACE BUFFER REGISTER (ONE THROUGH A

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

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6472 4462 7201 CLA IAC
6473 4463 6665 PCIE /ENABLE LA PRINTER INTERRUPTS - SET LIFT RIBBON=1
6474 / NOTE:LIFT RIBBON=1 INDICATES LQ MODE WHEN SIMULATOR IS IN USE.
6475 4464 6002 IOF
6476 4465 6506 LOLS /ENABLE LQ INTERRUPTS AND SET DONE FLAG
6477 4466 6505 LQRS /CLEAR DONE FLAG
6478 4467 7300 CLA CLL
6479 4470 3140 DCA TSTNU /CLEAR TEST NUMBER
6480 4471 5331 JMP SIMCK1
6481 4472 5777* NOSIM1, JMP PRETEST
6482
6483 4473 0000 SXMT, 0
6484 4474 0000 SREC, 0
6485
6486
6487 / SUBROUTINES USED BY PRINTER TESTS
6488
6489 4475 0000 XCLEPI, 0 /CLEAR EXPECTING PRINTER INT.
6490 4476 7300 CLA CLL
6491 4477 3135 DCA EPRNTI
6492 4500 5675 JMP I XCLEPI
6493
6494 4501 0000 XSEPI, 0
6495 4502 7240 CLA CMA
6496 4503 3135 DCA EPRNTI
6497 4504 5701 JMP I XSEPI
6498
6499
6500 /TEST 7 ERROR ROUTINE
6501
6502 4505 0000 BDTA, 0
6503 4506 1274 TAD SREC
6504 4507 4450 ERROR /WORD READ NOT = EXPECTED READ DATA
6505 /AC,MO = 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 DEVICE?
6524 4521 0376 AND (0200
6525 4522 7650 SNA CLA
6526 4523 5775* JMP NOSIM0 /NO

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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 LOLS
6545 4543 5776* JMP T1LA /EXECUTE NORMAL LA TYPE DIAGNOSTIC (DEVICE CODE=66)
6546
6547
6548 4570 3436
6549 4571 4600
6550 4572 0744
6551 4573 4005
6552 4574 0002
6553 4575 3420
6554 4576 0200
6555 4577 5000
6556 4600
6557
6558
6559 /TEST 10 - SIMULATOR REQUIRED - VERIFY IN/OUT AND DATA INTERFACE
6560 / CONNECTOR.
6561
6562 4600 4446 T10LS, LOOPPC
6563 4601 1377 TAD (10
6564 4602 3140 DCA TSTNU /SETUP TEST NUMBER FOR ERROR DISPLAY,
6565 4603 6506 LOLS /CLEAR LIFT RIBBON FLOP - SHOULD ALREADY BE CLEAR
6566 4604 6507 LQRE /ENABLE PARALLEL I/O SIMULATOR
6567 4605 6504 LQPC /ZERO INTERFACE BUFFER AND SWITCH IN/OUT
6568 4606 6503 LQMC / TO LOW BY SETTING ALL
6569 4607 7040 CMA / SIMULATOR STROBE FLOPS.
6570 4610 6502 LQMP
6571 4611 6501 LQRB /READ & VERIFY THAT IN DATA = 7777
6572 4612 7040 CMA
6573 4613 7440 SZA
6574 4614 4450 ERROR /IN/OUT FAILED TO DISABLE INTERFACE BUFFER
6575 / OUTPUT, AC CONTAINS DATA READ.
6576 4615 7040 CMA
6577 4616 6507 LQRE /ISSUE 'RESTORE' TO SET IN/OUT = H
6578 4617 7300 CLA CLL
6579 4620 6501 LQRS /READ & VERIFY THAT 'IN' DATA = 0000
6580 4621 7440 SZA

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```
6561 4622 4450 ERROR /IN/OUT FAILED TO ENABLE INTERFACE BUFFER OUTPUT.
6562 4623 6505 LQRS /READ STATUS & VERIFY THAT ALL READY FLAGS=0.
6563 4624 7440 SZA /ISSUE CLEAR FLAG.
6564 4625 4450 ERROR /STATUS INCORRECT - AC = STATUS -SHOULD BE ZERO
6565 4626 6500 LQSK /VERIFY NO-SKIP
6566 4627 7410 SKP
6567 4630 4450 ERROR /LQSK SKIPPED WITH ALL FLAGS CLEAR
6568 4631 4447 DONLOP
```

## /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 6525 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
```

## /TEST 12 - SIMULATOR REQUIRED. TEST CARRIAGE STROBE AND CARRIAGE READY LOGIC.

```
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
```

## /TEST 13 - SIMULATOR REQUIRED. TEST CHARACTER STROBE AND CHAR READY LOGIC.

```
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 LOPE /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
```

## /TEST 14 - SIMULATOR REQUIRED. TEST PRINTER READY LOGIC.

```
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
```

## /TEST 15 - SIMULATOR REQUIRED. TEST CHECK LOGIC.

```
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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/VIT8 CPU DIAGNOSTIC      PAL10  V142A  2-AUG-77      7:30      PAGE 15-2      SEQ 0151

6800      5054  1132      TAD GOOD      /LOAD MQ FOR DISPLAY
6801      5055  7421      MQL
6802      5056  6752      XDR      /TRANSFER DATA REGISTER FROM RX01 CONTROL
6803      /NOTE: IF NO RX01 IS CABLED, THEN
6804      /THIS XDR INST WILL CAUSE AC(=0) > INTERFACE REGISTER,
6805      /ACTUAL STATUS FROM [INIT]
6806      5057  3130      DCA BLANK
6807      5058  1130      TAD BLANK
6808      5061  0134      AND COMP
6809      5062  3131      DCA EAC      /STATUS MINUS DELETED DATA (BIT 5)
6810      5063  1131      TAD EAC
6811      5064  7041      CTA
6812      5065  1132      TAD GOOD      /EXPECTED
6813      5066  7650      SNA CLA
6814      5067  5272      JMP ,+3
6815      5070  1131      TAD EAC      /OK
6816      5071  4450      EIPRE, ERROR      / [INIT] STATUS NOT = EXPECTED
6817      /AC,MQ=ACTUAL STATUS,EXPECTED STATUS
6818      /IF AN RX01 MICROCONTROLLER IS CABLED TO THE RX8 INTERFACE
6819      /THEN THE PREVIOUS "SDN" SHOULD HAVE CLEARED THE DONE FLAG, BUT
6820      /IF AN RX01 MICROCONTROLLER IS NOT CABLED TO THE RX8 INTERFACE
6821      /THEN INITIALIZE SHOULD HAVE CLEARED THE DONE FLAG
6822      /
6823      /TECHNICAL NOTE:
6824      /IF THE DONE FLAG IS SET, AND IF THE INTERRUPT ENABLE FLIP-FLOP IS SET ILLEGALLY,
6825      /THEN AN "UNEXPECTED RX01 INTERRUPT" WILL OCCUR IN TEST 2 (IF AN RX01 CONTROLLER
6826      /IS CABLED TO THE RX8 INTERFACE) OR IN TEST 3 WHEN THE MAINTENANCE FLIP-
6827      /FLOP "SETS ALL FLAGS"
6828      /
6829      5072  6755      SDN
6830      5073  7410      SKP
6831      5074  4450      E4PRE, ERROR      /UNEXPECTED DONE FLAG
6832      5075  4447      DONLOP
6833      /
6834      /TEST 2 - FLAG DETECTION PART II / " C " LINES VERIFICATION PART I
6835      /
6836      /*****
6837      /*****
6838      /
6839      /IF AN RX01 MICROCONTROLLER IS CABLED TO THE RX8 INTERFACE
6840      /THEN DON'T EXECUTE THIS TEST
6841      /BECAUSE ISSUING THE IOT LCD WITH THE AC = 177
6842      /RESEMBLES A COMMAND TO THE RX01
6843      /
6844      5076  4446      T2, LOOPPC
6845      5077  1133      TAD RXHERE
6846      5100  7650      SNA CLA
6847      5101  5321      JMP T3
6848      5102  3132      DCA GOOD
6849      /*****
6850      /*****
6851      /

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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      /IF AN ERROR OCCURS, THEN IT IS ASSUMED [CAF] INIT FAILED TO CLEAR THE
6862      /MAINTENANCE FLIP-FLOP, OR, THAT THE ISSUING OF THE LCD IOT REALLY
6863      /SET THE MAINTENANCE FLIP-FLOP INSTEAD OF CLEARING .
6864      /
6865      /" C " LINES VERIFICATION PART I
6866      /
6867      5103  1370      TAD (177)
6868      5104  6751      LCD      /MAINTENANCE MODE <OFF>
6869      /THE (AC) SHOULD = 0 BECAUSE IOT LCD 6751 SHOULD CLEAR THE AC
6870      /
6871      5105  7440      SZA
6872      5106  4450      ERKOR      / IOT 6751 DID NOT CLEAR THE AC
6873      /
6874      /FLAG DETECTION PART II
6875      /
6876      /THE PURPOSE OF THIS TEST IS TO VERIFY THAT ISSUING IOT LCD 6751 WITH
6877      /THE AC = 177 DOES NOT SET THE MAINTENANCE FLIP-FLOP
6878      /WHICH IN TURN WOULD SET ALL FLAGS
6879      /
6880      /THEREFORE ALL FLAGS SHOULD BE CLEARED
6881      /
6882      5107  6753      STR
6883      5110  7410      SKP
6884      5111  4450      E1, ERROR      /UNEXPECTED TRANSFER REQUEST FLAG
6885      5112  6754      SER
6886      5113  7410      SKP
6887      5114  4450      E2, ERROR      /UNEXPECTED ERROR FLAG
6888      5115  6755      SDN
6889      5116  7410      SKP
6890      5117  4450      E3, ERROR      /UNEXPECTED DONE FLAG
6891      5120  4447      DONLOP
6892      /
6893      /TEST 3 - DIRECTION OF IOT XDR (6752) PART I / IOT DECODING PART I
6894      /
6895      /" C " LINES VERIFICATION PART II
6896      /
6897      /THE PURPOSE OF THIS TEST IS TO VERIFY THAT
6898      /ISSUING THE IOT XDR (TRANSFER DATA REGISTER) 6752 DOES NOT CLEAR
6899      /THE MAINTENANCE FLIP-FLOP
6900      /
6901      /TECHNICAL NOTE:
6902      /IF THE CONTENTS OF THE TRANSFER REGISTER IS NOT = 200, THEN IT MUST
6903      /BE ASSUMED THAT THE SECOND LCD IOT CLEARED THE MAINTENANCE FLIP-FLOP
6904      /OR THAT IOT XDR CLEARED THE MAINTENANCE FLIP-FLOP
6905      /
6906      5121  4446      T3, LOOPPC
6907      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 / IOT LCD 6751 FAILED TO CLEAR AC
6915 5126 4450 E11, ERROR
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
6929 /AC,MQ=ACTUAL,EXPECTED RESULT
6930 5143 4447 DONLOP
6931 5144 5765 JMF T4
6932
6933 /ROUTINE TO PRINT "FLOPPY INTERFACE TESTING" MESSAGE
6934
6935 PFMES, 0
6936 5145 0000 C1CRLF
6937 5146 4432 C1PRNT
6938 5147 4434 FLMES
6939 5150 5242 C1PRNT
6940 5151 4434 TESMES
6941 5152 3306 C1CRLF
6942 5153 4432 JMP I PFMES
6943 5154 5745
6944
6945
6946
6947 5165 5200
6948 5166 7600
6949 5167 0200
6950 5170 0177
6951 5171 0040
6952 5172 0277
6953 5173 6000
6954 5174 2200
6955 5175 2257
6956 5176 2267
6957 5177 0010 5700
6958
6959 /TEST 4 = FLAG DETECTION PART III / " C " LINES VERIFICATION PART III
6960 /
6961 / THE SETTING OF THE MAINTENANCE FLIP-FLOP SHOULD "DIRECT SET" ALL
6962 / FLAGS (DONE, TRANSFER REQUEST, AND ERROR).
6963 5200 4446 T4, LOOPPC
```

```
6964 5201 1377 TAD (200)
6965 5202 6751 LCD / MAINTENANCE <ON>
6966 5203 6755 SDN
6967 5204 4450 E20, ERROR /MISSING DONE FLAG
6968 5205 6753 STR
6969 5206 4450 E21, ERROR /MISSING TRANSFER REQUEST FLAG
6970 5207 6754 SFR
6971 5210 4450 E22, ERROR /MISSING ERROR FLAG
6972 /
6973 /ALL FLAGS SHOULD REMAIN " DIRECT SET "
6974 /BECAUSE THE MAINTENANCE FLIP-FLOP SHOULD STILL BE SET
6975 /
6976 /IF THE FLAGS ARE "MISSING" THEN IT IS ASSUMED THAT THE PREVIOUS
6977 /FLAG TESTING ACTUALLY (CLEARED) THE FLAGS.
6978 /
6979 5211 6755 SDN
6980 5212 4450 E23, ERROR /MISSING DONE FLAG
6981 5213 6753 STR
6982 5214 4450 E24, LPROP /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 SFR
7005 5235 7000 NOP
7006 5236 7650 SNA CLA
7007 5237 4450 E28, ERROR / IOT SER (6754) CLEARED THE AC
7008 5240 4447 DONLOP
7009 5241 5253 JMP TS
7010 5242 0014 FLMES, TEXT "FLOPPY INTERFACE "
7011 5243 1720
7012 5244 2031
7013 5245 4011
7014 5246 1624
7015 5247 0522
7016 5250 0601
7017 5251 0305
7018 5252 4000
```

