

IDENTIFICATION

PRODUCT CODE: MAINDEC-08-DKVTB-A-D
PRODUCT NAME: VT78 CPU DIAGNOSTIC
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MAINTAINER: DIAGNOSTIC GROUP
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TABLE OF CONTENTS

1.0	ABSTRACT
2.0	REQUIREMENTS
2.1	HARDWARE
2.2	SOFTWARE
2.3	STORAGE
2.4	PREREQUISITE SOFTWARE
3.0	RELATED DOCUMENTS
4.0	RESTRICTIONS
5.0	OPERATING INSTRUCTIONS
5.1	LOADING THE PROGRAM
5.2	PPOGRAM OPTIONS
5.2.1	SWITCH REGISTER SETTINGS
5.2.2	HARDWARE CONFIGURATION SETTINGS
5.3	CONSOLE TERMINAL PACKAGE
5.4	EXECUTION TIMES
6.0	ERROR INFORMATION
7.0	SUB-TEST SUMMARIES
7.1.1	CPU TESTS
7.1.2	MEMORY EXTENSION TESTS
7.1.3	REAL TIME CLOCK TESTS
7.1.4	SERIAL LINE UNIT TESTS
7.1.5	PARALLEL INTERFACE TESTS
7.1.6	FLOPPY INTERFACE TESTS
8.0	PROGRAM LISTING

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

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

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

5.2.1 SWITCH REGISTER SETTINGS

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

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

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

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

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

5.2.2 HARDWARE CONFIGURATION SETTINGS (HW3)

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

BIT 0 = 1	FLOPPY DRIVE 0 NOT READY
BIT 1 = 1	NO RX01 CABLED TO VT78 SYSTEM
BIT 2 = 1	NO EXTERNAL DEVICE ATTACHED TO PARALLEL INTERFACE
BIT 3 = 1	PARALLEL DEVICE ATTACHED AND USING DEVICE CODE 50. (LA180=DEVICE CODE 66; 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

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

CONTROL G

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

EXAMPLE:

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

TERMINATING CHARACTERS

CARRIAGE RETURN

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

EXAMPLE:

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

EXAMPLE:

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

LINE FEED

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

EXAMPLE:

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

EXAMPLE:

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

ILLEGAL CHARACTERS

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

EXAMPLE:

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

CONTROL S

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

CONTROL Q

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

CONTROL C

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

5.4 EXECUTION TIMES -----

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

6.0 ERROR INFORMATION -----

THE FOLLOWING MESSAGE FORMATS ARE USED IN THIS DIAGNOSTIC.

A) NORMAL ERROR DISPLAY

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

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

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

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

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

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

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

THE FLAGS DISPLAY CONTAINS THE FOLLOWING DATA:

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

ALL OTHER BITS ALWAYS CONTAIN 0.

B) COMBINED MICROINSTRUCTION SIMULATION ERROR DISPLAY

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

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

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

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

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

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

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

C) SLU ERROR DISPLAY

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

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

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

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

D) UNEXPECTED INTERRUPT

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

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

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

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

7.0 SUB-TEST SUMMARIES

7.1.1 CPU TESTS

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

7.1.2 MEMORY EXTENSION TESTS

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

7.1.3 REAL TIME CLOCK TESTS

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

7.1.4 SERIAL LINE UNIT TESTS

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

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

TN 0003 -- TEST THAT CAF CLEARS TRANSMIT FLAG ENABLE

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

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

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

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

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

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

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

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

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

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

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

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

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

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

TN 0022 -- VERIFY PROGRAMMABLE MODES OF SLU #2

7.1.5 PARALLEL INTERFACE TESTS

(DEVICE CODE 66)

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

(DEVICE CODE 50)

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

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

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

7.1.6

FLOPPY INTERFACE TESTS

TN 0001	-- CAF PART I / FLAG DETECTION PART I
TN 0002	-- FLAG DETECTION PART II / "C" LINES VERIFICATION PART I
TN 0003	-- DIRECTION OF IOT 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

/FIRST EDITION.

SEQ 0018

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/-----/
/      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,
/      (LA1800=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 ACWAS, 0
138 0055 0000 MCWAS, 0
139 0056 0000 LKWAS, 0
140 0057 0000 SKPPED, 0
141 0060 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 BIT8, 0
150 0066 7402 KSTOP, HLT
151 0067 0000 ACDATA, 0
152 0070 0000 MQDATA, 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 1450 POINTF, JMSLOC-2
165 0105 1515 INSTTR, INSTRT
```

```
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 RTCIF, 0
172 0114 4635 KFLD0, RTRN
173 0115 2023 TEST, TESTS
174 4516 CHKKS=FJMS I
175 0116 7111 XCHKKS=F
176 4517 KBCHK=FJMS I
177 0117 2737 CHKKB
178 4524 FIXIL=FJMS I
179 0120 5217 FIXLKG
180 4521 C8CRLF=FJMS I
181 0121 7200 XC8CRLF
182 4522 C8PRNT=FJMS I
183 0122 7423 MESAGX
184 4523 C8PRT4=FJMS I
185 0123 7464 XPRNT4
186 4524 C8SWIT=FJMS I
187 0124 7360 XC8SW
188 4525 LISN=FJMS I
189 0125 7225 XLISN
190 4526 PRNT1=FJMS I
191 0126 7477 XPRNT1
192 4527 TYPE=FJMS I
193 0127 7321 XTYPE
194 4530 PRNT2=FJMS I
195 0130 7153 XPRNT2
196 4531 SPACE2=FJMS I
197 0131 7217 SPACK2
198 4532 C8APT=FJMS I
199 0132 7400 XC8APT
200 4533 C8ERR=FJMS I
201 0133 6000 XC8ERR
202 4534 C8START=FJMS I
203 0134 6716 XC8START
204 4535 INTST=FJMS I
205 0135 2217 TSTIN
206 4536 ENDTST=FJMS I
207 0136 2227 TSTEND
208 4537 C8RC=FJMS I
209 0137 7012 XC8RC
210 4540 C8H3=FJMS I
211 0140 7540 XC8H3
212 4541 CLSKWT=FJMS I
213 0141 5427 WTCLSK
214
215 0177 *177
216 0177 7770 DATPAT, 7770
```

```
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, C8START /CONSOLE CALL TO ASK SWITCH REG QUESTION.
231      C8REST, CLA CLL
232      DCA ISTNO /CLEAR TEST NUMBER USED FOR ERROR DISPLAY
233      IOF
234      FIXIL /FIX UP INTERRUPT LINKAGE
235      TAD PSR
236      AND (100 /EXECUTE CPU TEST????
237      SZA CLA
238      JMP BEGEXH /NO
239      JMS PCPUNS /YES - PRINT "CPU TESTING" MESSAGE
240      PCPUH, JMS PCPUNS /IF NOT UNDER APT CONTROL.
241      CPUT1, INTST
242      CAF
243      NOP
244      NOP
245      NOP
246      SNA
247      SZL
248      C8ERR /SNA SKIPS WHEN AC CLEAR, OR SZL DOES NOT SKIP WHEN LINK = 0
249      ION /ENABLE INTERRUPTS FOR CONSOLE PACKAGE
250      CMA /AC TO 7777
251      SNA
252      C8ERR /CMA SKIPPED OR DID NOT COMPLEMENT, OR SNA DID NOT SKIP, OR ION SKIPPED
253      SZA
254      SKP
255      C8ERR /SNA CLEARED AC, OR SZA SKIPPED, OR SKP FAILED
256      SNA
257      C8ERR /SZA OR SKP CLEARED AC0, OR SNA FAILED TO SKIP
258      SPA
259      SKP
260      C8ERR /SNA CLEARED AC0, OR SPA SKIPPED WHEN AC0=1
261      /*****
262      /TEST CLA CLL TO CLEAR AC AND LINK
263      TSCACL, CLA CLL
264      SNA
265      SZL
266      C8ERR /CLA CLL DID NOT CLEAR AC OR LINK, OR SNA SKIPPED
267      CMA /WHEN AC=0000, OR SZL DID NOT SKIP WHEN LINK=0
268      /AC TO 7777
269      /*****
270      /TEST BASIC SKIPS TO SKIP OR NOT SKIP WHEN AC=0000
271      TSSSSK, CMA /AC TO 0000
```

```
272      0244 7440 SZA
273      0245 4533 C8ERR /CMA DID NOT COMPLEMENT AC OR SZA FAILED TO SKIP, OR CMA SKIPPED
274      0246 7510 SPA
275      0247 4533 C8ERR /SPA FAILED TO SKIP WHEN AC0=0
276      0250 7500 SNA
277      0251 7410 SKP
278      0252 4533 C8ERR /SNA SKIPPED WHEN AC0=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      C8ERR /SZA FAILED TO SKIP, OR IAC DID NOT INCREMENT AC TO 0000
286      /*****
287      /TEST TO SEE IF LINK COMPLEMENTED TO A 1 ON A CARRY OUT OF ADDER
288      TSTLCH, SNL
289      C8ERR /LINK DID NOT COMPLEMENT ON CARRY OUT, OR CLL FAILED
290      /OR SNL FAILED TO SKIP FOR LINK = 1
291      SZL
292      SKP
293      C8ERR /SZL SKIPPED ON LINK=1, OR SNL CLEARED LINK, OR SKP FAILED WHEN LINK = 1
294      /*****
295      /TEST CLL TO CLEAR LINK
296      TSTCLL, CLL
297      SNL
298      SKP
299      C8ERR /CLL FAILED, OR SNL SKIPPED WHEN LINK=0, OR SKP FAILED WHEN LINK=0
300      SZL
301      C8ERR /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      C8ERR /CML DID NOT SET LINK
307      /*****
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      C8ERR /CARRY OUT DID NOT COMPLEMENT LINK TO A 0
313      /*****
314      /TEST ABILITY OF CML TO COMPLEMENT LINK FROM A 0 TO A 1 AND BACK TO A 0
315      CLA
316      CML /LINK TO 1
317      CML /LINK TO 0
318      SZL
319      C8ERR /CML DID NOT COMPLEMENT LINK FROM A 1 TO A 0
320      SZA
321      C8ERR /CML CHANGED AC
322      /*****
323      /TEST CLA TO CLEAR AC AND NOT CLEAR LINK
324      CML
325      CMA /MAKE LINK A 1
326      CLA /AC TO 7777
327      /AC TO 0000
```

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327 0314 7420 SNL
328 0315 4533 CERR /CLA CLEARED LINK
329 0316 7440 SZA
330 0317 4533 CERR /CLA DID NOT CLEAR AC
331 /*****
332 /TEST NOP TO NOT CHANGE AC OR LINK
333 NOP /AC=0000 LINK=1
334 0320 7000 SNL
335 0321 7420 CERR /NOP SKIPPED OR CLEARED LINK
336 0322 4533 SZA
337 0323 7440 CERR /NOP SET AC BIT
338 0324 4533 CMA /AC TO 7777
339 0325 7040 CML /LINK TO 0
340 0326 7020 NOP /AC=7777, LINK=0
341 0327 7000 SZL
342 0328 7430 CERR /NOP SKIPPED OR SET LINK
343 0329 7450 SNA
344 0330 4533 CERR /NOP CLEARED AC
345 /*****
346 /TEST RAL TO NOT PICK UP BITS BY SHIFTING ZEROES
347 RAL /AC TO 0000
348 0334 7200 CLA
349 0335 7004 RAL
350 0336 7450 SNA
351 0337 7430 SZL
352 0340 4533 CERR /RAL OF ZEROES PICKED UP AC BIT OR LINK BIT
353 /*****
354 /TEST RTL TO NOT PICK UP BITS WHEN SHIFTING ALL ZEROES
355 RTL
356 0341 7006 SNA
357 0342 7450 SZL
358 0343 7430 CERR /RTL PICKED UP BIT IN AC OR LINK WHEN SHIFTING ZEROES
359 /*****
360 /TEST RAR TO NOT PICK UP BITS WHEN SHIFTING ALL ZEROES
361 RAR
362 0345 7010 SNA
363 0346 7450 SZL
364 0347 7430 CERR /RAR PICKED UP BIT IN AC OR LINK WHEN SHIFTING ZEROES
365 /*****
366 /TEST RTR TO NOT PICK UP BITS WHEN SHIFTING ALL ZEROES
367 RTR
368 0351 7012 SNA
369 0352 7450 SZL
370 0353 7430 CERR /RTR PICKED UP BIT IN AC OR LINK WHEN SHIFTING ZEROES
371 /*****
372 /TEST BSW TO NOT PICK UP ANY BITS WHEN SWAPPING ZEROES, AND TO NOT AFFECT LINK
373 BSW
374 0355 7002 SNA
375 0356 7450 SZL
376 0357 7430 CERR /BSW PICKED UP BIT IN AC WHEN SWAPPING ALL ZEROES, OR SET LINK
377 0360 4533 ENDTST
378 0361 4536 JMP CPUT2
379 0362 5774
380 0374 0401
381 0375 2200
382 0376 3000
383 0377 0100

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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 CERR /TAD DID NOT LOAD AC, OR TAD SKIPPED,
391 SZL
392 CERR /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 CERR /TAD USED INCORRECT VALUE, OR ADDER CARRY CKT
398 /FAULTY OR TAD SKIPPED
399 SNL
400 CERR /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 CERR /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 0 /AC=0000, LINK=0
412 SNA
413 SZL
414 CERR /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 CERR /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 SFA
425 CERR /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 CERR /CARRY FAILED IN AN ODD BIT POSITION
435 SNL
436 CERR /LINK COMPLEMENTED WHEN NO CARRY OUT EXPECTED

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436
437
438 0444 1050
439 0445 1050
440 0446 1050
441 0447 7001
442 0448 7040
443 0451 7440
444 0452 4533
445 0453 7430
446 0454 4533
447
448
449 0455 0053
450 0456 7450
451 0457 7430
452 0460 4533
453
454
455 0461 1053
456 0462 0377
457 0463 7450
458 0464 7430
459 0465 4533
460
461
462 0466 1053
463 0467 0053
464 0470 7040
465 0471 7450
466 0472 7430
467 0473 4533
468
469
470 0474 1046
471 0475 0050
472 0476 7440
473 0477 4533
474 0500 4536
475
476
477
478
479 0501 4535
480 0502 1041
481 0503 7450
482 0504 4533
483
484
485 0505 7200
486 0506 1376
487 0507 7450
488 0510 4533
489
490

/*****
/TEST ADDER'S ABILITY TO GENERATE CARRY WHEN ACN=1, MDN=1, AND CARRY IN N=0 IN ALL EVEN BIT POSITIONS
TAD K5252 /AC TO 5252, LINK=1
TAD K5252 /AC TO 2524, LINK=0
TAD K5252 /AC TO 7776, LINK=0
IAC /AC TO 7777, LINK=0
CMA /AC TO 0000, LINK=0
SZA
CSERR /CARRY FAILED IN AN EVEN BIT POSITION
SZL
CSERR /CARRY OUT FAILED TO COMPLEMENT LINK
/*****
/TEST AND INSTRUCTION TO NOT SET ANY AC BITS WHEN AC =0000
AND K7777 /AC=0000, LINK=0
SNA
SZL
CSERR /AND SET BIT WHEN AC INITIALLY CLEAR, OR AND SET LINK
/*****
/TEST AND INSTRUCTION TO CLEAR ALL AC BITS WHEN USING AN OPERAND OF 0000
TAD K7777 /AC TO 7777, LINK=0
AND 0 /AC TO 0000, LINK=0
SNA
SZL
CSERR /AND FAILED TO CLEAR ALL AC BITS, OR SET LINK
/*****
/TEST AND INSTRUCTION TO NOT CLEAR ANY AC BITS WHEN AC=7777 AND MD=7777
TAD K7777 /AC TO 7777
AND K7777 /AC=7777, LINK=0
CMA /AC TO 0000, LINK=0
SNA
SZL
CSERR /AND OF 7777 CLEARED AC BIT OR SET LINK
/*****
/TEST FOR ADJACENT PIN SHORTS IN "AND" CIRCUITRY
TAD K2525 /AC TO 2525
AND K5252 /AC TO 0000
SZA
CSERR /"AND" DID NOT CLEAR AC, POSSIBLE ADJACENT PIN SHORTS IN AND CIRCUITRY
ENDIST
/*****
/CPU TEST 3 - TEST ADDER FUNCTION
/*****
/TEST BIT 11 INPUT TO ADDER=0
CPUT3, INTST
TAD K1 /AC TO 0001
SNA
CSERR /ADDER=0 OPEN ON BIT 11 INPUT
/*****
/TEST BIT 10 INPUT TO ADDER=0
CLA /AC TO 0000
TAD 0 /AC TO 0002
SNA
CSERR /ADDER=0 OPEN ON BIT 10 INPUT
/*****
/TEST BIT 9 INPUT TO ADDER=0
CLA /AC TO 0000
TAD 0 /AC TO 0004
SNA
CSERR /ADDER=0 OPEN ON BIT 9 INPUT
/*****
/TEST BIT 8 INPUT TO ADDER=0
CLA /AC TO 0000
TAD K10 /AC TO 0000
SNA
CSERR /ADDER=0 OPEN ON BIT 8 INPUT
/*****
/TEST BIT 7 INPUT TO ADDER=0
CLA /AC TO 0000
TAD 0 /AC TO 0020
SNA
CSERR /ADDER=0 OPEN ON BIT 7 INPUT
/*****
/TEST BIT 6 INPUT TO ADDER=0
CLA /AC TO 0000
TAD 0 /AC TO 0000
SNA
CSERR /ADDER=0 OPEN ON BIT 6 INPUT
/*****
/TEST BIT 5 INPUT TO ADDER=0
CLA /AC TO 0000
TAD K100 /AC TO 0000
SNA
CSERR /ADDER=0 OPEN ON BIT 5 INPUT
/*****
/TEST BIT 4 INPUT TO ADDER=0
CLA /AC TO 0000
TAD K200 /AC TO 0200
SNA
CSERR /ADDER=0 OPEN ON BIT 4 INPUT
/*****
/TEST BIT 3 INPUT TO ADDER=0
CLA /AC TO 0000
TAD 0 /AC TO 0400
SNA
CSERR /ADDER=0 OPEN ON BIT 3 INPUT
/*****
/TEST BIT 2 INPUT TO ADDER=0
CLA /AC TO 0000
TAD 0 /AC TO 1000
SNA
CSERR /ADDER=0 OPEN ON BIT 2 INPUT
/*****
/TEST BIT 1 INPUT TO ADDER=0
CLA /AC TO 0000
TAD 0 /AC TO 0000
SNA
CSERR /ADDER=0 OPEN ON BIT 1 INPUT
/*****
/TEST BIT 0 INPUT TO ADDER=0
CLA /AC TO 0000
```

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491 0511 7200
492 0512 1375
493 0513 7450
494 0514 4533
495
496
497 0515 7200
498 0516 1042
499 0517 7450
500 0520 4533
501
502
503 0521 7200
504 0522 1374
505 0523 7450
506 0524 4533
507
508
509 0525 7200
510 0526 1373
511 0527 7450
512 0530 4533
513
514
515 0531 7200
516 0532 1044
517 0533 7450
518 0534 4533
519
520
521 0535 7200
522 0536 1045
523 0537 7450
524 0540 4533
525
526
527 0541 7200
528 0542 1372
529 0543 7450
530 0544 4533
531
532
533 0545 7200
534 0546 1371
535 0547 7450
536 0550 4533
537
538
539 0551 7200
540 0552 1370
541 0553 7450
542 0554 4533
543
544
545 0555 7200

CLA /AC TO 0000
TAD 0 /AC TO 0004
SNA
CSERR /ADDER=0 OPEN ON BIT 9 INPUT
/*****
/TEST BIT 8 INPUT TO ADDER=0
CLA /AC TO 0000
TAD K10 /AC TO 0000
SNA
CSERR /ADDER=0 OPEN ON BIT 8 INPUT
/*****
/TEST BIT 7 INPUT TO ADDER=0
CLA /AC TO 0000
TAD 0 /AC TO 0020
SNA
CSERR /ADDER=0 OPEN ON BIT 7 INPUT
/*****
/TEST BIT 6 INPUT TO ADDER=0
CLA /AC TO 0000
TAD 0 /AC TO 0000
SNA
CSERR /ADDER=0 OPEN ON BIT 6 INPUT
/*****
/TEST BIT 5 INPUT TO ADDER=0
CLA /AC TO 0000
TAD K100 /AC TO 0000
SNA
CSERR /ADDER=0 OPEN ON BIT 5 INPUT
/*****
/TEST BIT 4 INPUT TO ADDER=0
CLA /AC TO 0000
TAD K200 /AC TO 0200
SNA
CSERR /ADDER=0 OPEN ON BIT 4 INPUT
/*****
/TEST BIT 3 INPUT TO ADDER=0
CLA /AC TO 0000
TAD 0 /AC TO 0400
SNA
CSERR /ADDER=0 OPEN ON BIT 3 INPUT
/*****
/TEST BIT 2 INPUT TO ADDER=0
CLA /AC TO 0000
TAD 0 /AC TO 1000
SNA
CSERR /ADDER=0 OPEN ON BIT 2 INPUT
/*****
/TEST BIT 1 INPUT TO ADDER=0
CLA /AC TO 0000
TAD 0 /AC TO 0000
SNA
CSERR /ADDER=0 OPEN ON BIT 1 INPUT
/*****
/TEST BIT 0 INPUT TO ADDER=0
CLA /AC TO 0000
```

```
546 0556 1047 TAD K4000 /AC TO 4000
547 0557 7450 SNA
548 0560 4533 CBERR /ADDER=0 OPEN ON BIT 0 INPUT
549 0561 4536 ENDTST
550 0562 5767 JMP CPUT4
551 0567 0000
552 0570 2000
553 0571 1000
554 0572 0400
555 0573 0740
556 0574 0020
557 0575 0004
558 0576 0002
559 0577 0000
```

PAGE

```
560
561 /*****
562 /CPU TEST 4 - SECOND OPERATE MICROINSTRUCTION TEST
563 /*****
564 /TEST RAR TO ROTATE AND NOT DROP ANY BITS
565 CPUT4, INTST
566 TAD K2525 /AC TO 2525
567 CLL
568 CML /LINK TO 1
569 RAR /AC TO 5252, LINK=1
570 SNL
571 CBERR /RAR DID NOT SHIFT AC11 TO LINK
572 CMA /AC TO 2525, LINK=1
573 AND K5252 /AC=0000, LINK=1
574 SZA
575 CBERR /RAR DROPPED BIT OR DID NOT SHIFT
576 /ANY BIT SET IN AC INDICATES POSITION OF DROPPED BIT
577 /*****
578 /TEST RAR TO NOT PICK UP ANY BITS
579 TAD K2525 /AC TO 2525, LINK=1
580 RAR /AC TO 5252, LINK=1
581 AND K2525 /AC TO 0000, LINK=1
582 SNA
583 SNL
584 CBERR /RAR PICKED UP BIT, POSITION OF BIT PICK UP IS
585 /INDICATED BY BIT(S) SET IN AC
586 /*****
587 /TEST RAL TO SHIFT AND NOT DROP ANY BITS
588 TAD K5252 /AC TO 5252 LINK=1
589 RAL /AC TO 2525 LINK=1
590 SNL
591 CBERR /RAL DROPPED LINK BIT
592 CMA /AC TO 5252 LINK=1
593 AND K2525 /AC TO 0000 LINK=1
594 SZA
595 CBERR /RAL DROPPED BIT OR DID NOT SHIFT
596 /FAILING BIT POSITIONS ARE SET IN AC
597 /*****
598 /TEST RAL TO NOT PICK UP ANY BITS
599 TAD K5252 /AC TO 5252 LINK=1
600 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 CBERR /RAL PICKED UP BIT, BITS SET IN AC INDICATE FAILING POSITIONS
603 /*****
604 /TEST RTR TO SHIFT TWICE AND NOT DROP ANY BITS
605 CLL /CLEAR LINK
606 TAD (4444 /AC TO 4444 LINK=0
607 RTR /AC TO 1111 LINK=0
608 SZL
609 CBERR /RTR PICKED UP LINK BIT
610 CMA /AC TO 6666
611 AND (1111 /AC TO 0000 LINK=0
612 SZA
613 CBERR /RTR DROPPED BIT OR DID NOT SHIFT TWICE
614 /BIT SET IN AC INDICATES BIT DROPPED
615 /*****
616 /TEST RTR TO NOT PICK UP ANY BITS
617 TAD (4444 /AC TO 4444
618 RTR /AC TO 1111
619 AND (6666 /AC TO 0000
620 SZA
621 CBERR /RTR PICKED UP BIT, BIT SET IN AC INDICATES FAILING POSITION,
622 /*****
623 /TEST RTL TO SHIFT AND NOT DROP BITS
624 TAD (1111
625 RTL /AC TO 4444 LINK=0
626 SZL
627 CBERR /RTL PICKED UP LINK BIT
628 CMA /AC TO 3333 LINK=0
629 AND (4444 /AC TO 0000 LINK=0
630 SZA
631 CBERR /RTL DROPPED BIT OR DID NOT SHIFT
632 /BIT SET IN AC INDICATES BIT DROPPED
633 /*****
634 /TEST RTL TO NOT PICK UP ANY BITS
635 TAD (1111 /AC TO 1111
636 RTL /AC TO 4444
637 AND (3333 /AC TO 0000
638 SZA
639 CBERR /RTL PICKED UP BIT, BIT SET IN AC INDICATES FAILING POSITION
640 /*****
641 /TEST BSW TO SWAP AND NOT DROP BITS OR CHANGE LINK
642 CLL /INITIALIZE LINK TO ZERO
643 TAD K77 /AC TO 0077 LINK=0
644 BSW /AC TO 7700 LINK=0
645 SZL
646 CBERR /BSW SET LINK
647 TAD K100 /AC TO 0000 LINK TO 1
648 SZA
649 CBERR /BSW DID NOT SWAP OR PICKED UP BIT,
650 /*****
651 /TEST BSW FOR ADJACENT PIN SHORTS AND DROPPED BITS
652 TAD K7700 /AC TO 7700 LINK=1
653 BSW /AC TO 0077 LINK=1
654 SNL
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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
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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
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766 1042 3072
767 1043 1072
768 1044 7440
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773 1046 2072
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776 1051 7430
777 1052 4533
778 1053 1072
779 1054 1453
780 1055 7440
781 1056 4533
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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
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794 1070 4536
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799 1071 4535
800 1072 1274
801 1073 7410
802 1074 2526
803 1075 1950
804 1076 7440
805 1077 4533
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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 ZEROS
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
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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
```

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840
841
842 /*****
843 /CPU TEST 10 - TEST TAD, "AND", DCA AND ISZ INDIRECT THRU PAGE ZERO
844 /*****
845 /TEST OF TAD THRU PAGE ZERO INDIRECT
846 CPUT10, INTST
847 TAD I POINTR /AC TO 2526
848 TAD K5252 /AC TO 0000
849 SZA
850 CBERR /TAD INDIRECT THRU PAGE ZERO FAILED, OR AUTO-INDEXED.
851 /*****
852 /TEST DCA INDIRECT THRU PAGE ZERO
853 TAD K7777 /AC TO 7777
854 DCA I POINTB /7777 TO LOCATION "POINTC", AC TO 0000
855 TAD POINTC /AC TO 7777
856 CMA /AC TO 0000
857 SZA
858 CBERR /DCA INDIRECT THRU PAGE ZERO FAILED
859 /*****
860 /TEST ISZ INDIRECT THRU PAGE ZERO
861 ISZ I POINTB /LOCATION "POINTC" TO 0000, SKIP
862 CBERR /ISZ INDIRECT THRU PAGE ZERO FAILED TO SKIP
863 /*****
864 /TEST "AND" INDIRECT THRU PAGE ZERO
865 TAD K2525 /AC TO 2525
866 DCA POINTC /AC TO 0000
867 TAD K7777 /AC TO 7777
868 AND I POINTB /AC TO 2525
869 TAD K5253 /AC TO 0000
870 SZA
871 CBERR /AND INDIRECT THRU PAGE ZERO FAILED
872 /*****
873 /TEST AUTO-INDEX DECODER FROM BITS 0 THRU 3 BY ADDRESSING ADDRESS 1010
874 /INDIRECTLY AND INSURING THAT AUTO-INDEXING DID NOT TAKE PLACE.
875 TAD 1010 /GET INITIAL CONTENTS OF 1010
876 DCA TESLOC /SAVE FOR LATER COMPARISON
877 AND I 1010 /REFERENCE 1010 INDIRECTLY
878 TAD 1010 /GET CONTENTS OF 1010
879 CIA /NEGATE IT
880 TAD TESLOC /COMPARE TO INITIAL CONTENTS
881 SZA /FINAL INITIAL?
882 CBERR /NO, AUTO INDEX OCCURRED FOR LOCATION 1010
883 ENDTST
884 JMP CPUT11
885
886 PAGE
887 /*****
888 /CPU TEST 11 - TEST TAD, DCA, ISZ, & "AND" INDIRECT THRU SAME PAGE
889 /*****
890 /TEST TAD INDIRECT THRU SAME PAGE
891 CPUT11, INTST
892 TAD I .+2 /AC TO 2526
893 SKP
894 POINTR+1 /POINTER FOR TAD INDIRECT THRU SAME PAGE
895 TAD K5252 /AC TO 0000
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894 1205 7440 SZA
895 1206 4533 CBERR /TAD INDIRECT THRU SAME PAGE FAILED
896 /*****
897 /TEST DCA INDIRECT THRU SAME PAGE
898 TAD K7777 /AC TO 7777
899 DCA I .+2 /AC TO 0000
900 SKP
901 POINTC /POINTER FOR DCA INDIRECT THRU SAME PAGE
902 TAD POINTC /AC TO 7777
903 CMA
904 SZA
905 CBERR /DCA INDIRECT THRU SAME PAGE FAILED
906 /*****
907 /TEST ISZ INDIRECT THRU SAME PAGE
908 ISZ I .+3 /LOCATION "POINTC" TO 0000, SKIP
909 CBERR /ISZ INDIRECT THRU SAME PAGE FAILED TO SKIP
910 SKP
911 POINTC
912 /*****
913 /TEST "AND" INDIRECT THRU SAME PAGE
914 TAD K2525 /AC TO 2525
915 DCA POINTC /
916 TAD K7777 /AC TO 7777
917 AND I .+2 /AC TO 2525
918 SKP
919 POINTC /POINTER FOR "AND" INDIRECT THRU SAME PAGE
920 TAD K5253 /AC TO 0000
921 SZA
922 CBERR /"AND" INDIRECT THRU SAME PAGE FAILED
923 ENDTST
924 /*****
925 /CPU TEST 12 - TEST AUTO-INDEX
926 /*****
927 /TEST AUTO-INDEX TO NOT INCREMENT WHEN NOT INDIRECTLY ADDRESSED.
928 CPUT12, INTST
929 TAD K2525 /AC TO 2525
930 DCA 10 /ADDRESS 10 TO 2525
931 TAD 10 /AC TO 2525
932 TAD K5253 /AC TO 0000
933 SZA
934 CBERR /AUTO-INDEX INCREMENTED WHEN NOT INDIRECTLY ADDRESSED
935 /*****
936 /TEST AUTO-INDEX TO INCREMENT WHEN INDIRECTLY ADDRESSED
937 DCA POINTC /CLEAR LOCATION "POINTC"
938 TAD K2525 /AC TO 2525
939 DCA POINTD /LOCATION "POINTD" TO 2525
940 TAD POINTB
941 DCA 10 /SET LOCATION 10 TO THE ADDRESS OF "POINTC"
942 TAD I 10 /LOCATION "POINTD"'S CONTENTS TO AC, AC TO 2525
943 TAD K5253 /AC TO 0000
944 SZA
945 CBERR /AUTO-INDEX FAILED TO INCREMENT
946 /*****
947 /AUTO-INDEX DECODER OPEN ON INPUT FROM BITS 0-3
948 /TEST BIT 0 INPUT OF AUTO-INDEX DECODER BY ADDRESSING LOCATION 0007
```