7011  
7012  
7013  
7014

/TEST 5 - TRANSFER REGISTER DIRECTION TESTING (PART II)

7015  
7016  
7017

/ " C " LINES VERIFICATION PART IV

7018  
7019/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")7020  
7021/TRANSFERS INTO THE ACCUMULATOR FROM THE RXH TRANSFER REGISTER BY ISSUING  
/IOT "XOR" (TRANSFER DATA REGISTER) 6752 AFTER PREVIOUSLY LOADING THE7022  
7023/THE TRANSFER REGISTER WITH THE CONTENTS OF THE ACCUMULATOR REPRESENT-  
/ATIVE OF THE FOLLOWING PATTERNS WHEN THE "LCD" IOT 6751 IS ISSUED,7024  
7025

/ (1) 200 - MAINTENANCE MODE &lt;ON&gt;

7026  
7027

/ (2) 376 -

7028  
7029

/ (3) 375 -

7030  
7031

/ (4) 373 - (BYTES 2 THRU 7)

7032  
7033

/ (5) 367 - (INCLUSIVE "OR" )

7034  
7035

/ (6) 357 -

7036  
7037

/ (7) 337 -

7038  
7039

/ (8) 7677 - (WORD 8 - "JAM " )

7040  
7041

/THE LCD IOT WILL BE ISSUED A TOTAL OF 8 TIMES,

7042  
7043/THE 1ST LCD IOT WILL BE ISSUED WITH THE AC = 200 WHICH INITIALLY SETS THE  
/MAINTENANCE FLIP-FLOP THEREBY GUARANTEEING THE CONTENTS OF THE TRANSFER7044  
7045

/REGISTER AFTER EACH SUCCEEDING LCD IOT,

7046  
7047/LCD IOT'S 2 THRU 8 ARE ISSUED WITH THE ACCUMULATOR CONTAINING THE PATTERNS  
/DESCRIBED ABOVE,7048  
7049/ALL PATTERNS EXCEPT WORD 8 (7677) TEST THE INCLUSIVE "OR" TRANSFER OF  
/THE RXH INTERFACE TRANSFER REGISTER, WORD 8 TESTS THE 12-BIT "JAM" TRANSFER,7050  
7051

/

7052  
7053T5, LOOPPC  
TAD (200)7054  
7055

LCD /MAINTENANCE MODE &lt;ON&gt;

7056  
7057

CLL STA RAR / 377

7058  
7059

DCA BLANK

7060  
7061

T5B, TAD BLANK

7062  
7063

STL

7064  
7065

SMA

7066  
7067

CLL

7068  
7069

RAL

7070  
7071

DCA BLANK

7072  
7073

TAD BLANK / (BLANK) = (AC) BEFORE LCD IOT 6751

7074  
7075

LCD / TO

7076  
7077

/ " C " LINES VERIFICATION PART IV

7078

/THE PURPOSE OF THIS TEST IS TO VERIFY THAT SUCCEEDING LCD IOT'S(6751)

/TRANSFER THE (AC) INTO THE DATA REGISTER CLEARING THE ACCUMULATOR

7066  
7067  
7068TAD EAC  
SZA  
E42, ERROR7069  
7070

/ IOT LCD (6751) DIDN'T CLEAR THE AC

7071  
7072

/TRANSFER DIRECTION PART II

7073  
7074

/ XOR

7075  
7076

/ DCA EAC

7077  
7078

/ TAD (100)