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949
950 1255 3007 /INDIRECTLY AND CHECKING THAT AUTO-INDEXING DID NOT OCCUR
951 1256 1407 DCA 7 /CLEAR LOCATION 0007
952 1257 7700 TAD I 7 /REFERENCE LOCATION 0007 INDIRECTLY
953 1260 1407 CLA /CLEAR AC
954 1261 7440 TAD 7 /GET CONTENTS OF LOCATION 0007
955 1262 4533 SZA /DOES IT STILL CONTAIN 0000?
956 CBERR /NO, LOCATION 0007 AUTO-INDEXED
957
958 /*****
959 /TEST AUTO-INDEX DECODER INPUT FROM BITS 4 THRU 7, BY REFERENCING
960 /ADDRESS 0030 INDIRECTLY AND CHECKING THAT AUTO-INDEXING DID NOT OCCUR
961 1263 1030 TAD 30 /GET INITIAL CONTENTS OF LOC 0030
962 1264 3072 DCA TESLOC /SAVE IT FOR COMPARISON
963 1265 0430 AND I 30 /REFERENCE 30 INDIRECTLY
964 1266 1030 TAD 30 /GET FINAL CONTENTS OF LOC 30
965 1267 7040 CMA
966 1270 7001 IAC /COMPLEMENT IT FOR COMPARE
967 1271 1072 TAD TESLOC /COMPARE TO INITIAL CONTENTS
968 1272 7440 SZA /WAS LOC 30 AUTO-INDEXED?
969 1273 4533 CBERR /YES, LOC 30 AUTO-INDEXED
970 1274 4536 ENDTST
971
972 /*****
973 /CPU TEST 13 - TEST INTERNAL IOT INSTRUCTIONS
974 /*****
975 /TEST GTF TO SAVE LINK
976 CPUT13, INTST
977 1275 4535 CLL /CLEAR LINK
978 1276 7100 CML /LINK TO 1
979 1277 7020 GTF
980 1300 6304 SMA
981 1301 7500 CBERR /GTF DID NOT SAVE A 1 FOR LINK
982 1302 4533 CLA CLL
983 1303 7300 RDF /GET DATA FIELD
984 1304 6214 RTR
985 1305 7012 RAR /MOVE DF TO AC 9-11
986 1306 7010 RIF /GET INSTRUCTION FIELD
987 1307 6224 DCA SAVFLD
988 1310 3061
989 /*****
990 /TEST RTF TO RESTORE LINK
991 TAD K4000 /AC TO 4000
992 TAD SAVFLD /GET CORRECT IF AND DF INFORMATION
993 RTF /RESTORE LINK TO 1
994 JMP ,+1 /ENABLE INTERRUPT FOR CONSOLE INTERACTION.
995 SNL
996 CBERR /RTF DID NOT RESTORE LINK TO A 1
997 /*****
998 /TEST GTF TO SAVE A LINK OF 0, AND INT REQUEST AND INT ENABLE OF 0
999 IOF
1000 CLA CLL /CLEAR AC AND LINK
1001 GTF /GET FLAGS, LINK TO AC0
1002 AND K7600 /ELIMINATE SAVE FIELD REGISTER AND USER BIT
1003 SZA /LINK, INT REQUEST, AND INT ENABLE ALL ZERO?
1004 CBERR /NO, GTF DID NOT SAVE CORRECTLY.
1005 /IF BIT0=1 LINK WAS SAVED AS 1 INSTEAD OF 0
1006 /IF BIT2=1 INT REQUEST WAS SAVED AS 1 INSTEAD OF 0
1007 /IF BIT4=1 INT ENABLE WAS SAVED AS 1 INSTEAD OF 0
1008
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1004
1005 /*****
1006 /TEST CAF TO CLEAR AC AND LINK
1007 ION
1008 CMA /AC TO 7777
1009 CML /AC=7777 LINK TO 1
1010 CAF /CLEAR ALL FLAGS, CLEARS AC AND LINK, AND INT ENABLE
1011 KIE1 /DISABLE SLU#2
1012 KIE2 /DISABLE SLU#3
1013 SWA
1014 SZL
1015 CBERR /CAF FAILED TO CLEAR AC OR LINK
1016 /*****
1017 /TEST SKON TO NOT SKIP WHEN INTERRUPT ENABLE IS CLEAR
1018 SKON /SHOULD NOT SKIP
1019 SKP
1020 CBERR /SKON SKIPPED WHEN INT ENABLE CLEAR, OR CAF FAILED
1021 /TO CLEAR INT ENABLE
1022 /*****
1023 /TEST SKON TO SKIP ON INTERRUPT ON AND TURN INTERRUPT OFF
1024 ION /INTERRUPT ON.
1025 SKON /SKIP IF INTERRUPT ON, TURN INTERRUPT OFF
1026 CBERR /ION DID NOT ENABLE INTERRUPT, OR SKON FAILED TO SKIP
1027 /*****
1028 /TEST THAT SKON TURNED OFF INTERRUPT
1029 SKON /SHOULD NOT SKIP
1030 SKP
1031 CBERR /SKON DID NOT TURN OFF INT, OR SKON SKIPS WHEN INT OFF
1032 /*****
1033 /TEST IOF TO DISABLE INTERRUPTS
1034 ION /ENABLE INTERRUPTS
1035 NOP /ALLOWS TIME FOR INTERRUPT DELAY TO SET
1036 IOF /TURN OFF INTERRUPT
1037 SKON
1038 SKP
1039 CBERR /IOF DID NOT DISABLE INTERRUPT
1040 JMP INTEN1
1041
1042 PAGE
1043 /*****
1044 /TEST PROPER OPERATION OF INT ENABLE,
1045 INTEN1, ION /INTERRUPT ON
1046 GTF /SHOULD GET A 1 FOR INT ENABLE
1047 AND K200 /MASK OUT INT ENABLE BIT
1048 SWA /SKIP IF INT ENABLE BIT SET
1049 CBERR /ION DID NOT SET INT ENABLE OR GTF DID NOT GET A 1 FOR INT ENABLE
1050 /*****
1051 /TEST RTF TO SET INT ENABLE AND TO CLEAR LINK
1052 IOF /CLEAR INT ENABLE
1053 CLA CLL /SET LINK
1054 TAD SAVFLD /GET IF AND DF INFORMATION
1055 RTF /RESTORE FLAGS, LINK TO 0, SET INTERRUPT ENABLE
1056 JMP ,+1 /ENABLE INTERRUPT FOR CONSOLE INTERACTION.
1057 SZL
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1058 1414 4533 CBERR /RTF DID NOT CLEAR LINK
1059 1415 6000 SKON /SKIP IF INTERRUPT ON
1060 1416 4533 CBERR /RTF FAILED TO ENABLE INTERRUPTS
1061
1062 /*****
1063 /TEST SRQ TO NOT SKIP WHEN NO INTERRUPT REQUEST
1064 ION /INTERRUPT ON
1065 CLA CLL /GIVE POWER FAIL A CHANCE TO INTERRUPT
1066 SRQ /SKIP ON INTERRUPT REQUEST
1067 SKP
1068 CBERR /SRQ SKIPPED WHEN NO INTERRUPT, OR ILLEGAL INTERRUPT
1069 /CAME UP DURING SRQ INSTRUCTION,
1070
1071 ENDTST
1072 /*****
1073 /CPU TEST 14 - TEST JUMPS AND JMS'S
1074 /*****
1075 /TEST JUMP DIRECT
1076 CPUT14, INTST
1077 CLA CLL /CLEAR AC AND LINK
1078 TAD KSTOP
1079 DCA 0 /PUT CBERR IN LOC 0 IN CASE JUMP FAILS TO GATE MD TO PC
1080 JMP +2 /FIRST JUMP TESTED
1081 CBERR /JMP FAILED TO JUMP DIRECT
1082 /*****
1083 /TEST JMS DIRECT
1084 JMS +2
1085 CBERR /JMS FAILED TO JUMP
1086 JMSLOC, 0 /JMS ENTRY POINT, PC STORAGE.
1087 TAD -1 /GET STORED PC
1088 CMA
1089 IAC /COMPLEMENT IT
1090 TAD
1091 SZA
1092 CBERR /JMS DID NOT STORE PROPER PC
1093 /*****
1094 /TEST JUMP INDIRECT TO JUMP CORRECTLY
1095 JMP I +2
1096 CBERR /JMP INDIRECT FAILED TO JUMP
1097 /POINTER FOR JMP INDIRECT ABOVE
1098 /*****
1099 /TEST JMS INDIRECT TO JUMP AND STORE PC
1100 JMS I +2
1101 CBERR /JMS INDIRECT FAILED TO JUMP
1102 JMSLOC, 0 /JMS INDIRECT PC STORAGE
1103 TAD -1
1104 CMA
1105 IAC /COMPLEMENT STORED PC
1106 TAD POINTF /COMPARE IT TO EXPECTED VALUE
1107 SZA /WAS IT EQUAL?
1108 CBERR /NO, JMS INDIRECT STORED INCORRECT PC.
1109 ENDTST
1110 /*****
1111 /CPU TEST 15 - TEST COMBINED OPERATE MICROINSTRUCTIONS OF FORM 7XX0,7XX1
1112 /*****
1113 /ALL INSTRUCTIONS IN RANGE 7XX0,7XX1 ARE TESTED.
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1113 /FOR EACH OF THE INSTRUCTIONS
1114 /EXECUTED, A TOTAL OF 8 PATTERNS OF AC, MQ, AND LINK CONTENTS ARE USED,
1115 /TO TEST FOR ERRORS IN THE EXECUTED INSTRUCTION A SIMULATION OF THE
1116 /INSTRUCTION IS ALSO PERFORMED, AND THE RESULTS OF THE INSTRUCTION ARE
1117 /COMPARED TO THE SIMULATION.
1118 /*****
1119 /CREATE THE INSTRUCTION TO BE USED, INSTRUCTION RANGE IS 7XX0, 7XX1.
1120 CPUT15, INTST
1121 DCA POINTC /INITIALIZE INSTRUCTION MAKER
1122 SKP
1123 NXTONE, CLA CLL
1124 ISZ POINTC
1125 CML
1126 TAD POINTC
1127 TAD K7700
1128 SNA CLA /ALL COMBINATIONS TRIED?
1129 JMP CPUDN /YES,CPU TEST OVER
1130 CLA CLL
1131 TAD POINTC
1132 RTL
1133 TAD /7000 /MAKE NEXT INSTRUCTION
1134 DCA INSTRT /SAVE IT,
1135 TAD /7770
1136 TESAGN, TAD DATPAT
1137 DCA
1138 /*****
1139 /SET UP AC, MQ, AND LINK FOR EXECUTION OF TEST INSTRUCTION
1140 NXTPAT, CAM
1141 DCA SKPPED
1142 DCA SOMSKP
1143 TAD LKDATA
1144 RAR /LOAD LINK
1145 K7600, 7600/CLA
1146 TAD MQDATA /LOAD MQ
1147 SWP /LOAD AC
1148 TAD ACDATA
1149 /*****
1150 /EXECUTE TEST INSTRUCTION
1151 INSTRT, 0 /EXECUTE INSTRUCTION
1152 ISZ SKPPED /DIDN'T SKIP
1153 /*****
1154 /SAVE RESULTS OF TEST INSTRUCTION
1155 DCA ACWAS
1156 CMA
1157 SNL
1158 CLA LKWAS
1159 DCA
1160 SWP
1161 DCA MQWAS
1162 JMP GRFSIM
1163
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1167 /*****
1168 /SET UP FOR SIMULATED EXECUTION TO TEST RESULT
1169 GRFSIM, CMA
1170 DCA BIT11
1171 CMA
1172 DCA BIT8
1173 CMA
1174 DCA BIT7
1175 CMA
1176 DCA BIT6
1177 CMA
1178 DCA BIT5
1179 CMA
1180 DCA BIT4
1181 CMA
1182 DCA BIT3
1183 SETSIM, TAD I INSTTR /GET INSTRUCTION
1184 RTL
1185 RTL
1186 SZL /WAS BIT 3 SET?
1187 ISZ BIT3 /YES, CLEAR POINTER
1188 NOP
1189 RAL
1190 SZL /BIT 4 SET?
1191 ISZ BIT4 /YES, CLEAR POINTER
1192 NOP
1193 RAL
1194 SZL /BIT 5 SET?
1195 ISZ BIT5 /YES, CLEAR POINTER
1196 NOP
1197 RAL
1198 SZL /BIT 6 SET?
1199 ISZ BIT6 /YES, CLEAR POINTER
1200 NOP
1201 RAL
1202 SZL /BIT 7 SET?
1203 ISZ BIT7 /YES, CLEAR POINTER
1204 NOP
1205 PAL
1206 SZL /BIT 8 SET ?
1207 ISZ BIT8 /YES, CLEAR POINTER
1208 NOP
1209 RTL
1210 RAL
1211 SZL /WAS BIT 11 SET?
1212 ISZ BIT11 /YES, CLEAR POINTER
1213 NOP
1214 CLA
1215 /*****
1216 /SET UP AC, MQ, AND LINK FOR SIMULATED EXECUTION
1217 DOSIMU, TAD LKDATA
1218 RAR
1219 CLA
1220 TAD MQDATA
1221 SWP /LOAD LINK
```

```
1222 TAD ACDATA /LOAD AC
1223 /*****
1224 /SIMULATED EXECUTION BEGINS
1225 /*****
1226 /GROUP 1 SIMULATION
1227 GR1SIM, ISZ BIT3 /WAS BIT 3 SET IN THE INSTRUCTION?
1228 JMP GR2GR3 /YES, IT IS A GROUP 2 OR 3.
1229 ISZ BIT4 /WAS BIT 4 SET?(GROUP 1)
1230 CLA /YES, SO CLEAR THE AC
1231 ISZ BIT5 /WAS IT CLL?
1232 CLL /YES.
1233 ISZ BIT6 /WAS IT CMA?
1234 CMA /YES
1235 ISZ BIT7 /WAS IT CML?
1236 CML /YES
1237 ISZ BIT11 /WAS IT IAC?
1238 TAD K1 /YES, ADD 1
1239 ISZ BIT8 /WAS IT RAR?
1240 RAR /YES
1241 ISZ SKPPED /INDICATE NO SKIP
1242 JMP I TEST /GO CHECK RESULTS
1243
1244 /*****
1245 /GROUP 2 SIMULATION
1246 GR2GR3, ISZ BIT11 /GROUP 2?
1247 JMP GROUP3 /NO, GROUP 3.
1248 GROUP2, ISZ BIT8 /REVERSE SENSE SKIPS?
1249 JMP REVSEN /YES, GO DO REVERSE
1250 ISZ BIT5 /IS IT SMA?
1251 SMA /YES
1252 SKP
1253 ISZ SOMSKP /SMA SKIPPED,
1254 ISZ BIT6 /IS IT SZA?
1255 SZA /YES
1256 SKP
1257 ISZ SOMSKP /SZA SKIPPED
1258 ISZ BIT7 /IS IT SNL?
1259 SNL /YES
1260 SKP
1261 ISZ SOMSKP
1262 OUT, DCA BIT7 /SAVE AC
1263 TAD SOMSKP
1264 SNA /ANY SKIP?
1265 ISZ SKPPED /NO
1266 CLA
1267 TAD BIT7 /REPLACE AC
1268 ISZ BIT4 /WAS IT CLA?
1269 CLA /YES
1270 JMP I TEST
1271 /*****
1272 /REVERSE SENSE SKIPPING FOR GROUP 2
1273 REVSEN, ISZ BIT5 /WAS IT SPA?
1274 SNA /YES.
1275 SKP /SPA WOULD HAVE SKIPPED.
1276 JMP OUT /SPA WOULD NOT HAVE SKIPPED
```

```
1277 1741 2102 ISZ BIT6 /WAS IT SNA?
1278 1742 7440 SZA /YES.
1279 1743 7410 SKP /SNA WOULD HAVE SKIPPED
1280 1744 5324 JMP OUT /SNA WOULD NOT HAVE SKIPPED
1281 1745 2007 ISZ BIT7 /SZL?
1282 1746 7420 SNL /YES
1283 1747 5323 JMP OUT-1 /QUALIFIED SKIP
1284 1750 5324 JMP OUT /SZL WOULD NOT HAVE SKIPPED.
1285 1777 2000
```

PAGE

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1286 /*****
1287 /GROUP 3 OPERATE SIMULATION
1288 GROUP3, ISZ SKPPED /INDICATE NO SKIP
1289 ISZ BIT4 /CLA?
1290 CLA /YES
1291 ISZ BIT5 /IS IT MQA?
1292 JMP +4 /YES
1293 ISZ BIT7 /IS IT MQL?
1294 MQL /YES
1295 JMP I TEST /COMPARE RESULTS
1296 ISZ BIT7 /IT IS MQA, IS IT ALSO MQL? (SWP)
1297 JMP DOSWAP /YES, DO A SWP.
1298 MQA /NO, JUST DO MQA.
1299 JMP I TEST /COMPARE RESULTS
1300 DOSWAP, DCA BIT3 /MQ TO AC
1301 MQA /SAVE PREVIOUS MQ
1302 DCA BIT4 /GET PREVIOUS AC
1303 TAD BIT3 /PUT IN MQ
1304 MQL /PUT PREVIOUS MQ IN AC.
1305 TAD BIT4 /TEST RESULTS
1306 JMP I TEST
1307 /*****
1308 /COMPARE RESULTS OF SIMULATION TO ACTUAL RESULTS
1309 /*****
1310 /TEST LINKS
1311 TESTS, DCA BIT11 /SAVE SIMULATED AC
1312 RAL /LINK TO AC 11
1313 DCA BIT7 /SAVE SIMULATED LINK
1314 TAD BIT7 /GET EXPECTED LINK
1315 TAD LKNAS /ADD IN LINK OBTAINED
1316 DCA BIT3 /SET ERROR INDICATOR IF LINKS DIFFERENT
1317 /CLEAR ERROR INDICATOR IF LINKS SAME
1318 /*****
1319 /LINKS AGREE, TEST THE AC CONTENTS
1320 TAD BIT11 /GET EXPECTED AC CONTENTS
1321 CMA /COMPLEMENT IT
1322 IAC /COMPARE TO ACTUAL RESULTS
1323 TAD ACWAS /SAME?
1324 SZA /NO, SET ERROR INDICATOR
1325 DCA BIT3
1326 /*****
1327 /AC CONTENTS OK, TEST MQ CONTENTS
1328 SWP /MQ TO AC
1329 DCA BIT8 /SAVE MQ
1330
```

```
1331 2041 1065 TAD BIT8
1332 2042 7040 CMA /COMPLEMENT IT
1333 2043 7001 IAC /COMPARE TO ACTUAL RESULTS
1334 2044 1055 TAD MQWAS /SAME?
1335 2045 7440 SZA /NO, SET ERROR INDICATOR
1336 2046 3062 DCA BIT3
1337 /*****
1338 /CHECK FOR SIMULATED INSTRUCTION AND ACTUAL INSTRUCTION TO BOTH HAVE
1339 /SKIPPED OR BOTH TO HAVE NOT SKIPPED
1340 SKPCHK, TAD SKPPED /GET SKIP INDICATOR
1341 RAR /AC 11 TO LINK
1342 CLA /BOTH SKIP OR BOTH NOT SKIP?
1343 SNL /YES, BOTH SKIPPED OR BOTH DIDN'T
1344 JMP SIMERR
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 SINERR, TAD BIT3 /GET ERROR INDICATOR
1351 SNA /ANY SIMULATION ERRORS?
1352 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 TESTPT, ISZ DATPAT /ALL PATTERNS TRIED?
1359 JMP TRNXPT /NO, TRY NEXT PATTERN
1360 DCA ACDATA
1361 DCA MQDATA
1362 DCA LKDATA
1363 TAD I INSTTR /GET INSTRUCTION
1364 RAR /BIT11 TO LINK
1365 SNL /HAS INSTRUCTION BEEN TRIED WITH BIT11=1?
1366 JMP I NXTONN /YES, DO NEXT INSTRUCTION (JMP TO NXTONE)
1367 ISZ I INSTTR /UPDATE INSTRUCTION
1368 AND K200 /MASK OUT MQ TYPE BIT
1369 SNA /MQ TYPE?
1370 JMP I TESAGG /NO, GO DO IT
1371 CLA
1372 TAD I INSTTR
1373 AND (7721 /MASK OUT BITS NOT ALLOWED(EAE)
1374 DCA I INSTTR
1375 JMP I TESAGG /JMP TO TESAGN
1376 /*****
1377 /CREATE NEXT DATA SET UP
1378 TRNXPT, NOP/JMS POINT
1379 TAD DATPAT /AC BIT TO LINK
1380 RAR
1381 CLA
1382 TAD K2525 /AC TO BE SET?
1383 SNL /NO
1384 CLA
```

```

1386 2112 3067 DCA ACDATA
1387 2113 1177 TAD DATPAT
1388 2114 7012 RTR
1389 2115 7206 CLA
1390 2116 1535 TAD I INSTTR
1391 2117 7420 SNL
1392 2120 7200 CLA
1393 2121 3070 DCA MODATA
1394 2122 1177 TAD DATPAT
1395 2123 7012 RTR
1396 2124 7010 RAR
1397 2125 7420 SNL
1398 2126 7200 CLA
1399 2127 3071 DCA LKDATA
1400 2130 5731 JMP I NXTPTT
1401 2131 1504 NXTPTT, NXTPAT
1402 2132 1465 NXTONN, NXTONE
1403 2133 1502 TESAGG, TESAGN
1404 2134 4536 CPUDN, ENDTST
1405 2135 3075 DCA TSTNO
1406 2136 5776 JMP BEGEXM
1407
1408
1409 2176 3000
1410 2177 7721
1411 2200
1412
1413 2200 0000 PCPUMS, 0
1414 2201 4521 C8CRLF
1415 2202 4522 C8PRNT
1416 2203 2210 CPUMES
1417 2204 4522 C8PRNT
1418 2205 2213 TESTMS
1419 2206 4521 C8CRLF
1420 2207 5600 JMP I PCPUMS
1421 2210 0320 CPUMES, TEXT "CPU "
1422 2211 2540
1423 2212 0000
1424 2213 2405 TESTMS, TEXT "TESTING"
1425 2214 2324
1426 2215 1116
1427 2216 0700
1428
1429 /ROUTINE TO INITIALIZE FOR TEST
1430
1431 TSTIN, 0
1432 CLA CLL
1433 ISZ TSTNO
1434 NOP
1435 TAD TSTIN
1436 DCA TSLOP
1437 JMP I TSTIN
1438 TSLOP, 0
1439
1440 /ROUTINE TO HANDLE SCOOP LOOPING AT END OF TEST IF ERROR OCCURRED
1441
1442 TSTEND, 0
1443 CLA CLL
1444 KRCHK
1445 TAD PSR
1446 RTL
1447 SMA CLA
1448 JMP I TSTEND
1449 JMP I TSLOP
1450
1451 /ROUTINE TO CHECK FOR KEYBOARD INTERVENTION
1452
1453 CHKKB, 0
1454 CLA CLL
1455 KIE
1456 CHKKSF
1457 NOP
1458 CLA IAC
1459 KIE
1460 CLA CLL
1461 JMP I CHKKB

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1435 /ROUTINE TO HANDLE SCOOP LOOPING AT END OF TEST IF ERROR OCCURRED
1436
1437 TSTEND, 0
1438 CLA CLL
1439 KRCHK
1440 TAD PSR
1441 RTL
1442 SMA CLA
1443 JMP I TSTEND
1444 JMP I TSLOP
1445
1446 /ROUTINE TO CHECK FOR KEYBOARD INTERVENTION
1447
1448 CHKKB, 0
1449 CLA CLL
1450 KIE
1451 CHKKSF
1452 NOP
1453 CLA IAC
1454 KIE
1455 CLA CLL
1456 JMP I CHKKB
1457

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1450
1459      3000  *3000
1460
1461      /*****
1462      /MEMORY EXTENSION TEST
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      IOF
1477      TAD PSR      /EXECUTE MEMORY EXTENSION TEST??????
1478      AND (0040
1479      SZA CLA
1480      JMP BEGRIC   /NO
1481      FIXIL        /FIXUP INTERRUPT LINKAGE
1482      JMS PMEMES   /PRINT MEMORY EXTENSION TESTING MESSAGE
1483                      /IF NOT UNDER APT CONTROL.
1484
1485      EXMT1, INTST
1486      CAF
1487      ION
1488
1489      DF0, CDF 00      /DF 0
1490      RDF
1491      SZA
1492      CSERR          /ERROR, CDF OR RDF FAILED.
1493
1494      DF7, CDF 70      /DF 7
1495      RDF
1496      TAD (7747
1497      CMA          /AC = 0
1498      SZA
1499      CSERR          /ERROR, CDF OR RDF FAILED.
1500
1501      DF1, CDF 10      /DF 10
1502      RDF
1503      TAD (7767
1504      CMA          /AC=0
1505      SZA
1506      CSERR
1507
1508      DF2, CDF 20      /DF2
1509      RDF
1510      TAD (7757
1511      CMA          /AC=0
1512      SZA
1513      CSERR          /CDF2 OR RDF FAILED

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1514      3041 6231
1515      3042 6214
1516      3043 1374
1517      3044 7040
1518      3045 7440
1519      3046 4533
1520
1521      3047 6201
1522      3050 6214
1523      3051 7440
1524      3052 4533
1525      3053 6000
1526      3054 4533
1527      3055 4536
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1538      3056 4535
1539      3057 6201
1540      3060 1376
1541      3061 3001
1542      3062 6041
1543      3063 4506
1544
1545      3064 6001
1546      3065 7200
1547      3066 6234
1548      3067 7440
1549      3070 4533
1550
1551      3071 6211
1552      3072 6001
1553      3073 7200
1554      3074 6214
1555      3075 7440
1556      3076 4533
1557
1558      3077 6234
1559      3100 1371
1560      3101 7040
1561      3102 7440
1562      3103 4533
1563
1564      3104 6221
1565      3105 6001
1566      3106 7200
1567      3107 6214

```

/*****
 /CONSOLE PACKAGE REQUESTS ARE INHIBITED FROM HERE TO END OF EXT. MEMORY TESTS.
 /*****
 /MEMORY EXTENSION TEST 2
 /NOW TEST SAVE FIELD BITS 9-11 WITH
 /RIP. PI IS ENABLED. TELEPRINTER FLAG IS
 /USED FOR INTERRUPT. DO ALL COMBINATIONS 0 TO 3 & 7.
 /THIS TEST OVERWRITES LOCATIONS 0 & 1 IN FIELD 0.
 /
 EXMT2, INTST
 CDF 00 /DF0
 TAD (JMP I 0
 DCA 1 /C(1)=JMP I 0
 TSF /TEST TTY FLAG
 JMS I XTFLG /SET FLAG
 /
 IB0, ION /ENABLE PI
 CLA /AN INTERRUPT SHOULD OCCUR AFTER THIS INST IS EXECUTED.
 RIB /READ SF
 SZA
 CSERR /RIB FAILED.
 /
 IB1, CDF 10 /DF 1
 ION
 CLA /INTERRUPT HERE
 PDF /DF SHOULD BE 0 AFTER A PI
 SZA
 CSERR /DF NOT CLEARED, OR NO PI.
 /
 RIB /READ SF
 TAD (7776
 CMA /AC=0
 SZA
 CSERR /RIB OR SF FAILED.
 /
 IB2, CDF 20 /DF 2
 ION
 CLA /INTERRUPT HERE
 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 DFLD
1652 3223 1377 TAD (0007
1653 3224 3074 DCA NDF
1654 3225 5207 JMP DFLD
1655 3226 1042 DNF7, TAD K10
1656 3227 1207 TAD DFLD /INCR, CDF IOT
1657 3230 3207 DCA DFLD
1658 3231 2074 ISZ NDF
1659 3232 5207 JMP DFLD
1660 /
1661 3233 4510 TADI, JMS I XSTKS /RESET UP STKS,
1662 3234 7001 IAC
1663 3235 3074 DCA NDF /DF#=-1 AGAIN
1664 3236 1300 TAD CCDF /6201
1665 3237 1042 TAD K10
1666 3240 3241 DCA ,+1
1667 3241 6201 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 5275 JMP IBSF /NEXT TEST
1682 3260 1107 TAD STKS /IF STKS=-1 CHECK FIELD 7.
1683 3261 7040 CMA
1684 3262 7640 SZA CLA
1685 3263 5271 JMP TNF7 /NOT READY FOR FIELD 7 YET.
1686 3264 1376 TAD (CDF 70 /CHECK FIELD 7.
1687 3265 3241 DCA TFLD
1688 3266 1377 TAD (0007
1689 3267 3074 DCA NDF
1690 3270 5241 JMP TFLD
1691 3271 1042 TNF7, TAD K10
1692 3272 1241 TAD TFLD /CDF IOT + 10
1693 3273 3241 DCA TFLD
1694 3274 2074 ISZ NDF
1695 3275 5241 JMP TFLD
1696 3276 4536 IBSF, ENDTST
1697 /
1698 /*****
1699 /MEMORY EXTENSION TEST 4
1700 /CIF TEST. CHECKS THE ABILITY OF A CIF-ION-NOP-JMP OR
1701 /CIF-ION-NOP-JMS SEQUENCE TO DO THE FOLLOWING:
1702 /1. CIF ENABLE MAR TO IB TRANSFER.
1703 /2. INHIBIT INTERRUPT TILL JMP OR JMS EXECUTED.
1704 /3. INTERRUPT AFTER JMP OR JMS EXECUTED.
1705 /4. JMP OR JMS ENABLES IB TO IF TRANSFER.
1706 /5. INTERRUPT ENABLES IF TO SF TRANSFER.
1707 /
1708 /THIS TEST OVERWRITES LOCATIONS 0,1,2, & 3 IN FIELD 0;
1709 / ALSO LOCATIONS 1,3347, 3422 & 3425 IN FIELDS 1,2, & 3.
1710 /
1711 /SET UP FOR CIF-ION-NOP-JMP CHECK.
1712
1713 3277 4535 EXMT4, INIST
1714 3300 6201 CCDF, CDF 00 /SET LOCS 1-2 TO ISZ 0.
1715 3301 1375 TAD (ISZ 0 /JMP I 0 RESPECTIVELY.
1716 3302 3001 DCA 1
1717 3303 1350 TAD KNOP
1718 3304 3002 DCA 2
1719 3305 1374 TAD (JMP I 0
1720 3306 3003 DCA 3
1721 /
1722 /NOW STORE HALTS IN LOC1, CIFJMP+1.
1723 /AND CIFJMS+1 OF ALL EXTENDED FIELDS.
1724 /
1725 /NOTE: IF THE HALT IS EXECUTED, THE SYSTEM WILL TRAP TO CONTROL
1726 / PANEL MEMORY AND PRINT OUT THE FACT THAT A HALT OCCURED.
1727 / THE FIELD AND LOCATION WHERE THE HALT WAS ENCOUNTERED WILL
1728 / ALSO BE IDENTIFIED, THE SYSTEM MUST BE RE-BOOTED TO
1729 / RESTART THE DIAGNOSTIC. SORRY ABOUT THAT....
1730 /
1731 3307 4510 JMS I XSTKS
```