/ AND BLANK

/ CLL RTL

/ RTL

/ LINK = 1 FOR 8-BIT MODE

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

```
7134 5342 6753 STR
7135 5343 4450 E51, EPROR /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, EPROR /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 5430
7153 5375 0377
7154 5376 0100
7155 5377 0200
7156 5400
7157
7158
7159
7160
7161
7162
7163
7164
7165
7166
7167
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 E00
7173 5404 6035 KIE /DISABLE CONSOLE PACKAGE INTERRUPTS
7174 5405 6001 ION
7175 5406 1377 TAD (200)
7176 5407 6751 LCD
7177 5410 6750 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
```

```
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 6750 INTR /DISABLE THE INTERRUPT ENABLE F/F
7197 5417 6755 SDN
7198 5420 4450 E61, ERKOR /MISSING DONE FLAG
7199 5421 6753 STR
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 RX8 INTERRUPT ENABLE, OR INTERRUPT REQUEST
7226 /
7227 5426 4440 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 6021 ION
7235 5436 7201 CLA IAC
7236 5437 6750 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
```

```
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 TOO LONG TO SET
7258 /FROM THE PREVIOUS TEST.
7259 /
7260 /
7261 5445 4440 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 /TEST 12
7278 /
7279 /INTERRUPT TEST (PART IV) (NO INT. SHOULD OCCUR DURING THIS TEST).
7280 /
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
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7298  5471  6751      LCD
7299  5472  6755      SDN
7300  5473  7000      NOP
7301  5474  7000      NOP
7302  5475  6001      ION
7303  5476  7201      CLA IAC
7304  5477  6756      INTR
7305  5500  7000      NOP
7306  5501  7000      NOP
7307  5502  7410      SKP
7308  5503  4450      E110, ERROR
7309  5504  6756      INTR
7310  5505  4447      DONLOP
7311  5506  5307      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
/
7320  5507  4446      T13,  LOOPPC
7321  5510  1133      TAD RXHERE
7322  5511  7650      SNA CLA
7323  5512  5345      JMP FLDON
/*****
/*****
/
/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
/
7333  5513  6002      IOF
7334  5514  4141      JMS PATCH
7335  5515  5527      E124
7336  5516  6035      KIE
7337  5517  6001      ION
7338  5520  7201      CLA IAC
7339  5521  6756      INTR
7340  5522  6757      INIT
/...BUT AN INTERRUPT SHOULD NOT OCCUR
/
/IF AN INTERRUPT OCCURS THEN IOT INIT FAILED TO CLEAR
/
/THE RX8 INTERRUPT ENABLE FLIP-FLOP
/
7347  5523  1377      TAD (200)
7348  5524  6751      LCD
7349  5525  6751      LCD
/
/ THE DONE FLAG SHOULD BE SET, BUT NO INTERRUPTS SHOULD OCCUR
/

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7353  5526  7410      SKP
7354
7355
7356
7357  5527  4450      E124, ERROR
7358
7359
7360
7361
7362  5530  7240      STA
7363  5531  6751      LCD
7364  5532  6757      INIT
7365  5533  6755      SDN
7366  5534  7410      SKP
7367  5535  4450      E120, ERROR
7368  5536  6753      STR
7369  5537  7410      SKP
7370  5540  4450      E121, ERROR
7371  5541  6754      SER
7372  5542  7410      SKP
7373  5543  4450      E122, ERROR
7374  5544  4447      DONLOP
7375  5545  4466      FLDON, GETHW
7376  5546  0377      AND (0200)
7377  5547  7640      SZA CLA
7378  5550  5770      JMP T145
7379  5551  3140      DCA TSTNU
7380  5552  4443      CLEOP
/
/ WAIT FOR FLAG ROUTINE
/
7384  5553  0000      XWAIT, 0
7385  5554  2366      ISZ H1
7386  5555  5753      JMP I XWAIT
7387  5556  2367      ISZ HANGER
7388  5557  5753      JMP I XWAIT
7389  5560  1353      TAD XWAIT
7390  5561  4450      ERROR
7391  5562  1353      TAD XWAIT
7392  5563  1375      TAD (2
7393  5564  3353      DCA XWAIT
7394  5565  5753      JMP I XWAIT
7395  5566  0000      H1, 0
7396  5567  0000      HANGER, 0
7397
7398
7399  5575  0002
7400  5576  5600
7401  5577  0200
7402
7403
7404
7405  5600  4777
7406  5601  4446

PAGE
/ THE REMAINING FLOPPY INTERFACE TESTS REQUIRE A SPECIAL HARDWARE
/ SIMULATOR CONNECTED TO THE EXTERNAL FLOPPY PORT.
/
T145, JMS INTUN
LOOPPC
/ INITIALIZE PROG UNIT VARIABLES FOR UNIT A

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7407	5602 4776*	MODAGN, JMS INITMOD	/INITIALIZE PROG MODE VARIABLES FOR 12 BIT MODE
7408	5603 6007	CAF	/INITIALIZE FLOPPY INTERFACE=MAINT MODE=OFF,
7409			/
7410			MODE=12 BIT,UNIT=A,IN1,EN=OFF,
7411	5604 6507	LORE	/RUNL=FALSE,FLAGS CLEARED,PARITY FLOP=CLEARED,
7412			/
7413			CLEAR PARALLEL I/O STROBE FLOPS AND ENABLE
7414	5605 1375	TAD (0017	/THE PARALLEL I/O SIMULATOR & THE FLOPPY
7415			/
7416			RXDATA TO ERROR LOOPBACK,
7417			/SETUP FLOPPY (VIA PARALLEL I/O INTERFACE BUFFER)
7418	5606 6502	LQMP	/TO NORMAL IDLE STATE(0=DONEL,1=XFER RQSTL,
7419	5607 3774*	DCA SHFTCT	1=OUTL). NOTE PARALLEL I/O INVERTS DATA
7420	5610 1773*	TAD UNIT	/
7421	5611 6750	SEL	IN LQMP MODE,
7422	5612 6505	LQRS	/ALSO SETS PAPER RDY VIA PAPER STROBE
7423	5613 0372	AND (400	/INITIALIZE SHIFT COUNT TO ZERO
7424	5614 7650	SNA CLA	/AC=0 FOR UNIT A, AC=1 FOR UNIT B
7425	5615 4450	ERROR	/SETUP "UNIT" (A OR B)
7426			/VERIFY RUNL FALSE VIA PAPER READY
7427			/FLAG = SET,
7428			/FITHER CAF FAILED TO ENABLE PARALLEL I/O
7429	5616 1771*	TAD LCDATA	/SIMULATOR OR FLOPPY RUNL IS TRUE,
7430	5617 6751	LCD	/NOTE: RUNL TRUE DISABLES PARALLEL I/O STROBE
7431	5620 6505	LQRS	/
7432	5621 0372	AND (400	DECODER,
7433	5622 7640	SZA CLA	/AC=2452 FOR 12 BIT MODE,AC=0125 FOR 8 BIT MODE
7434	5623 4450	ERROR	/MAINT BIT = 0 IN EITHER CASE,
7435	5624 1370	TAD (0017	/VERIFY THAT LCD CAUSES RUNL=TRUE
7436	5625 1767*	TAD UDONE	
7437	5626 6502	LQMP	
7438	5627 6505	LQRS	/LCD FAILED TO CAUSE RUNL TO GO TRUE,
7439			/CHANGE DONEL TO 1 FOR UNIT UNDER TEST
7440	5630 0372	AND (400	/UDONE=2000 FOR UNIT A,4000 FOR UNIT B
7441	5631 7650	SNA CLA	
7442	5632 4450	ERROR	/VERIFY THAT DONEL GOING H CAUSES RUNL=FALSE
7443	5633 0000	SHIFT0, 0/LQRE/LQPC	/PAPER RDY FLAG SHOULD BE SET,
7444			
7445	5634 2774*	ISZ SHFTCT	/DONEL FAILED TO CAUSE RUNL TO GO FALSE
7446	5635 7300	CLA CLL	/SHIFT OUT FLOPPY INTERFACE REGISTER
7447	5636 1774*	TAD SHFTCT	/SHIFTL=RESTORE,SHIFTIL=CHAR, STROBE
7448	5637 1366	TAD (-10	/UPDATE SHIFT COUNTER
7449	5640 7450	SNA	
7450	5641 5250	JMP CKMODE	/NO OF SHIFTS ISSUED?
7451	5642 7510	SPA	
7452	5643 5255	JMP SMORE	/8 - CHECK MODE
7453	5644 1365	TAD (-4	
7454	5645 7640	SZA CLA	/8 - TEST CURRENT RXDATA BIT & SHIFT,
7455	5646 5255	JMP SMORE	
7456	5647 5257	JMP TSTPC	/8<SHIFT COUNT<12 - TEST CURRENT RXDAT & SHIFT
7457	5650 1771*	CKMODE, TAD LCDATA	/12 - TEST PARITY BIT,DONE SHIFTING
7458	5651 7041	CIA	/CHECK FOR 8 OR 12 BIT MODE
7459	5652 1764*	TAD DLCD8	
7460	5653 7650	SNA CLA	
7461	5654 5257	JMP TSTPC	/8 BIT MODE - TEST PARITY BIT

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7462	5655 4763*	SMORE, JMS TSTUAB	/TEST CURRENT RXDATA
7463	5656 5233	JMP SHFT0	/SHIFT OUT AGAIN
7464	5657 4763*	TSTPC, JMS TSTUAB	/TEST PARITY BIT=DONE WITH SHIFTING
7465	5660 3774*	DCA SHFTCT	/ZERO SHIFT COUNTER
7466	5661 4762*	JMS SHINDA	/SETUP SHIFT IN DATA
7467	5662 0000	SHIFT1, 0/LORE/LQPC	/SHIFT IN FLOPPY INTERFACE REGISTER
7468	5663 2774*	ISZ SHFTCT	/UPDATE SHIFT COUNTER
7469			/SHIFTL=RESTORE,SHIFTIL=CHAR STROBE,
7470	5664 7320	CLA CLL	
7471	5665 1774*	TAD SHFTCT	/NO OF SHIFTS ISSUED?
7472	5666 1366	TAD (-10	
7473	5667 7450	SNA	
7474	5670 5277	JMP CKIMOD	/8 - CHECK MODE
7475	5671 7510	SPA	
7476	5672 5261	JMP SHFT1-1	/8 - SHIFT AGAIN
7477	5673 1365	TAD (-4	
7478	5674 7640	SZA CLA	
7479	5675 5261	JMP SHFT1-1	/8<SHIFT COUNT<12 - SHIFT AGAIN
7480	5676 5324	JMP CKINDA	/DONE SHIFTING IN, CHECK DATA WORD THAT
7481			/ GOT SHIFTED IN,
7482	5677 1761*	CKIMOD, TAD XDRDATA	/CHECK FOR 8 OR 12 BIT MODE,
7483	5700 7041	CIA	
7484	5701 1760*	TAD DXDR8	
7485	5702 7640	SZA CLA	
7486	5703 5261	JMP SHFT1-1	/12 BIT MODE - CONTINUE SHIFTING
7487			/DONE SHIFTING IN - CHECK DATA WORD IN INTERFACE REG,
7488			
7489	5704 6753	CKINDA, STR	/TRANSFER REQUEST FLAG SHOULD BE CLEAR
7490	5705 7410	SKP	
7491	5706 4450	ERROR	/TRANSFER REQUEST FLAG FALSELY SET
7492	5707 1370	TAD (0017	
7493	5710 1767*	TAD UDONE	/CHANGE XFER RQSTL TO 0 FOR PROPER UNIT,
7494	5711 1757*	TAD UOUT	
7495	5712 1756*	TAD UXFR	
7496	5713 6502	LQMP	
7497	5714 6753	STR	
7498	5715 4450	ERROR	/CHANGING XFER RQSTL TO 0 FAILED TO SET FLAG
7499	5716 6752	XDR	/READ INTERFACE REGISTER INTO AC,
7500	5717 7421	MQL	/SAVE READ DATA IN MQ FOR ERROR DISPLAY
7501	5720 7701	ACL	/RESTORE DATA TO AC FROM MQ
7502	5721 7041	CIA	
7503	5722 1761*	TAD XDRDATA	/COMPARE WITH EXPECTED DATA
7504			/EXPECTED DATA=0525 FOR 12 BIT MODE
7505			/ " =0242 FOR 8 BIT MODE
7506	5723 7440	SZA	
7507	5724 4450	ERROR	/BAD SHIFT IN - MQ CONTAINS ACTUAL DATA
7508			/SHIFTED IN,
7509	5725 6505	LQRS	/VERIFY THAT XDR SETS RUNL TO TRUE
7510			/PAPER RDY FLAG=CLEAR
7511	5726 0372	AND (400	
7512	5727 7640	SZA CLA	
7513	5730 4450	ERROR	/XDR FAILED TO CHANGE RUNL TO TRUE,
7514	5731 1370	TAD (0017	/CHANGE XFR REQ L TO 1 & OUTL TO 1,
7515	5732 1767*	TAD UDONE	
7516	5733 6502	LQMP	



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7517 5734 6505      LQHS          /VERIFY THAT RUNL GOES FALSE
7518 5735 6355      AND (44H      /NOTE:FOR UNIT B TESTING CHAR STROBE GETS SET
7519                      /      BY LQPC USED IN SHIFTING ABOVE.
7520 5736 7650      SNA CLA
7521 5737 4450      EPROR
7522 5740 1375      TAD (6017    /CHANGING XFR ROSTL TO 1 FAILED TO NEGATE RUNL
7523 5741 6502      LQMP        /CHANGE DONE1 TO W
7524 5742 6755      SDN
7525 5743 4450      EPROR
7526 5744 4754*     JMS CHGMOD    /DONE FLAG FAILED TO SET
7527 5745 5203      JMP MODAGN+1 /CHANGE MODE & REPEAT TILL BOTH MODES HAVE BEEN TESTED.
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 6853
7547 5774 2017
7548 5771 6071
7549 5772 6400
7550 5773 6052
7551 5774 6110
7552 5775 6017
7553 5776 6034
7554 5777 6041
7555          6000
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.

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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
7622 6060 2000
7623 6061 1000
7624 6062 0040
7625 6063 0200

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SEQ 0168

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6661      6123  7300      CLA CLL
7662      6124  5711      JMP I TSTDAB
7663      6125  6754      ZEXP,