```
1732 3310 2107 ISZ STKS /FIELD 0 NOT TESTED.
1733 3311 1330 TAD LCDF
1734 3312 1042 TAD K10
1735 3313 3314 DCA +1
1736 3314 6211 HLTs, CDF 10
1737 3315 1373 TAD (HLT
1738 3316 3441 DCA I K1
1739 3317 1373 TAD (HLT
1740 3320 3766 DCA I CAB
1741 3321 1373 TAD (HLT
1742 3322 3767 DCA I CAC
1743 3323 2107 ISZ STKS
1744 3324 7410 SKP
1745 3325 5330 JMP +3
1746 3326 1314 TAD HLTs
1747 3327 5312 JMP HLTs-2
1748 3330 6201 LCDF, CDF 00
1749 3331 6241 TSF /ENSURE TIO FLAG SET.
1750 3332 4506 JMS I XIFLG /INITIALIZE TO CIF 00.
1751 3333 1372 AGAIN1, TAD (CIF
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 /MODIFIED TO CURRENT FIELD
1762 3346 6202 CIFJMP, CIF 00 /UNDER TEST.
1763
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 /LOAD MQ
1774 3361 7421 MQL
1775 3362 6234 RIB
1776 3363 4533 CAD, CSERR /ERROR. I.B. TO I.F. TRANSFER
1777 /FAILED AFTER CIF-JMP. BAD
1778 /I.F. IN AC, GOOD I.F. IN MQ.
1779 3364 5771 JMP CIFOK
1780 3365 0000 CIFCK, 0
1781 3366 3347 CAB, CIFJMP+1
1782 3367 3422 CAC, CIFJMS+1
1783
1784 3371 3400
1785 3372 6202
1786 3373 7402
```

```
1787 3374 5430
1788 3375 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 TIO 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
```

```
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
```

/VT78 CPU DIAGNOSTIC			PAL10	V142A	2-AUG-77	7:30	PAGE 4-8	SEQ 0053
1895	3605	6005		RTF			/LOADS IN & DF,EN INT,,SETS INT INH.	
1896	3606	5207		JMP .+1			/INTERRUPT HERE;JMP LOADS IF FROM IN,CLRS INT INH.	
1897	3607	4533		CRERR			/INTERRUPT WAS INHIBITED.	
1898	3610	6004		GTF				
1899	3611	3264		DCA SFLGS				
1900	3612	1264		TAD SFLGS				
1901	3613	7041		CIA			/CHECK FOR LINK=0,INT REQ=1,INT EN=0	
1902	3614	1375		TAD (1000				
1903	3615	7650		SNA CLA			/CHECK OK	
1904	3616	5223		JMP L61				
1905	3617	1375		TAD (1000				
1906	3620	7421		MQL				
1907	3621	1264		TAD SFLGS			/AC,MQ=ACTUAL FLAGS,EXPECTED FLAGS	
1908	3622	4533		CRERR				
1909	3623	1374	L61,	TAD (5200				
1910	3624	6005		RTF			/CHECK FOR JAM ON GTF	
1911	3625	7240		CLA CMA			/EXPECTED BITS ARE LINK=1,INT EN=1	
1912	3626	6004		GTF				
1913	3627	3264		DCA SFLGS				
1914	3630	1264		TAD SFLGS			/ (NO INT REQ - TTY FLAG BECAUSE	
1915	3631	7041		CIA			/ INT INH=1 TILL NEXT JMS OR JMP),	
1916	3632	1373		TAD (4200				
1917	3633	7640		SZA CLA				
1918	3634	5253		JMP L62			/REPLACE ION,INT INH	
1919	3635	6005		RTF				
1920	3636	7300		CLA CLL				
1921	3637	6004		GTF				
1922	3640	3264		DCA SFLGS				
1923	3641	1264		TAD SFLGS			/EXPECTED BITS ARE LINK=0,INT REQ=0 BECAUSE INT INH=1	
1924	3642	7041		CIA				
1925	3643	1372		TAD (0200			/SOMETHING WRONG WITH FLAGS	
1926	3644	7640		SZA CLA			/INTERRUPT HERE	
1927	3645	5257		JMP RPERR			/INTERRUPT WAS INHIBITED.	
1928	3646	5247		JMP .+1				
1929	3647	4533		CRERR				
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			/AC,MQ=ACTUAL FLAGS,EXPECTED FLAGS	
1936	3655	1264		TAD SFLGS				
1937	3656	4533		CRERR				
1938	3657	1372	RPERR,	TAD (0200				
1939	3660	7421		MQL			/AC,MQ=ACTUAL FLAGS,EXPECTED FLAGS	
1940	3661	1264		TAD SFLGS				
1941	3662	4533		CRERR				
1942	3663	5250		JMP RTFRP				
1943	3664	0000	SFLGS, 0					
1944	3771	0000						
1945	3772	0200						
1946	3773	4200						
1947	3774	5200						
1948	3775	1000						
1949	3776	5400						

/VT78 CPU DIAGNOSTIC			PAL10	V142A	2-AUG-77	7:30	PAGE 4-9	SEQ 0054
1950	3777	2000						
		4000						
1951				PAGE				
1952				/				
1953				/*****				
1954				/MEMORY EXTENSION TEST 7				
1955				/CONFIDENCE CHECK ON ALL EXISTENT FIELDS.				
1956				/MAKE SURE DCA I AND TAD I ARE TO CORRECT STACK.				
1957				/MAKE SURE JUMP IS TO CORRECT STACK.				
1958				/CHECK ALL COMBINATIONS.				
1959				/FIELDS WILL CONTAIN THEIR DF NUMBER IN LOC.0				
1960				/				
1961				/THIS TEST OVERWRITES LOCATIONS 0,1,2,3, & 7 OF FIELDS 0,1,2, & 3.				
1962				/				
1963	4000	4535		EXMT7, INTST				
1964	4001	6002		IOF				
1965	4002	3270		DCA NUMX				
1966	4003	4510		JMS I XSTKS				
1967	4004	1377		TAD (CDF				
1968	4005	3206		DCA .+1				
1969	4006	6201	FDWRD,	CDF			/MODIFIED UNDER TEST	
1970	4007	4252		JMS FILCOR				
1971	4010	2107		ISZ STKS			/ARE ALL STACKS DONE	
1972	4011	7410		SKP				
1973	4012	5220		JMP CONCHK			/CHECK RESULTS	
1974	4013	1042		TAD K10				
1975	4014	1206		TAD FDWRD				
1976	4015	3206		DCA FDWRD			/UPDATE FIELD CHANGE	
1977	4016	2273		ISZ NUMX				
1978	4017	5206		JMP FDWRD				
1979				/				
1980	4020	7300		CONCHK, CLA CLL				
1981	4021	6201		CDF 00				
1982	4022	3270		DCA NUMX				
1983	4023	4510		JMS I XSTKS				
1984	4024	1376		TAD (CIF				
1985	4025	3226		DCA .+1			/START WITH FIELD 0	
1986	4026	6202	CONCH,	CIF			/MODIFIED UNDER TEST	
1987	4027	5775		JMP I (0001				
1988	4030	3271	RETADD,	DCA SNUMX				
1989	4031	1271		TAD SNUMX				
1990	4032	7041		CIA			/RETURN HERE FROM FIELDS	
1991	4033	1270		TAD NUMX				
1992	4034	7650		SNA CLA				
1993	4035	5242		JMP X1			/GOOD FIELD	
1994	4036	1270		TAD NUMX				
1995	4037	7421		MQL				
1996	4040	1271		TAD SNUMX				
1997	4041	4533		CRERR			/AC,MQ=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, RETAD
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
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.
/
2127 4400 4535 EXMT11, INTST
2128 4401 4510 JMS I XSTKS
2129 4402 2107 ISZ STKS /FIELD 0 NOT TESTED
2130 4403 1377 TAD (0011
2131 4404 3211 DCA IFDF
2132 4405 7001 IAC
2133 4406 3324 DCA XDATA
2134 4407 1376 TAD (7777
2135 4410 3010 DCA 0010
2136 4411 0000 IFDF, 0000 /SET TO CURRENT FIELD UNDER TEST
2137 4412 7300 CLA CLL
2138 4413 1211 TAD IFDF
2139 4414 6005 RTF /SET FIELDS AND TURN ION
2140 4415 6002 IOF
2141 4416 7300 CLA CLL
2142 4417 1324 TAD XDATA
2143 4420 3410 DCA I 0010
2144 4421 1375 TAD (ISZ 10
2145 4422 3410 DCA I 0010
2146 4423 1374 TAD (JMP 5
2147 4424 3410 DCA I 0010
2148 4425 1373 TAD (ION
2149 4426 3410 DCA I 0010 /ION FOR THAT FIELD
2150 4427 1372 TAD (1000
2151 4430 3410 DCA I 0010 /TAD FOR THAT FIELD
2152 4431 1371 TAD (CDF 00
2153 4432 3410 DCA I 0010
2154 4433 1370 TAD (CIF 00
2155 4434 3410 DCA I 0010
2156 4435 1367 TAD (JMP I 10
2157 4436 3410 DCA I 0010
2158 4437 1366 TAD (FRET-1 /REMEMBER AUTO INDEX
2159 4440 3410 DCA I 0010
2160 4441 1365 TAD (0003
2161 4442 3246 DCA ADPS
2162 4443 1111 TAD JMPIR
2163 4444 3001 DCA 0001 /SET LOC 1 FOR RETURN AFTER PI
2164 4445 5646 JMP I ,+1 /GO TO THAT FIELD
2165 4446 0000 ADPS, 0000
2166 4447 3325 RET, DCA SDATA

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2167 4452 1325 TAD SDATA
2168 4451 7441 CIA
2169 4452 1324 TAD XDATA
2170 4453 7650 SNA CLA
2171 4454 5261 JMP L111
2172 4455 1324 TAD XDATA
2173 4456 7421 MQL
2174 4457 1325 TAD SDATA
2175 4460 4533 CSERR /AC DATA FAILED DURING PI
2176 /AC,MO=ACTUAL AC DATA,EXPECTED AC DATA
2177 4461 1000 L111, TAD 0000
2178 4462 7041 CIA
2179 4463 1364 TAD (0005
2180 4464 7650 SNA CLA
2181 4465 5272 JMP L112
2182 4466 1364 TAD (0005
2183 4467 7421 MQL
2184 4470 1000 TAD 0000
2185 4471 4533 CSERR /PC FAILED DURING PI
2186 /AC,MO=ACTUAL PC,EXPECTED PC
2187 4472 6214 L112, RDF
2188 4473 6224 RIF
2189 4474 7440 SZA
2190 4475 4533 CSERR /I,F, SHOULD BE 0 AFTER A PI
2191 /AC=ACTUAL I,F.
2192 4476 6004 GTF
2193 4477 0363 AND (0077
2194 4500 3325 DCA SDATA
2195 4501 1325 TAD SDATA
2196 4502 7041 CIA
2197 4503 1211 TAD IFDF
2198 4504 7650 SNA CLA
2199 4505 5312 JMP CONTDG
2200 4506 1211 TAD IFDF
2201 4507 7421 MQL
2202 4510 1325 TAD SDATA
2203 4511 4533 CSERR /GTF,RTF, OR SF FAILED
2204 /AC,MO=ACTUAL FIELDS,EXPECTED FIELDS
2205 4512 2107 CONTDG, ISZ STKS
2206 4513 7410 SKP
2207 4514 5322 JMP XSFIB
2208 4515 7300 CLA CLL
2209 4516 1377 TAD (0011
2210 4517 1211 TAD IFDF
2211 4520 3211 DCA IFDF /SET FOR NEXT FIELD
2212 4521 5207 JMP IFDF-2
2213 4522 4536 XSFIB, ENDST
2214 4523 5762 JMP EXMT12
2215 4524 0000 XDATA, 0
2216 4525 0000 SDATA, 0
2217 4526 5331 FRET, JMP NOPI
2218 4527 4533 CSERR /ERROR RETURN FROM EXTENDED FIELD.
2219 4530 7410 SKP /GOT PI BUT DIDN'T CHANGE FIELDS.
2220 4531 4533 NOPI, CSERR /NO PI
2221 4532 5312 JMP CONTDG

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2222
2223 4533 0000
2224 4534 1361
2225 4535 3107
2226 4536 5733
2227
2228
2229
2230 4537 0000
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 0077
2240 4564 0005
2241 4565 0003
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
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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 0000
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 0006
2337 4771 4634
2338 4772 0005
2339 4773 5406
2340 4774 0004
2341 4775 6202
2342 4776 0003
2343 4777 6201
5000

PAGE

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

/EXMT14, FIXIL /FIXUP INTERRUPT LINKAGE
INTST
CAF
ION /UNUSED IOT'S SHOULD NOT CAUSE INTERRUPTS
TAD KIOT
DCA TSTIOT /INITIALIZE TEST IOT
TAD (USEDIOT
DCA CUIPTR /INITIALIZE POINTER INTO USED IOT TABLE
IOTLP, TAD TSTIOT
AND (0770
CIA
TAD I CUIPTR /IS TEST IOT DEVICE CODE A SYSTEM DEVICE CODE ?
SZA CLA
JMP EXIOT /NO-EXECUTE IT
ISZ CUIPTR /YES-SKIP THIS DEVICE CODE
TAD TSTIOT
TAD (0010 /UPDATE TO NEXT TEST IOT
DCA TSTIOT
TAD TSTIOT
AND (1000
SNA CLA
JMP IOTLP
JMP EXIOTL /ALL UNUSED IOTS TESTED
TAD (5252 /LOAD AC WITH ARBITRARY DATA WORD
TSTIOT, 0000 /EXECUTE UNUSED IOT
SKP
JMP SKPERR /IOT CAUSED A SKIP
DCA ACAIOT
TAD ACAIOT
TAD (-5252
SZA CLA
JMP ACCERR /IOT DESTROYED AC CONTENTS
NXTIOT, ISZ TSTIOT /UPDATE TO NEXT IOT WITHIN SAME DEVICE CODE
TAD TSTIOT
AND (0007
SZA CLA
JMP EXIOT

2385 5045 5210
2386 5046 7300
2387 5047 1320
2388 5050 7421
2389 5051 1230
2390 5052 4533
2391
2392 5053 5240
2393 5054 1320
2394 5055 7421
2395 5056 1230
2396 5057 4533
2397
2398 5060 5240
2399 5061 4530
2400 5062 3075
2401 5063 5770
2402
2403
2404 5064 0010
2405 5065 0030
2406 5066 0040
2407 5067 0070
2408 5070 0130
2409 5071 0200
2410 5072 0210
2411 5073 0220
2412 5074 0230
2413 5075 0240
2414 5076 0250
2415 5077 0260
2416 5100 0270
2417 5101 0300
2418 5102 0310
2419 5103 0320
2420 5104 0330
2421 5105 0500
2422 5106 0600
2423 5107 0750
2424 5110 0000
2425 5111 0000
2426 5112 0000
2427 5113 0000
2428 5114 0000
2429 5115 0000
2430 5116 0000
2431
2432 5117 6010
2433 5120 0000
2434 5121 0000
2435
2436
2437 5170 5400
2438 5171 0007
2439 5172 2526

JMP IOTLP /DEVICE CODE FINISHED
SKPERR, CLA CLL
TAD ACAIOT
MQL
TAD TSTIOT
CBERR
/IOT CAUSED INST SKIP
/AC,MQ=BAD IOT,AC DATA
JMP NXTIOT
ACCERR, TAD ACAIOT
MQL
TAD TSTIOT
CBERR
/AC,MQ=BAD IOT, AC DATA AFTER IOT EXECUTION.
/(AC DATA BEFORE EXECUTION=5252)
JMP NXTIOT
EXIOTL, ENDTST
DCA TSTNO
JMP BEGRTC
/CLEAR TEST NUMBER

USEDIOT,0010 /ORDERED LIST OF USED DEVICE CODES
0030
0040
0070
0130
0200
0210
0220
0230
0240
0250
0260
0270
0300
0310
0320
0330
0500
0600
0750
0000
0000
0000
0000
0000
0000
0000
KIOT, 6010
ACAIOT, 0
CUIPTR, 0000

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
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2486
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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

/ROUTINE TO PRINT "REAL TIME CLOCK TESTING" MESSAGE

```
2528
2529
2530      5442 0000  PRICMS, 0
2531      5443 4521  C0CRLF
2532      5444 4522  C0PRNT
2533      5445 4522  RTCMS
2534      5446 4522  C0PRNT
2535      5447 2213  TESTMS
2536      5450 4521  C0CRLF
2537      5451 5642  JMP I PRICMS
2538
2539      5452 2205  RTCMS, TEXT "REAL TIME CLOCK "
2540
2541
2542
2543
2544
2545
2546
2547
2548      5463 4535  RTCT2, INTST
2549      5464 1374  TAD (RTCI2
2550      5465 3003  DCA 3
2551      5466 6007  CAF
2552      5467 6001  ION
2553      5470 4541  CLSKWT
2554      5471 4533  C0ERR
2555      5472 6136  CLCL
2556      5473 7610  SKP CLA
2557      5474 4533  C0ERR
2558      5475 6137  CLSK
2559      5476 7610  SKP CLA
2560      5477 4533  C0ERR
2561      5500 4536  RTCT2D, ENDTST
2562      5501 5304  JMP RTCT3
2563
2564      5502 4533  RTCI2, C0ERR
2565      5503 5300  JMP RTCT2D
2566
2567
2568
2569
2570
2571
2572
2573      5504 4535  RTCT3, INTST
2574      5505 1373  TAD (ISZ RTCIF
```

```
*****
/REAL TIME CLOCK TEST 2 - CHECKS THAT CLOCK FLAG WILL SET AND THAT
/ IT CAN BE CLEARED BY CLCL. THE TEST IS
/ CHECKED NOT TO INTERRUPT.
*****
/PATCH INTERRUPT LINKAGE TO RETURN TO THIS
/ TEST ON INTERRUPT.
/ WAIT FOR THE CLOCK FLAG TO SET
/ CLOCK FLAG FAILED TO SET.
/ CLEAR THE CLOCK FLAG
/ CLCL SKIPPED
/ SKIP ON CLOCK FLAG
/ CLCL FAILED TO CLEAR CLOCK FLAG
/ CAF FAILED TO DISABLE CLOCK INT.
/ CHECK THAT CLOCK INT. ENABLE CAN BE SET
/ AND CLEARED BY DATA BIT 11 AND CLLE USING
/ THE CLOCK FLAG TO INTERRUPT ON.
*****
/ FIX UP INT. LINKAGE TO SET REAL TIME CLOCK
```

```
2575      5506 3002  DCA 2
2576      5507 1372  TAD (JMP I 0
2577      5510 3003  DCA 3
2578      5511 3113  DCA RTCIF
2579      5512 6007  CAF
2580      5513 6001  ION
2581      5514 4541  CLSKWT
2582      5515 4533  C0ERR
2583      5516 6136  CLCL
2584      5517 6137  CLSK
2585      5520 7610  SKP CLA
2586      5521 4533  C0ERR
2587      5522 7301  CLA CLL IAC
2588      5523 6135  CLLE
2589      5524 7610  SKP CLA
2590      5525 4533  C0ERR
2591      5526 1113  TAD RTCIF
2592      5527 7640  SZA CLA
2593      5530 4533  C0ERR
2594      5531 4541  CLSKWT
2595      5532 4533  C0ERR
2596      5533 1113  TAD RTCIF
2597      5534 7650  SNA CLA
2598      5535 4533  C0ERR
2599
2600      5536 3113  DCA RTCIF
2601      5537 6135  CLLE
2602      5540 6001  ION
2603      5541 7300  CLA CLL
2604      5542 1113  TAD RTCIF
2605      5543 7640  SZA CLA
2606      5544 4533  C0ERR
2607      5545 6136  CLCL
2608      5546 6137  CLSK
2609      5547 7610  SKP CLA
2610      5550 4533  C0ERR
2611      5551 4536  ENDTST
2612      5552 5771  JMP RTCT4
2613
2614
2615
2616      5571 5600
2617      5572 5400
2618      5573 2113
2619      5574 5502
2620      5575 5425
2621      5576 6000
2622      5577 0002
2623
2624
2625
2626
2627
2628
```

PAGE

```
*****
/REAL TIME CLOCK TEST 4 - CHECK THAT CLOCK INT. ENABLE CAN BE SET
/ AND THAT CAF WILL CLEAR IT USING THE CLOCK
/ FLAG TO INTERRUPT ON.
*****
```

```
2629 5600 4535 RTCT4, INTST
2630 5601 3113 DCA RTCIF
2631 5602 6407 CAF /CLEAR ALL FLAGS
2632 5603 6801 ION
2633 5604 4541 CLSKWT /WAIT FOR THE CLOCK FLAG TO SET
2634 5605 4533 CRERR /CLOCK FLAG FAILED TO SET
2635 5606 7301 CLA CLL IAC
2636 5607 6135 CLLE /SET INTERRUPT ENABLE TO A ONE
2637 5610 7300 CLA CLL /SHOULD INTERRUPT HERE
2638 5611 1113 TAD RTCIF
2639 5612 7650 SNA CLA
2640 5613 4533 CRERR /PROGRAM FAILED TO INT. WITH CLOCK FLAG SET
2641 / AND CLOCK INT. ENABLED.
2642 5614 3113 DCA RTCIF /CLEAR CLOCK FLAG
2643 5615 6807 CAF /CLEAR ALL FLAGS AND DISABLE CLK INT.
2644 5616 6801 ION
2645 5617 4541 CLSKWT /WAIT FOR FLAG
2646 5620 4533 CRERR /CLOCK FLAG FAILED TO SET
2647 5621 1113 TAD RTCIF /GET THE CLOCK INT. FLAG
2648 5622 7640 SZA CLA /DID IT INTERRUPT?
2649 5623 4533 CRERR /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 6801 ION
2662 5632 7344 CLA CLL CMA RAL /-2
2663 5633 6135 CLLE /CLEAR CLOCK INT. ENABLE
2664 5634 1377 TAD (2
2665 5635 7440 SZA
2666 5636 4533 CRERR /CLLE CHANGED THE AC
2667 5637 7240 CLA CMA
2668 5640 6136 CLCL /CLEAR CLOCK FLAG
2669 5641 7001 IAC
2670 5642 7440 SZA
2671 5643 4533 CRERR /CLCL CHANGED THE AC
2672 5644 7240 CLA CMA
2673 5645 6137 CLSK /SKIP ON CLOCK FLAG
2674 5646 7000 NOP
2675 5647 7001 IAC
2676 5650 7440 SZA
2677 5651 4533 CRERR /CLSK CHANGED THE AC
2678 5652 7200 CLA
2679 5653 4536 ENDTST
2680 5654 5255 JMP RTCT6
2681
2682
2683
```

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*****
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```
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 6801 ION
2694 5664 4541 CLSKWT /WAIT FOR CLOCK FLAG TO SET
2695 5665 4533 CRERR /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 CRERR /CLOCK FAILED TO TRIGGER INTERRUPT
2702 5674 1312 CLKIR, TAD CLKCT
2703 5675 7041 CIA
2704 5676 1313 TAD CLCON
2705 5677 7500 SNA
2706 5700 5315 JMP CLKERR
2707 5701 1314 TAD CDELTA
2708 5702 7510 SPA
2709 5703 5315 JMP CLKERR
2710 5704 7300 CONTT, CLA CLL
2711 5705 6135 CLLE /DISABLE CLOCK INTERRUPT
2712 5706 4536 ENDTST
2713 5707 3075 DCA TSTNO /CLEAR TEST NUMBER
2714 5710 4520 FIXIL /FIX UP INTERRUPT LINKAGE
2715 5711 5775 JMP BEGBST
2716
2717 5712 0000 CLKCT, 0
2718 5713 1200 CLCON, 1200 /LOWER LIMIT ON EXPECTED CLOCK COUNT
2719 5714 0010 CDELTA, 10 /ALLOWED RANGE FOR CLOCK COUNT
2720
2721 5715 7300 CLKERR, CLA CLL
2722 5716 1312 TAD CLKCT
2723 5717 4533 CRERR /CLOCK TIMING ERROR - AC = ACTUAL COUNT
2724 / CONTINUE FOR EXPECTED COUNT.
2725 5720 7300 CLA CLL
2726 5721 1313 TAD CLCON
2727 5722 1314 TAD CDELTA
2728 5723 7421 MQL
2729 5724 1313 TAD CLCON
2730 5725 4533 CRERR /EXPECTED TIMING - AC,MQ = LOWER LIMIT, UPPER LIMIT
2731 / FOR COUNT.
2732 5726 5304 JMP CONTT
2733
2734
2735
```

```

2736
2737      5775 6000
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 7719      SPA CLA
2754      6004 5225      JMP DOSLU          /YES-DON'T EXECUTE THIS TEST-CONTINUE
2755
2756      6005 1020      TAD PSR
2757      6006 0377      AND (0001          /WITH SLU TESTING.
2758      6007 7650      SNA CLA          /NO-IS BAUD SWITCH TEST REQUESTED?
2759      6010 5225      JMP DOSLU          /CHECK PSR BIT 11)
2760      6011 4227      JMS PBRMS
2761      6012 7300      BSTLP, CLA CLL
2762      6013 7604      LAS
2763      6014 0376      AND (0017
2764      6015 1375      TAD (BASEP
2765      6016 3275      DCA TBLPTR
2766      6017 4521      C8CRLF          /PRINT A CARRIAGE RETURN & LINE FEED
2767      6020 4276      JMS PRTRS          /PRINT DECIMAL SETTING
2768      6021 4247      JMS LISNR
2769      6022 1374      TAD (-015
2770      6023 7640      SZA CLA          /LISTEN FOR A CHARACTER
2771      6024 5212      JMP BSTLP          /IS IT A CARRIAGE RETURN?
2772      6025 6213      DOSLU, CDI 10
2773      6026 5773      JMP CIREST          /NO-DISPLAY NEW SETTING
2774
2775
2776
2777      6027 0000      /ROUTINE TO PRINT "BAUD RATE SWITCH TESTING" MESSAGE
2778      6030 4521      PBRMS, 0
2779      6031 4522      C8CRLF
2780      6032 6036      C8PRNT
2781      6033 4522      BRMS
2782      6034 2213      C8PRNT
2783      6035 5027      TESTMS
2784
2785      6036 0201      JMP I PBRMS
2786
2787
2788
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2800
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2837      6043 2327
2838      6044 1124
2839      6045 0310
2840      6046 4000
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/VT78 CPU DIAGNOSTIC      PAL10  V142A  2-AUG-77      7:30    PAGE 6-2      SEQ 0071

2837  6117  4350  PSS4,  JMS PRDD      /PRINT 192
2838  6120  0261      #261
2839  6121  0271      #271
2840  6122  0262      0262
2841  6123  0000      0000
2842  6124  4530      PRNT2      /PRINT TRAILING 2 ZEROS
2843  6125  5676      JMP I PRTBRS
2844  6126  4350  PSS3,  JMS PRDD      /PRINT 96
2845  6127  0271      0271
2846  6130  0266      0266
2847  6131  0000      0000
2848  6132  4530      PRNT2      /PRINT TRAILING 2 ZEROS
2849  6133  5676      JMP I PRTBRS
2850  6134  4350  PSS2,  JMS PRDD      /PRINT 48
2851  6135  0264      0264
2852  6136  0270      0270
2853  6137  0000      0000
2854  6140  4530      PRNT2      /PRINT TRAILING 2 ZEROS
2855  6141  5676      JMP I PRTBRS
2856  6142  4350  PSS1,  JMS PRDD      /PRINT 18
2857  6143  0261      0261
2858  6144  0270      0270
2859  6145  0000      0000
2860  6146  4530      PRNT2      /PRINT TRAILING 2 ZEROS
2861  6147  5676      JMP I PRTBRS
2862
2863  6150  0000  PRDD,  0      /PRINT ASCII DIGITS FOLLOWING CALL
2864  6151  1750      TAD I PRDD
2865  6152  7450      SNA
2866  6153  5750      JMP I PRDD      /DIGIT#0 = RETURN
2867  6154  4527      TYPE
2868  6155  2350      ISZ PRDD
2869  6156  5351      JMP PRDD+1
2870
2871
2872

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/VT78 CPU DIAGNOSTIC      PAL10  V142A  2-AUG-77      7:30    PAGE 7      SEQ 0072

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
2885
2886
2887
2888
2889  6200  3276  SKPCHN, DCA SAVAC      /GET HERE VIA INTERRUPT
2890
2891  6201  4516      CHKXSF      /SAVE AC
2892  6202  5206      JMP RFINT      /CHECK FOR CONSOLE PACKAGE INT.
2893  6203  7000      NOP      /SET-BUT IGNORE
2894  6204  7000      NOP      /NOT SET
2895  6205  4533  UEI,      /UNEXPECTED INTERRUPT
2896  6206  1276  RFINT,  TAD SAVAC
2897  6207  5400      JMP I 0      /CONTINUE WITH DIAGNOSTIC
2898
2899
2900
2901
2902
2903  6210  4521  SERUEI, C0CRLF
2904  6211  4522      C0PRNT
2905  6212  6311      UEIMES
2906  6213  4521      C0CRLF
2907  6214  4777      JMS MTN      /DISPLAY TEST NUMBER
2908  6215  1000      TAD 0
2909  6216  3776      DCA PCSAVE
2910  6217  4775      JMS MPC      /DISPLAY PC
2911  6220  1276      TAD SAVAC
2912  6221  3774      DCA ACSAVE
2913  6222  4773      JMS MAC      /DISPLAY AC
2914  6223  4772      JMS MFL      /DISPLAY FLAGS
2915  6224  4521      C0CRLF
2916  6225  4522      C0PRNT
2917  6226  6331      F0MES
2918  6227  1371      TAD (CDI
2919  6230  3274      DCA VCDI
2920  6231  4233      JMS CKFLG      /DISPLAY FLAGS SET
2921  6232  5770      JMP IEH
2922
2923  6233  0000  CKFLG,  0
2924  6234  6041      TSF
2925  6235  5240      JMP UL1
2926  6236  4522      C0PRNT
2927  6237  6337      MXHT1

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2927 6240 6311 UL1, TSF1
2928 6241 6244 JMP UL2
2929 6242 4522 CRPRNT /SLU #2 XMIT FLAG SET
2930 6243 6342 MXMT2
2931 6244 6331 UL2, TSF2
2932 6245 6250 JMP UL3
2933 6246 4522 CRPRNT /SLU #3 XMIT FLAG SET
2934 6247 6345 MXMT3
2935 6250 2040 UL3, ISZ KSF LG
2936 6251 6254 JMP UL4
2937 6252 4522 CRPRNT /SLU #1 REC FLAG SET
2938 6253 6350 MREC1
2939 6254 6301 UL4, KSF1
2940 6255 6260 JMP UL5
2941 6256 4522 CRPRNT /SLU #2 REC FLAG SET
2942 6257 6353 MREC2
2943 6260 6321 UL5, KSF2
2944 6261 6264 JMP UL6
2945 6262 4522 CRPRNT /SLU #3 REC FLAG SET
2946 6263 6356 MREC3
2947 6264 6661 UL6, PSKF
2948 6265 6270 JMP UL7
2949 6266 4522 CRPRNT /LA180 PRINTER FLAG SET
2950 6267 6361 MLAP
2951 6270 6500 UL7, LOSK
2952 6271 6274 JMP VCDI
2953 6272 4522 CRPRNT /LQP PRINT FLAG SET
2954 6273 6364 MLQP
2955 6274 6203 VCDI, CDI 00
2956 6275 6633 JMP I CKFLG
2957 6276 0000 SAVAC, 0
2958 6277 1501 MMID, 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

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        6327 4060
        6330 0000
2960 6331 0614 FSNES, TEXT "FLAG 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

```

```

2969
2970 6370 6646
2971 6371 6203
2972 6372 6472
2973 6373 6456
2974 6374 6675
2975 6375 6532
2976 6376 6674
2977 6377 6524
        6400
2978
2979
2980
2981
2982
2983
2984
2985 6400 4314
2986 6401 4256
2987 6402 4264
2988 6403 4272
2989 6404 4521
2990 6405 5777*
2991
2992
2993
2994 6406 4314
2995 6407 4300
2996 6410 4521
2997 6411 1067
2998 6412 3776*
2999 6413 4256
3000 6414 1072
3001 6415 3775*
3002 6416 4264
3003 6417 4306
3004 6420 4521
3005 6421 5777*
3006
3007
3008
3009 6422 4314
3010 6423 4300
3011 6424 4521
3012 6425 4522
3013 6426 6547
3014 6427 1054
3015 6430 3776*
3016 6431 4256
3017 6432 1055
3018 6433 3775*
3019 6434 4264
3020 6435 1056
3021 6436 3071
3022 6437 4306

*6400
/*****
/ERROR DISPLAY FORMAT ROUTINES
/*****

/NORMAL DISPLAY = TN,PC,AC,MQ,FLAGS

NORMDIS,JMS MESHDR      /PRINT ERROR HEADER & PC
        JMS MAC          /PRINT AC
        JMS MMQ          /PRINT MQ
        JMS MFL          /PRINT FLAGS
        C8CRLF
        JMP IEH

/COMBINED CPU MICROINST SKIP FAILURE DISPLAY

CPUSDIS,JMS MESHDR      /PRINT ERROR HEADER & PC
        JMS MINS         /PRINT INSTRUCTION
        C8CRLF
        TAD ACDATA        /PRINT AC CONTENTS BEFORE INST EXECUTION
        DCA ACSAVE
        JMS MAC
        TAD MQDATA        /PRINT MQ CONTENTS BEFORE INST EXECUTION
        DCA MQSAVE
        JMS MMQ
        JMS MLK          /PRINT LINK CONTENTS BEFORE INST EXECUTION
        C8CRLF
        JMP IEH

/COMBINED CPU MICROINST DATA ERROR DISPLAY

CPUDIS, JMS MESHDR      /PRINT ERROR HANDLER & PC
        JMS MINS         /PRINT INSTRUCTION
        C8CRLF
        C8PRNT
        MESACT           /PRINT ACTUAL AC,MQ,LINK
        TAD ACWAS
        DCA ACSAVE
        JMS MAC
        TAD MQWAS
        DCA MQSAVE
        JMS MMQ
        TAD LKWAS
        DCA LKDATA
        JMS MLK

```

```

3023 6440 4521
3024 6441 4522
3025 6442 6556
3026 6443 1072
3027 6444 3776*
3028 6445 4256
3029 6446 1065
3030 6447 3775*
3031 6450 4264
3032 6451 1007
3033 6452 3071
3034 6453 4306
3035 6454 4521
3036 6455 5777*
3037
3038
3039
3040 6456 0000
3041 6457 4522
3042 6460 6663
3043 6461 1776*
3044 6462 4523
3045 6463 5656
3046
3047 6464 0000
3048 6465 4522
3049 6466 6666
3050 6467 1775*
3051 6470 4523
3052 6471 5664
3053
3054 6472 0000
3055 6473 4522
3056 6474 6671
3057 6475 1774*
3058 6476 4523
3059 6477 5672
3060
3061 6500 0000
3062 6501 4522
3063 6502 6543
3064 6503 1505
3065 6504 4523
3066 6505 5700
3067
3068 6506 0000
3069 6507 4522
3070 6510 6540
3071 6511 1071
3072 6512 4523
3073 6513 5706
3074
3075 6514 0000
3076 6515 4521
3077 6516 4522

SUBROUTINES FOR DISPLAY ROUTINES

MAC, 0 /DISPLAY AC MESSAGE
        C8PRNT
        MESAC
        TAD ACSAVE
        C8PRT4
        JMP I MAC

MMQ, 0 /DISPLAY MQ MESSAGE
        C8PRNT
        MESMQ
        TAD MQSAVE
        C8PRT4
        JMP I MMQ

MFL, 0 /DISPLAY FLAGS MESSAGE
        C8PRNT
        MESFL
        TAD FLSAVE
        C8PRT4
        JMP I MFL

MINS, 0 /DISPLAY OCTAL INSTRUCTION
        C8PRNT
        MESINS
        TAD I INSTTR
        C8PRT4
        JMP I MINS

MLK, 0 /DISPLAY LINK MESSAGE
        C8PRNT
        MESLK
        TAD LKDATA
        C8PRT4
        JMP I MLK

MESHDP, 0 /DISPLAY MESSAGE HEADER & PC
        C8CRLF
        C8PRNT

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```

3078 6517 5238 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

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```

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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3162 6644 5770 JMP CPUUIS /USE MICROINST DATA FAILURE DISPLAY
3163 6645 5767 JMP NORMDIS /USE NORMAL DISPLAY
3164 6646 1020 IEH, TAD PSR /INHIBIT ERFOR HALT?
3165 6647 7704 SNA CLA /TEST BIT 0
3166 6650 4524 C8SWIT /NO - GO TO THE INQUIRE ROUTINE
3167 6651 1020 TAD PSR /LOOP ON ERROR?
3168 6652 7304 RAL /TEST BIT 1
3169 6653 7710 SPA CLA
3170 6654 5703 JMP I TLOOP /LOOP
3171 6655 4303 JMS C8GET /CONTINUE TEST
3172 6656 7000 NOP /LEAVE INTERRUPT SYSTEM DISABLED
3173 6657 5600 JMP I XC8ERR
3174 6660 4040 MESPC, TEXT " PC1"
3175 6661 2003 MESAC, TEXT " AC1"
3176 6662 7200 MESMQ, TEXT " MQ1"
3177 6663 4040 MESFL, TEXT " FL1"
3178 6664 7200 PCSAVE, 7777
3179 6665 7777 ACSAVE, 7777
3180 6666 7777 MQSAVE, 7777
3181 6667 7777 FLSAVE, 7777
3182 6700 0000 TLOOP, 0
3183 6701 5702 APTOW1, JMP I .+1
3184 6702 7000 APTER
3185
3186
3187 6703 0000 C8GET, 0
3188 6704 1276 TAD MQSAVE
3189 6705 7421 MQL /RESTORE THE MQ
3190 6706 1277 TAD FLSAVE
3191 6707 7004 RAL /RESTORE THE LINK
3192 6710 7200 CLA
3193 6711 1200 TAD XC8ERR /RESTORE AC IF IN CPU TEST, OTHERWISE CLEAR AC
3194 6712 1366 TAD (-2400
3195 6713 7710 SPA CLA
3196 6714 1275 TAD ACSAVE /RESTORE THE AC
3197 6715 5703 JMP I C8GET
3198
3199
3200
3201
3202 /*****
3203 /XC8START IS CALLED AT START OF PROGRAM TO PRINT THE MAINDEC NUMBER
3204 /AND THE SWITCH REGISTER QUESTION.
3205
3206 6716 0000 XC8START, 0
3207 6717 4532 C8APT /CHECK FOR APT CONTROL
3208 6720 4521 C8CRLF //PRINT A CR LF
3209 6721 4522 C8PRNT
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3209 6722 6277 MWID /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 I (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 /APT/ ROUTINE TO NOTIFY APT THAT THE PROGRAM IS RUNNING OK.
3224 APTOK, 0 /APT/
3225 6732 0000 IOF /APT/
3226 6733 6002 CLA /APT/
3227 6734 7200 TAD APTIMX /APT/DELAY 100MS.
3228 6735 1354 DCA APTCTX /APT/
3229 6736 3356 TAD APTIMY /APT/
3230 6737 1355 DCA APTCTY /APT/
3231 6740 3357 ISZ APTCTY /APT/
3232 6741 2357 JMP .-1 /APT/
3233 6742 5341 ISZ APTCTX /APT/
3234 6743 2356 JMP .-5 /APT/
3235 6744 5337 RIF /APT/AC=IF.
3236 6745 6224 TAD (6201 /APT/CREATE A CDF INST.
3237 6746 1364 DCA .+1 /APT/MODIFY NEXT CDF INST.
3238 6747 3350 CDF /APT/(MODIFIED CDF) DF=IF.
3239 6750 6201 CIF 70 /APT/IF=FIELD 7.
3240 6751 6272 JMS 6500 /APT/CALL APT = 'PROG OK'.
3241 6752 4763 JMP I APTOK /APT/RTN FROM APT = RTN TO CALL+1.
3242 6753 5712
3243
3244 6754 7771 APTIMX, -7 /APT/
3245 6755 0000 APTIMY, 0 /APT/
3246 6756 0000 APTCTX, 0 /APT/
3247 6757 0000 APTCTY, 0 /APT/
3248
3249 6760 4310 HCW3MS, TEXT "HCW3="
3250 6761 2763
3251 6762 7500
3252
3253 6763 6500
3254 6764 6201
3255 6765 0137
3256 6766 5400
3257 6767 6400
3258 6770 6422
3259 6771 2060
3260 6772 6406
3261 6773 2054
3262 6774 6210
3263 6775 6205
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3262 6776 6200
3263 6777 2726
      7000
PAGE
3264
3265 /*****
3266
3267
3268
3269
3270 7000 6002 APTER, IOF /APT/
3271 7001 7200 CLA /APT/
3272 7002 6224 RIF /APT/AC=IF,
3273 7003 1377 TAD (6201 /APT/CREATE A CDF INST.
3274 7004 3227 OCA ,+3 /APT/MODIFY NEXT CDF INST.
3275 7005 7240 CLA CMA /APT/
3276 7006 1770 TAD XCBERR /APT/AC=ERROR PC,
3277 7007 6201 CDF /APT/(MODIFIED CDF) DF=IF.
3278 7010 6272 CIF 70 /APT/IF=FIELD 7,
3279 7011 5775 JMP 6520 /APT/CALL APT = 'ERROR'.
3280
3281
3282
3283
3284
3285
3286 7012 0000 XCBRC, 0 /GET MESSAGE PARAMETER
3287 7013 1612 TAD I XCBRC
3288 7014 3300 DCA PROPM5
3289 7015 2212 ISZ XCBRC
3290 7016 1612 TAD I XCBRC /GET THE REGISTER PARAMETER
3291 7017 3302 DCA PROPLC
3292 7020 2212 ISZ XCBRC
3293 7021 4276 JMS PPRMS /PRINT REG QUESTION
3294 7022 1702 TAD I PROPLC /GET THE VALUE OF THE REGISTER
3295 7023 4523 C8PRT4 /PRINT THE 4 DIGITS
3296 7024 7346 CLA CLL CMA RTL /SETUP A COUNTER TO ACCEPT 4 DIGITS
3297 7025 3304 DCA TTYCNT /SAVE THE COUNTER
3298 7026 1374 TAD (CHARR0 /GET POINTER FOR FIRST CHARACTER
3299 7027 3232 DCA CHGCHR /SAVE THE POINTER FOR DIGITS
3300 7030 4525 LISN /WAIT FOR KEYBOARD INPUT
3301 7031 0001 1 /CHECK FOR A OCTAL DIGIT
3302 7032 7050 CHGCHR, CHARR0 /THIS LOCATION WILL GET MODIFIED
3303 7033 7566 -212 /CHECK FOR LINE FEED
3304 7034 0200 START /LINE FEED TYPED- RETURN TO START
3305 7035 7563 -215 /CHECK FOR CARRIAGE RETURN
3306 7036 7064 RETYPE /RETYPE SR AND CONT IF DIGITS TYPED
3307 7037 7575 -203 /CHECK FOR A CONTROL C
3308 7040 7105 C8RM /CONTROL C TYPED-RETURN TO MONITOR
3309 7041 7555 -223 /CHECK FOR A CONTROL S
3310 7042 7145 CNTRS /WAS CONTROL S WAIT FOR "Q OR "C
3311 7043 0000 0 /NONE OF ABOVE CHARACTERS-ILLEGAL CHAR
3312 7044 7045 .+1 /GO TO NEXT ADDRESS TO PRINT ?
3313 7045 4522 C8PRNT /GO PRINT ?
3314 7046 7315 QESTMK /POINTER TO ? MESSAGE
3315 7047 5221 JMP RQUEST /RETURN AND ASK QUESTION AGAIN

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3316 7050 3702 CHARR0, DCA I PROPLC /SAVE THE LEAST SIGNIFICANT BIT
3317 7051 1373 TAD (CHARR1 /UPDATA POINTER FOR CHARACTERS 2 3 4
3318 7052 3232 DCA CHGCHR /SAVE THE POINTER ADDRESS
3319 7053 5230 JMP CHGCHR-2 /RETURN FOR NEXT CHARACTER INPUT
3320 7054 3303 CHARR1, DCA SAVCHR /SAVE THE CHARACTER TYPED
3321 7055 1702 TAD I PROPLC /GET THE VALUE OF REG
3322 7056 7106 CLL RTL /MOVE IT INTO NEXT POSITION
3323 7057 7004 RAL
3324 7060 1303 TAD SAVCHR /ADD NEW CHARACTER TO IT
3325 7061 3702 DCA I PROPLC /SAVE THE NEW VALUE
3326 7062 2304 ISZ TTYCNT /DONE ALL 4 CHARACTERS
3327 7063 5230 JMP CHGCHR-2 /NO GET NEXT INPUT FROM KEYBOARD
3328 7064 1374 RETYPE, TAD (CHARR0 /GET POINTER TO SEE IF REG ECHOED
3329 7065 7041 CIA /NEGATE THE POINTER
3330 7066 1232 TAD CHGCHR /GET THE POINTER STORED
3331 7067 7650 SNA CLA /ECHO VALUE OF REG?
3332 7070 5612 JMP I XCBRC /NO-ONLY CR WAS TYPED-USE ORIGINAL VALUE
3333 7071 4276 JMS PPRMS /RE-ECHO VALUE TYPED
3334 7072 1702 TAD I PROPLC /GET VALUE OF REG
3335 7073 4523 C8PRT4 /PRINT THE 4 OCTAL DIGITS
3336 7074 4521 C8CRLF /ISSUE A CR AND LF
3337 7075 5612 JMP I XCBRC /RETURN TO PROGRAM
3338 7076 0000 PPRMS, 0 /PRINT REGISTER MESSAGE
3339 7077 4522 C8PRNT
3340 7100 0000 PROPM5, 0
3341 7101 5676 JMP I PPRMS
3342
3343 7102 0000 PROPLC, 0
3344 7103 0000 SAVCHR, 0
3345 7104 0000 TTYCNT, 0
3346
3347
3348 7105 6007 C8RM, CAF
3349 7106 6203 CDF CIF /CHANGE INST AND DATA FIELD TO 0
3350 7107 5710 JMP I ,+1 /GOTO 7600 OF THAT FIELD
3351 7110 7600 7600 /MONITOR STARTING ADDRESS
3352
3353
3354 /*****
3355
3356
3357
3358
3359
3360 7111 0000 XCHKKSF,0
3361 7112 6031 KSF /SKIP ON CONSOLE RECEIVE FLAG
3362 7113 5337 JMP NOCRF /RECEIVE FLAG NOT SET RETURN TO PROGRAM
3363 7114 1022 TAD HCW2 /CHECK TO SEE IF CONSOLE WAS ACTIVE
3364 7115 0047 AND K4000 /(VERSUS APT IN CONTROL),
3365 7116 7650 SNA CLA
3366 7117 5322 JMP ,+3 /ACTIVE CONSOLE-CHECK FOR "C OR "G
3367 7120 6032 KCC /APT ACTIVE,CLEAR CONSOLE RECEIVE FLAG
3368 7121 5711 JMP I XCHKKSF /RETURN TO PROGRAM
3369 7122 4772 JMS SUBBLK /SAVE SUBROUTINE LINKAGE
3370 7123 4525 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          CRHM          /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  6440          0             /CHAR WAS NOT "C OR "G
3378  7133  7134          ,+1          /ECHO CHAR AND QUESTION MARK
3379  7134  1371          IAD (277      /PRINT ?
3380  7135  4527          TYPE
3381  7136  5350          JMP RLK        /RETURN TO PROGRAM
3382  7137  2341          NOCRF, ISZ XCHKASF
3383  7140  5711          JMP I XCHKASF
3384
3385  7141  4522          CNTRLG, C8PRNT    /PRINT "G AND CR LF
3386  7142  7317          UPARRG        /POINTER TO MESSAGE
3387  7143  4770          JMS XC8SW      /GO ASK THE SR QUESTION
3388  7144  5350          JMP RLK        /RETURN TO THE PROGRAM
3389
3390  7145  4767          CNTRS, JMS WAITQC  /GO WAIT FOR A CONTROL Q OR C
3391  7146  5230          JMP CHGCHR=2    /GO WAIT FOR NEXT CHAR
3392
3393  7147  4767          CNTRS1, JMS WAITQC  /WAIT FOR A CONTROL Q OR C
3394  7150  4766          RLK, JMS RSUBLK  /RESTORE SUBROUTINE LINKAGE
3395  7151  5711          JMP I XCHKASF    /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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SEQ 0083

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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          PAGE
3431          /TYPE A CR AND LF WITH NUMBER OF FILLERS
3432          /AS DETERMINED BY LOCATION "FILLER"
3433          XC8CRLF,0          /CALL BY "CRLF"
3434          CLA
3435          TAD K215
3436          TYPE
3437          TAD FILLER
3438          CMA
3439          DCA XORS
3440          TAD K212
3441          TYPE
3442          ISZ XORS
3443          JMP ,+2
3444          JMP I XC8CRLF
3445
3446  7214  0000          XORS, 0
3447  7215  0215          K215,215
3448  7216  0212          K212,212
3449
3450          /PRINT 2 SPACES
3451
3452  7217  0000          SPACX2, 0        /CALL BY "SPACE2"
3453  7220  4522          C8PRNT
3454  7221  7223          ,+2
3455  7222  5617          JMP I SPACX2
3456  7223  4040          4040
3457  7224  0000          0000
3458
3459          /COMPARE INPUT TO LIST FOLLOWING CALL
3460          /INPUT ONE CHARACTER IF AC=0
3461          /USE LAST INPUT IF AC NON ZERO
3462
3463  7225  0000          XLISN, 0          /CALL BY "LISN"
3464  7226  7640          SZA CLA
3465  7227  5255          JMP LISN1        /USE LAST INPUT SINCE AC NOT ZERO
3466  7230  6031          KSF
3467  7231  5230          JMP ,+1
3468  7232  6036          KRB
3469  7233  0376          AND (177
3470  7234  1045          TAD K200
3471  7235  3311          DCA CHIREC
3472  7236  1311          TAD CHIREC
3473  7237  1310          TAD M212
3474  7240  7450          SNA
3475  7241  5245          JMP ,+4          /IS IT A LFT
3476  7242  1307          TAD M3          /YES
3477  7243  7640          SZA CLA
3478  7244  5247          JMP ,+3          /IS IT A CRT
3479  7245  4521          CRCLRF          /NO
3480  7246  5255          JMP LISN1

```

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 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 /IS IT LESS THAN 8?
3507 7302 5273 JMP LISN2 /NO, SO NOT AN OCTAL NUMBER
3508 7303 1042 TAD K10
3509 7304 7510 M270, SPA
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
3520 7315 7743 QESTMK, TEXT "?"
3521 7316 0000
3522 7317 3607 UPARRG, TEXT "G="
3523 7320 4300
3524 /TYPE THE ASCII CHARACTER IN THE AC
3525
3526 7321 0000 XTYPE, 0 /CALL BY "TYPE"
3527 7322 3334 DCA CHAR /SAVE THE CHARACTER
3528 7323 7000 NOP/JMP I XTYPE /OVERWRITTEN IF RUNNING UNDER APT CONTROL.
3529 7324 4774 JMS CNTRL5 /CONSOLF ACTIVE-CHECK FOR CONTROL S
3530 7325 1334 TAD CHAR /GET THE CHARACTER SAVED AND PRINT
3531 7326 6046 TLS
3532 7327 7200 CLA
3533 7330 6041 TSF
3534 7331 5330 JMP -1
```

```
3531 7332 6042 TCF
3532 7333 5721 APTCON, JMP I XTYPE
3533
3534 7334 0000 CHAR, 0
3535
3536 /ROUTINE TO SAVE SUBROUTINE LINKAGES WHICH MAY GET DESTROYED
3537 / BY A KEYBOARD INTERVENTION CHECK.
3538
3539 7335 0000 SSUBLK, 0
3540 7336 1773 TAD XCHKKSF
3541 7337 3355 DCA LSAV1
3542 7340 1772 TAD MESAGX
3543 7341 3356 DCA LSAV2
3544 7342 1771 TAD XPRNT4
3545 7343 3357 DCA LSAV3
3546 7344 5735 JMP I SSUBLK
3547
3548 /ROUTINE TO RESTORE SUBROUTINE LINKAGES SAVED BY SSUBLK ROUTINE
3549
3550 7345 0000 RSUBLK, 0
3551 7346 1355 TAD LSAV1
3552 7347 3773 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 C0RC
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
```

```

3585 7402 1022 TAD HCW2 /RUN UNDER APT CONTROLS?
3586 7403 7704 SNA CIA
3587 7404 5604 JMP I XC8APT
3588 7405 1777 TAD APT0W1 /YES--OVERWRITE C8EKR ROUTINE (FLD 2)
3589 7406 3776 DCA 0W1APT
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 K8CHK /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 6305 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 0037 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 CNTRL8, 0
3671 7507 6031 KSF
3672 7510 5706 JMP I CNTRL8 /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 CLA /CHECK FOR A CONTROL S
3677 7515 5706 JMP I CNTRL8 /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 CNTRL8 /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 KRB /
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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/VT70 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
3699
/ASK HCW3 QUESTION (HCW3=HARDWARE OPTION WORD 3 - LOC 23)
3700    7540    0000    XC8H3, 0
3701    7541    4537    CARC    /PRINT QUESTION
3702    7542    6760    HCW3MS
3703    7543    0023    HCW3
3704    7544    5748    JMP I XC8H3
3705
3706
3707
3708    7561    0200
3709    7562    7771
3710    7563    7105
3711    7564    7775
3712    7565    7755
3713    7566    8177
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
3723    0001
FIELD 1

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SEQ 0089

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/VT70 CPU DIAGNOSTIC    PAL10    V142A    2-AUG-77    7:30    PAGE 9-12

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SEQ 0090

```

0000 11111111 11111110 11110000 00000000 11111111 11111111 11111111 11111111
0100 11111111 11111111 11111111 11111111 11000000 00000000 00000000 00000001
0200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
0300 11111111 11111111 11111111 11111111 11111111 11111111 11100000 00001111
0400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
0500 11111111 11111111 11111111 11111111 11111111 11111111 11100001 11111111
0600 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
0700 11111111 11111111 11111111 11111111 11111111 11111111 10000000 00011111
1000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
1100 11111111 11111111 11111111 11111111 11111111 11111111 11111110 00000001
1200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
1300 11111111 11111111 11111111 11111111 11111111 11111100 00000000 00000011
1400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
1500 11111111 11111111 11111110 00000000 00000000 00000000 00000000 00001111
1600 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
1700 11111111 11111111 11111111 11111111 11111111 10000000 00000000 00000001
2000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
2100 11111111 11111111 11111111 11111110 00000000 00000000 00000000 00000011
2200 11111111 11111111 11111111 11111111 11111111 00000000 00000000 00000000
2300 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
2400
2500
2600
2700
3000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
3100 11111111 11111111 11111111 11111111 11111111 11111111 10000001 11111111
3200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
3300 11111111 11111111 11111111 11111111 11111111 11111111 11111111 01111111
3400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
3500 11111111 11000000 00000000 00000000 00000000 00000000 00000000 00111111
3600 11111111 11111111 11111111 11111111 11111111 11111111 11111000 00000000
3700 00000000 00000000 00000000 00000000 00000000 00000000 00000000 01111111

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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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```
3088
3089      6500      LORSK=6500      /SKIP ON DONE FLAG
3090      6501      LORR=6501      /IF OUT=0 READ EXTERNAL DEVICE(PRINTER)
3091
3092      6502      LQMP=6502      /IF OUT=1 READ INTERFACE BUFFER
3093      6503      LQMC=6503      /MOVE PAPER
3094      6504      LQPC=6504      /MOVE CARRIAGE
3095      6505      LQRS=6505      /PRINT CHAP
3096      6506      LQLS=6506      /READ STATUS AND CLEAR DONE FLAG
3097      6507      LQRE=6507      /WRITE STATUS AND SET DONE FLAG
3098
3099
3100
3101
3102      0000      0000      *0      ERROR
3103      0000      4450      /LOCATIONS 0-10 GET DESTROYED BY MEMORY EXTENSION
3104
3105
3106
3107      0004      0004      *4
3108      0004      7000      NOP
3109      0005      7000      NOP
3110      0006      7000      NOP
3111
3112
3113
3114
3115
3116      0024      0016      *24      NSQBDR, 16      /BAUD RATE USED FOR NORMAL TEST SEQUENCE
3117
3118      0025      0000      SDEV, 0      /DEVICE CODE BEING TESTED.
3119      0026      0016      BDR1, 16      /BAUD RATE INDICATOR FOR SLU#1
3120      0027      0016      BDR2, 16      /BAUD RATE INDICATOR FOR SLU#2
3121      0030      0016      BDR3, 16      /BAUD RATE INDICATOR FOR SLU#3
3122      0031      0000      LOOPA, 0      /STATUS OF LOOPAROUND (1=LOOPED,0=NOT LOOPED)
3123
3124
3125      4432
3126      0032      7200      C1CRLF=JMS I,
3127      4433      XC1CRLF
3128      0033      1600      SLU2MC=JMS I,
3129      4434      XMODE2
3130      0034      7414      C1PRNT=JMS I,
3131      4435      MFSAG
3132      0035      7453      C1PRT4=JMS I,
3133      4436      X1PRN4
3134      0036      7013      C1SWIT=JMS I,
3135      4437      XC1SW
3136      0037      7223      L1SNF1=JMS I,
3137      4440      XL1SN1
3138      0040      7215      SPAC21=JMS I,
3139      4441      SPAC2
3140      0041      7466      PRN11=JMS I,
3141      4442      X1PRN1
3142      0042      7400      TYPE1=JMS I,
3143      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      CHKSF=JMS I,
3948      0045      7106      XCH1KSF
3949
3950
3951      4446      LOOPPC=JMS I,
3952      0046      2200      PCLOOP
3953      4447      DONLOP=JMS I,
3954      0047      2242      LOPDON
3955      4450      EPROR=JMS I,
3956      0050      6000      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      EIFCLR
3967      4456      CLREXI=JMS I,
3968      0056      2214      EXICLR
3969      4457      CLKERI=JMS I,
3970      0057      2220      ERICLR
3971      4460      SETEXI=JMS I,
3972      0060      2274      EXISET
3973      4461      SETERI=JMS I,
3974      0061      2230      ERISSET
3975      4462      KBCHK=JMS I,
3976      0062      3320      CHKKB
3977      4463      MIOT=JMS I,
3978      0063      3024      XMIOT
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      /MSLU IOTS
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3998      4474      MKCF=JMS I .
3999      0071 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 3752      XSCAF
4026      4512      CFSLU=JMS I .
4027      0112 3765      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