7664      6126  7610      SKP CLA
7665      6127  4450      ERROR
                                /EXPECTED RXDATA BIT=0,ACTUAL = 1
                                /          AC CONTAINS SHIFT COUNT.
                                /NOTE: DATA AT RXDATA1 IS INVERTED.
6666      6130  5711      JMP I TSTDAB
7667
7668
7669
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  7464      RAL
7698      6135  3274      DCA SXDRDA
                                /SAVE SHIFTED DATA IN
7699      6136  7632      SZL CLA
                                /FORM PARALLEL I/O WORD FOR PROPER SHIFT IN
7700      6137  1255      TAD UDATA
                                /          DATA ON RXDATA1.
7701      6140  1373      TAD (0017
                                /AT SAME TIME CHANGE OUTL TO 0.
7702      6141  1256      TAD UOUT
7703      6142  1253      TAD UOONE
7704      6143  5731      JMP I SHINDA
7705
7706
7707      /ROUTINE TO COPY A SET OF 5 CONSTANTS INTO 5 VARIABLES.
7708
7709      6144  0000      FILVAR, 0
7710      6145  1744      TAD I FILVAR
                                /GET VARIABLE LOCATION
7711      6146  3364      DCA VAR
7712      6147  2344      ISZ FILVAR
7713      6151  3365      TAD I FILVAR
                                /GET CONSTANT LOCATION
7714      6152  2344      DCA CONST
7715      6153  1372      ISZ FILVAR
7716      6154  3366      TAD (-5
7717      6155  1765      DCA FVLCT
                                /SET A LOOP COUNTER
7718      6156  3764      FVLOOP, TAD I CONST
                                /COPY CONSTANT INTO VARIABLE
7719      6157  2365      DCA I VAR
7720      6160  2364      ISZ CONST
7721      6161  2366      ISZ VAR
7722      6162  5355      ISZ FVLCT
7723      6163  5744      JMP FVLOOP
                                /REPEAT FOR EACH OF 5 CONSTANTS
7724
                                JMP I FILVAR
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 2017
7735 6174 6527
7736 6175 5662
7737 6176 5633
7738 6177 6504
7739 6200 3255
7740
7741
7742
7743
7744 6200 3255 SRP1CHN,DCA AC /GET HERE VIA INTERRUPT
7745 /SAVE AC.
7746 6201 6701 CDF 00
7747 6202 1777 TAD I (0
7748 6203 3000 DCA 0 /SAVE PC AT TIME OF INT.
7749 6204 6244 RMF /RESTORE OF
7750 6205 1120 XR, TAD EXMITI /EXPECTING A XMIT INT?
7751 6206 7640 SZA CLA
7752 6207 5724 JMP CKXMF /YES-VERIFY XMIT FLAG SET
7753 6210 1121 CRA, TAD ERECI /EXPECTING A RECV INT?
7754 6211 7640 SZA CLA
7755 6212 5227 JMP CKRFG /YES-VERIFY RECV FLAG SET
7756 6213 1135 TAD EPRNTI /EXPECTING A PRINTER INT.
7757 6214 7640 SZA CLA
7758 6215 5232 JMP CKPTFG /YES-VERIFY PRINT FLAG
7759 6216 1136 TAD ECONS1 /CAN CONSOLE PACKAGE INT. INT?
7760 6217 7640 SZA CLA
7761 6220 5741 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 CKXMF, 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, CICRLF
7803 6257 4434 CIPRNT
7804 6260 6303 UNETMS
7805 6261 4432 CICRLF
7806 6262 4775 JMS HITN /DISPLAY TEST NUMBER
7807 6263 1000 TAD 0
7808 6264 3774 DCA PCISAVE
7809 6265 4773 JMS MIPC /DISPLAY PC
7810 6266 1255 TAD AC
7811 6267 3772 DCA ACISAVE
7812 6270 4771 JMS MIAC /DISPLAY AC
7813 6271 4770 JMS MIFL /DISPLAY FLAGS
7814 6272 4432 CICRLF
7815 6273 4434 CIPRNT
7816 6274 6323 FSIMES
7817 6275 1367 TAD (CDI 10
7818 6276 6201 CDF 00
7819 6277 3760 DCA I (VCDI
7820 6300 6203 CDI 00
7821 6301 4213 JMS CKFLG /DISPLAY FLAGS SET
7822 6302 5765 JMP IERI
7823
7824
7825 6303 2516 UNETMS, TEXT "UNEXPECTED INTERRUPT = FIELD 1"
6304 0530
6305 2005
6306 0324
6307 0504
6310 4011
6311 1624
6312 0522
6313 2225
6314 2024
6315 4055
6316 4006
6317 1105
6320 1404
6321 4061
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7026      6322 0000
          6323 0014
          6324 0107
          6325 2340
          6326 2305
          6327 2472
          6330 0000
7027      6331 0413      ERRMES,TEXT      "DKVTR=A FAILED, FIELD 1 "
          6332 2624
          6333 0255
          6334 0140
          6335 0601
          6336 1114
          6337 0504
          6340 5440
          6341 0611
          6342 0514
          6343 0440
          6344 6140
          6345 4000

7028
7029      /ROUTINE TO GET HARDWARE OPTION WORD 3 (LOC 23) FROM FIELD 0.
7030
7031      6346 0000      XGHW3, 0
          6347 7300      CLA CLL
          6350 6201      CDF 00
          6351 1764      TAD I (23)
          6352 6211      CDF 10
          6353 5740      JMP I XGHW3
7037
7038

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7039
7040      6364 0023
7041      6365 6655
7042      6366 6274
7043      6367 6213
7044      6370 6440
7045      6371 6424
7046      6372 6710
7047      6373 6531
7048      6374 6707
7049      6375 6523
7050      6376 2400
7051      6377 0000
          6400

7052      *6400
7053      /*****
7054      /ERROR DISPLAY FORMAT ROUTINES
7055      /*****
7056
7057      /NORMAL DISPLAY = TN,PC,AC,MQ,FLAGS
7058
7059      6403 4257      NORDIS, JMS MSHDR      /PRINT ERROR HEADER & PC
          6401 4224      JMS MIAC      /PRINT AC
          6402 4232      JMS MIMQ      /PRINT MQ
          6403 4240      JMS MIFL      /PRINT FLAGS
          6404 4432      C1CRLF
          6405 5777      JMP IEH1
7065
7066      /SLU DISPLAY = TN,PC,AC,SLU,BR
7067
7068      6406 4246      SLUDIS, JMS NORSLU
          6407 5777      JMP IEH1
7070
7071      /SPECIAL SLU DISPLAY = TN,PC,AC,SLU,BR,XMIT DATA,REC DATA
7072
7073      6410 1776      SSLUDIS,TAD ODERSLU
          6411 3775      DCA PC1SAVE
          6412 4246      JMS NORSLU
          6413 4434      C1PRNT
          6414 6537      MESXM
          6415 1126      TAD SLUXMT
          6416 4435      C1PRT4
          6417 4434      C1PRNT
          6420 6546      MESRC
          6421 1127      TAD SLUREC
          6422 4435      C1PRT4
          6423 5777      JMP IEH1
7085
7086      /SUBROUTINES FOR DISPLAY ROUTINES
7087
7088      6424 0000      MIAC, 0      /DISPLAY AC MESSAGE
          6425 4434      C1PRNT
          6426 6676      MESIAC
          6427 1774      TAD AC1SAVE
          6430 4435      C1PRT4

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7893 6431 5624 JMP I MIAC
7894
7895 6432 0000 MIMQ, 0 /DISPLAY MQ MESSAGE
7896 6433 4434 CIPRNT
7897 6434 6701 MESIMQ
7898 6435 1771 TAD MQISAVE
7899 6436 4435 CIPRT4
7900 6137 5632 JMP I MIMQ
7901
7902 6440 0000 MIFL, 0 /DISPLAY FLAGS MESSAGE
7903 6441 4434 CIPRNT
7904 6442 6701 MESIFL
7905 6443 1772 TAD FLISAVE
7906 6444 4435 CIPRT4
7907 6445 5640 JMP I MIFL
7908
7909 6446 0000 NORSLU, 0
7910 6447 4257 JMS MSHDR /PRINT HEADER & PC MESSAGE
7911 6450 4224 JMS MIAC /PRINT AC
7912 6451 4232 JMS MIMQ /PRINT MQ
7913 6452 4240 JMS MIFL /PRINT FLAGS
7914 6453 4267 JMS MSLU /PRINT SLU#
7915 6454 4312 JMS MBR /PRINT BAUD RATE
7916 6455 4432 CICRLF
7917 6456 5646 JMP I NORSLU
7918
7919 6457 0000 MSHDR, 0 /DISPLAY MESSAGE HEADER & PC
7920 6460 4432 CICRLF
7921 6461 4434 CIPRNT
7922 6462 6331 ERRIMES
7923 6463 4432 CICRLF
7924 6464 4323 JMS MITN
7925 6465 4331 JMS MIPC
7926 6466 5657 JMP I MSHDR
7927
7928 6467 0000 MSLU, 0 /DISPLAY SLU #
7929 6470 4434 CIPRNT
7930 6471 6557 MESSLU
7931 6472 1771 TAD IOT10 /DETERMINE WHICH SLU IS BEING WORKED ON,
7932 6473 0370 AND (0030
7933 6474 7450 SNA
7934 6475 5307 JMP UX
7935 6476 1367 TAD (-10
7936 6477 7640 SZA CLA
7937 6500 7001 IAC /SLU #3
7938 6501 7001 IAC /SLU #2
7939 6502 7001 U1, IAC /SLU #1
7940 6503 3311 DCA SSLUN
7941 6504 1311 TAD SSLUN
7942 6505 4435 CIPRT4
7943 6506 5667 JMP I MSLU
7944
7945 6507 7300 UX, CLA CLL
7946 6510 5302 JMP U1
7947 6511 0000 SSLUN, 0

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7948
7949 6512 0000 MBR, 0 /DISPLAY SLU BAUD RATE CONSTANT
7950 6513 4434 CIPRNT
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 CIPRT4
7957 6522 5712 JMP I MBR
7958
7959 6523 0000 MITN, 0 /DISPLAY TEST NUMBER MESSAGE
7960 6524 4434 CIPRNT
7961 6525 6554 MESITN
7962 6526 1140 TAD TSTNU
7963 6527 4435 CIPRT4
7964 6530 5723 JMP I MITN
7965
7966 6531 0000 MIPC, 0 /DISPLAY PC MESSAGE
7967 6532 4434 CIPRNT
7968 6533 6672 MESIPC
7969 6534 1775 TAD PCISAVE
7970 6535 4435 CIPRT4
7971 6536 5731 JMP I MIPC
7972
7973
7974 6537 4040 MESXM, TEXT " XMIT DATA:"
7975 6540 3015
7976 6541 1124
7977 6542 4004
7978 6543 0124
7979 6544 6172
7980 6545 0000
7981 6546 4040 MESRC, TEXT " REC DATA:"
7982 6547 2205
7983 6550 0340
7984 6551 0401
7985 6552 2401
7986 6553 7200
7987 6554 4040 MESITN, TEXT " IN:"
7988 6555 2416
7989 6556 7200
7990 6557 4040 MESSLU, TEXT " SLU:"
7991 6560 2314
7992 6561 2572
7993 6562 0000
7994 6563 4040 MESBR, TEXT " BR:"
7995 6564 0222
7996 6565 7200

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7981      6566  8025
7982      6567  7770
7983      6570  6330
7984      6571  2702
7985      6572  6712
7986      6573  6711
7987      6574  6710
7988      6575  6707
7989      6576  2470
7990      6577  6655
7991      6600
7992
7993      /*****
7994      /
7995      /*****
7996
7997      /THIS ROUTINE WILL DETERMINE WHAT TO DO WHEN A ERROR IS ENCOUNTERED
7998      /WILL CHECK IF UNDER APT CONTROL.
7999
8000
8001      6600  8000  XCIERR, 0
8002      6601  6002  IOF
8003      6602  7000  OWIAPT, NOP
8004      6603  3310  DCA ACISAVE /OVERWRITTEN WITH "JMP APTIER" IF RUNNING UNDER APT CONTROL
8005      6604  6004  DCA ACISAVE /SAVE AC
8006      6605  3312  DCA FLISAVE /SAVE THE FLAGS
8007      6606  7501  MQA
8008      6607  3311  DCA MQISAVE /SAVE THE MQ
8009      6610  7340  CLA CLL CMA /SUBTRACT A 1 FOR TRUE LOCATION
8010      6611  1200  TAD XCIERR /GET RETURN LOCATION
8011      6612  3307  DCA PCISAVE /SAVE ADD OF ERROR CALL
8012      6613  6031  KSF /CHECK FOR SLU #1 REC FLAG
8013      6614  7410  SKP /SAVE STATE OF FLAG IS KSFLG (FLD 0)
8014      6615  7000  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 TYPL0UT?
8023      6626  7640  SZA CLA
8024      6627  5255  JMP IEH1 /NO ERROR PRINTOUT
8025      6630  6037  ALB /REMOVE LOOP AROUND ON SLU
8026      6631  1375  TAD (0010 /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  1307  TAD PCISAVE
8032      6637  7041  CIA

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8033      6640  1374  TAD (UNEI
8034      6641  7650  SNA CLA
8035      6642  5771  JMP SUNEI /USE UNEXPECTED INTERRUPT DISPLAY
8036      6643  1307  TAD PCISAVE
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 PCISAVE