```

/LOCATIONS USED BY THE PROGRAM

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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

```

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

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

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4088
4089      0200      6002      CIREST, IOF
4090
4091      0201      3140      DCA TSTNU      /CLEAR TEST # FOR ERROR DISPLAY
4092      0202      7740      CLA CMA
4093      0203      3136      DCA ECONS1
4094
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
4111
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4120
4121      0221      4446      TEST1, LOOPPC      /SETUP LOOPING ADDRESS
4122      0222      1372      TAD (1      /SETUP TEST NUMBER FOR ERROR DISPLAY
4123      0223      3140      DCA TSTNU
4124      0224      6302      IOF
4125      0225      4455      CLRIF
4126      0226      4511      SLUCAF
4127      0227      4475      MKSF
4128      0230      7410      SKP
4129      0231      4450      ERROR
4130      0232      4503      MTSF
4131      0233      7410      SKP
4132      0234      4450      ERROR
4133      0235      4507      MTSK
4134      0236      7410      SKP
4135      0237      4450      ERROR
4136      0240      4447      DONLOP
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4143
4144
4145      0241      4446      TEST2, LOOPPC
4146      0242      1371      TAD (2
4147      0243      3140      DCA TSTNU
4148      0244      4455      CLRIF
4149      0245      4511      SLUCAF
4150      0246      6301      ION
4151      0247      4475      MKSF
4152      0250      7610      SKP CLA
4153      0251      4450      ERROR
4154      0252      4500      MKIE
4155      0253      4502      MSPF
4156      0254      4533      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      MTSF
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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4202      0403  4446      TEST3,  LOOPPC      /SETUP TEST NUMBER FOR ERROR DISPLAY
4203      0401  1377      TAD (3
4204      0402  3140      DCA TSTNU
4205      0403  4453      CLREIF      /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
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4230      0425  4446      TEST4,  LOOPPC      /SETUP TEST NUMBER FOR ERROR DISPLAY
4231      0426  1376      TAD (4
4232      0427  3140      DCA TSTNU
4233      0430  4455      CLREIF      /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      CLREXI      /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
    
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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      MTCF      /CLEAR XMIT FLAG ENABLE
4261      0464  4503      MTSF      /SKIP ON TRANSMIT FLAG SET AND ENABLED
4262      0465  7410      SKP
4263      0466  4450      ERROR      /TCF 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
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4274      0473  4446      TEST5,  LOOPPC      /SETUP TEST NUMBER FOR ERROR DISPLAY
4275      0474  1375      TAD (5
4276      0475  3140      DCA TSTNU
4277      0476  4455      CLREIF      /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  4450      CLREXI      /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      /PROGRAM FAILED TO INTERRUPT WITH INT ENA + XMIT FLAG
4297      0522  4450      ERROR
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      MTCF      /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 /TCF FAILED TO CLEAR XMIT FLAG
4309 0536 4450 ERROR /SKIP ON RECEIVE FLAG
4310 0537 4475 MTSF /RECEIVE FLAG SET BY ABOVE CODE
4311 0540 7610 SKP CLA
4312 0541 4450 ERROR
4313 0542 4447 DONLOP
4314
4315 0575 0005
4316 0576 0004
4317 0577 0003

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PAGE

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4318
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 3263 DCA TS60W2
4331 0604 1376 TAD (6
4332 0605 3140 DCA TSTNU /SETUP TEST NUMBER FOR ERROR DISPLAY
4333 0606 4446 TEST6, LOUOPC
4334 0607 1775 TAD BORATE /IS BAUD RATE SET = 19200 BITS/SEC ?
4335 0610 0374 AND (0017
4336 0611 7640 SZL CLA
4337 0612 5224 JMP RES60W /NO-DO FULL INTERRUPT TEST
4338 0613 1373 TAD (NOP /YES-REPLACE SOME OF THE IONS WITH NOPS
4339 /OTHERWISE THE SECOND RCV FLAG WILL GET
4340 /LOST DUE TO PROGRAM TIMING
4341 0614 3264 DCA TS60W3
4342 0615 1373 TAD (NOP
4343 0616 3274 DCA TS60W4
4344 0617 1373 TAD (NOP
4345 0620 3341 DCA TS60W5
4346 0621 1373 TAD (NOP
4347 0622 3347 DCA TS60W6
4348 0623 5235 JMP OWSET
4349 0624 1372 RES60W, TAD (ION /RESTORE TEST6 TO NORMAL
4350 0625 3264 DCA TS60W3
4351 0626 1371 TAD (ERROR
4352 0627 3274 DCA TS60W4
4353 0630 1372 TAD (ION
4354 0631 3341 DCA TS60W5
4355 0632 1371 TAD (ERROR
4356 0633 3347 DCA TS60W6
4357 0634 5235 JMP OWSET
4358 0635 4455 OWSET, CLREIF /CLEAR EXPECTING INTERRUPT FLAGS,
4359 0636 4512 CFSLU /CLEAR ALL FLAGS BUT SET SLU INT ENA
4360 0637 4467 LOOP /SETUP LOOPAROUND ON ALL SLUS.

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4361 0640 3136 DCA ECON61 /INT, CANNOT BE ATTRIBUTED TO CONSOLE PACK REQ
4362 / WHILE LOOPED,
4363 0641 6001 ION /TURN THE INTERRUPT ON
4364 0642 4464 SETEXI /SET EXP XMIT INT FLAG
4365 0643 4502 MSPF /SET THE TRANSMIT FLAG EN
4366 0644 4503 MTSF /SKIP ON XMIT FLAG SET AND EN
4367 0645 4450 ERROR /TRANSMIT FLAG FAILED TO SET BY SPF
4368 0646 4507 MTSK /SKIP ON XMIT FLAG AND INT ENA ON A 1
4369 0647 4450 ERROR /TSK FAILED TO SKIP WITH INT ENA + FLAG SET
4370 0650 2117 ISZ INTFLG /DID THE PROGRAM INTERRUPT
4371 0651 4450 EPROR /PROGRAM FAILED TO INTERRUPT WITH XMIT AND INT ENA SET
4372 0652 4510 TS60W1, MTLS/MTPC /LOAD TRANSMIT BUFFER, TRANSMIT, CLEAR XMIT FLAG, SET XMIT EN
4373 0653 6021 ION /TURN THE INTERRUPT ON
4374 0654 4503 MTSF /NOTE: XMIT FUNCTION IN UART IS BUFFERED,
4375 / THE FIRST TLS WILL BRING THE XMIT FLAG BACK
4376 / UP VERY QUICKLY, THE SECOND TLS MUST WAIT FOR THE
4377 / FIRST CHARACTER TO BE XMITTED BEFORE
4378 / BRINGING UP XMIT FLAG,
4379 0655 7610 SKP CLA
4380 0656 5261 JMP ,+3
4381 0657 4451 TSFWAT
4382 0660 4450 EPROR /NO XMIT FLAG
4383 0661 2117 ISZ INTFLG /ERROR, NO INTERRUPT OCCURRED
4384 0662 4450 EPROR
4385 0663 4510 TS60W2, MTLS/MTPC
4386 0664 6001 TS60W3, ION/NOP
4387 0665 4503 MTSF /SKIP ON THE TRANSMIT FLAG
4388 0666 7610 SKP CLA
4389 0667 4450 EPROR /TLS FAILED TO CLEAR XMIT FLAG
4390 0670 4461 SETERI /SET EXPECTING RECEIVE INTERRUPT FLAG
4391 /NOTE: FIRST REC FLAG MAY SET BEFORE SECOND XMIT FLAG
4392 0671 4451 TSFWAT /WAIT FOR TRANSMIT FLAG TO SET
4393 0672 4450 ERROR /TIMEOUT; UART FAILED TO SET XMIT FLAG
4394 0673 2117 ISZ INTFLG /DID THE PROGRAM INTERRUPT?
4395 0674 4450 TS60W4, ERROR/NOP /ERROR, NO INTERRUPT WITH XMIT AND INT ENA SET
4396 0675 4507 MTSK /SKIP ON XMIT FLAG SET & EN +INT ENA SET,
4397 0676 4450 ERROR /FAILED TO SKIP OR INT ENA OR FLAG GOT CLEARED
4398 0677 4504 VTCF /CLEAR TRANSMIT FLAG ENABLE
4399 0700 4456 CLREXIT /CLEAR EXPECTING TRANSMIT INTERRUPT FLAG
4400 0701 6001 ION/NOP /TURN THE INTERRUPT ON
4401 0702 4452 KSFWAT /WAIT FOR THE RECEIVE FLAG TO SET
4402 0703 4450 EPROR /NO SKIP, OR RECEIVE FLAG NOT SET BY RCD DATA AVAILABLE
4403 0704 4507 MTSK /SKIP ON RCV FLAG AND INT ENA
4404 0705 4450 ERROR
4405 0706 2117 ISZ INTFLG /DID RCV AND INT ENA CAUSE AN INTERRUPT?
4406 0707 4450 TS60W6, ERROR/NOP /NO, ERROR
4407 0710 4474 MKCF /CLEAR RECEIVE FLAG
4408 0711 6001 ION /TURN THE INTERRUPT ON
4409 0712 4452 KSFWAT /WAIT FOR SECOND CHAR TO BE RECEIVED
4410 0713 4450 ERROR
4411 0714 4474 MKCF /CLEAR RECEIVE FLAG
4412 0715 6001 ION
4413 0716 4475 MTSF /SKIP ON RECEIVE FLAG
4414 0717 7610 SKP CLA
4415 0720 4450 ERROR /KCF FAILED TO CLEAR RECEIVE FLAG

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4416 0721 4503      MTSF      /SKIP ON XMIT FLAG
4417 0722 7610      SKP CLA
4418 0723 4450      ERROR      /TRANSMIT FLAG GOT RESET BY ABOVE CODE
4419 0724 4447      DONLOP
4420
4421
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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 1140      DCA TSTNU
4432 0733 5206      JMP TEST6
4433
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4435 0767 0007
4436 0770 4506
4437 0771 4450
4438 0772 0001
4439 0773 7000
4440 0774 0017
4441 0775 3124
4442 0776 0006
4443 0777 4512
4444 1000

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4451 1000 4446      TEST10, LOOPPC
4452 1001 1377      TAD (10
4453 1002 3140      DCA TSTNU
4454 1003 4455      CLRIF
4455 1004 4511      SLUCAF
4456 1005 4467      LOOP
4457 1006 0001      ION
4458 1007 4460      SETEXI
4459 1010 4502      MSPF
4460 1011 4456      CLRFXI
4461 1012 4503      MTSF
4462 1013 4450      ERROR
4463 1014 2117      ISZ INTFLG
4464 1015 4450      ERROR
4465 1016 4510      MTL5
4466 1017 4504      MTCF
4467 1020 4461      SETERI
4468 1021 0001      ION
4469 1022 4503      MTSF

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/SETUP TEST NUMBER FOR ERROR DISPLAY

/CLEAR EXPECTING INTERRUPT FLAGS
/CLEAR ALL FLAGS BUT SET INT ENABLE
/SETUP LOOPAROUND ON SLU'S
/TURN THE INTERRUPT ON
/SET EXPECTING TRANSMIT INTERRUPT FLAG
/SET THE TRANSMIT FLAG ENABLE
/CLEAR EXPECTING TRANSMIT INTERRUPT FLAG
/SKIP ON TRANSMIT FLAG SET AND ENABLED
/SPF FAILED TO SET XMIT FLAG

/PROGRAM FAILED TO INTERRUPT

/SET EXPECTING RECEIVE INTERRUPT FLAG

/SKIP ON XMIT FLAG SET AND ENABLED

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4470 1023 7410      SKP
4471 1024 4450      ERROR
4472 1025 4451      TSFWAT
4473 1026 7410      SKP
4474 1027 4450      ERROR
4475 1030 4452      KSFWAT
4476 1031 4450      ERROR
4477 1032 4457      CLRERI
4478 1033 4507      MTSF
4479 1034 4450      ERROR
4480 1035 2117      ISZ INTFLG
4481 1036 4450      EPROR
4482 1037 4476      MKCC
4483 1040 0001      ION
4484 1041 4475      MKSF
4485 1042 7610      SKP CLA
4486 1043 4450      ERROR
4487 1044 4447      DONLOP
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/*****
/TEST 11 - CHECKS THAT KRB WILL CLEAR THE RCV FLAG, THE RCV FLAG
/IS SET BY ISSUING TLS COMMAND.
/*****/

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4496 1045 4446      TEST11, LOOPPC
4497 1046 1376      TAD (11
4498 1047 3140      DCA TSTNU
4499 1050 4455      CLRIF
4500 1051 4511      SLUCAF
4501 1052 4467      LOOP
4502 1053 0001      ION
4503 1054 7000      NOP
4504 1055 4460      SETEXI
4505 1056 4510      MTL5
4506 1057 4451      TSFWAT
4507 1060 4450      ERROR
4508 1061 2117      ISZ INTFLG
4509 1062 4450      ERROR
4510 1063 4504      MTCF
4511 1064 4456      CLRFXI
4512 1065 4461      SETERI
4513 1066 0001      ION
4514 1067 4452      KSFWAT
4515 1070 4450      ERROR
4516 1071 4457      CLRERI
4517 1072 4477      MKRS
4518 1073 4475      MKSF
4519 1074 4450      ERROR
4520 1075 2117      ISZ INTFLG
4521 1076 4450      ERROR
4522 1077 4501      MKRB
4523 1100 0001      ION
4524 1101 4475      MKSF

```

/SETUP TEST NUMBER FOR ERROR DISPLAY

/CLEAR EXPECTING INTERRUPT FLAG
/CLEAR ALL FLAGS AND SET SLU INT ENA
/SETUP LOOPAROUND ON SLU'S
/TURN THE INTERRUPT ON

/SET EXPECTING XMIT INTERRUPT FLAG
/TRANSMIT, SET XMIT EN, CLEAR XMIT FLAG
/WAIT FOR THE XMIT FLAG TO SET
/XMIT FLAG FAILED TO SET BY TLS
/DID THE PROGRAM INTERRUPT
/FAILED TO INTERRUPT WITH INT ENA AND XMIT FLAG
/CLEAR XMIT FLAG
/CLEAR EXPECTING TRANSMIT INTERRUPT FLAG
/SET EXPECTING RECEIVE INTERRUPT FLAG,
/TURN THE INTERRUPT ON
/WAIT FOR THE RCV FLAG TO SET
/RECEIVE FLAG FAILED TO SET
/CLEAR EXPECTING RECEIVE INTERRUPT FLAG
/READ THE RECEIVE BUFFER
/SKIP ON RECEIVE FLAG
/KRS CLEARED THE RCV FLAG
/DID THE PROGRAM INTERRUPT
/FAILED TO INTERRUPT WITH INT ENA + RCV FLAG
/CLEAR RECEIVE FLAG
/TURN THE INTERRUPT BACK ON
/SKIP ON RECEIVE FLAG

```
4525 1102 7610 SKP CLA
4526 1103 4450 ERROR /KRB FAILED TO CLEAR RECEIVE FLAG
4527 1104 4447 DONLOP
4528
4529
4530
4531 /*****
4532 /TEST 12 - CHECKS THAT CAF WILL CLEAR RCV FLAG
4533 /*****
4534 TEST12, LOOPPC
4535 TAD (12 /SETUP TEST NUMBER FOR ERROR DISPLAY
4536 DCA TSTNU
4537 CLRIF /CLEAR EXPECTING INTERRUPT FLAGS
4538 SLUCAF /CLEAR ALL FLAGS
4539 LOOP /SETUP LOOPAROUND ON ALL SLU'S
4540 ION /TURN THE INTERRUPT ON
4541 NOP
4542 SETEXI /SET EXPECTING TRANSMIT INTERRUPT FLAG
4543 MTLS /TRANSMIT, SET XMIT EN, CLEAR XMIT FLAG
4544 TSFWAT /WAIT FOR XMIT FLAG
4545 ERROR /XMIT FLAG FAILED TO SET
4546 CLREXI /CLEAR EXPECTING TRANSMIT INTERRUPT FLAG
4547 IS2 INTFLG /DID THE PROGRAM INTERRUPT?
4548 ERROR /PROGRAM FAILED TO INTERRUPT
4549 MTCF /CLEAR TRANSMIT FLAG EN
4550 SETERI /SET EXPECTING RECEIVE INTERRUPT FLAG
4551 ION
4552 KSFWAT /WAIT FOR RECEIVE FLAG
4553 ERROR /RECEIVE FLAG FAILED TO SET
4554 CLRERI /CLEAR EXPECTING RECEIVE INTERRUPT
4555 IS2 INTFLG /DID THE PROGRAM INTERRUPT
4556 ERROR /PROGRAM FAILED TO INTERRUPT
4557 SLUCAF /CLEAR ALL FLAGS
4558 ION /TURN THE INTERRUPT BACK ON
4559 MKSF /SKIP ON RECEIVE FLAG
4560 SKP CLA
4561 ERROR /INITIALIZE FAILED TO CLEAR RECEIVE FLAG
4562 DONLOP
4563 1175 0012
4564 1176 0011
4565 1177 0010
4566 1200
4567
4568
4569 /*****
4570 /TEST 13 - CHECKS THE EFFECT OF THE SLU IOT'S UPON THE AC
4571 /*****
4572 TEST13, LOOPPC
4573 TAD (13 /SETUP TEST NUMBER FOR ERR DISPLAY
4574 DCA TSTNU
4575 CLRIF /CLEAR EXPECTING INTERRUPT FLAGS
4576 SLUCAF /CLEAR ALL FLAGS
4577 LOOP /SETUP LOOPAROUND ON SLU'S
4578 ION /TURN THE INTERRUPT ON
```

PAGE

```
4579 1207 7144 CLA CLL CMA RAL /SET THE AC TO -2
4580 1210 4500 MKIE /CLEAR SLU INTERRUPT ENABLE
4581 1211 7050 CMA RAR
4582 1212 7420 SNL
4583 1213 4450 ERROR /KIE CHANGED THE AC
4584 1214 7240 CLA CMA
4585 1215 4476 MKCC /CLEAR RECEIVE FLAG AND AC
4586 1216 7440 SZA
4587 1217 4450 ERROR /KCC FAILED TO CLEAR THE AC
4588 1220 7240 CLA CMA
4589 1221 4501 MKRB /CLEAR AC AND READ RECEIVE BUFFER
4590 1222 7510 SPA
4591 1223 4450 ERROR /KRB FAILED TO CLEAR AC
4592 1224 7240 CLA CMA
4593 1225 4477 MKRS /READ RECEIVE BUFFER - INCLUSIVE OR WITH AC
4594 1226 7040 CMA /SET THE AC BACK TO 0
4595 1227 7440 SZA
4596 1230 4450 ERROR /KRS CHANGED THE AC
4597 1231 7340 CLA CLL CMA
4598 1232 4475 MKSF /SKIP ON RECEIVE FLAG
4599 1233 7040 CMA
4600 1234 7440 SZA
4601 1235 4450 ERROR /KSF CHANGED THE AC
4602 1236 7240 CLA CMA
4603 1237 4474 MKCF /CLEAR RECEIVE FLAG
4604 1240 7040 CMA
4605 1241 7440 SZA
4606 1242 4450 ERROR /KCF CHANGED THE AC
4607 1243 7240 CLA CMA
4608 1244 4502 MSPF /SET TRANSMIT FLAG ENABLE
4609 1245 7040 CMA
4610 1246 7440 SZA
4611 1247 4450 ERROR /TFL CHANGED THE AC
4612 1250 7240 CLA CMA
4613 1251 4504 MTCF /CLEAR THE TRANSMIT FLAG EN
4614 1252 7040 CMA
4615 1253 7440 SZA
4616 1254 4450 ERROR /TCF CHANGED THE AC
4617 1255 7240 CLA CMA
4618 1256 4503 MTSF /SKIP ON TRANSMIT FLAG SET AND ENABLED
4619 1257 7040 CMA
4620 1260 7440 SZA
4621 1261 4450 ERROR /TSF CHANGED THE AC
4622 1262 7240 CLA CMA
4623 1263 4506 MTPC /LOAD TRANSMIT BUFFER AND TRANSMIT
4624 1264 7040 CMA
4625 1265 7440 SZA
4626 1266 4450 ERROR
4627 1267 4451 TSFWAT /WAIT FOR THE TRANSMIT FLAG
4628 1270 4450 ERROR /TRANSMIT FLAG FAILED TO SET
4629 1271 4452 KSFWAT /WAIT FOR THE RECEIVE FLAG
4630 1272 4450 ERROR /RECEIVE FLAG FAILED TO SET
4631 1273 4504 MTCF /CLEAR THE XMIT FLAG EN
4632 1274 4474 MKCF /CLEAR THE RECEIVE FLAG
4633 1275 7240 CLA CMA
```

```

4634 1276 4537 MTSK /SKIP IF XMIT/RCV FLAG SET AND INT ENA SET
4635 1277 7840 CMA
4636 1303 7440 SZA
4637 1301 4450 ERROR /TSK CHANGED THE AC
4638 1302 7240 CLA CMA /LOAD TRANSMIT BUFFER, TRANSMIT + CLEAR FLAG, SET XMIT EN
4639 1303 4510 MTL5
4640 1304 7840 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 KSFAT /WAIT FOR THE RECEIVE FLAG TO SET
4646 1312 4450 ERROR /ERROR RECEIVE FLAG FAILED TO SET
4647 1313 4504 MTCF /CLEAR THE TRANSMIT FLAG
4648 1314 4476 MKCC /CLEAR AC AND RECEIVE FLAG
4649 1315 4447 DONLOP

```

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

```

4654 1316 4446 TEST14, LOOPPC /SETUP TEST NUMBER FOR ERROR DISPLAY
4655 1317 1376 TAD (14
4656 1320 3140 DCA TSTNU
4657 1321 4455 CLWELF /CLEAR EXPECTING INT FLAGS
4658 1322 4512 CFSLU /CLEAR ALL SLU FLAGS AND EN SLU INT.
4659 1323 3126 DCA SLUXMT /CLEAR THE WORD TO BE TRANSMITTED
4660 1324 4453 SLUDAT /GO TRANSMIT, READ AND COMPARE THE WORD
4661 1325 4454 SLUDER /DATA ERROR=WORD WAS NON ZERO BEING READ BACK
4662 1326 4447 DONLOP

```

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

```

4671 1327 4446 TEST15, LOOPPC /CHECK FOR APT CONTROL AND OK REPORT TO APT
4672 1330 4775 JMS APT /SETUP TEST NUMBER FOR ERROR DISPLAY
4673 1331 1374 TAD (15
4674 1332 3140 DCA TSTNU
4675 1333 4455 CLREIF /CLEAR EXPECTING INT FLAGS
4676 1334 4512 CFSLU /CLEAR ALL SLU FLAGS AND EN SLU INT.
4677 1335 1373 TAD (377
4678 1336 3126 DCA SLUXMT /SET THE WORD TO BE TRANSMITTED TO ALL ONE'S
4679 1337 4453 SLUDAT /GO TRANSMIT, READ AND COMPARE
4680 1340 4454 SLUDER /DATA ERROR = WORDS DO NOT COMPARE
4681 1341 4447 DONLOP

```

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

```

4689 1342 4446 TEST16, LOOPPC /SETUP TEST NUMBER FOR ERROR DISPLAY
4690 1343 1372 TAD (16
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
4696 1351 4453 SLUDAT /TRANSMIT, READ AND COMPARE THE WORD
4697 1352 4454 SLUDER /DATA ERROR = TRANSMITTED A 252
4698 1353 1370 TAD (125
4699 1354 3126 DCA SLUXMT /SET TRANSMIT WORD TO 125
4700 1355 4453 SLUDAT /TRANSMIT, READ AND COMPARE THE WORD
4701 1356 4454 SLUDER /DATA ERROR = TRANSMITTED A 125
4702 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 /SETUP TEST NUMBER FOR ERROR DISPLAY
4714 1401 1377 TAD (17
4715 1402 3140 DCA TSTNU
4716 1403 4455 CLREIF /CLEAR EXPECTING INTERRUPT FLAGS
4717 1404 4512 CFSLU /CLEAR ALL SLU FLAGS AND EN SLU INT.
4718 1405 7301 OTZ, CLA CLL IAC
4719 1406 3126 DCA SLUXMT
4720 1407 4453 SLUDAT
4721 1410 4454 SLUDER
4722 1411 1126 TAD SLUXMT
4723 1412 8376 AND (8200
4724 1413 7640 SZA CLA
4725 1414 5220 JMP ZTO
4726 1415 1126 TAD SLUXMT
4727 1416 7104 CLL RAL
4728 1417 5206 JMP OTZ+1
4729 1420 7144 ZTO, CLL CMA RAL
4730 1421 8375 AND (8377
4731 1422 3126 DCA SLUXMT
4732 1423 4453 SLUDAT
4733 1424 4454 SLUDER
4734 1425 1126 TAD SLUXMT
4735 1426 8376 AND (8200
4736 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  6200    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 00P1 0001 / 110
4853 1603 00P1 0021 / 134.5
4854 1604 00P1 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 7300 CLA CLL
4908 1662 1660 TAD I XMODE2
4909 1663 6307 KMDI /GET MODE REQUEST
4910 1664 7300 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 7300 CLA CLL
4918 1671 1667 TAD I XVDLY
4919 1672 7041 CIA
4920 1673 3300 DCA VDCTR
4921 1674 2267 ISZ XVDLY
4922 1675 2300 ISZ VDCTR
4923 1676 5275 JMP ,+1
4924 1677 5667 JMP I XVDLY
4925 1700 0000 VDCTR, 0
4926
4927 /*****
4928 /TEST 21 - VERIFY EIA DRIVERS ON SIGNAL DISTRIBUTION BOARD
4929 / (EXCEPT FOR SLU #1 WHICH IS NOT 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 /YES--SKIP THIS TEST
4946 1716 6507 LORE /YES--LOOP SLU'S EXTERNALLY
4947 / VIA SIMULATOR (RESTORE)
4948 CLREIF /CLEAR EXPECTING INTERRUPT FLAGS
4949 CFSLU /CLEAR ALL SLU FLAGS & EN SLU INT.
4950 1721 1373 TAD (0252
4951 1722 3126 DCA SLUXMT /SET UP THE WORD TO BE TRANSMITTED - 252
4952 1723 1372 TAD (LOOP
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 6252
4964 1774 6030
4965 1775 2621
4966 1776 6200
4967 1777 6221
4968 2060
4969 2061
4970 2062
4971 2063
4972 2064
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 6374
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 6002
5011 2045 1372
5012 2046 3344
5013 2047 6316
5014 2050 6311
5015 2051 5250

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

TEST22, LOOPPC
TAD (22
DCA TSTNU
CLKEIF
CFSLU
TAD IOT0
CIA
TAD (KCF1
SZA CLA
JMP EXS17
CMA
DCA SLUXMT
DCA VMODE
SLU2MC
0000
SLUDAT
JMP L211
TAD SLUREC
ERROR
L211, TAD VMODE
AND (0000
CLL RAR
TAD LENBAS
DCA PTED
TAD I PTED
CIA
TAD SLUREC
SZA CLA
JMS SLULER
ISZ VMODE
TAD VMODE
AND (0040
SNA CLA
JMP CHARLP
SLU2MC
MODE1
IOF
TAD (-4
DCA XLCTR
XNC, TSL1
TSF1
JMP ,-1

/SETUP TEST NUMBER FOR ERROR DISPLAY
/CLEAR EXPECTING INTERRUPT FLAGS
/CLEAR ALL SLU FLAGS AND EN SLU INT,
/SLU #2 BEING TESTED?
/NO-SKIP TEST 17
/SETUP XMIT WORD TO ALL ONES
/CLEAR MODE CONTROL WORD
/SET MODE IN SLU#2
/TRANSMIT CHAR AND READ REC'D CHAR
/REC'D CHAR NOT=XMIT WORD (AS EXPECTED)
/REC'D CHAR CONTAINS 12 ONES - ALL FOUR ERROR
/ BITS ARE SET, AC=RECEIVED CHARACTER
/ISOLATE CHAR LENGTH BITS IN VMODE
/SETUP POINTER TO EXPECTED RECV DATA
/COMPARE REC'D DATA WITH EXPECTED DATA
/NOT EQUAL
/EQUAL - WORK ON NEXT MODE
/ALL MODES TESTED
/RESTORE SLU #2 TO NORMAL MODE
/CHECK FOR SLU#2 OVERRUN ERROR
/XMIT FOUR CHARACTERS BEFORE UNLOADING RECEIVE BUFFER REGISTER

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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 1427
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 6037
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 1276

ISZ XLCTR
JMP XNC
KSFAT
ERROR
KRBI
DCA SLUREC
TAD SLUREC
AND (7400
TAD (-4400
SZA CLA
JMS OERR
DELAY
CFSLU
TAD BOR2
TAD (-16
SZA CLA
JMP EXS17
TAD (MODE2
DCA PMODE
SLU2MC
0000
TSL1
TSF1
JMP ,-1
VDELAY
0010
KLB
VDELAY
0004
CLA IAC
KLB
KSFAT
ERROR
KRBI
DCA SLUREC
TAD SLUREC
AND (7400
TAD (-6000
SZA CLA
JMS PERR
TAD PMODE
TAD (-MODE2
SZA CLA
JMP EXS17
ISZ PMODE
JMP PMODE=1

/FOUR CHAR HAVE BEEN XMITTED-WAIT FOR REC FLAG
/NO RECEIVE FLAG
/CLEAR AC AND REC FLAG AND READ BUFFER
/SAVE REC'D STATUS
/MASK OFF STATUS BITS
/EXPECTED OE=4400
/DELAY AND THEN CLEANUP RECEIVER
/CLEAR ALL SLU FLAGS AND EN SLU INT.
/SKIP PARITY CHECK IF BAUD RATE IS NOT 9600.
/(DELAYS ARE SET FOR 9600 BAUD RATE ONLY)
/CHECK FOR PARITY ERROR USING ODD PARITY MODE
/XMIT AN ALL ZERO CHAR
/PRE-DELAY LET FIRST FEW BITS OF CHAR BE XMITTED
/REMOVE LOOPAROUND LONG ENOUGH TO MESS UP REC DATA AND
/ CAUSE A PARITY ERROR.
/RESTORE LOOPAROUND
/WAIT FOR RECEIVE FLAG
/NO RECEIVE FLAG
/CLEAR AC AND REC FLAG AND READ BUFFER
/SAVE REC'D STATUS
/MASK OFF STATUS BITS
/EXPECTED PE=6000
/PERFORM SAME PARITY ERROR CHECK USING EVEN PARITY MODE
/AC=REC'D DATA AND STATUS-OVERRUN SHOULD HAVE OCCURRED

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SEQ 0117

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5071 2137 7421 MQL
5072 2140 1127 TAD SLURFC
5073 2141 4450 ERROR
5074 /AC,MQ=REC'D DATA AND STATUS,MODE
5075 2142 7300 CLA CLL
5076 2143 5735 JMP I PERR
5077 2144 0000 XLCTR, 0
5078 2145 4447 EX817, DONLOP
5079
5080 2146 2147 LENSAS, ,+1
5081 2147 0037
5082 2150 0077 /EXPECTED DATA - CHAR LENGTH= 5 BITS
5083 2151 0177 /
5084 2152 0377 /
5085
5086
5087 2153 0000 SLULER, 0
5088 2154 1127 TAD SLUKEC
5089 2155 7421 MQL
5090 2156 1216 TAD VMODE
5091 2157 4450 ERROR
5092 /AC,MQ=MODE,REC'D DATA
5093 /EXPECTED DATA=ALL 1'S FOR CHAR LENGTH
5094 2160 7300 CLA CLL
5095 2161 5753 JMP I SLULER
5096 2162 0000 PTED, 0
5097

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SEQ 0118

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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 PAGE
5111 /ROUTINE TO SETUP # OF PASSES/TEST AND TO STORE THE RETURN ADDRESS FOR SCOPE LOOPING
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
5120 2210 7000 NOP
5121 2211 1700 NUOK, TAD PCLOOP
5122 2212 3124 DCA TESTF1
5123 2213 5000 JMP I PCLOOP
5124
5125 /EXPECTED INTERRUPT ROUTINES
5126
5127 2214 0000 EXICLR, 0
5128 2215 7300 CLA CLL
5129 2216 3120 DCA EXMITI
5130 2217 5014 JMP I EXICLR
5131
5132 2220 0000 ERICLR, 0
5133 2221 7300 CLA CLL
5134 2222 3121 DCA ERECI
5135 2223 5020 JMP I ERICLR
5136
5137 2224 0000 EXISER, 0
5138 2225 7240 CLA CMA
5139 2226 3120 DCA EXMITI
5140 2227 5024 JMP I EXISER
5141
5142 2230 0000 ERISER, 0
5143 2231 7240 CLA CMA
5144 2232 3121 DCA ERECI
5145 2233 5030 JMP I ERISER
5146
5147 2234 0000 EIFCLR, 0
5148 2235 7300 CLA CLL
5149 2236 3120 DCA EXMITI
5150 2237 3121 DCA ERECI
5151 2240 3117 DCA INTFLG

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5152      2241 5634      JMP I EIFCLR
5153
5154
5155      /DONE TEST ROUTINE
5156
5157      2242 0000      LOPDON, 0
5158      2243 7300      CLA CLL
5159      2244 1757      TAD LLLD      /SLU TESTING IN PROGRESS?
5160      2245 7841      CIA
5161      2246 1267      TAD KJILD
5162      2247 7640      SZA CLA
5163      2250 5253      JMP GSR      /YES
5164      2251 4462      KBCHK      /CHECK FOR KEYBOARD INTERVENTION
5165      2252 5253      JMP GSR
5166      2253 4465      GSR, GETSR /CHECK FOR LOOP ON TEST
5167      2254 7806      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
5173
5174      2260 1665      TAD I TESTAB
5175      2261 7450      SNA
5176      2262 5271      JMP CKBRSG /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      CKBRSG, JMS XBAUD /SETUP FOR NEXT BAUD RATE
5185      2272 5775      JMP NXTDC /ALL BAUD RATES TESTED, DO NEXT SLU
5186      2273 1374      TAD (BDRSG-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      BDRSG, 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
5260      2357 0000      ADDTIM, 0
5261      2360 2122      ISZ CNT /EACH INCREMENT ON CNT = APP. 67.5 MICROSEC
5261      2361 7610      SKP CLA