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 CIBY2 /LEAVE
8049      6660  4765  JMS SETBDR /NO-SET BAUD RATES IN ALL SLUS IN CASE OPERATOR LEAVES DIAGNOSTIC
8050      6661  4436  C1SWIT /GO TO THE INQUIRE ROUTINE
8051      6662  4764  CIBY2, 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 CIGET /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 XCIERR
8061      6672  4042  MES1PC, TEXT " PC;"
8062      6673  2003
8063      6674  7200
8064      6675  9000  TLOOP1,0
8065      6676  4040  MES1AC, TEXT " AC;"
8066      6677  0103
8067      6700  7200
8068      6701  4040  MES1MQ, TEXT " MQ;"
8069      6702  1521
8070      6703  7200
8071      6704  4040  MES1FL, TEXT " FL;"
8072      6705  0614
8073      6706  7200
8074      6707  7777  PCISAVE,7777
8075      6710  7777  ACISAVE,7777
8076      6711  7777  MQISAVE,7777
8077      6712  7777  FLISAVE,7777
8078      6713  5714  API0W1, JMP I .+1
8079      6714  7000  APTIER
8080
8081      6715  8000  CIGET, 0
8082      6716  7200  CLA
8083      6717  1311  TAD MQISAVE
8084      6720  7421  MOL /RESTORE THE MQ
8085      6721  1312  TAD FLISAVE
8086      6722  7004  RAL /RESTORE THE LINK

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0000 6723 7200 CLA
0001 6724 5715 JMP I C1GET
0002
0003
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/APT/ ROUTINE TO NOTIFY APT THAT THE PROGRAM IS RUNNING OK.
APTOK1, 0 /APT/
      IOF /APT/
      CLA /APT/
      TAD APTIM1 /APT/DELAY 100MS.
      DCA APTCT1 /APT/
      TAD APTIM2 /APT/
      DCA APTCT2 /APT/
      ISZ APTCT2 /APT/
      JMP ,+1 /APT/
      ISZ APTCT1 /APT/
      JMP ,+5 /APT/
      RIF /APT/AC=IF.
      TAD (6201 /APT/CREATE A CDF INST.
      DCA ,+1 /APT/MODIFY NEXT CDF INST.
      CDF /APT/(MODIFIED CDF) DF=IF.
      CIF 70 /APT/IF=FIELD 7.
      JMS 6500 /APT/CALL APT - 'PROG OK'.
      JMP I APTOK1 /APT/RTN FROM APT - RTN TO CALL+1.

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 6400
0121 6767 6400
0122 6770 4447
0123 6771 6410
0124 6772 2466
0125 6773 6256
0126 6774 6222
0127 6775 0016
0128 6776 6200
0129 6777 0040
0130
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0133

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0134 /APT/ ROUTINE TO HANDLE ERRORS UNDER APT CONTROL.
0135
0136 7060 6002 APTIER, IOF /APT/
0137 7001 7200 CLA /APT/
0138 7002 6003 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 3210 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 /APT/(MODIFIED CDF) DF=IF.
0145 7011 6772 CIF 70 /APT/IF=FIELD 7.
0146 7012 5775 JMP 6520 /APT/CALL APT - 'ERROR'.
0147
0148
0149
0150
0151
0152
0153 7013 0000
0154 7014 7200
0155 7015 4434
0156 7016 7343
0157 7017 4465
0158 7020 4435
0159 7021 7346
0160 7022 3301
0161 7023 1374
0162 7024 3227
0163 7025 4437
0164 7026 0001
0165 7027 7045
0166 7030 7566
0167 7031 7337
0168 7032 7563
0169 7033 7065
0170 7034 7575
0171 7035 7102
0172 7036 7555
0173 7037 7144
0174 7040 0000
0175 7041 7042
0176 7042 4434
0177 7043 7346
0178 7044 5215
0179 7045 6201
0180 7046 3773
0181 7047 6211
0182 7050 1372
0183 7051 3227
0184 7052 5225
0185 7053 3300
0186 7054 4465
0187 7055 7106
0188 7056 7004

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/APT/ ROUTINE TO HANDLE ERRORS UNDER APT CONTROL.
APTIER, IOF /APT/
      CLA /APT/
      KLB /APT/ REMOVE LOOP AROUND ON SLU'S
      RIF /APT/AC=IF.
      TAD (6201 /APT/CREATE A CDF INST.
      DCA ,+3 /APT/MODIFY NEXT CDF INST.
      CLA CMA /APT/
      TAD XC1ERR /APT/AC=ERROR PC.
      CDF /APT/(MODIFIED CDF) DF=IF.
      CIF 70 /APT/IF=FIELD 7.
      JMP 6520 /APT/CALL APT - 'ERROR'.

/Routine used for console switch register changes
XC1SW, 0
SR1QUEST, CIPRNT /PRINT SR QUESTION
      CIPRNT /POINTER TO MESSAGE
      SR1MSG /GET PSR FORM FIELD 0
      CIPRT4 /PRINT THE 4 DIGITS
      CLA CLL CMA RTL /SETUP A COUNTER TO ACCEPT 4 DIGITS
      DCA TTY1CNT /SAVE THE COUNTER
      TAD (CH1R0 /GET POINTER FOR FIRST CHARACTER
      DCA (CH1R0 /SAVE THE POINTER FOR DIGITS
      LISNF1 /WAIT FOR KEYBOARD INPUT
      1 /CHECK FOR A OCTAL DIGIT
      CHG1CHR, CH1R0 /THIS LOCATION WILL GET MODIFIED
      -212 /CHECK FOR LINE FEED
      COMPST /LINE FEED TYPED- RETURN TO START
      -215 /CHECK FOR CARRIAGE RETURN
      RE1TYPE /RETYPE SR AND CONT IF DIGITS TYPED
      -203 /CHECK FOR A CONTROL C
      C1RM /CONTROL C TYPED -RETURN TO MONITOR
      -223 /CHECK FOR A CONTROL S
      CTRS1 /WAS CONTROL S WAIT FOR "Q OR "C
      0 /NONE OF ABOVE CHARACTERS-ILLEGAL CHAR
      ,+1 /GO TO NEXT ADDRESS TO PRINT ?
      CIPRNT /GO PRINT ?
      QES1MK /POINTER TO ? MESSAGE
      JMP SR1QUEST /RETURN AND ASK QUESTION AGAIN
      CH1R0, CDF 00 /SAVE THE LEAST SIGNIFICANT BIT
      DCA I (PSR
      CDF 10
      TAD (CH1R1 /UPDATA POINTER FOR CHARACTERS 2 3 4
      DCA CHG1CHR /SAVE THE POINTER ADDRESS
      JMP CHG1CHR-2 /RETURN FOR NEXT CHARACTER INPUT
      CH1R1, DCA SAV1CHR /SAVE THE CHARACTER TYPED
      GETSR /GET THE VALUE OF SR
      CLL RTL /MOVE IT INTO NEXT POSITION
      RAL

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8189 7057 1306 TAD SAVICHR /ADD NEW CHARACTER TO IT
8190 7060 6201 CDF 02
8191 7061 3773 DCA I (PSR
8192 7062 6211 CDF 10
8193 7063 2301 ISZ TTYICNT /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 SR1MSG /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 SAVICHR,0
8208 7101 0000 TTYICNT,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 /MONITOR STARTING ADDRESS
8215
8216
8217
8218
8219
8220
8221
8222
8223 7106 0000 XCH1KSF,0
8224 7107 6031 KSF /SKIP ON CONSOLE RECEIVE FLAG
8225 7110 5330 JMP NORF /RECEIVE FLAG NOT SET RETURN TO PROGRAM
8226 7111 6201 CDF 00
8227 7112 1771 TAD I (MCW2 /CHECK TO SEE IF CONSOLE WAS ACTIVE
8228 7113 0211 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 LISNFI /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 CNTRIG /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

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/ROUTINE TO CHECK FOR CONSOLE RECEIVE FLAG

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8223 7106 0000 XCH1KSF,0
8224 7107 6031 KSF /SKIP ON CONSOLE RECEIVE FLAG
8225 7110 5330 JMP NORF /RECEIVE FLAG NOT SET RETURN TO PROGRAM
8226 7111 6201 CDF 00
8227 7112 1771 TAD I (MCW2 /CHECK TO SEE IF CONSOLE WAS ACTIVE
8228 7113 0211 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 LISNFI /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 CNTRIG /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

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8244 7133 1366 TAD (277 /PRINT ?
8245 7134 4442 TYPE1
8246 7135 5347 JMP R1LK /RETURN TO PROGRAM
8247 7136 2306 NORF, ISZ XCH1KSF
8248 7137 5706 JMP I XCH1KSF
8249
8250 7140 4434 CNTRIG, 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 RISUBL /RESTORE SUBROUTINE LINKAGE
8260 7150 5706 JMP I XCH1KSF /RETURN TO PROGRAM
8261 7151 0004 FILLR1, 0004 /SET TO NUMBER OF FILLERS REQUIRED.
8262
8263
8264
8265
8266
8267
8268
8269
8270 7164 7547
8271 7165 7506
8272 7166 0277
8273 7167 7537
8274 7170 4000
8275 7171 0022
8276 7172 7053
8277 7173 0020
8278 7174 7045
8279 7175 6520
8280 7176 6600
8281 7177 6201
8282 7200 0000
8283
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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0298 7214 0000 XORS1, 0
0299
0300 /PRINT 2 SPACES
0301
0302 7215 0000 SPAC2, 0 /CALL BY "SPAC21"
0303 7216 4434 C1PRNT
0304 7217 7221 +2
0305 7220 5015 JMP I SPAC2
0306 7221 4040 4040
0307 7222 0000 0000
0308
0309
0310 /COMPARE INPUT TO LIST FOLLOWING CALL
0311 /INPUT ONE CHARACTER IF AC=0
0312 /USE LAST INPUT IF AC NON ZERO
0313
0314 7223 0000 XLISN1, 0 /CALL BY "LISN1"
0315 7224 7640 SZA CLA
0316 7225 5253 JMP LISN11 /USE LAST INPUT SINCE AC NOT ZERO
0317 7226 6031 KSF
0318 7227 5226 JMP -1
0319 7230 6030 KRB
0320 7231 0374 AND (177
0321 7232 1373 TAD (200
0322 7233 3305 DCA CHAREC
0323 7234 1305 TAD CHAREC
0324 7235 1372 TAD (-212
0325 7236 7450 SNA /IS IT A LFT
0326 7237 5243 JMP +4 /YES
0327 7240 1371 TAD (-3
0328 7241 7640 SZA CLA /IS IT A CR?
0329 7242 5245 JMP +3 /NO
0330 7243 4432 C1CRLF
0331 7244 5253 JMP LISN11
0332 7245 1305 TAD CHAREC /GET THE CHAR
0333 7246 1370 TAD (-223 /CHECK FOR A CONTROL 8
0334 7247 7650 SNA CLA /WAS IT A CONTROL 8
0335 7250 5253 JMP LISN11 /YES=DO NOT ECHO CHARACTER
0336 7251 1305 TAD CHAREC
0337 7252 4442 TYPE1 /PRINT THE CHARACTER
0338 7253 1623 LISN11, TAD I XLISN1 /GET COMPARE VALUE
0339 7254 2223 ISZ XLISN1
0340 7255 7450 SNA
0341 7256 5264 JMP LISN31 /EXIT?
0342 7257 7500 SNA /YES
0343 7260 5274 JMP LIS1NUM /LOOK FOR OCTAL NUMBER
0344 7261 1305 TAD CHAREC /COMPARE
0345 7262 7640 SZA CLA /EQUAL?
0346 7263 5271 JMP LISN21 /NO
0347 7264 3214 LISN31, DCA XORS1
0348 7265 1623 TAD I XLISN1
0349 7266 3223 DCA XLISN1
0350 7267 1214 TAD XORS1
0351 7270 5023 JMP I XLISN1 /AC IS ZERO UNLESS OCTAL NUMBER
0352 7271 7200 LISN21, CLA
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0353 7272 2223 ISZ XLISN1
0354 7273 5253 JMP LISN11
0355 7274 7200 LIS1NUM, CLA /LOOK FOR OCTAL NUMBER
0356 7275 1305 TAD CHAREC
0357 7276 1367 TAD (-270
0358 7277 7500 SNA /IS IT LESS THAN 0?
0359 7300 5271 JMP LISN21 /NO, SO NOT AN OCTAL NUMBER
0360 7301 1366 TAD (10
0361 7302 7510 SPA /IS IT GREATER THAN ZERO?
0362 7303 5271 JMP LISN21 /NO, SO NOT A NUMBER
0363 7304 5264 JMP LISN31
0364
0365 7305 0000 CHAREC, 0
0366
0367
0368
0369
0370 /*****
0371
0372 /END OF PASS ROUTINE
0373
0374
0375 7306 0000 XC1EOP, 0
0376 7307 6002 IOF
0377 7310 4432 C1CRLF / CONTROL TO JMP APTJ01.
0378 7311 4434 C1PRNT
0379 7312 7327 EOPIMES
0380 7313 2137 ISZ PASSNO /UPDATE PASS COMPLETED NUMBER
0381 7314 7000 NOP
0382 7315 1137 TAD PASSNO
0383 7316 4435 C1PRT4
0384 7317 4432 C1CRLF
0385 7320 4465 GETSR /CONTINUE?
0386 7321 0365 AND (0400
0387 7322 7640 SZA CLA
0388 7323 5337 JMP COMPST /NO-ASK SWITCH REG QUESTION.
0389 7324 4515 APTREP /IF UNDER APT CONTROL REPORT OK STATUS TO APT
0390 7325 6203 CDI 00
0391 7326 5764 JMP C0REST
0392 7327 0516 EOPIMES, TEXT "END OF PASS "
0393 7330 0440
0394 7331 1706
0395 7332 4020
0396 7333 0123
0397 7334 2340
0398 7335 4040
0399 7336 4000
0393 7337 6203 COMPST, CDI 00
0394 7340 5773 JMP START
0395
0396 7341 6203 C1RST, CDI 00
0397 7342 5764 JMP C0REST
0398
0399 7343 4323 SRIMESG, TEXT "#SR="
0399 7344 2275
```