```

ISZ CNT1
CLA CLL CHA RTL
IAC
TAD ADDTIM
DCA ADUTIM
JMP I ADDTIM

5262 2362 2123
5263 2363 7346
5264 2364 7001
5265 2365 1357
5266 2366 3357
5267 2367 5757
5268
5269
5270 2372 2471
5271 2373 7777
5272 2374 2321
5273 2375 0214
5274 2376 3112
5275 2377 3331
2400

PAGE

/THIS ROUTINE SETS UP A RETURN ADDRESS FOR INTERRUPT RETURNS FROM ANOTHER FIELD

RETURN, 0
CDF /CHANGE DATA FIELD TO FIELD 0
TAD I K0 /GET THE INTERRUPT PC
DCA RETIADD /SAVE IT
RIF /READ THE PROGRAM INSTRUCTION FIELD
TAD KCDF /ADD A CDF INSTRUCTION TO IT
DCA ,+1 /SAVE IT IN THE NEXT LOCATION
HLT/CDF /RETURN TO THE PROGRAM DATA FIELD
TAD I RETURN /GET THE INTERRUPT RETURN LOCATION
DCA SAVLOC /SAVE IT
ISZ RETURN
TAD RETIADD
DCA I SAVLOC
JMP I RETURN

K0, 0
RETIADD, 0
SAVLOC, 0

/ROUTINE FOR TRANSMITTING, READING AND COMPARING DATA FOR SLU

DATSLU, 0
CLA CLL
DLOP, LOOP /SETUP LOOPAROUND IN SLU'S
TAD (LOOP /SETUP LOOP INST. IN CASE EIA DRIVER TEST
(TEST 21) HAS CHANGED IT TO A NOP

DCA DLOP
ION /TURN THE INTERRUPT ON
DCA INTFLG /CLEAR THE PROGRAM INTERRUPT FLAG
SETEXI /SET EXPECTING TRANSMIT INT FLAG
TAD SLUXMT /GET THE WORD TO BE TRANSMITTED
MTLS /LOAD AND TRANSMIT IT AND CLEAR THE FLAG
ISFWAT /WAIT FOR THE TRANSMIT FLAG
ERROR /XMIT FLAG FAILED TO SET
CLNEXI /CLEAR EXP XMIT INT FLAG
ISZ INTFLG /DID THE PROGRAM INTERRUPT?
ERROR /PROGRAM FAILED TO INTERRUPT

MTCF /CLEAR THE XMIT FLAG EN
SETERI /SET EXP RECV INT FLAG
ION /TURN THE INTERRUPT BACK ON
KSFWAT /WAIT FOR THE RECEIVE FLAG TO SET
ERROR /RECEIVE FLAG FAILED TO SET
CLRERI /CLEAR EXP RECV INT FLAG
ISZ INTFLG /DID THE RECEIVE FLAG CAUSE A INTERRUPT
ERROR /RECEIVE FLAG FAILED TO CAUSE A INTERRUPT
MKRB /CLEAR THE AC AND RCV FLAG AND READ BUFFER
DCA SLUREC /SAVE THE WORD READ BACK
ION /TURN THE INTERRUPT BACK ON
TAD SLUXMT /GET THE WORD TRANSMITTED
CIA
TAD SLUREC /GET THE WORD READ BACK
SZA CLA
JMP I DATSLU /DATA ERROR-RETURN TO REPORT THE ERROR
ISZ DATSLU /BUMP RETURN ADDRESS POINTER BY ONE
JMP I DATSLU /RETURN TO TEST

/DATA ERROR ROUTINE FOR SERIAL LINE UNIT

DERSLU, 0
CLA CMA
TAD DERSLU /
DCA DDERSLU /SAVE ADDRESS WHERE ERROR WAS DETECTED
SPE3, ERROR /WORD XMITTED NOT= WORD RECEIVED
JMP I DERSLU /NO, RETURN TO TEST
DDERSLU, 0

OFONKI, 0
TAD TESTF1 /ROUTINE TO TURN INT ENA OFF OR ON
TAD (-TEST13-1 /GET THE TEST BEING EXECUTED
SZA CLA
CLA CLL IAC /NO, SET THE AC TO 0001
TAD (2 /
MKIE /ENABLE OR DISABLE SLU INT ENA
/ENABLE SLU 2 STATUS BITS
CLA /CLEAR THE AC BIT IF SET
JMP I OFONKI /RETURN

/ROUTINE TO CHECK IF UNDER APT CONTROL--IF SO REPORT OK STATUS TO APT.

REPAPT, 0
CLA CLL
CDF 00
TAD I (HCW2 /UNDER APT CONTROL?
CDF 10
SMA CLA
JMP I REPAPT /NO
JMS APTOK1 /YES--REPORT OK TO APT
JMP I REPAPT

```

5371
5372 /REPORT TO APT DURING VARIABLE BAUD RATE SEQUENCE OF TESTING WHEN
5373 / BAUD RATE FOR TEST REACHES A PRESET VALUE.
5374
5375 2513 0000 APTP, 0
5376 2514 1772 TAD BDRATE /GET CUPRENT SETTING(+1)
5377 2515 0371 AND (0003) /LOOK AT ONLY 2 LEAST SIGNIF, BITS
5378 2516 7041 CIA
5379 2517 1323 TAD BPIHR /AGREE WITH PRESET VALUE?
5380 2520 7650 SNA CLA
5381 2521 4515 APTPEP /YES--REPORT TO APT
5382 2522 5713 JMF I APTP
5383 2523 0002 RPTBR, 0002
5384
5385
5386
5387 2571 0003
5388 2572 3124
5389 2573 6725
5390 2574 0022
5391 2575 0002
5392 2576 6577
5393 2577 4467
5394 2600
5395 PAGE
5396 /*****
5397 /SUBROUTINES TO ISSUE SLU IOTS
5398 /*****
5399 2600 0000 XMKCF, 0
5400 2601 6030 IOT0, KCF /CLEAR RECEIVE FLAG
5401 2602 5600 JMP I XMKCF
5402 2603 4450 ERROR /KCF SKIPPED
5403 2604 5600 JMP I XMKCF
5404
5405 2605 0000 XMKSF, 0
5406 2606 6031 IOT1, KSF /SKIP ON RECEIVE FLAG
5407 2607 5605 JMP I XMKSF /RECV FLAG NOT SET
5408 2610 2205 ISZ XMKSF
5409 2611 5005 JMP I XMKSF /RECV FLAG SET - SKIP OCCURRED
5410
5411 2612 0000 XMKCC, 0
5412 2613 6032 IOT2, KCC /CLEAR RECV FLAG & AC
5413 2614 5612 JMP I XMKCC
5414 2615 4450 ERROR /KCC SKIPPED
5415 2616 5612 JMP I XMKCC
5416
5417 2617 0000 XMKRS, 0
5418 2620 6034 IOT3, KRS /"OR" CONTENTS OF RECV BUFFER INTO AC
5419 2621 5617 JMP I XMKRS
5420 2622 4450 ERROR /KRS SKIPPED
5421 2623 5617 JMP I XMKRS
5422
5423 2624 0000 XMKIE, 0
5424 2625 6035 IOT4, KIE /IF AC11=1 SET INT EN
/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 5271 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 0044 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 0045 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 0045 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 = 37
5508 2735 5726 JMP I APT3CK /NO
5509 2736 6201 CDF 00 /YES
5510 2737 1770 TAD I (MCW2 /RUNNING UNDER APT CONTROL?
5511 2740 6211 CDF 10
5512 2741 7700 SMA CLA /NO
5513 2742 5726 JMP I APT3CK /YES-SKIP TESTING OF THIS SLU
5514 2743 2773 ISZ TABADD
5515 2744 2773 ISZ TABADD
5516 2745 5726 JMP I APT3CK
5517
5518 2746 0000 STAB, 0
5519
5520
5521 2770 3022
5522 2771 7460
5523 2772 0770
5524 2773 3055
5525 2774 6017
5526 2775 3124
5527 2776 7770
5528 2777 0030
5529
5530 PAGE
5531 /SETUP IOTS FOR PARTICULAR SLU UNDER TEST
5532
5533 3000 0000 XIOT, 0
5534 3001 6002 IOF
5535 3002 4514 RLOOP /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 ENDSL /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 ENDSL /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 SDEVC /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 SDEVC /ADD NEW DEVICE CODE
5566 3040 3644 DCA I IOTADD /PUT BACK IOT
5567 3041 2243 ISZ IOTTA
5568 3042 5231 JMP ,+11
5569 3043 0000 IOTTA, 0
5570 3044 0000 IOTADD, 0
5571
5572
5573 3045 0030 DVCTAB, 0030
5574 3046 0040 0040
5575 3047 0300 0300
5576 3050 0310 0310
5577 3051 0320 0320
5578 3052 0330 0330
5579 3053 0000 0000
5580 3054 0000 0000
5581
5582 3055 0000 TABADD, 0
5583
5584 3056 2601 IOTREC, IOT0
5585 3057 2600 IOT1
5586 3060 2613 IOT2
5587 3061 2620 IOT3
5588 3062 2625 IOT4

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5589 3063 2632 IOT5
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 CXMFG
5601 3076 0000 0
5602
5603
5604 /INITIALIZE FOR STARTUP
5605
5606 3077 0000 INIT1, 0
5607 3100 7300 CIA CLL
5608 3101 3324 DCA BDRATE /INIT TEST BAUD RATE TO 50 BITS/SEC
5609 3102 1374 TAD (DVCTAB) /INIT TABADD TO START OF DEVICE CODE TABLE
5610 3103 3755 DCA TABADD
5611 3104 1373 TAD (NORMSQ-1)
5612 3105 3772 DCA TESTAB /INITIALIZE TESTAB TO NORMAL TEST SEQUENCE.
5613 3106 1771 TAD KISZTT /SETUP DONLOP ROUTINE FOR SLU TESTING
5614 3107 3770 DCA LLLD
5615 3110 3140 DCA TSTNU /CLEAR TEST NUMBER USED FOR ERROR DISPLAY
5616 3111 5677 JMP I INIT1
5617
5618
5619
5620 /SET BAUD RATE IN SLU UNDER TEST
5621 3112 0000 XBAUD, 0
5622 3113 1324 TAD BDRATE /GET BAUD RATE CONSTANT
5623 3114 0000 AND (0020) /MASK
5624 3115 7640 SZA CIA /BAUD RATE SEQ 50-19200 COMPLETE?
5625 3116 5325 JMP LLXB /YES - WORK ON NEXT SLU.
5626 3117 4535 MTSB /NO-SET BAUD RATE IN SLU UNDER TEST
5627 3120 2324 ISZ BDRATE /GET SETUP FOR NEXT BAUD RATE LOOP
5628 3121 4470 DELAY /WAIT FOR BAUD RATE CHANGES TO TAKE EFFECT
5629 3122 2312 ISZ XBAUD
5630 3123 5712 JMP I XBAUD
5631 3124 0000 BDRATE, 0
5632
5633 3125 3324 LLXB, DCA BDRATE
5634 3126 1373 TAD (NORMSQ-1)
5635 3127 3772 DCA TESTAB
5636 3130 5712 JMP I XBAUD
5637
5638
5639 /SET BAUD RATES BEFORE LEAVING SLU DIAGNOSTIC; REMOVE LOOPAROUND
5640
5641 3131 4350 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
5649 3141 6002 IOF
5650 3142 4514 RLOOP
5651 3143 3025 DCA SDEV
5652 3144 1764 TAD KJLD
5653 3145 3770 DCA LLLD
5654 3146 3140 DCA TSTNU
5655 3147 5763 JMP PRTEST
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
5662 3153 6333 TS02 /RESTORE SLU#1 BAUD RATE TO 9600
5663 3154 7604 LAS /RESTORE SLU#3 BAUD RATE TO 9600
5664 3155 0365 AND (0017)
5665 3156 6313 TSB1 /RESTORE SLU#2 BAUD RATE FROM BAUD RATE SWITCH
5666 3157 7300 CIA CLL
5667 3160 4470 DELAY /WAIT FOR BAUD RATE CHANGES TO TAKE EFFECT
5668 3161 5750 JMP I SETBDR
5669
5670
5671
5672 3163 3400
5673 3164 2267
5674 3165 0017
5675 3166 0016
5676 3167 0020
5677 3170 2257
5678 3171 2270
5679 3172 2265
5680 3173 2275
5681 3174 3445
5682 3175 7007
5683 3176 0770
5684 3177 2720
5685
5686 PAGE
5687 /SET BAUD RATE IN ALL 3 SLUS TO NORMAL TEST SEQUENCE
5688 / BAUD RATE (PRESET TO 9600)
5689 3200 0000 BDRNS, 0
5690 3201 1024 TAD NSQBDR
5691 3202 6043 TSB
5692 3203 6333 TSB1
5693 3204 6333 TSB2
5694 3205 3026 DCA BDR1
5695 3206 4470 DELAY
5696 3207 1024 TAD NSQBDR
5697 3210 3027 DCA BDR2
5698 3211 1024 TAD NSQBDR

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5698 3212 3334 DCA HDRJ
5699 3213 5000 JMF I BURNS
5700 /RESTORE BAUD RATES AND LOOPAROUND TO STATES EXPECTED BY DIAGNOSTIC
5701
5702 RESTBR, 0
5703 3214 0000 TAD BDR1
5704 3215 1026 /SLU#1 BAUD RATE RESTORED
5705 3216 6043 TSB
5706 3217 7300 CLA CLL
5707 3220 1027 TAD BDR2
5708 3221 6313 /SLU#2 BAUD RATE RESTORED
5709 3222 7300 TSB1
5710 3223 1030 CLA CLL
5711 3224 6333 TAD BDR3
5712 3225 7300 /SLU#3 BAUD RATE RESTORED
5713 3226 1031 TSB2
5714 3227 6037 CLA CLL
5715 3230 7300 TAD LOOPA
5716 3231 4470 /LOOPAROUND RESTORED
5717 3232 5614 KLB
5718 DELAY
5719 JMP I RESTBR
5720 /WAIT FOR BAUD RATE CHANGES TO TAKE EFFECT
5721
5722 /SETUP LOOPAROUND ON ALL SLU'S
5723 SLOOPA, 0
5724 3233 0000 CLA CLL IAC
5725 3234 7301 KLB
5726 3235 6037 DCA LOOPA
5727 3236 3031 JMP I SLOOPA
5728
5729 /CLEAR LOOPAROUND ON ALL SLU'S
5730 CLOOPA, 0
5731 3240 0000 CLA CLL
5732 3241 7300 KLB
5733 3242 6037 DCA LOOPA
5734 3243 3031 JMP I CLOOPA
5735
5736 XDELAY, 0
5737 3245 0000 ISZ DELAY1
5738 3246 2251 /,063 SEC DELAY
5739 3247 5246 JMP ,+1
5740 3250 5645 JMP I XDELAY
5741 3251 0000 DELAY1, 0
5742
5743 /CLEAR ALL FLAGS ROUTINE FOR SLU TESTING.
5744
5745 XSCAF, 0
5746 3252 0000 CAF
5747 3253 6007 /CLEAR ALL FLAGS & EN INT. FROM SLUS.
5748 3254 7006 NOP/CLA CLL
5749 3255 7000 /DISABLE INT. FROM SLU1
5750 3256 7000 NOP/KIE
5751 3257 7000 /DISABLE INT. FROM SLU2
5752 3258 7000 NOP/KIE2
5753 3259 7000 /DISABLE INT. FROM SLU3

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5753 3260 7000 NOP/IAC
5754 3261 7000 NOP/MKIE
5755 /ABOVE 6 NOPS CAN BE REPLACED WITH CODE SHOWN TO DISABLE INTERRUPTS FROM THOSE SLUS
5756 /NOT CURRENTLY BEING TESTED.
5757 3262 7300 CLA CLL
5758 3263 6665 PCIE
5759 3264 5652 /DISABLE INT. FROM PARALLEL INTERFACE
5760 JMP I XSCAF
5761
5762 /CLEAR SLU FLAGS AND ENABLE SLU INTERRUPTS
5763 / (A SUBSTITUTE FOR CAF -AVOIDS RX01 CLICKING)
5764
5765 XCFSLU, 0
5766 3265 0000 KCF
5767 3266 6030 /CLEAR REC AND XMIT FLAGS IN ALL 3 SLUS
5768 3267 6042 TCF
5769 3270 6300 KCF1
5770 3271 6312 TCF1
5771 3272 6320 KCF2
5772 3273 6332 TCF2
5773 3274 7300 CLA CLL
5774 3275 1377 TAD (0003)
5775 3276 6035 KIE/MKIE
5776 3277 6305 /EN INT. FROM SLU UNDER TEST (ALSO EN SLU2 ERROR STATUS)
5777 3278 6325 KIE1/NOP
5778 /THE ABOVE 3 KIE'S CAN BE REPLACED WITH CODE SHOWN TO DISABLE INTERRUPTS FROM
5779 /THOSE SLUS NOT CURRENTLY UNDER TEST.
5780 3301 7300 CLA CLL
5781 3302 5665 JMP I XCFSLU
5782
5783 /SLU TESTING MESSAGE
5784 3303 2314 SLUMES, TEXT "SLU "
5785 3304 2540
5786 3305 6000
5787 3306 2405
5788 3307 2324
5789 3308 1110
5790 3311 0700
5791
5792 /GET PSEUDO SWITCH REGISTER FROM LOCATION 20 IN FIELD 0
5793 XGETSR, 0
5794 3312 0000 CLA CLL
5795 3313 7300 CDF 00
5796 3314 6201 TAD I (PSR)
5797 3315 1776 CDF 10
5798 3316 6211 JMP I XGETSR
5799
5800 /ROUTINE TO CHECK FOR KEYBOARD INTERVENTION
5801 CH1KB, 0
5802 3320 0000 CLA CLL
5803 3321 7300 KIE
5804 3322 6035 /DISABLE INTERRUPTS FROM KEYBOARD
5805 3323 4445 CH1KSF
5806 3324 7000 /CHECK FOR KEYBOARD FLAG
5807 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 /***** /END MARKER FOR SLU TESTS-THIS MARKER MUST ALWAYS
SLUEND. / BE LOCATED AFTER LAST SLU TEST LOOP
5813 /
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 3020
5830 3377 3023
5831 3420 *3430
5832
5833 /*****
5834 /PARALLEL INTERFACE DIAGNOSTIC
5835 /*****
5836 3400 4465 PRTEST, 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 6002 IOF
5841 3405 7240 CLA CMA
5842 3406 3136 DCA ECONS /SET FLAG INDICATING THAT A CONSOLE INTERRUPT IS POSSIBLE NOW.
5843 3407 1775 TAD KJILD
5844 3410 3774 DCA LLLD
5845 3411 4773 PPIM, JMS PPIMES /PRINT PARALLEL I/O INTERF TESTING MESSAGE
5846
5847 3412 6027 CAF /IF NOT UNDER APT CONTROL,
5848 /CLEAR ALL FLAGS & DISABLE PARALLEL I/O SIMULATION
5849 3413 4141 JMS PATCH /STROBE DECODER,
5850 3414 6200 SKP1CHN /SETUP INTERRUPT SERVICE LINKAGE
5851 3415 5772 JMP 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 SPCIE /CLEAR PRINTER INT, ENABLE
5906 3462 7410 SKP
5907 3463 4450 ERROR /PCIE SKIPPED.
5908 3464 6001 ION
5909 3465 6060 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 SPCIE /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 EXXPECTING PRINTER INT.
5922 3502 6661 PSKF
5923 3503 4450 ERROR /FLAG FAILED TO SET OR NO SKIP
5924 3504 2117 IS2 INTFLG
5925 3505 4450 ERROR /PROGRAM FAILED TO INT.
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      T3LA,  LOOPPC
5939      3515 4471      CLREPI      /CLEAR EXPECTING PRINTER INT.
5940      3516 6662      PCLF        /CLEAR PRINT FLAG
5941      3517 4510      SPCIE       /DISABLE PRINTER INT.
5942      3528 6407      CAF         /ENABLE PRINTER INTERRUPTS & CLEAR FLAGS
5943
5944      /NOTE: CAF CLEARS LIFT RIBBON, IF THE SIMULATOR
5945      / IS IN USE CLEARING LIFT RIBBON SWITCHES THE
5946      / PARALLEL INTERFACE TO THE LQP MODE.
5947      3521 7326      CLA CLL CML RTL /IN CASE SIMULATOR IS IN USE SWITCH MODE BACK TO LA
5948
5949      / & CLEAR FLAGS, THIS LOLS INST. HAS NO EFFECT
5950      / IF SIMULATOR IS NOT IN USE.
5951      3522 6536      LOLS
5952      3523 6662      PCLF
5953      3524 6001      ION
5954      3525 4472      SETEPI      /SET EXPECTING PRINTER INT.
5955      3526 6060      PSSF
5956      3527 7000      NOP
5957      3530 4471      CLREPI
5958      3531 6661      PSKF
5959      3532 4450      ERROR       /FLAG NOT SET OR NO SKIP
5960      3533 2117      ISZ INTFLG
5961      3534 4450      ERROR       /PROGRAM FAILED TO INTERRUPT
5962      3535 6662      PCLF        /CLEAR PRINT FLAG
5963      3536 6001      ION
5964      3537 6661      PSKF
5965      3540 7410      SKP
5966      3541 4450      ERROR       /FLAG FAILED TO CLEAR
5967      3542 4447      DONLOP
5968      3543 5766      JMP T4LA
5969
5970      /ROUTINE TO ISSUE PCIE AND LEAVE LIFT RIBBON = 0.
5971      / NOTE: LIFT RIBBON = 0 DESIGNATES LA MODE WHEN SIMULATOR IS IN USE.
5972
5973      3544 0000      XSPCIE, 0
5974      3545 1365      TAD (2      /AC BIT 10 CONTROLS LIFT RIBBON STATE UPON PCIE EXECUTION
5975      3546 6665      PCIE
5976      3547 7200      CLA
5977      3550 5744      JMP I XSPCIE
5978
5979      3565 0002
5980      3566 3600
5981      3567 0400
5982      3570 4005
5983      3571 1000
5984      3572 4520
5985      3573 4342
5986      3574 2257
5987      3575 2267
5988      3576 5000
5989      3577 0004
5990      3600

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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 4516      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      /AC CONTAINS WORD READ
6015      /WORD WRITTEN=0
6016      3621 6662      PCLF
6017      3622 7240      STA
6018      3623 6664      PSTB       /LOAD INTERFACE BUFFER WITH ALL ONES
6019      3624 6661      PSKF
6020      3625 7410      SKP
6021      3626 4450      ERROR       /PSTB SET FLAG--NOTE: PARALLEL I/O DEVICE IS POWERED DOWN
6022      3627 7200      CLA
6023      3630 6667      PRDB       /READ WORD BACK
6024      3631 6661      PSKF
6025      3632 7410      SKP
6026      3633 4450      ERROR       /PRDB SET FLAG--NOTE: PARALLEL I/O DEVICE IS POWERED DOWN
6027      3634 6667      PRDB       /READ WORD BACK AGAIN--IN CASE THE PREVIOUS 'ERROR' OCCURRED,
6028      3635 7040      CMA
6029      3636 7440      SZA
6030      3637 4450      ERROR       /DATA READ NOT = DATA WRITTEN
6031
6032      /AC CONTAINS COMPLEMENT OF WORD READ
6033      /WORD WRITTEN = 7777
6034      3640 4447      DONLOP
6035
6036      /*****
6037      /TEST 5 - CHECK THAT PCLP LOADS PRINTER INTERFACE BUFFER AND CLEARS FLAG.
6038      /*****
6039
6040      3641 4446      T5LA,  LOOPPC
6041      3642 4471      CLREPI
6042      3643 4516      SPCIE       /DISABLE PRINTER INTERRUPTS
6043      3644 6001      ION
6044      3645 6660      PSSF        /SET FLAG
6045      3646 6666      PCLP        /LOAD PRINTER INTERFACE BUFFER
6046      3647 7410      SKP

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6046 3650 4450 ERROR /PCLP SKIPPED
6047 3651 6661 PSKF
6048 3652 7410 SFP
6049 3653 4450 ERROR /PCLP FAILED TO CLEAR FLAG
6050 3654 7240 STA
6051 3655 6667 PRDR /READ WORD BACK
6052 3656 7440 SZA
6053 3657 4450 ERROR /DATA READ NOT = DATA WRITTEN
6054 /AC CONTAINS WORD READ
6055 /WORD WRITTEN=0
6056 3660 7240 STA
6057 3661 6666 PCLP /LOAD ALL ONES INTO BUFFER
6058 3662 7200 CLA
6059 3663 6667 PRDR /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,PSTB,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 PSTB /LOAD INTERFACE BUFFER
6078 3674 1376 TAD (-5252
6079 3675 7440 SZA
6080 3676 4450 ERROR /PSTB CHANGED AC CONTENTS
6081 3677 1377 TAD (5252
6082 3700 6660 PSSF
6083 3701 1376 TAD (-5252
6084 3702 7440 SZA
6085 3703 4450 ERROR /PSSF CHANGED AC CONTENTS
6086 3704 1377 TAD (5252
6087 3705 6661 PSKF
6088 3706 7000 NOP
6089 3707 1376 TAD (-5252
6090 3710 7440 SZA
6091 3711 4450 ERROR /PSKF CHANGED AC CONTENTS
6092 3712 1377 TAD (5252
6093 3713 6665 PCIE
6094 3714 1376 TAD (-5252
6095 3715 7440 SZA
6096 3716 4450 ERROR /PCIE CHANGED AC CONTENTS
6097 3717 1377 TAD (5252
6098 3720 6662 PCLF
6099 3721 1376 TAD (-5252
6100 3722 7440 SZA

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6101 3723 4450 ERROR /PCLF CHANGED AC CONTENTS
6102 3724 6667 PPDB /READ INTERFACE BUFFER
6103 3725 1376 TAD (-5252
6104 3726 7440 SZA
6105 3727 4450 ERROR /INTERFACE BUFFER CHANGED SINCE LOAD BY PSTB ABOVE
6106 3730 6667 PRDR
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
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
6132
6133
6134
6135
6136
6137
6138
6139
6140
6141
6142
6143 4005 4446 T1LQ, LOOPPC
6144 4006 6002 IOF
6145 4007 6505 LQRS /READ STATUS AND CLEAR DONE FLAG
6146 4010 7410 SKP
6147 4011 4450 ERROR /LQRS SKIPPED
6148 4012 6500 LQSK /SKIP ON DONE FLAG
6149 4013 7410 SKP
6150 4014 4450 ERROR /LQRS FAILED TO CLEAR DONE FLAG OR
6151 / LQSK SKIPPED.
6152 4015 7300 CLA CLL
6153 4016 6500 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 /TEST 4 - CHECK THAT LQMP,LQMC,LQPC,AND LQPE LOAD INTERFACE BUFFER
6267 / AND THAT LQRB READS INTERFACE BUFFER. NOTE; DATA IS
6268 / INVERTED BEFORE BEING STORED IN INTERFACE BUFFER.
6269 /*****
6270
6271 4200 4446 T4LQ, LOOPPC
6272 4201 4471 CLREPI
6273 4202 1377 TAD LQ4TAB
6274 4203 3251 DCA LQTAB
6275 4204 5232 JMP INITL
6276 4205 6506 INSL1, LQLS /DISABLE LQI INTERRUPTS AND SET DONE FLAG
6277 4206 6001 ION
6278 4207 6502 LQI1, LQMP/LQMC/LQPC/LQRE /AC0-11 TO INTERFACE BUFFER,CLEAR AC, CLEAR DONE FLAG
6279 4210 7410 SKP
6280 4211 4450 ERROR /LQXX SKIPPED-DETERMINE LQXX FROM LOCATION LQI1
6281 4212 6506 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 LQI2, STA
6293 4224 6502 LQMP/LQMC/LQPC/LQRE /AC0-11 TO INTERF. BUFFER,CLEAR AC,CLEAR DONE FLAG
6294 4225 7240 STA
6295 4226 6501 LQRB /READ INTERFACE BUFFER
6296 4227 7440 SZA
6297 4230 4450 ERROR /DATA READ NOT = EXPECTED READ DATA
6298 /AC CONTAINS WORD READ BACK FROM INTERF BUFFER
6299 /WORD WRITTEN=7777; EXPECTED READ DATA = 0000
6300 4231 2251 ISZ LQTAB
6301 4232 1651 INITL, TAD I LQTAB
6302 4233 7450 SNA
6303 4234 5241 JMP TABDON
6304 4235 3207 DCA LQI1
6305 4236 1651 TAD I LQTAB
6306 4237 3224 DCA LQI2
6307 4240 5245 JMP INSL1
6308 4241 7300 TABDON, CLA CLL
6309 4242 4513 KLSIM
6310 4243 6506 LQLS
6311 4244 6501 LQRB
6312 4245 6506 LQSK
6313 4246 4450 ERROR /LQRB CLEARED DONE FLAG
6314 4247 4447 DONLOP
6315 4250 5257 JMP T5LQ
6316
6317 4251 0000 LQTAB, 0
6318 4252 6502 LQ4TAB, LQMP

```

```

6319 4253 6503 LQMC
6320 4254 6501 LQPC
6321 4255 6507 LQRE
6322 4256 0000 0
6323
6324
6325
6326
6327 /*****
6328 /TEST 5 - CHECK THAT LQMP,LQMC,LQLS AND LQPC CLEAR AC.
6329 /*****
6330
6331 4257 4446 T5LQ, LOOPPC
6332 4260 4471 CLREPI
6333 4261 6002 IOF
6334 4262 1376 TAD (7775 /IN CASE SIMULATOR IS IN USE DON'T SET LIFT
6335 / RIBBON - THIS WOULD SWITCH MODES TO LA.
6336 4263 6506 LQLS
6337 4264 7440 SZA
6338 4265 4450 ERROR /LQLS FAILED TO CLEAR AC
6339 4266 6506 LQLS /DISABLE 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 /TEST 6 - CHECK THAT LQSK,AND LQRE LEAVE AC UNCHANGED, ALSO CHECKS
6358 / THAT LQSK,LQRB,LQRS, AND LQLS LEAVE INTERFACE BUFFER
6359 / REGISTER UNCHANGED.
6360 /*****
6361
6362 4305 4446 T6LQ, LOOPPC
6363 4306 6002 IOF
6364 4307 1375 TAD (5252 /LOAD INTERFACE BUFFER
6365 4310 6503 LQMC
6366 4311 1375 TAD (5252
6367 4312 6500 LQSK
6368 4313 7000 NOP
6369 4314 1374 TAD (-5252
6370 4315 7440 SZA
6371 4316 4450 ERROR /LQSK CHANGED AC
6372 4317 6505 LQRS
6373 4320 6501 LQRB