8400 7345 8222  
8401 7346 7743  
8402 7347 8220  
8403 7350 3647  
8404 7351 4300  
8405 7364 8231  
8406 7365 8400  
8407 7366 8010  
8408 7367 7510  
8409 7370 7555  
8410 7371 7775  
8411 7372 7566  
8412 7373 8200  
8413 7374 8177  
8414 7375 8212  
8415 7376 7151  
8416 7377 8215  
8417 7400 7400

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/TYPE THE ASCII CHARACTER IN THE AC

```
X1TYPE, 0          /CALL BY "TYPE"
DCA CHAR1          /SAVE THE CHARACTER
TYOUT1, NOP/JMP I X1TYPE /OVERWRITTEN IF RUNNING UNDER APT CONTROL,
JMS CNTR1S         /CONSOLE ACTIVE-CHECK FOR CONTROL S
TAD CHAR1          /GET THE CHARACTER SAVED AND PRINT
TIS
CLA
TSF
JMP ,=1
TCF
JMP I X1TYPE
APT1CON=JMP I X1TYPE
```

CHAR1, 0

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

```
MESAG, 0          /CALL BY "MESSAGE"
CLA
KB1CHK
TAD I MESAG
DCA FOR10CK
```

8451 7421 2214  
8452 7422 1652  
8453 7423 7017  
8454 7424 7012  
8455 7425 7012  
8456 7426 4233  
8457 7427 1652  
8458 7430 4233  
8459 7431 2252  
8460 7432 5222  
8461 7433 8000  
8462 7434 8377  
8463 7435 7450  
8464 7436 5614  
8465 7437 1376  
8466 7440 7450  
8467 7441 5250  
8468 7442 1375  
8469 7443 7510  
8470 7444 1374  
8471 7445 1373  
8472 7446 4442  
8473 7447 5633  
8474 7450 4432  
8475 7451 5633  
8476  
8477  
8478  
8479 7452 8000  
8480  
8481  
8482  
8483  
8484 7453 8000  
8485 7454 3252  
8486 7455 1252  
8487 7456 7012  
8488 7457 7012  
8489 7460 7012  
8490 7461 4444  
8491 7462 1252  
8492 7463 4444  
8493 7464 4440  
8494 7465 5653  
8495  
8496  
8497 7466 8000  
8498 7467 8372  
8499 7470 1371  
8500 7471 4442  
8501 7472 5666  
8502  
8503  
8504  
8505

```
ISZ MESAG          /SET UP RETURN
TAD I FOR10CK
RTR
RTR
RTR
JMS MES1F
TAD I FOR10CK
JMS MES1F
ISZ FOR10CK
JMP ,=10
MES1F, 0
AND (77
SNA
JMP I MESAG
TAD (=43
SNA
JMP ,+7
TAD (3
SPA
TAD (100
TAD (240
TYPE1
JMP I MES1F
C1CRLF
JMP I MES1F
```

FOR10CK,0

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

```
X1PRN4, 0          /CALL BY "PRNT4"
DCA FOR10CK
TAD FOR10CK
RTR
RTR
PRN21
TAD FOR10CK
PRN21
SPAC21
JMP I X1PRN4
/
X1PRN1, 0          /CALL BY "PRN11"
AND (7
TAD (260
TYPE1
JMP I X1PRN1
```

```

0506 /ROUTINE TO CHECK FOR A CONTROL S WHILE TYPING OUT MESSAGES
0507 /TO EXIT ROUTINE IF A CONTROL S WAS TYPED-A CONTROL Q OR C MUST BE
0508 /INPUTTED ON THE KEYBOARD
0509
0510 7473 0000 CNTRIS, 0
0511 7474 6031 KSF /SKIP ON CONSOLE KEYBOARD FLAG
0512 7475 5673 JMP I CNTRIS /RETURN TO TYPE ROUTINE-FLAG NOT SET
0513 7476 6034 KRS /READ THE CHARACTER STATICALLY
0514 7477 0370 AND (177 /MASK TO 7 BIT ASCII
0515 7500 1367 TAD (-23 /CHECK FOR A CONTROL S
0516 7501 7640 SZA CLA /WAS IT A CONTROL S
0517 7502 5673 JMP I CNTRIS /NO-RETURN WITH KEYBOARD FLAG STILL SET
0518 7503 6032 KCC /CLEAR KEYBOARD FLAG FROM "S
0519 7504 4306 JMS WAIT10C /WAIT FOR CONTROL Q OR C
0520 7505 5673 JMP I CNTRIS /RETURN TO PRINT MESSAGE BEING TYPED
0521
0522 7506 0000 WAIT10C, 0 /ROUTINE TO WAIT FOR CONTROL Q OR C
0523 7507 6031 KSF /WAIT FOR A CONTROL Q OR C TO EXIT
0524 7510 5307 JMP =-1 /
0525 7511 6036 KRB /READ THE CHARACTER TYPED
0526 7512 0370 AND (177 /MASK TO 7 BIT ASCII
0527 7513 1366 TAD (-3 /CHECK FOR A CONTROL C
0528 7514 7450 SNA /WAS IT A CONTROL C?
0529 7515 5765 JMF C1RM /YES-RESTORE MONITOR AND RETURN
0530 7516 1364 TAD (-7 /CHECK FOR A LINE FEED CHARACTER
0531 7517 7450 SNA /WAS IT A LINE FEED
0532 7520 5763 JMP COMBST /YES GO RESTART THE PROGRAM
0533 7521 1364 TAD (-7 /CHECK FOR A CONTROL Q "Q
0534 7522 7640 SZA CLA /WAS IT A CONTROL Q
0535 7523 5307 JMP WAIT10C+1 /NO-WAIT FOR APPROPRIATE KEY
0536 7524 5706 JMP I WAIT10C /RETURN TO WHENCE IT CAME
0537
0538 /PRINT THE TWO OCTAL NUMBERS IN THE AC 6 THRU 11
0539
0540
0541 7525 0000 X1PRN2, 0 /CALL BY "PRN21"
0542 7526 3336 DCA TWO10CK
0543 7527 1336 TAD TWO10CK
0544 7530 7012 RTR
0545 7531 7010 RAR
0546 7532 4441 PRN11
0547 7533 1336 TAD TWO10CK
0548 7534 4441 PRN11
0549 7535 5725 JMP I X1PRN2
0550
0551 7536 0000 TWO10CK, 0
0552
0553 /ROUTINE TO SAVE SUBROUTINE LINKAGES WHICH MAY GET DESTROYED BY KEYBOARD
0554 / INTERVENTION CHECK
0555
0556 7537 0000 SISUBL, 0
0557 7540 1762 TAD XCHIKSF
0558 7541 3357 DCA LISAV1
0559 7542 1214 TAD MESAG
0560 7543 3360 DCA LISAV2

```

```

0561 7544 1753 TAD X1PRN4
0562 7545 3361 DCA LISAV3
0563 7546 5737 JMP I SISUBL
0564
0565 /ROUTINE TO RESTORE LINKAGES SAVED BY SISUBL ROUTINE
0566
0567 7547 0000 RISUBL, 0
0568 7550 1357 TAD LISAV1
0569 7551 3762 DCA XCHIKSF
0570 7552 1360 TAD LISAV2
0571 7553 3214 DCA MESAG
0572 7554 1361 TAD LISAV3
0573 7555 3253 DCA X1PRN4
0574 7556 5747 JMP I RISUBL
0575
0576 7557 0000 LISAV1, 0
0577 7560 0000 LISAV2, 0
0578 7561 0000 LISAV3, 0
0579
0580 7562 7106
0581 7563 7337
0582 7564 7771
0583 7565 7102
0584 7566 7775
0585 7567 7755
0586 7570 0177
0587 7571 0260
0588 7572 6027
0589 7573 0240
0590 7574 0100
0591 7575 0003
0592 7576 7735
0593 7577 0077
0594 0177 0163
0595 0000

```

FIELD 0

[illegible][illegible]

8395 0700 \*200  
8396  
8397 8888

AC 6255	BYT7 0007	CHGCHR 7032	CONTT 5704
ACISAV 6710	BIT8 0065	CHGMOD 6000	CPUDIS 4422
ACAIOT 5120	BLANK 0130	CHGUNT 6014	CPUDN 2134
ACCERR 5054	BRSMS 0036	CHKKB 2237	CPUMES 2210
ACDATA 0067	BSTLP 6012	CHKKSP 4516	CPUSDI 6406
ACL 7701	BSW 7002	CIFCK 3365	CPUT1 0212
ACSAVE 6675	CIBY2 6662	CIFCK1 3444	CPUT10 1131
ACWAS 0054	CICRLF 4432	CIFJMP 3346	CPUT11 1200
ADDTIM 2357	CIEOP 4443	CIFJMS 3421	CPUT12 1235
ADRS 4446	CIGET 6715	CIFJPL 3340	CPUT13 1275
AGAIN1 3333	CIPRNT 4434	CIFJSL 3413	CPUT14 1425
AGAIN2 3406	CIPRT4 4435	CIFOK 3400	CPUT15 1462
ALRSM 6012	CIREST 0200	CIFOK1 3440	CPUT2 0400
ALRSU 6032	CIRM 7102	CKBRGQ 2271	CPUT3 0501
APIOW1 6713	CIRST 7341	CKCON 6241	CPUT4 0600
APTICO 5000	CISWIT 4436	CKFLG 6233	CPUT5 0712
APTIER 7000	CISPT 4532	CKMOD 5677	CPUT6 1026
APTICK 2726	CICRLF 4521	CKINDA 5704	CPUT7 1071
APTCOM 7333	CISRR 4533	CKNF 3501	CRA 6210
APTCT1 6751	CIGST 6703	CKMODE 5600	CRB1 7144
APTCT2 6752	CSH3 4540	CKPTFG 6232	CUIPTR 5121
APTCTX 6756	CSPRNT 4522	CKRFG 6227	DAT 0073
APTCTY 6757	CSPRT4 4523	CKMFG 6224	DATPAT 0177
APTER 7000	CSRC 4537	CLCL 6136	DATSLU 2421
APTHW3 6143	CSPRST 0201	CLCON 5713	DDERSL 2470
APTIM1 6747	CSRM 7105	CLKCT 5712	DECPRT 6104
APTIM2 6750	CSSTAR 4534	CLKERR 5715	DELAY 4470
APTIMX 6754	CSSWIT 4524	CLKIR 5674	DELAY1 3251
APTIMY 6755	CAB 3366	CLLE 6135	DERSLU 2462
APTOK 6732	CAC 3367	CLOOPA 3240	DF0 3013
APTOK1 6725	CAD 3363	CLREIF 4455	DF1 3025
APTOW1 6701	CAE 3437	CLREPI 4471	DF2 3033
APR 2513	CAF 6007	CLRERI 4457	DF3 3041
APRREP 4515	CAG 4625	CLREXI 4456	DF4 3047
ATIMLS 1466	CAM 7621	CLSK 6137	DF7 3017
ATIMMS 1467	CAMTST 1000	CLSKWT 4541	DFLD 3207
BASEP 6055	CCDF 3300	CLUPEX 1547	DLCD0 6103
BDN1 0026	CDELTA 5714	CNT 0122	DLOP 2423
BDN2 0027	CDI 6203	CNT1 0123	DNF7 3226
BDN3 0030	CFSLU 4512	CNT1B1 7146	DONLOP 4447
BDRATE 3124	CH1KB 3320	CNTR1G 7140	DONT17 1435
BDRNS 3200	CH1KSF 4445	CNTR1S 7473	DOSIMU 1656
BDRSQ 2322	CH1R0 7045	CNTRLG 7141	DOSLU 6025
BDTA 4505	CH1R1 7053	CNTRLG 7506	DOSWAP 2014
BEGBST 6000	CH1REC 7311	CNTRS 7145	DVCTAB 3045
BEGEXM 3000	CHAR 7334	CNTRS1 7147	DXDR0 6104
BEGRTC 5400	CHAR1 7413	COMP 0134	E0 5106
BIT11 0072	CHAREC 7305	COMPST 7337	EOPRE 5026
BIT3 0062	CHARLP 2015	CONCH 4026	E1 5111
BIT4 0063	CHARR0 7050	CONCHK 4020	E10 5142
BIT5 0064	CHARR1 7054	CONST 6165	E100 5460
BIT6 0102	CHGICH 7027	CONTDG 4512	E11 5126