```

```

6374 4321 7200 CLA
6375 4322 6521 LQPR /READ INTERFACE BUFFER
6376 4323 1373 TAD (5253
6377 4324 7440 SZA
6378 4325 4450 ERROR /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 4601
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 0001 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 LQFC
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 7441 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 LQFC
6453 4441 7300 CLA CLL
6454 4442 6667 PRDB /READ BUFFER
6455 4443 6501 LQRB
6456 4444 3274 DCA SREC /SAVE ACTUAL WORD READ
6457 4445 1274 TAD SREC
6458 4446 7440 T7OW2, CMA/NOP /CMA FOR LQ DEVICE CODE; NOP FOR LA DEV CODE
6459 4447 7441 CIA
6460 4450 1273 TAD SXMT
6461 4451 7640 SZA CLA
6462 4452 4305 JMS BDTA /WORD READ NOT = EXPECTED READ DATA
6463 4453 1273 TAD SXMT
6464 4454 7120 STL
6465 4455 7004 RAL
6466 4456 7430 SZL
6467 4457 5233 JMP LL2
6468 4460 4447 DONLOP
6469
6470
6471 4461 6662 EXITLA, PCLF /CLEAR FLAG

```

```

6472 4462 7201 CLA IAC
6473 4463 6665 PCIE /ENABLE LA PRINTER INTERRUPTS - SET LIFT RIBBON=1
6474 / NOTE:LIFT RIBBON=1 INDICATES LQ MODE WHEN SIMULATOR IS IN USE.
6475 4464 6002 IOF
6476 4465 6506 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
6505 /WORD READ NOT = EXPECTED READ DATA
6506 /AC,MQ = ACTUAL WORD READ, WORD WRITTEN
6507 /NOTE: WHEN TESTING WITH LQ DEVICE CODES DATA
6508 /READ SHOULD BE THE COMPLEMENT OF DATA WORD WRITTEN
6509
6510 4510 5705 JMP I BDTA
6511
6512 /DISABLE PARALLEL I/O SIMULATOR IF IN USE - NOTE: LQRE ENABLES SIMULATOR
6513
6514 4511 0000 XKLSIM, 0
6515 4512 7300 CLA CLL
6516 4513 4466 GETHW3 /IS PARALLEL I/O SIMULATOR IN USE?
6517 4514 0376 AND (0200
6518 4515 7040 SZA CLA
6519 4516 6007 CAF /YES - DISABLE IT
6520 4517 5711 JMP I XKLSIM
6521
6522
6523 4520 4466 SIMCK0, GETHW3 /USING SIMULATORS FOR PARALLEL I/O DEVI E?
6524 4521 0376 AND (0200
6525 4522 7050 SNA CLA
6526 4523 5775* JMP NOSIM0 /NO

```

```

6527 4524 6505 LQRS /YES-VERIFY LIFT RIBBON FALSE BY READ STATUS
6528 4525 0374 AND (0002
6529 4526 7440 SZA
6530 4527 4450 ERROR /INITIALIZE(CAF) FAILED TO CLEAR LIFT RIBBON FLOP,
6531 4530 5773* JMP TILO /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 7050 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 7040 SZA CLA
6540 4540 5771* JMP TI0LS /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 TI1A /EXECUTE NORMAL LA TYPE DIAGNOSTIC (DEVICE CODE=66)
6546
6547
6548 4570 3436
6549 4571 4600
6550 4572 0740
6551 4573 4005
6552 4574 0002
6553 4575 3420
6554 4576 0200
6555 4577 5300
6556 4600
6557
6558
6559
6560
6561
6562 4600 4446
6563 4601 1377
6564 4602 3140 DCA TSTNU
6565 4603 6506 LOLS /SETUP TEST NUMBER FOR ERROR DISPLAY,
6566 4604 6507 LQRE /CLEAR LIFT RIBBON FLOP - SHOULD ALREADY BE CLEAR
6567 4605 6504 LQPC /ENABLE PARALLEL I/O SIMULATOR
6568 4606 6503 LQMC /ZERO INTERFACE BUFFER AND SWITCH IN/OUT
6569 4607 7040 CMA / TO LOW BY SETTING ALL
6570 4610 6502 LQMP / SIMULATOR STROBE FLOPS.
6571 4611 6501 LQRB /READ & VERIFY THAT IN DATA = 7777
6572 4612 7040 CMA
6573 4613 7440 SZA
6574 4614 4450 ERROR /IN/OUT FAILED TO DISABLED INTERFACE BUFFER
6575 / OUTPUT, AC CONTAINS DATA READ.
6576 4615 7040 CMA
6577 4616 6507 LQRE /ISSUE 'RESTORE' TO SET IN/OUT = H
6578 4617 7300 CLA CLL
6579 4620 6501 LQRB /READ & VERIFY THAT 'IN' DATA = 0000
6580 4621 7440 SZA

```

PAGE

/THE FOLLOWING TESTS CHECK OUT PARALLEL I/O INTERFACE LOGIC WHICH CAN ONLY BE CHECKED USING A SPECIAL EXTERNAL HARDWARE SIMULATOR.

/TEST 10 - SIMULATOR REQUIRED - VERIFY IN/OUT AND DATA INTERFACE CONNECTOR.

TI0LS,

LOOPPC

TAD (10

DCA TSTNU

LOLS

LQRE

LQPC

LQMC

CMA

LQMP

LQRB

CMA

SZA

ERROR

CMA

LQRE

CLA CLL

LQRB

SZA

```
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.

```
6609
6610
6611 4652 4446 T12LS, LOOPPC
6612 4653 6503 LQMC /ISSUE CARRIAGE STROBE
6613 4654 6500 LQSK /VERIFY SKIP
6614 4655 4450 ERROR /LQSK FAILED TO SKIP WITH CARRIAGE RDY FLAG SET
6615 4656 6505 LQRS /READ STATUS AND VERIFY CARRIAGE READY
6616 4657 1375 TAD (-1000)
6617 4660 7640 SZA CLA
6618 4661 4450 ERROR /CARRIAGE READY FLAG DID NOT SET,
6619 4662 6507 LQRE /ISSUE RESTORE TO CLEAR FLAG
6620 4663 6505 LQRS /READ STATUS AND VERIFY ALL FLAGS = 0.
6621 4664 7440 SZA
6622 4665 4450 ERROR /CARRIAGE READY FLAG FAILED TO CLEAR
6623 4666 6500 LQSK /VERIFY NO SKIP
6624 4667 7410 SKP
6625 4670 4450 ERROR /LQSK SKIPPED WITH ALL FLAGS CLEAR
6626 4671 4447 DONLOP
```

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

```
6629
6630 4672 4446 T13LS, LOOPPC
6631 4673 6504 LQPC /ISSUE CHARACTER STROBE
6632 4674 6500 LQSK /VERIFY SKIP
6633 4675 4450 ERROR /LQSK FAILED TO SKIP WITH CHAR RDY FLAG SET
6634 4676 6505 LQRS /READ STATUS AND VERIFY CHARACTER READY
6635 4677 1374 TAD (-2000)
```

```
6636 4700 7640 SZA CLA
6637 4701 4450 ERROR /CHARACTER READY FLAG DID NOT SET.
6638 4702 6507 LQRE /ISSUE RESTORE TO CLEAR FLAG
6639 4703 6505 LQRS /READ STATUS AND VERIFY ALL FLAGS=0
6640 4704 7440 SZA
6641 4705 4450 ERROR /CHAR RDY FLAG FAILED TO CLEAR
6642 4706 6500 LQSK /VERIFY NO SKIP
6643 4707 7410 SKP
6644 4710 4450 ERROR /LQSK SKIPPED WITH ALL FLAGS CLEAR
6645 4711 4447 DONLOP
```

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

```
6646
6647
6648
6649 4712 4446 T14LS, LOOPPC
6650 4713 6502 LQMP /ACTIVATE PRINTER READY INPUT - REQUIRES
6651 4714 6503 LQMC / ISSUING 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.

```
6666
6667
6668
6669 4733 4446 T15LS, LOOPPC
6670 4734 6502 LQMP /ACTIVATE CHECK INPUT - REQUIRES
6671 4735 6504 LQPC / ISSUING PAPER STROBE AND CHAR STROBE
6672 4736 6500 LQSK /VERIFY SKIP
6673 4737 4450 ERROR /LQSK FAILED TO SKIP WITH CHECK SET
6674 4740 6505 LQRS
6675 4741 1372 TAD (-40)
6676 4742 7640 SZA CLA
6677 4743 4450 ERROR /CHECK FLAG DID NOT SET
6678 4744 6507 LQRE /ISSUE RESTORE TO CLEAR ALL FLAGS
6679 4745 6505 LQRS /READ AND VERIFY STATUS = 0
6680 4746 7440 SZA
6681 4747 4450 ERROR /RESTORE FAILED TO CLEAR CHECK FLAG
6682 4750 6500 LQSK /VERIFY NO SKIP
6683 4751 7410 SKP
6684 4752 4450 ERROR /LQSK SKIPPED WITH ALL FLAGS CLEAR.
6685 4753 4447 DONLOP
6686 4754 7300 CLA CLL
6687 4755 3140 DCA TSTNU
6688 4756 5771 JMP NOSIM1
6689
6690
```

6691
6692
6693 4771 4472
6694 4772 7740
6695 4773 4030
6696 4774 6030
6697 4775 7030
6698 4776 7430
6699 4777 0010
5000

*5000

/TEST 1 = INITIALIZE [CAF] PART 1 / FLAG DETECTION PART 1

/(A) IF AN RX01 MICROCONTROLLER IS NOT CABLED TO THE RX8 INTERFACE,
THEN ALL FLAGS (DONE, TRANSFER REQUEST, AND ERROR)
SHOULD HAVE BEEN CLEARED BY INITIALIZE (IF EVER SET).
NOTE- FOR THE VT78 SYSTEM CAF DOES NOT CLEAR INTERFACE XFER REGISTER

/(B) IF AN RX01 MICROCONTROLLER IS CABLED TO THE RX8 INTERFACE,
THEN INITIALIZE SHOULD HAVE SET THE DONE FLAG BECAUSE
ANY INIT OF THE RX01 MICROCONTROLLER IS AN IMPLIED READ SECTOR
OF TRACK 0 SECTOR 1 (FOR SYSTEMS PROGRAMMING BOOTSTRAP APPLICATIONS).
THEREFORE, ANY ERROR (EXCEPT PARITY) THAT MAY OCCUR FROM A NORMAL
"READ SECTOR" COMMAND MAY OCCUR HERE CAUSING THE ERROR FLAG TO SET, AND
DISPLAYING THE ERROR STATUS WITHIN THE TRANSFER REGISTER AT "DONE".
THE TRANSFER REQUEST FLAG SHOULD BE CLEARED.

6700
6701
6702
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6705
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6709
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6711
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6713
6714
6715
6716
6717
6718
6719 5000 4465
6720 5001 0377
6721 5002 7640
6722 5003 4443
6723 5004 6002
6724 5005 7240
6725 5006 3130
6726 5007 4141
6727 5010 6200
6728 5011 4345
6729
6730 5012 1776*
6731 5013 3775*
6732 5014 4446
6733 5015 6007
6734
6735
6736
6737 5016 7300
6738 5017 6502
6739
6740 5020 7300
6741 5021 4466
6742 5022 0374
6743 5023 3133
6744 5024 6753

PRETEST, GETSR /GET PSEUDO SWITCH REGISTER FROM FIELD 0
AND (0010
SZA CLA /EXECUTE FLOPPY INTERFACE TEST????
CIEOP /NO
IOF
CLA CMA
DCA ECOMSI /SET FLAG INDICATING THAT A CONSOLE INTERRUPT IS POSSIBLE NOW
JMS PATCH /SETUP INTERRUPT SERVICE LINKAGE
SKPICHN
JMS PFMS /PRINT "FLOPPY INTERF TESTING"
/MESSAGE IF NOT UNDER APT CONTROL,
/MODIFY DONLOP ROUTINE.

PFM,
TAD KJILD
DCA LLLD
LOOPPC
CAF /IN CASE FLOPPY SIMULATOR IS IN USE SETUP FLOPPY
/TO "UNCABLED" (NO RX01) STATE,
/SET PARALLEL I/O MODE TO LG AND CLEAR FLOPPY
/FLAGS, DISABLE FLOPPY DATA LOOPBACK TO ERRORL,
/ENABLE PARALLEL I/O SIMULATOR AND SETUP FLOPPY
/TO NORMAL "UNCABLED" STATE(1>DONE, 1>XFER RQSTL
/1>OUTL, 1>ERRORL, 1>RXDATAL).

CLA CLL
LQMP
CLA CLL
GETHW3 /SETUP RXHERE
AND (2200
DCA RXHERE /RXHERE=0 IF RX01 IS CABLED TO INTERFACE.
STP

6745 5025 7410
6746 5026 4450
6747 5027 6754
6748 5030 7410
6749 5031 4450
6750
6751
6752
6753
6754
6755
6756
6757 5032 1133
6758 5033 7640
6759 5034 5253
6760 5035 4464
6761 5036 6755
6762 5037 5235
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6768
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6770
6771
6772
6773 5040 4466
6774 5041 6373
6775 5042 7650
6776 5043 5247
6777 5044 1372
6778 5045 3134
6779 5046 5252
6780 5047 1372
6781 5050 3134
6782
6783
6784 5051 1371
6785
6786
6787
6788
6789
6790
6791
6792
6793
6794
6795
6796
6797
6798 5052 7107
6799 5053 3132

EOPRE, SKP
EPPOR /UNEXPECTED TRANSFER REQUEST FLAG
SER
SKP
E2PRE, ERROR /UNEXPECTED ERROR FLAG

/IF AN RX01 MICROCONTROLLER IS CABLED TO THE RX8 INTERFACE
/THEN THE DONE FLAG SHOULD BE SET

TAD RXHERE
SZA CLA
JMP NORX01
WAIT
SDN
JMP -2 /WAIT FOR DONE FLAG

/THE ENTIRE STATUS WORD IS DISPLAYED IN THE TRANSFER REGISTER AT ERROR/DONE TIME.
/IF AN RX01 CONTROLLER IS CABLED TO THE RX8 INTERFACE
/ (AND DRIVE 0 IS READY THEN THE STATUS SHOULD INDICATE "SEL DRV RDY"), ALSO
/DELETED DATA MAY = 1 IF TRACK 0/SECTOR 1 WAS WRITTEN WITH DELETED DATA
/AND "INIT DONE" SHOULD BE SET.

GETHW3 /IS DRIVE 0 READY?
AND (6000
SNA CLA
JMP RDY /YES
TAD (0277 /NO
DCA COMP
JMP NORX01=1
RDY, TAD (0277
DCA COMP

TAD (40 /PROGRAM EXPECTS DRIVE 0 TO BE READY

//////
4 5 - - 8 9 10 11 /
SEL WRITE INIT PAR /
DRIVE DD PROTECT [DONE] CRC /
RDY (N/A) /
//////

CLL IAC RTL / 4 [INIT] DONE OR 204
NORX01, DCA GOOD

```

/VT78 CPU DIAGNOSTIC      PAL10  V142A  2-AUG-77      7130  PAGE 15-2
6800      5054  1132      TAD GOOD      /LOAD MQ FOR DISPLAY
6801      5055  7421      MQL
6802      5056  6752      XDR
6803
6804
6805      5057  3130      DCA BLANK
6806      5060  1130      TAD BLANK
6807      5061  0134      AND      COMP
6808      5062  3131      DCA EAC
6809      5063  1131      TAD EAC
6810      5064  7041      CTA
6811      5065  1132      TAD GOOD      /EXPECTED
6812      5066  7656      SNA CLA
6813      5067  5272      JMP ,+3      /OK
6814      5070  1131      TAD EAC
6815      5071  4450      E1PRE,  ERROR      / [INIT] STATUS NOT = EXPECTED
6816
6817
6818      /IF AN RX01 MICROCONTROLLER IS CABLED TO THE RX8 INTERFACE
6819      /THEN THE PREVIOUS "SDN" SHOULD HAVE CLEARED THE DONE FLAG, BUT
6820
6821      /IF AN RX01 MICROCONTROLLER IS NOT CABLED TO THE RX8 INTERFACE
6822      /THEN INITIALIZE SHOULD HAVE CLEARED THE DONE FLAG
6823
6824      /TECHNICAL NOTE:
6825
6826      /IF THE DONE FLAG IS SET, AND IF THE INTERRUPT ENABLE FLIP-FLOP IS SET ILLEGALLY,
6827      /THEN AN "UNEXPECTED RX01 INTERRUPT" WILL OCCUR IN TEST 2 (IF AN RX01 CONTROLLER
6828      /IS CABLED TO THE RX8 INTERFACE) OR IN TEST 3 WHEN THE MAINTENANCE FLIP-
6829      /FLOP "SETS ALL FLAGS"
6830
6831      5072  6755      SDN
6832      5073  7410      SKP
6833      5074  4450      E4PRE,  ERROR      /UNEXPECTED DONE FLAG
6834      5075  4447      DONLOP
6835
6836
6837
6838
6839
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6847      5076  4446      T2,      LOOPPC
6848      5077  1133      TAD RXHERE
6849      5100  7650      SNA CLA
6850      5101  5321      JMP T3
6851      5102  3132      DCA GOOD
6852
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6854

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/VT78 CPU DIAGNOSTIC      PAL10  V142A  2-AUG-77      7130  PAGE 15-3
6855
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6867
6868      5103  1370      TAD (177)
6869      5104  6751      LCD      /MAINTENANCE MODE <OFF>
6870
6871
6872      5105  7440      /THE (AC) SHOULD = 0 BECAUSE IOT LCD 6751 SHOULD CLEAR THE AC
6873      5106  4450      EQ,      ERROR      / IOT 6751 DID NOT CLEAR THE AC
6874
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6881
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6883      5107  6753      STR
6884      5110  7410      SKP
6885      5111  4450      E1,      ERROR      /UNEXPECTED TRANSFER REQUEST FLAG
6886      5112  6754      SER
6887      5113  7410      SKP
6888      5114  4450      E2,      ERROR      /UNEXPECTED ERROR FLAG
6889      5115  6755      SDN
6890      5116  7410      SKP
6891      5117  4450      E3,      ERROR      /UNEXPECTED DONE FLAG
6892      5120  4447      DONLOP
6893
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6908      5121  4446      T3,      LOOPPC
6909      5122  3132      DCA GOOD

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/V178 CPU DIAGNOSTIC      PAL10  V142A  2-AUG-77      7:30  PAGE 15-4
                                                                    SEQ 0153
6910  5123  1367          TAD (200)
6911  5124  6751          LCD              / MAINTENANCE MODE <ON>
6912                                     /THE (AC) SHOULD = 0 AFTER ISSUING IOT LCD 6751
6913                                     /
6914  5125  7440          SZA
6915  5126  4450          E11, ERROR              / IOT LCD 6751 FAILED TO CLEAR AC
6916                                     /
6917  5127  1367          TAD (200)
6918  5130  6751          LCD              / MAINTENANCE MODE <ON>, AGAIN
6919  5131  6752          XDR              /CONTENTS OF TRANSFER REGISTER
6920  5132  3131          DCA EAC          /SAVE
6921  5133  1131          TAD EAC
6922  5134  1366          TAD (-200)      /COMPARE WITH "EXPECTED"
6923  5135  7650          SNA CLA
6924  5136  5343          JMP ,+5          / OK
6925  5137  1367          TAD (200)
6926  5140  7421          MQL              / "EXPECTED" RESULT
6927  5141  1131          TAD EAC          / "ACTUAL" RESULT
6928  5142  4450          E10, ERROR        /TRANSFER REGISTER NOT =200
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
6936  5145  0000          PFMES, 0
6937  5146  4432          C1CRLF
6938  5147  4434          C1PRNT
6939  5150  5242          FLMES
6940  5151  4434          C1PRNT
6941  5152  3306          TESMES
6942  5153  4432          C1CRLF
6943  5154  5745          JMP I PFMES
6944
6945
6946
6947  5165  5200
6948  5166  7600
6949  5167  0200
6950  5170  0177
6951  5171  0040
6952  5172  0277
6953  5173  6000
6954  5174  2200
6955  5175  2257
6956  5176  2267
6957  5177  0010
6958                                     5700
6959
6960
6961
6962
6963  5200  4446          T4,  LOOPPC

PAGE
/TEST 4 = FLAG DETECTION PART III / " C " LINES VERIFICATION PART III
/
/ THE SETTING OF THE MAINTENANCE FLIP-FLOP SHOULD "DIRECT SET" ALL
/ FLAGS (DONE, TRANSFER REQUEST, AND ERROR).
/
/

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/V178 CPU DIAGNOSTIC      PAL10  V142A  2-AUG-77      7:30  PAGE 15-5
                                                                    SEQ 0154
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, EPROP        /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

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/TEST 5 - TRANSFER REGISTER DIRECTION TESTING (PART II)
/
/   - " C " LINES VERIFICATION PART IV
/
/ WITH THE MAINTENANCE FLIP-FLOP SET THE PROGRAM WILL VERIFY THE DIRECTION
/ AND TRANSFER MODE (8-BIT MODE INCLUSIVE "OR", AND 12-BIT MODE "JAM")
/ TRANSFERS INTO THE ACCUMULATOR FROM THE RXH TRANSFER REGISTER BY ISSUING
/ IOT "XDR" (TRANSFER DATA REGISTER) 6752 AFTER PREVIOUSLY LOADING THE
/ THE TRANSFER REGISTER WITH THE CONTENTS OF THE ACCUMULATOR REPRESENT-
/ ATIVE OF THE FOLLOWING PATTERNS WHEN THE "LCD" IOT 6751 IS ISSUED,
/
/       (1)    200    - MAINTENANCE MODE <ON>
/       (2)    376    -
/       (3)    375    -
/       (4)    373    - (BYTES 2 THRU 7)
/       (5)    367    - (INCLUSIVE "OR" )
/       (6)    357    -
/       (7)    337    -
/       (8)    7677   - (WORD 8 - "JAM" )
/
/ THE LCD IOT WILL BE ISSUED A TOTAL OF 8 TIMES.
/
/ THE 1ST LCD IOT WILL BE ISSUED WITH THE AC = 200 WHICH INITIALLY SETS THE
/ MAINTENANCE FLIP-FLOP THEREBY GUARANTEEING THE CONTENTS OF THE TRANSFER
/ REGISTER AFTER EACH SUCCEEDING LCD IOT.
/
/ LCD IOT'S 2 THRU 8 ARE ISSUED WITH THE ACCUMULATOR CONTAINING THE PATTERNS
/ DESCRIBED ABOVE,
/
/ 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.
/
T5,      LOOPPC
          TAD (200)
          LCD                      /MAINTENANCE MODE <ON>
          CLL STA RAR              / 3777
          DCA BLANK
T5B,      TAD BLANK
          STL
          SHA
          CLL
          RAL
          DCA BLANK
          TAD BLANK              / (BLANK) = (AC) BEFORE LCD IOT 6751
          LCD                    / TO
/
/ " C " LINES VERIFICATION PART IV
/
/ THE PURPOSE OF THIS TEST IS TO VERIFY THAT SUCCEEDING LCD IOT'S(6751)
/ TRANSFER THE (AC) INTO THE DATA REGISTER CLEARING THE ACCUMULATOR
/
          DCA EAC                / (AC) AFTER ISSUING IOT LCD (6751)
          DCA GOOD              / PROGRAM EXPECTS AC = 0

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          5272  1131
          5273  7440
          5274  4450
          5275  6752
          5276  3131
          5277  1376
          5300  0130
          5301  7106
          5302  7006
          5303  7006

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          TAD EAC
          SZA
E42,      ERROR
/
/ TRANSFER DIRECTION PART II
/
          XDR
          DCA EAC
          TAD (100)
          AND BLANK
          CLL RTL
          RTL
          / LINK = 1 FOR 8-BIT MODE
/ IOT LCD (6751) DIDN'T CLEAR THE AC
/ FROM

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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
7086 5313 7041 CIA
7087 5314 1131 TAD EAC
7088 5315 7650 SNA CLA /COMPARED OK
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 TSB
7098 5325 4447 DONLOP
7099
7100 /TEST 6
7101 /
7102 /RX8 IOT DECODING VERIFICATION PART II
7103 /
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

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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 /PAGE
7157 /TEST 7 - INTERRUPT TEST PART I / IOT DECODING VERIFICATION PART III
7158 /
7159 /INTERRUPT TEST PART I (NO INTERRUPTS SHOULD OCCUR DURING THIS TEST)
7160 /
7161 /THE MAINTENANCE FLIP-FLOP HAS PREVIOUSLY BEEN VERIFIED TO DIRECT
7162 / SET ALL FLAGS AND THE INTERFACE IOT -SKIP ON DONE- "SDN" 6755 WAS
7163 /FOUND TO "SKIP AND CLEAR" SUCCESSFULLY,
7164 /
7165 /FIRST SET THE MAINTENANCE FLIP-FLOP WHICH IN TURN SETS ALL FLAGS,
7166 /
7167 /THEN ISSUE IOT INTR 6756 WITH THE AC = 0 CLEARING THE RX8 INTERRUPT ENABLE
7168 /NO INTERRUPTS SHOULD OCCUR
7169 /
7170 5400 4446 T7, LOOPPC
7171 5401 6002 IOF
7172 5402 4141 JMS PATCH /SETUP INTERRUPT SERVICE LINKAGE TO RETURN TO THIS TEST
7173 5403 5414 E00
7174 5404 6035 KIE /DISABLE CONSOLE PACKAGE INTERRUPTS
7175 5405 6001 ION
7176 5406 1377 TAD (200)
7177 5407 6751 LCD
7178 5410 6750 INTR /INTERRUPT ENABLE FLIP-FLOP <OFF>
7179 5411 7000 NOP /...WAIT
7180 5412 7000 NOP /...PLENTY
7181 5413 7410 SKP /...OF TIME
7182 5414 4450 E60, ERROR /UNEXPECTED INTERRUPT
7183 /
7184 /*****
7185 /*****
7186 /
7187 /IOT DECODING PART III- IOT INTR 6756 DECODING VERIFICATION

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7188 /
7189 /TECHNICAL NOTE:
7190 /
7191 /ALL FLAGS SHOULD REMAIN SET
7192 /IF ANY FLAG IS MISSING,
7193 /THEN IT IS ASSUMED THAT IOT "INTR" 6756 CLEARED THE FLAG(S)
7194 /
7195 5415 6751 LCD /MAINTENANCE MODE <OFF>
7196 5416 6756 INTR /DISABLE THE INTERRUPT ENABLE F/F
7197 5417 6755 SDN
7198 5420 4450 E61, ERKOR /MISSING DONE FLAG
7199 5421 6753 STR
7200 5422 4450 E62, EPROR /MISSING TRANSFER REQUEST FLAG
7201 5423 6754 SER
7202 5424 4450 E63, ERORR /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 4446 T10, LOOPPC
7228 5427 6002 IOF
7229 5430 4141 JMS PATCH /SETUP INT. LINKAGE TO RETURN TO THIS TEST
7230 5431 5444 T70K
7231 5432 6035 KIE /DISABLE CONSOLE PACKAGE INT.
7232 5433 1377 TAD (200)
7233 5434 6751 LCD /MAINTENANCE <ON>
7234 5435 6001 ION
7235 5436 7201 CLA IAC
7236 5437 6756 INTR /RX01 INTERRUPT ENABLE <ON>
7237 5440 7000 NOP
7238 5441 7000 NOP
7239 5442 7000 NOP
7240 5443 4450 E70, ERORR /MISSING INTERRUPT
7241 5444 4447 T70K, DONLOP
7242 /

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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 /WITH ALL FLAGS SET, NO INTERRUPTS SHOULD OCCUR
7252 /
7253 /TECHNICAL NOTE:
7254 /
7255 /IF AN UNEXPECTED PROGRAM INTERRUPT OCCURS FROM APPROXIMATELY THIS PC
7256 /THEN THE RX PROGRAM INTERRUPT REQUEST TOOK TOO LONG TO SET
7257 /FROM THE PREVIOUS TEST.
7258 /
7259 /
7260 /
7261 5445 4446 T11, LOOPPC
7262 5446 6002 IOF
7263 5447 4141 JMS PATCH /SETUP INT. LINKAGE TO RETURN TO THIS TEST
7264 5450 5460 E100
7265 5451 6035 KIE /DISABLE CONSOLE PACKAGE INT.
7266 5452 6756 INTR /DISABLE RX8 INTERRUPT ENABLE
7267 5453 6001 ION
7268 5454 1377 TAD (200)
7269 5455 6751 LCD
7270 5456 7000 NOP
7271 5457 7410 SKP
7272 5460 4450 E100, ERORR /UNEXPECTED INTERRUPT
7273 5461 4447 DONLOP
7274 /
7275 /
7276 /
7277 /
7278 /TEST 12
7279 /
7280 /INTERRUPT TEST (PART IV) (NO INT. SHOULD OCCUR DURING THIS TEST).
7281 /
7282 /*****
7283 /*****
7284 /*****
7285 /
7286 /TOGGING THE MAINTENANCE MODE <ON> / <OFF> SETS ALL FLAGS AND
7287 /
7288 /PERMITS IOT SDN TO CLEAR THE DONE FLAG
7289 /
7290 /THEREFORE NO INTERRUPTS SHOULD OCCUR (ONLY DONE FLAG RAISES AN INTERRUPT REQUEST)
7291 /
7292 5462 4446 T12, LOOPPC
7293 5463 6002 IOF
7294 5464 4141 JMS PATCH /SETUP INTERRUPT LINKAGE TO RETURN TO THIS TEST
7295 5465 5303 E110
7296 5466 6035 KIE /DISABLE CONSOLE PACKAGE INT.
7297 5467 1377 TAD (200)
7298 5470 6751 LCD

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7407 5602 4776* MODAGN, JMS INTMOD /INITIALIZE PROG MODE VARIABLES FOR 12 BIT MODE
7408 5603 6007 CAF /INITIALIZE FLOPPY INTERFACE-MAINT MODE=OFF,
7409 / /MODE=12 BIT,UNIT=A,INT,EN=OFF,
7410 / /RUNL=FALSE,FLAGS CLEARED,PARITY FLOP=CLEARED,
7411 5604 6507 LQRE /CLEAR PARALLEL I/O STROBE FLOPS AND ENABLE
7412 / /THE PARALLEL I/O SIMULATOR & THE FLOPPY
7413 / /RXDATA TO ERROR LOOPBACK.
7414 5605 1375 TAD (0017) /SETUP FLOPPY (VIA PARALLEL I/O INTERFACE BUFFER)
7415 / /TO NORMAL IDLE STATE(0>DONEL,1>XFER RQSTL,
7416 / /1>OUTL). NOTE PARALLEL I/O INVERTS DATA
7417 / /IN LQF MODE.
7418 5606 6502 LQMP /ALSO SETS PAPER RDY VIA PAPER STROBE
7419 5607 3774* DCA SHFTCT /INITIALIZE SHIFT COUNT TO ZERO
7420 5610 1773* TAD UNIT /AC=0 FOR UNIT A, AC=1 FOR UNIT B
7421 5611 6750 SEL /SETUP "UNIT" (A OR B)
7422 5612 6505 LQRS /VERIFY RUNL FALSE VIA PAPER READY
7423 5613 0372 AND (400) /FLAG = SET.
7424 5614 7650 SNA CLA
7425 5615 4450 ERROR /FITHER CAF FAILED TO ENABLE PARALLEL I/O
7426 / /SIMULATOR OR FLOPPY RUNL IS TRUE.
7427 / /NOTE: RUNL TRUE DISABLES PARALLEL I/O STROBE
7428 / /DECODER.
7429 5616 1771* TAD LCDATA /AC=2452 FOR 12 BIT MODE,AC=0125 FOR 8 BIT MODE
7430 5617 6751 LCD /MAINT BIT = 0 IN EITHER CASE.
7431 5620 6505 LQRS /VERIFY THAT LCD CAUSES RUNL=TRUE
7432 5621 0372 AND (400)
7433 5622 7640 SZA CLA
7434 5623 4450 ERROR /LCD FAILED TO CAUSE RUNL TO GO TRUE.
7435 5624 1378 TAD (0017) /CHANGE DONEL TO 1 FOR UNIT UNDER TEST
7436 5625 1767* TAD UDONE /UDONE=2000 FOR UNIT A,4000 FOR UNIT B
7437 5626 6502 LQMP
7438 5627 6505 LQRS /VERIFY THAT DONEL GOING H CAUSES RUNL=FALSE
7439 / /PAPER RDY FLAG SHOULD BE SET.
7440 5630 0372 AND (400)
7441 5631 7650 SNA CLA
7442 5632 4450 ERROR /DONEL FAILED TO CAUSE RUNL TO GO FALSE
7443 5633 0000 SHIFT0, 0/LQRE/LQPC /SHIFT OUT FLOPPY INTERFACE REGISTER
7444 / /SHIFTL=RESTORE,SHIFTIL=CHAR, STROBE
7445 5634 2774* ISZ SHFTCT /UPDATE SHIFT COUNTER
7446 5635 7300 CLA CLL
7447 5636 1774* TAD SHFTCT /NO OF SHIFTS ISSUED?
7448 5637 1366 TAD (-10)
7449 5640 7450 SNA
7450 5641 5250 JMP CKMODE /8 - CHECK MODE
7451 5642 7510 SPA
7452 5643 5255 JMP SMORE /<8 - TEST CURRENT RXDATA BIT & SHIFT.
7453 5644 1365 TAD (-4)
7454 5645 7640 SZA CLA
7455 5646 5255 JMP SMORE /8<SHIFT COUNT<12 - TEST CURRENT RXDAT & SHIFT
7456 5647 5257 JMP TSTPC /12 - TEST PARITY BIT,DONE SHIFTING
7457 5650 1771* CKMODE, TAD LCDATA /CHECK FOR 8 OR 12 BIT MODE
7458 5651 7041 CIA
7459 5652 1764* TAD DLCD8
7460 5653 7650 SNA CLA
7461 5654 5257 JMP TSTPC /8 BIT MODE - TEST PARITY BIT

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7462 5655 4763* SMORE, JMS TSTPAR /TEST CURRENT RXDATA
7463 5656 5233 JMP SHFT0 /SHIFT OUT AGAIN
7464 5657 4763* TSTPC, JMS TSTPAR /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/LQRE/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 SHIFT1-1 /<8 - SHIFT AGAIN
7477 5673 1365 TAD (-4)
7478 5674 7640 SZA CLA
7479 5675 5261 JMP SHIFT1-1 /8<SHIFT COUNT<12 - SHIFT AGAIN
7480 5676 5304 JMP CKINDA /DONE SHIFTING IN, CHECK DATA WORD THAT
7481 / /GOT SHIFTED IN.
7482 5677 1761* CKIMOD, TAD XDRDATA /CHECK FOR 8 OR 12 BIT MODE.
7483 5700 7041 CIA
7484 5701 1760* TAD DXDR8
7485 5702 7640 SZA CLA
7486 5703 5261 JMP SHIFT1-1 /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