E110	5503	EXTSET	2224	HLTS	3314	JMSLOC	1435
E120	5535	EXTSTA	4461	IR0	3064	K0	2416
E121	5540	EXMIT1	0120	IR1	3071	K1	0041
E122	5543	EXMT1	3010	IR2	3104	K10	0042
E124	5527	EXMT10	4200	IR3	3117	K100	0044
E1PRE	5071	EXMT11	4400	IR7	3143	K200	0045
E2	5114	EXMT12	4600	IRSF	3276	K212	7216
E20	5204	EXMT13	4636	IRSF1	3402	K215	7215
E21	5206	EXMT14	5000	ICDI	4244	K240	7462
E22	5210	EXMT2	3056	IEH	6646	K2525	0046
E23	5212	EXMT3	3200	IEH1	6655	K260	7504
E24	5214	EXMT4	3277	IFDF	4411	K3	7461
E25	5216	EXMT5	3445	IR0	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	FTLCOR	4052	INSTR1	1515	K77	0043
E40	5320	FILLER	7152	INSTR	0105	K7700	0052
E42	5274	FILLR1	7151	INTEN1	1400	K7777	0053
E4PRE	5074	FILVAR	6144	INTFLG	0117	K81CHK	4462
E50	5336	FIXIL	4520	INTMOD	6034	K8CHK	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	FORIOC	7452	IOF	6002	KCF1	6300
E60	5414	FOROCK	7463	ION	6001	KCF2	6320
E61	5420	PRET	4526	IOF0	2601	KFLD0	0114
E62	5422	FSIMES	6323	IOF1	2606	KIE	6035
E63	5424	FSAV	3511	IOF10	2702	KIE1	6305
E70	5443	FSMES	6331	IOF11	2710	KIE2	6325
EAC	0131	FVLCT	6166	IOF12	2715	KIOT	5117
ECONSI	0136	FVLOOP	6155	IOF13	2722	KISZTT	2270
EIFCLR	2234	GETHW3	4466	IOF2	2613	KJILD	2267
ENDSLU	3131	GETSR	4465	IOF3	2620	KJMP3	5227
ENDIST	4530	GOOD	0132	IOF4	2625	KKRTN	4634
EOPIME	7327	GR1SIM	1664	IOF5	2632	KLB	6037
EPRNTI	0135	GR2GR3	1704	IOF7	2637	KL8IM	4513
ERECE	0121	GRFSIM	1600	IOF8	2644	KMD1	6307
ERICLR	2220	GROUP2	1706	IOF9	2651	KNOP	3350
ERISST	2230	GROUP3	2000	IOTADD	3044	KRB	6036
ERRIME	6331	GSR	2253	IOTLP	5010	KRB1	6306
ERRMES	5230	GTF	6004	IOTREC	3056	KRB2	6326
ERROR	4450	H1	5566	IOTTA	3043	KRS	6034
ETIMLL	1472	HANGER	5567	IOTXMT	3066	KRS1	6304
ETIMLU	1473	HCW1	0021	ISSTSB	2700	KRS2	6324
ETIMMS	1471	HCW2	0022	ITOLOC	0166	KRTN	4627
EXICLR	2214	HCW3	0023	JMPIR	0111	KSF	6031
EXIOT	5027	HCW3MS	6760	JMPRET	4073	KSF1	6301
EXIOTL	5061	HLT	7402	JMSLOC2	1452	KSF2	6321

KSLG	0040	LQTAB	4251	MKSF	4475	NXTONN	2132
KSPWAT	4452	LSAV1	7355	MLAP	6361	NXTPAT	1504
KSTOP	0066	LSAV2	7356	MLA	6506	NXTPT	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	4260	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	NQA	7501	PASSNO	0137
L62	3653	M43	7460	MQDATA	0070	PATCH	0141
LCD	6751	M8CON	6103	NQL	7421	PBRMS	6027
LCDATA	6071	NAC	6456	NQSAVE	6676	PC1SAV	6707
LCDF	3330	NBR	6512	NQWAS	0055	PCIE	6665
LENGAS	2146	MEHES	5210	NREC1	6350	PCLF	6662
LIS1NU	7274	MEOW	3007	NREC2	6353	PCLOOP	2200
LISN	4525	MES1AC	6676	NREC3	6356	PCLP	6666
LISN1	7255	MES1F	7433	MSHDR	6457	PCPUM	0211
LISN11	7253	MES1FL	6704	MSLU	6467	PCPUMS	2200
LISN2	7273	MES1MQ	6701	MSPF	4502	PCSAVE	6674
LISN21	7271	MES1PC	6672	MTCF	4504	PERR	2135
LISN3	7266	MES1TN	6554	MTLS	4510	PFM	5011
LISN31	7264	MESAC	6663	MTN	6524	PFMES	5145
LISNF1	4437	MESACT	6547	MTPC	4506	PINES	4352
LISNSR	6047	MESAG	7414	MTSB	4505	PMENES	5200
LISNUM	7276	MESAGF	7441	MTSF	4503	PMODE	2076
LKDATA	0071	MESAGX	7423	MTSK	4507	POINTB	0100
LKWAS	0056	MESBR	6563	MXMT1	6337	POINTC	0101
LL1	4406	MESEXP	6556	MXMT2	6342	POINTD	0102
LL2	4433	MESFL	6671	MXMT3	6345	POINTE	0103
LLLD	2257	MESHDR	6514	NDF	0074	POINTF	0104
LLXB	3125	MESINS	6543	NOCRF	7137	POINTR	0076
LOC1	0164	MESLK	6540	NOPI	4531	PPIM	3411
LOOP	4467	MESMQ	6666	NORDIS	6400	PPINES	4342
LOOPA	0031	MESPC	6660	NORF	7136	PPRMS	7076
LOOPEC	4446	MESRC	6546	NORMDI	6400	PRDB	6667
LOPOON	2242	MESSLU	6557	NORMSQ	2276	PRDD	6150
LQATAB	4252	MESTN	6565	NORSLU	6446	PRETES	5000
LQ11	4207	MESXM	6537	NORX01	5053	PRN11	4441
LQ12	4224	NFL	6472	NOSIM0	3426	PRN21	4444
LQLS	6506	MGTF	3453	NOSIM1	4472	PRNT1	4526
LQMC	6503	MINS	6500	NSQBDR	0024	PRNT2	4530
LQMP	6502	MIOT	4463	NSTKS	4533	PROPLC	7102
LQPC	6504	MKCC	4476	NUNX	4070	PROPM3	7100
LQRB	6501	MKCF	4474	NUOK	2211	PRTR3	6076
LQRE	6507	MKIE	4500	NXTDC	0214	PRTCMS	5442
LQRS	6505	MKR3	4501	NXTIOT	5040	PRTEST	3400
LQSK	6500	MKRS	4477	NXTONE	1465	P8KF	6661

PSHES	0277	RKHEPE	0133	SLULSH	1640	T21DN	1730
PSR	0020	S1SUBL	7517	SLUMES	3303	T2LA	1457
PS81	0142	SAVICH	7100	SLUMST	1600	T2LQ	4041
PS82	0134	SAVAC	6276	SLUREC	0127	T3	5121
PS83	0126	SAVCHR	7103	SLUXMT	0120	T3LA	1514
PS84	0117	SAVFLD	0061	SMES	0213	T3LQ	4112
PS8F	0660	SAVLOC	2420	SMOPE	5655	T4	5200
PS7B	0664	SBDRI	2675	SNUMX	4071	T4LA	1000
PTED	2162	SBDRI2	2671	SOMSKP	0060	T4LQ	4200
PTEST6	0600	SBDRI3	2665	SPAC2	7215	T5	5253
QES1MK	7346	SD1	0065	SPAC21	4440	TSB	5260
QESTMK	7315	SD2	0071	SPACE2	4531	TSBA	1641
RILK	7147	SD3	0073	SPACX2	7217	TSLQ	4257
RISUBL	7547	SD4	0074	SPCIE	4516	T6	5326
RCNT	5441	S0ATA	4525	SPE1	2054	T6LA	1670
RDF	6214	S0EVC	0025	SPE2	2060	T6LQ	4305
RDX	5047	SDN	6755	SPE3	2466	T7	5400
RE1TYP	7065	SEL	6750	SPF	0040	T70K	5441
REPAPT	2502	SER	6754	SPF1	6310	T7LA	4000
RE860W	0024	SERUEI	6210	SPF2	6330	T7LQ	4400
RE8TBR	3214	SETHDR	3150	SRIMES	7343	T7OW1	4421
RET	4447	SETEPI	4472	SRIOES	7015	T7OW2	4440
RETIAD	2417	SETERI	4461	SREC	4474	TABADD	3055
REIADD	4030	SETEXI	4460	SRMESG	7312	TABDON	4241
RETURN	2400	SETIF	6246	SRQ	6003	TADI	3233
RETYPE	7064	SESSIM	1610	SSLUDI	6410	TBLPTR	6075
REVSEN	1735	SFLDS	4276	SSLUN	6511	ICF	6042
REINT	6206	SFLDS	3664	SSUBLK	7335	ICF1	6312
RIB	6234	SHFTCT	6110	STAB	2746	ICF2	6332
RIF	6224	SHFTTI	5662	START	0200	TESAGG	2130
RLK	7150	SHIFTO	5633	STKS	0107	TESAGN	1502
RL0OP	4514	SHINDA	6131	STR	6753	TESLOC	0072
RNF	6244	SIMCK0	4520	SUNEI	6256	TESMES	3306
RPERR	3657	SINCK1	4531	SVBDC	1470	TEST	0115
RPIBR	2523	SINERR	2055	SWP	7521	TEST1	0221
ROEST	7021	SKON	0000	SKDRDA	0074	TEST10	1000
RSUBLK	7345	SKPICH	6200	SKMT	4473	TEST11	1045
RTC11	5425	SKPCHK	2047	T1	5014	TEST12	1105
RTC12	5502	SKPCHN	6200	T10	5420	TEST13	1200
RTC1F	0113	SKPERR	5046	T10LS	4600	TEST14	1316
RTCMS	5452	SKPLRC	4067	T11	5445	TEST15	1327
RTC1	5410	SKPPED	0057	T11LS	4632	TEST16	1342
RTC1D	5423	SLCOTA	6073	T12	5462	TEST17	1400
RTC2	5463	SLOOPA	3233	T12LS	4652	TEST2	0241
RTC2D	5500	SLU2MC	4433	T13	5507	TEST20	1436
RTC3	5504	SLUCAF	4511	T13LS	4672	TEST21	1701
RTC4	5600	SLUDAT	4453	T14LS	4712	TEST22	2000
RTC5	5627	SLUDER	4454	T14S	5600	TEST3	0400
RTC6	5655	SLUDIS	6406	T15LS	4733	TEST4	0425
RTF	6005	SLUEND	3331	T1LA	3430	TEST5	0473
RTRPD	3650	SLULER	2153	T1LQ	4005	TEST6	0606
RTRN	4635	SLULSL	1620	T2	5076	TEST7	0725

TESTAB	2265	TWO10C	7536	XC1SW	7013	XSEPI	4501
TESTF1	0124	TWOOCK	7164	XC8APT	7400	XSFIB	4522
TESTMS	2213	TYOUT	7323	XC8CRL	7200	XSPCIE	3544
TESTPT	2061	TYOUT1	7402	XC8ERR	6600	XSRFT	4210
TESTS	2023	TYPE	4527	XC8H3	7540	XSTKS	0110
TFLD	3241	TYPE1	4442	XC8RC	7012	XTFLG	0106
TFLG	4537	U1	6502	XC8STA	6716	XTOR	4275
TIMERR	1474	UDATA	6055	XC8SW	7360	XTYPE	7321
TJLOC	2266	UDONE	6053	XCDIL	4240	XVDLY	1667
TLOOP	6700	UEI	6205	XCFBLU	3265	XWAIT	5553
TLOOP1	6675	UEIMES	6311	XCHIKS	7106	ZEAP	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	0752		
TPC1	6314	UL6	6264	XDRDAT	6072		
TPC2	6334	UL7	6270	XGETSR	3312		
TRNXPT	2103	UNACON	6057	XGHW3	6346		
TS60W1	0652	UNACON	6064	XIOT	3000		
TS60W2	0663	UNEI	6222	XKLSIM	4511		
TS60W3	0664	UNEINT	6221	XLCTR	2144		
TS60W4	0674	UNETMS	6303	XLIGN	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	USEDIO	5064	XMKRS	2617		
TSF	6041	UX	6507	XMKSF	2605		
TSF1	6311	UXFR	6054	XMODE2	1660		
TSF2	6331	VAR	6164	XMSPP	2636		
TSFWAT	4451	VCDI	6274	XMTCF	2650		
TSK	6045	VDCTR	1700	XMTLS	2721		
TSK1	6315	VDELAY	4473	XMTPC	2707		
TSK2	6335	VMODE	2016	XMTSS	2655		
TSLOP	2226	WAIT	4464	XMTSF	2643		
TSICLL	0265	WAITIO	7506	XMTSK	2714		
STCML	0273	WAITQC	7521	XNC	2047		
STDAB	6111	WATKSF	2346	XORS	7214		
STEND	2227	WATTSF	2333	XORS1	7214		
STIAC	0253	WTCLSK	5427	XPRNT1	7477		
STIN	2217	X1	4042	XPRNT2	7153		
STIOT	5030	X1PRN1	7466	XPRNT4	7464		
STILCM	0260	X1PRN2	7525	XR	6205		
STLOP	0125	X1PRN4	7453	XRET	0112		
STNO	0075	X1TYPE	7400	XRETAD	4072		
STINU	0140	XBAUD	3112	XRTF1	4066		
STTFC	5657	XC1CRL	7200	XSAV	3510		
TTVICN	7101	XC1WOP	7306	XSCAF	3252		
TTICNT	7104	XC1ERR	6600	XSDP	3461		

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ERRORS DETECTED: 0
LINKS GENERATED: 203
RUN-TIME: 16 SECONDS
4K CORE USED

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[illegible]



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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			
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C1GEI	8057	8074#	8081														
C1PRNT	3929#	418#	4182	6396	6398	6938	6940	7803	7815	7876	7880	7889	7896	7903			
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C1PRT4	3931#	7879	7883	7892	7899	7906	7942	7956	7963	7970	8158	8203	8383				
C1REST	2773	4091#															
C1RM	8171	8211#	8237	8529													
C1RST	8396#																
C1SWIT	3933#	8050															
C8APT	198#	3206															
C8CRLF	180#	1414															
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	301	306	312	319	321	328	330	335	337	342	344	351	357	363			
	369	375	389	391	396	399	407	413	420	424	433	435	444	446			
	452	459	467	473	482	488	494	500	506	512	518	524	530	536			
	542	548	570	574	583	590	594	602	609	613	621	627	631	639			
	646	649	655	659	669	675	682	691	700	709	712	715	729	731			
	734	740	742	746	757	759	763	769	775	777	781	787	789	792			
	805	815	824	829	837	849	857	861	870	881	895	905	909	922			
	934	945	955	967	978	992	1000	1014	1019	1025	1030	1038	1048	1058			
	1060	1067	1079	1083	1090	1094	1099	1107	1346	1354	1491	1498	1505	1512			
	1519	1524	1526	1549	1556	1562	1569	1575	1582	1588	1595	1598	1605	1611			
	1678	1767	1776	1814	1823	1866	1897	1908	1929	1937	1941	1997	2057	2070			
	2086	2099	2175	2185	2190	2203	2218	2220	2289	2300	2317	2325	2390	2396			
	2503	2507	2511	2554	2557	2560	2564	2582	2586	2590	2593	2595	2598	2606			
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C8H3	210#	3212															
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	2937	2941	2945	2949	2953	3012	3024	3041	3048	3055	3062	3069	3077	3085			
	3092	3208	3313	3339	3385	3451											
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C8RC	208#	3565	3701														
C8REST	231#	8391	8397														
C8RM	3308	3348#	3372	3689													
C8STAR	202#	230															
C8SWIT	186#	3166	3211														
CAB	1740	1781#															
CAC	1742	1782#															
CAD	1776#																
CAE	1823#																
CAF	30#	242	1009	1485	2350	2500	2504	2551	2579	2631	2643	3348	3730#	4957			
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CAG	2289#																

SEQ 0197

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CAMTST	716	724#															
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CHIKSF	3947#	5801	7784														
CHIR0	8161	8165	8179#	8195													
CHIR1	8182	8185#															
CHIREC	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															
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CHARR1	3317	3320#															
CHGICH	8162	8165#	8183	8184	8194	8197	8256										
CHGCHR	3299	3302#	3318	3319	3327	3330	3391										
CHGMOD	7526	7557#	7566	7567	7568												
CHGUN1	7528	7572#	7586	7586	7587												
CHKKB	177	1448#	1456														
CHKKSF	174#	1451	2891														
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CIFJMS	1782	1798	1802	1804	1808#												
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CIFOK	1772	1779	1791#														
CIFOK1	1819	1826#															
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CKCON	7761	7784#															
CKFLG	2919	2922#	2956	7821													
CKIMOD	7474	7482#															
CKINDA	7480	7489#															
CKMF	1862	1867#															
CKMODE	7450	7457#															
CKPTFG	7758	7776#															
CKRFG	5590	7755	7772#														
CKAMFG	5600	7752	7768#														
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CLCON	2704	2718#	2726	2729													
CLKCT	2692	2099	2702	2717#	2722												
CLKERR	2706	2709	2721#														
CLKIR	2689	2702#															
CLLE	47#	2588	2601	2636	2663	2698	2711										
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CLREIP	3964#	4125	4148	4205	4233	4277	4358	4454	4499	4536	4575	4658	4675	4693			
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CLREPI	3968#	4477	4516	4553	5321												
CLREXI	3966#	4244	4290	4399	4460	4511	4545	5313									

SEQ 0198

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CNTR1G	8239	8257#						
CNTR18	8426	8510#	8512	8517	8520			
CNTRLG	3374	3385#						
CNTRL8	3525	3670#	3672	3677	3680			
CNTRS	3310	3390#						
CNTRS1	3376	3393#						
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COMPST	8167	8388	8393#	8532				
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CONCHK	1973	1980#						
CONST	7713	7717	7719	7726#				
CONTOG	2199	2235#	2221					
CONTI	2710#	2732						
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CPUMES	1416	1421#						
CPUSDI	2994#	3157						
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CPUT10	845#							
CPUT11	883	889#						
CPUT12	928#							
CPUT13	973#							
CPUT14	1074#							
CPUT15	1120#							
CPUT2	377	386#						
CPUT3	479#							
CPUT4	550	564#						
CPUT5	665#							
CPUT6	752#							
CPUT7	799#							
CRA	7753#	7769						
CTRS1	8173	8255#						
CUIPTR	2355	2359	2362	2434#				
DAT	155#	1669	1670	1677				
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DATSLU	3961	5300#	5331	5332	5333			
DDERSL	5342	5345#	7873					
DECPRT	2822	2826#						
DELAY	3906#	5027	5628	5667	5694	5716	8028	
DELAY1	5738	5741#						
DESLU	3963	5339#	5341	5344				
DF0	1488#							
DF1	1500#							
DF2	1507#							
DF3	1514#							
DF4	1521#							
DF7	1493#							

SEQ 0199

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DNF7	1649	1655#															
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	7146	7203	7241	7273	7310	7374	7530										
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DOSIMU	1217#																
DOSLU	2754	2759	2772#														
DOSWAP	1297	1300#															
DVCTAB	5573#	5609															
DXDR8	7484	7658#															
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E10	6928#																
E100	7264	7272#															
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E110	7294	7308#															
E120	7367#																
E121	7370#																
E122	7373#																
E124	7335	7357#															
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E2	6888#																
E20	6967#																
E21	6969#																
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E28	7007#																
E2PRE	6749#																
E3	6891#																
E40	7091#																
E42	7068#																
E4PRE	6833#																
E50	7129#																
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E52	7141#																
E53	7133#																
E54	7139#																
E55	7145#																
E56	7127#																
E60	7172	7181#															
E61	7198#																
E62	7200#																
E63	7202#																
E70	7240#																

SEQ 0200

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ENDSLU	5537	5544	5641#														
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	2611	2651	2679	2712													
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ERICLR	3969	5132#	5135														
ERISLT	3973	5142#	5145														
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ERRMES	2470#	3078															
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	4583	4587	4591	4596	4601	4606	4611	4616	4621	4626	4628	4630	4637	4642			
	4644	4646	4779	4795	4800	4805	4991	5019	5048	5065	5073	5091	5312	5315			
	5320	5323	5343	5401	5413	5419	5426	5432	5438	5450	5477	5483	5495	5881			
	5884	5888	5890	5895	5907	5911	5915	5923	5925	5930	5957	5959	5964	6002			
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ETIMLU	4789#	4802	4819	4830													
ETIMMS	4785#	4799	4804	4813	4820												
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EXMT12	2214	2265#															
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EXMT3	1615	1633#															
EXMT4	1713#																
EXMT5	1829	1839#															
EXMT6	1973	1990#															
EXMT7	1932	1963#															
EXS17	4982	5032	5059	5078#													
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FILCOR	1970	2007#	2018														
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FILLR1	8261#	8289															
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FLDON	7123	7175#															
FLMES	6939	7010#															
FLSAVE	3057	3131	3181#	3190													
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FOROCK	3610	3612	3617	3619	3639#	3645	3646	3651									
FRET	2158	2217#															
FS1MES	7816	7826#															
FSAV	1057	1058	1865	1875#													
FSMES	2916	2962#															
FVLCT	7716	7721	7727#														
FVLOOP	7717#	7722															
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GR2GR3	1228	1246#															
GRFSIM	1162	1169#															
GROUP2	1248#																
GROUP3	1247	1288#															
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HANGER	7387	7396#															
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HCW2	2752	3363	3585	5364	5510	8227											
HCW3	1018	3601	3703														
HCW3MS	3249#	3702															
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HLTS	1736#	1746	1747														
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IB1	1551#																
IB2	1564#																
IB3	1577#																
IB7	1600#																
IBSF	1681	1696#															
IBSF1	1793#																
ICDI	2082#																
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INITL	6275	6301#															

SEQ 0201

SEQ 0202

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INTP	3060#	7177	7196	7236	7266	7304	7309	7339									
INTPET	7793	7795	7797#														
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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			
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	6475	6723	7170	7228	7262	7292	7333	8002	8092	8136	8376						
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	4412	4457	4468	4483	4502	4513	4523	4539	4550	4557	4578	4774	5306	5318			
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KCC	3367	3678	3747#	5411	8030	8232	8518										
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SEQ 0204

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LISN2	3494	3500#	3507	3510													
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LL2	6447#	6467															
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LLXB	5025	5033#															
LOC1	4068	4085#															
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LQ4TAH	6273	6318#															
LQ11	6278#	6304															
LQ12	6293#	6306															
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LQRE	3897#	4946	6166	6226	6321	6380	6566	6577	6600	6619	6638	6658	6678	7411			
	7603	7605															
LQRS	3895#	6145	6159	6186	6202	6213	6245	6372	6477	6527	6582	6596	6601	6615			

SEQ 0205

LQSK	6620	6634	6639	6654	6659	6674	6679	7422	7431	7438	7509	7517					
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LSAV2	3543	3553	3559#														
LSAV3	3545	3555	3560#														
LXC8ST	3216#	3602															
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M1AC	7812	7860	7888#	7893	7911												
M1FL	7813	7862	7902#	7907	7913												
M1HQ	7861	7895#	7900	7912													
M1PC	7809	7925	7966#	7971													
M1TN	7806	7924	7959#	7964													
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M270	3505	3509#															
M3	3475	3512#															
M43	3625	3636#															
M8CON	7560	7565	7656#														
MAC	2912	2906	2999	3016	3028	3040#	3045										
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MEOW	1402#																
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MKCF	3998#	4407	4411	4603	4632												
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MRRS	4008	4517	4593														
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MLK	3003	3022	3034	3068	3073												
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MODE2	3853	5033	5057														
MODE3	3854																
MODVAR	7558	7564	7593	7638													
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MQISAV	7898	8008	8068	8076													
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NREC3	2946	2966															
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[illegible]

[illegible][illegible]

[illegible][illegible]



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UNIT	7420	7612#													
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XCPSLU	4027	5765#	5780						
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XDR	3864#	6002	6919	7072	7125	7499			
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