```

```

7517 5734 6505 LQMS /VERIFY THAT RUNL GOES FALSE
7518 5735 6355 AND (440 /NOTE:FOR UNIT B TESTING CHAK STROBE GETS SET
7519 / BY LQPC USED IN SHIFTING ABOVE.
7520 5736 7650 SNA CLA /CHANGING XFR ROSTL TO 1 FAILED TO NEGATE RUNL
7521 5737 4450 ERROR /CHANGE DONE1 TO 0
7522 5740 1375 TAD (6017
7523 5741 6502 LQMP
7524 5742 6755 SDN
7525 5743 4450 LPROR /DONE FLAG FAILED TO SET
7526 5744 4754 JMS CHGMOD /CHANGE MODE & REPEAT TILL BOTH MODES HAVE BEEN TESTED.
7527 5745 5233 JMP MODAGN+1
7528 5746 4753 JMS CHGUNIT /CHANGE UNIT & REPEAT TILL BOTH UNITS HAVE BEEN TESTED.
7529 5747 5202 JMP MODAGN
7530 5750 4447 DONLOP
7531 5751 3140 DCA TSTNU
7532 5752 4443 CLEOP
7533
7534 5753 6014
7535 5754 6000
7536 5755 6440
7537 5756 6054
7538 5757 6056
7539 5760 6104
7540 5761 6072
7541 5762 6131
7542 5763 6111
7543 5764 6103
7544 5765 7774
7545 5766 7770
7546 5767 6053
7547 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 M8CON
7561 6004 7650 SNA CLA /8 BIT MODE
7562 6005 5212 JMP ALRBM /12 BIT MODE - SWITCH TO 8 BIT MODE
7563 6006 4344 JMS FILVAR /COPY 8 BIT MODE CONSTANTS INTO MODE VARIABLES
7564 6007 6071 MODVAR
7565 6010 6103 M8CON
7566 6011 5600 JMP I CHGMOD /MODE TESTING COMPLETE FOR UNIT
7567 6012 2200 ALRBM, ISZ CHGMOD
7568 6013 5600 JMP I CHGMOD
7569
7570 /ROUTINE TO CHANGE UNIT FROM A TO B & THEN REPEAT TEST.

```

```

7571 6014 0000 CHGUNIT, 0
7572 6015 1252 TAD UNVAR /WHICH UNIT WAS JUST TESTED?
7573 6016 7041 CIA
7574 6017 1264 TAD UNBCON
7575 6020 7650 SNA CLA /UNIT B
7576 6021 5232 JMP ALRBU /UNIT A - SWITCH TO UNIT B
7577 6022 4344 JMS FILVAR /COPY UNIT B CONSTANTS INTO UNIT VARIABLES
7578 6023 6052 UNVAR
7579 6024 6064 UNBCON /SETUP LQPC FOR SHIFT INST.
7580 6025 1377 TAD (LQPC
7581 6026 3776 DCA SHIFTO
7582 6027 1377 TAD (LQPC
7583 6030 3775 DCA SHIFTI
7584 6031 5614 JMP I CHGUNIT /UNIT TESTING COMPLETE
7585 6032 2214 ALRBU, ISZ CHGUNIT
7586 6033 5614 JMP I CHGUNIT
7587
7588 /INITIALIZE MODE VARIABLES FOR 12 BIT MODE
7589
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 UNBCON
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, 0
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, 0000
7621 6057 0000 2000
7622 6060 2000 1000
7623 6061 1000 0040
7624 6062 0040 0200
7625 6063 0200

```

```

7626
7627 /UNIT B CONSTANTS
7628
7629 UNBCON,
7630 6064 0001 0001
7631 6065 4000 4000
7632 6066 8000 8000
7633 6067 0020 0020
7634 6070 0100 0100
7635
7636 /MODE VARIABLES
7637
7638 MODVAR,
7639 6071 0000 LCDATA, 0
7640 6072 0000 XDRDATA, 0 /DATA EXPECTED TO READ FROM INTERFACE REG AFTER SHIFT IN.
7641 6073 0000 SLCOTA, 0
7642 6074 0000 SXDRDA, 0 /DATA TO BE SHIFTED INTO INTERFACE REG
7643 6075 0000 0
7644
7645 /MODE 12 CONSTANTS
7646
7647 M12CON,
7648 6076 4452 4452
7649 6077 0525 0525
7650 6100 4452 4452
7651 6101 7252 7252
7652 6102 0000 0000
7653
7654 /MODE 8 CONSTANTS
7655
7656 M8CON,
7657 6103 0125 DLCD8, 0125
7658 6104 0242 DXDR8, 0242
7659 6105 6500 6500
7660 6106 2720 2720
7661 6107 0000 0000
7662
7663 6110 0000 SHFICT, 0 /SHIFT COUNTER
7664
7665 /ROUTINE TO CHECK FOR PROPER DATA AT RXDATA PRIOR TO EACH SHIFT
7666 / OUT PULSE, NOTE: RXDATA IS LOOPED TO ERROR VIA SIMULATOR
7667
7668 6111 0000 TSTDAB, 0 /INITIALLY (WHEN SHIFT COUNT=0) SLCOTA CONTAINS
7669 / LCDATA BITS(EXCEPT BIT 0) CONCATENATED
7670 6112 7300 CLA CLL / WITH PARITY.
7671 6113 1273 TAD SLCOTA /AC(0) CONTAINS CURRENT RXDATA H BIT
7672 6114 7004 RAL
7673 6115 3273 DCA SLCOTA /LINK CONTAINS EXPECTED DATA BIT
7674 6116 1310 TAD SHFICT /LOAD AC WITH SHIFT POSITION FOR ERROR DISPLAY
7675 6117 7420 SNL
7676 6120 5325 JMP ZEXP
7677 6121 6754 SER
7678 6122 4450 ERROR /EXPECTED RXDATA H BIT=1,ACTUAL=0
7679 / AC CONTAINS SHIFT COUNT
7680 /NOTE: DATA AT RXDATA IS INVERTED.

```

```

7681 6123 7300 CLA CLL
7682 6124 5711 JMP I TSTDAB
7683 6125 6754 ZEXP, SER
7684 6126 7610 SKP CLA
7685 6127 4450 ERROR /EXPECTED RXDATA H BIT=0,ACTUAL = 1
7686 / AC CONTAINS SHIFT COUNT.
7687 /NOTE: DATA AT RXDATA IS INVERTED.
7688 6130 5711 JMP I TSTDAB
7689
7690 /ROUTINE TO SETUP RXDATA PRIOR TO EACH SHIFT IN PULSE.
7691
7692 6131 0000 SHINDA, 0
7693 6132 7300 CLA CLL /INITIALLY (BEFORE ANY IN SHIFTING) SXDRDA CONTAINS
7694 / XDRDATA.
7695 6133 1274 TAD SXDRDA /AC(0) CONTAINS NEXT DATA BIT TO BE
7696 / SHIFTED IN.
7697 6134 7404 RAL
7698 6135 3274 DCA SXDRDA /SAVE SHIFTED DATA IN
7699 6136 7630 SZL CLA
7700 6137 1255 TAD UDATA /FORM PARALLEL I/O WORD FOR PROPER SHIFT IN
7701 6140 1373 TAD (0017 / DATA ON RXDATA.
7702 6141 1256 TAD UOUT /AT SAME TIME CHANGE OUTL TO 0.
7703 6142 1253 TAD UDONE
7704 6143 5731 JMP I SHINDA
7705
7706 /ROUTINE TO COPY A SET OF 5 CONSTANTS INTO 5 VARIABLES.
7707
7708 6144 0000 FILVAR, 0
7709 6145 1744 TAD I FILVAR /GET VARIABLE LOCATION
7710 6146 3364 DCA VAR
7711 6147 2344 ISZ FILVAR
7712 6150 1744 TAD I FILVAR /GET CONSTANT LOCATION
7713 6151 3365 DCA CONST
7714 6152 2344 ISZ FILVAR
7715 6153 1372 TAD (-5
7716 6154 3366 DCA FVLCT /SET A LOOP COUNTER
7717 6155 1765 TAD I CONST /COPY CONSTANT INTO VARIABLE
7718 6156 3764 DCA I VAR
7719 6157 2365 ISZ CONST
7720 6160 2364 ISZ VAR
7721 6161 2366 ISZ FVLCT
7722 6162 5355 JMP FVLOOP /REPEAT FOR EACH OF 5 CONSTANTS
7723 6163 5744 JMP I FILVAR
7724
7725 6164 0000 VAR, 0
7726 6165 0000 CONST, 0
7727 6166 0000 FVLCT, 0
7728
7729
7730

```

```

7731
7732
7733 6172 7773
7734 6173 2017
7735 6174 6507
7736 6175 5662
7737 6176 5633
7738 6177 6504
7739 6200
7740
7741
7742
7743
7744 6200 3255 SKPICHN,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
7749 6204 6244 RMF /SAVE PC AT TIME OF INT.
7750 6205 1120 XR, TAD EXMIII /RESTORE DF
7751 6206 7640 SZA CLA /EXPECTING A XMIT INT?
7752 6207 5224 JMP CKXMFQ /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. IN?
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, ERROR /UNEXPECTED INTERRUPT
7764 /AC= PC AT TIME OF INT.
7765 /CONT TO DETERMINE WHICH FLAGS ARE SET
7766 6223 5246 JMP SETIF
7767
7768 6224 6041 CKXMFQ, 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

```

```

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 UNETHS
7805 6261 4432 CICRLF
7806 6262 4775 JMS M1TN /DISPLAY TEST NUMBER
7807 6263 1000 TAD 0
7808 6264 3774 DCA PC1SAVE
7809 6265 4773 JMS M1PC /DISPLAY PC
7810 6266 1255 TAD AC
7811 6267 3772 DCA AC1SAVE
7812 6270 4771 JMS M1AC /DISPLAY AC
7813 6271 4770 JMS M1FL /DISPLAY FLAGS
7814 6272 4432 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 4233 JMS CKFLG /DISPLAY FLAGS SET
7822 6302 5765 JMP IEH1
7823
7824
7825 6303 2516 UNETHS, TEXT "UNEXPECTED INTERRUPT = FIELD 1"
6304 0530
6305 2005
6306 0324
6307 0504
6310 4011
6311 1024
6312 0522
6313 2225
6314 2024
6315 4055
6316 4006
6317 1105
6320 1404
6321 4061

```

```

7826 6322 0000
      6323 0014
      6324 0107
      6325 2340
      6326 2305
      6327 2472
      6330 0000
7827 6331 0413
      6332 2624
      6333 0255
      6334 0140
      6335 0601
      6336 1114
      6337 0504
      6340 5440
      6341 0611
      6342 0514
      6343 0440
      6344 6140
      6345 4000

7828
7829
7830
7831 6346 0000
7832 6347 7300
7833 6350 6201
7834 6351 1764
7835 6352 6211
7836 6353 5746
7837
7838

```

FSIMES, TEXT "FLAGS SET:"

ERRIMES, TEXT "DKVTR=A FAILED, FIELD 1 "

/ROUTINE TO GET HARDWARE OPTION WORD 3 (LOC 23) FROM FIELD 0.

```

XGHW3, 0
      CLA CLL
      CDF 00
      TAD I (23)
      CDF 10
      JMP I XGHW3

```

```

7839
7840 6364 0023
7841 6365 6655
7842 6366 6274
7843 6367 6213
7844 6370 6440
7845 6371 6424
7846 6372 6710
7847 6373 6531
7848 6374 6707
7849 6375 6523
7850 6376 2400
7851 6377 0000
      6400

7852
7853
7854
7855
7856
7857
7858
7859 6403 4257
7860 6401 4224
7861 6402 4232
7862 6403 4240
7863 6404 4432
7864 6405 5777
7865
7866
7867
7868 6406 4246
7869 6407 5777
7870
7871
7872
7873 6410 1776
7874 6411 3775
7875 6412 4246
7876 6413 4434
7877 6414 6537
7878 6415 1126
7879 6416 4435
7880 6417 4434
7881 6420 6546
7882 6421 1127
7883 6422 4435
7884 6423 5777
7885
7886
7887
7888 6424 0000
7889 6425 4434
7890 6426 6676
7891 6427 1774
7892 6430 4435

```

*6400

/ERROR DISPLAY FORMAT ROUTINES

/NORMAL DISPLAY = TN,PC,AC,MQ,FLAGS

```

NORDIS, JMS MSHDR
      JMS MIAC
      JMS MIMQ
      JMS MIFL
      CIRCFL
      JMP IEH1

```

/PRINT ERROR HEADER & PC

/PRINT AC

/PRINT MQ

/PRINT FLAGS

/SLU DISPLAY = TN,PC,AC,SLU,BR

```

SLUDIS, JMS NORSLU
      JMP IEH1

```

/SPECIAL SLU DISPLAY = TN,PC,AC,SLU,BR,XMIT DATA,REC DATA

```

SSLUDIS, TAD DDERSLU
      DCA PCISAVE
      JMS NORSLU
      CIPRNT
      MESXM
      TAD SLUXMT
      CIPRT4
      CIPRNT
      MESRC
      TAD SLUREC
      CIPRT4
      JMP IEH1

```

/SUBROUTINES FOR DISPLAY ROUTINES

```

MIAC, 0
      CIPRNT
      MESIAC
      TAD ACISAVE
      CIPRT4

```

/DISPLAY AC MESSAGE

```

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

```

```

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

```

```

7979
7980
7981      6566 2025
7982      6567 7770
7983      6570 6030
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      /      CONSOLE ROUTINES
7996      /      *****
7997
7998      /THIS ROUTINE WILL DETERMINE WHAT TO DO WHEN A ERROR IS ENCOUNTERED
7999      /WILL CHECK IF UNDER APT CONTROL,
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 7040      CMA      /KB1CHK CLEARS FLAG
8015      6616 6201      CDF 00      /KSFLG USED BY UNEXPECTED INT, DISPLAY
8016      6617 3777      DCA I (KSFLG
8017      6620 6211      CDF 10
8018      6621 4462      KB1CHK
8019      6622 1124      TAD TESTF1
8020      6623 3275      DCA TLOOP1
8021      6624 4465      GETSR      /GET PSR FROM FIELD 0
8022      6625 0376      AND (0200      /INHIBIT ERROR TYPEOUT?
8023      6626 7640      SZA CLA
8024      6627 5255      JMP IEH1      /NO ERROR PRINTOUT
8025      6630 6037      KLB      /REMOVE LOOP AROUND ON SLU
8026      6631 1375      TAD (0016      /SET SLU#1 BAUD RATE TO 9600 BITS/SEC
8027      6632 6043      TSB
8028      6633 4474      DELAY      /WAIT FOR BAUD RATE CHANGE TO TAKE EFFECT
8029      6634 7300      CLA CLL
8030      6635 6032      KCC      /CLEAR OUT REC FLAG-MAY BE SET IF ENTERING FROM A SLU ERROR.
8031      6636 1307      TAD PCISAVE
8032      6637 7041      CIA

```

```

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 C1BY2      /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      C1BY2, JMS RESTBR      /RESTORE BAUD RATES IN ALL SLUS TO
8052      / STATES PRIOR TO ERROR,
8053      6663 4465      GETSR      /LOOP ON ERROR?
8054      6664 7004      RAL      /TEST BIT 1
8055      6665 7710      SPA CLA
8056      6666 5675      JMP I TLOOP1      /LOOP
8057      6667 4315      JMS 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 0101
8067      6678 7200
8068      6679 4040      MES1MQ, TEXT " MQ:"
8069      6680 1521
8070      6681 7200
8071      6682 4040      MES1FL, TEXT " FL:"
8072      6683 0614
8073      6684 7200
8074      6685 7777      PCISAVE,7777
8075      6686 7777      ACISAVE,7777
8076      6687 7777      MQISAVE,7777
8077      6688 7777      FLISAVE,7777
8078      6689 5714      APIOW1, JMP I ,+1
8079      6690 7000      APTIER
8080
8081      6715 8000      CIGET, 0
8082      6716 7200      CLA
8083      6717 1311      TAD MQISAVE
8084      6718 7421      MOL      /RESTORE THE MQ
8085      6719 1312      TAD FLISAVE
8086      6720 7004      RAL      /RESTORE THE LINK

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0000      6721  7200      CLA
0001      6724  5715      JMP I C1GET
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0134      /APT/      ROUTINE TO HANDLE ERRORS UNDER APT CONTROL,
0135
0136      7000  6002  APTIER, IOF      /APT/
0137      7001  7200  CLA          /APT/
0138      7002  6037  KLB          /APT/ REMOVE LOOP AROUND ON SLU'S
0139      7003  6224  RIF          /APT/AC=IF,
0140      7004  1377  TAD          (6201 /APT/CREATE A CDF INST.
0141      7005  3210  DCA          +3 /APT/MODIFY NEXT CDF INST.
0142      7006  7240  CLA CMA      /APT/
0143      7007  1770  TAD          /APT/AC=ERROR PC.
0144      7010  6201  CDF          /APT/(MODIFIED CDF) DF=IF,
0145      7011  6272  CIF          /APT/IF=FIELD 7.
0146      7012  5775  JMP          /APT/CALL APT = 'ERROR'.
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0152      /ROUTINE USED FOR CONSOLE SWITCH REGISTER CHANGES
0153
0154      7013  0000  XC1SW, 0
0155      7014  7200  CLA
0156      7015  4434  SR1QEST,C1PRNT /PRINT SR QUESTION
0157      7016  7343  SR1MSLG /POINTER TO MESSAGE
0158      7017  4465  GETSR /GET PSR FORM FIELD 0
0159      7020  4435  C1PRT4 /PRINT THE 4 DIGITS
0160      7021  7346  CLA CLL CMA RTL /SETUP A COUNTER TO ACCEPT 4 DIGITS
0161      7022  3301  DCA TTYCNT /SAVE THE COUNTER
0162      7023  1374  TAD (CH1R0 /GET POINTER FOR FIRST CHARACTER
0163      7024  3227  DCA CHG1CHR /SAVE THE POINTER FOR DIGITS
0164      7025  4437  LISNF1 /WAIT FOR KEYBOARD INPUT
0165      7026  0001  1 /CHECK FOR A OCTAL DIGIT
0166      7027  7045  CHG1CHR,CH1R0 /THIS LOCATION WILL GET MODIFIED
0167      7030  7566  -212 /CHECK FOR LINE FEED
0168      7031  7337  COMPSST /LINE FEED TYPED- RETURN TO START
0169      7032  7563  -215 /CHECK FOR CARRIAGE RETURN
0170      7033  7065  RETIYPE /RETYPE SR AND CONT IF DIGITS TYPED
0171      7034  7575  -203 /CHECK FOR A CONTROL C
0172      7035  7102  C1RM /CONTROL C TYPED -RETURN TO MONITOR
0173      7036  7555  -223 /CHECK FOR A CONTROL S
0174      7037  7144  CTRS1 /WAS CONTROL S WAIT FOR "Q OR "C
0175      7040  0000  0 /NONE OF ABOVE CHARACTERS=ILLEGAL CHAR
0176      7041  7042  +1 /GO TO NEXT ADDRESS TO PRINT ?
0177      7042  4434  C1PRNT /GO PRINT ?
0178      7043  7346  QES1MK /POINTER TO ? MESSAGE
0179      7044  5215  JMP SR1QEST /RETURN AND ASK QUESTION AGAIN
0180      7045  6201  CH1R0,CDF 00 /SAVE THE LEAST SIGNIFICANT BIT
0181      7046  3773  DCA I (PSR
0182      7047  6211  CDF 10
0183      7050  1372  TAD (CH1R1 /UPDATE POINTER FOR CHARACTERS 2 3 4
0184      7051  3227  DCA CHG1CHR /SAVE THE POINTER ADDRESS
0185      7052  5225  JMP CHG1CHR-2 /RETURN FOR NEXT CHARACTER INPUT
0186      7053  3300  CH1R1,DCA SAV1CHR /SAVE THE CHARACTER TYPED
0187      7054  4465  GETSR /GET THE VALUE OF SR
0188      7055  7106  CLL RTL /MOVE IT INTO NEXT POSITION
0189      7056  7004  RAL

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0189 7057 1300 TAD SAVICHR /ADD NEW CHARACTER TO IT
0190 7060 6201 CDF 00
0191 7061 3773 DCA I (PSR
0192 7062 6211 CDF 10
0193 7063 2301 ISZ TTYICNT /DONE ALL 4 CHARACTERS
0194 7064 5225 JMP CHGICHR-2 /NO GET NEXT INPUT FROM KEYBOARD
0195 7065 1374 RE1TYPE,TAD (CHIR0 /GET POINTER TO SEE IF SR ECHOED
0196 7066 7041 CIA /NEGATE THE POINTER
0197 7067 1227 TAD CHGICHR /GET THE POINTER STORED
0198 7070 7650 SNA CLA /ECHO VALUE OF SR?
0199 7071 5613 JMP I XC1SW /NO-ONLY CR WAS TYPED-USE ORIGINAL VALUE
0200 7072 4434 C1PRNT /RE-ECHO VALUE TYPED
0201 7073 7343 SR1MSG /POINTER TO SR MESSAGE
0202 7074 4465 GETSR /GET PSR FORM FIELD 0
0203 7075 4435 C1PRT4 /PRINT THE 4 OCTAL DIGITS
0204 7076 4432 C1CRLF /ISSUE A CR AND LF
0205 7077 5613 JMP I XC1SW /RETURN TO PROGRAM
0206
0207 7100 0000 SAVICHR,0
0208 7101 0000 TTYICNT,0
0209
0210
0211 7102 6007 C1RM, CAF
0212 7103 6203 CDI 00
0213 7104 5705 JMP I ,+1 /CHANGE INST AND DATA FIELD TO 0
0214 7105 7600 7600 /GOTO 7600 OF THAT FIELD
0215 /MONITOR STARTING ADDRESS
0216
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0223 7106 0000
0224 7107 6031 XCHIKSF,0
0225 7110 5336 KSF /SKIP ON CONSOLE RECEIVE FLAG
0226 7111 6201 JMP NORF /RECEIVE FLAG NOT SET RETURN TO PROGRAM
0227 7112 1771 CDF 00
0228 7113 6211 TAD I (MCW2 /CHECK TO SEE IF CONSOLE WAS ACTIVE
0229 7114 0370 CDF 10
0230 7115 7650 AND (4000 /((VERSUS APT IN CONTROL),
0231 7116 5321 SNA CLA
0232 7117 6032 JMP ,+3 /ACTIVE CONSOLE-CHECK FOR "C OR "G
0233 7120 5706 KCC /APT ACTIVE,CLEAR CONSOLE RECEIVE FLAG
0234 7121 4767 JMP I XCHIKSF /RETURN TO PROGRAM
0235 7122 4437 JMS SISUBL /SAVE SUBROUTINE LINKAGE
0236 7123 7575 LISNFI /CHECK THE KEYBOARD CHARACTER
0237 7124 7102 -203 /CODE FOR "C
0238 7125 7571 C1RM /WAS A CONTROL C-EXIT TO MONITOR
0239 7126 7140 -207 /CODE FOR "G
0240 7127 7555 CNTRIG /WAS "G ECHO CHAR-ENTER SR QUESTION
0241 7130 7146 -223 /CHECK FOR A CONTROL S
0242 7131 0000 CNT1S1 /WAS A CONTROL S WAIT FOR "Q OR "C
0243 7132 7133 0 /CHAR WAS NOT "C OR " G
,+1 /ECHO CHAR AND QUESTION MARK

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/ROUTINE TO CHECK FOR CONSOLE RECEIVE FLAG

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0244 7133 1366 TAD (277 /PRINT ?
0245 7134 4442 TYPE1
0246 7135 5347 JMP RILK /RETURN TO PROGRAM
0247 7136 2300 NORF, ISZ XCHIKSF
0248 7137 5706 JMP I XCHIKSF
0249
0250 7140 4434 CNTRIG, C1PRNT /PRINT "G AND CR LF
0251 7141 7350 UPARR1 /POINTER TO MESSAGE
0252 7142 4213 JMS XC1SW /GO ASK THE SR QUESTION
0253 7143 5347 JMP RILK /RETURN TO THE PROGRAM
0254
0255 7144 4765 CTRS1, JMS WAITIQC /GO WAIT FOR A CONTROL Q OR C
0256 7145 5225 JMP CHGICHR-2 /GO WAIT FOR NEXT CHAR
0257
0258 7146 4765 CNT1S1, JMS WAITIQC /WAIT FOR A CONTROL Q OR C
0259 7147 4764 RILK, JMS RISUBL /RESTORE SUBROUTINE LINKAGE
0260 7150 5706 JMP I XCHIKSF /RETURN TO PROGRAM
0261 7151 0004 FILLR1, 0004 /SET TO NUMBER OF FILLERS REQUIRED.
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0270 7164 7547
0271 7165 7506
0272 7166 0277
0273 7167 7537
0274 7170 4000
0275 7171 0022
0276 7172 7053
0277 7173 0020
0278 7174 7045
0279 7175 6520
0280 7176 6600
0281 7177 6701
7200
0282 PAGE
0283 /TYPE A CR AND LF WITH NUMBER OF FILLERS
0284 /AS DETERMINED BY LOCATION "FILLR1"
0285 7200 0000 XC1CRLF,0 /CALL BY "CRLF"
0286 7201 7200 CLA
0287 7202 1377 TAD (215
0288 7203 4442 TYPE1
0289 7204 1776 TAD FILLR1
0290 7205 7040 CMA
0291 7206 3214 DCA XORS1
0292 7207 1375 TAD (212
0293 7210 4442 TYPE1
0294 7211 2214 ISZ XORS1
0295 7212 5710 JMP ,+2
0296 7213 5600 JMP I XC1CRLF
0297

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8298 7214 0000 XORS1, 0
8299
8300 /PRINT 2 SPACES
8301
8302 7215 0000 SPAC2, 0 /CALL BY "SPAC21"
8303 7216 4434 CIPRNT
8304 7217 7221 .+2
8305 7220 5615 JMP I SPAC2
8306 7221 4040 4040
8307 7222 0000 0000
8308
8309
8310 /COMPARE INPUT TO LIST FOLLOWING CALL
8311 /INPUT ONE CHARACTER IF AC=0
8312 /USE LAST INPUT IF AC NON ZERO
8313
8314 7223 0000 XLISN1, 0 /CALL BY "LISN1"
8315 7224 7640 SZA CLA
8316 7225 5253 JMP LISN11 /USE LAST INPUT SINCE AC NOT ZERO
8317 7226 6031 KSF
8318 7227 5226 JMP .-1
8319 7230 6036 KRB
8320 7231 0374 AND (177
8321 7232 1373 TAD (200
8322 7233 3305 DCA CHAREC
8323 7234 1305 TAD CHAREC
8324 7235 1372 TAD (-212
8325 7236 7450 SNA
8326 7237 5243 JMP .+4 /IS IT A LF?
8327 7240 1371 TAD (-3 /YES
8328 7241 7640 SZA CLA /IS IT A CR?
8329 7242 5245 JMP .+3 /NO
8330 7243 4432 C1CRLF
8331 7244 5253 JMP LISN11
8332 7245 1305 TAD CHAREC /GET THE CHAR
8333 7246 1370 TAD (-223 /CHECK FOR A CONTROL S
8334 7247 7650 SNA CLA /WAS IT A CONTROL S
8335 7250 5253 JMP LISN11 /YES-DO NOT ECHO CHARACTER
8336 7251 1305 TAD CHAREC
8337 7252 4442 TYPE1 /PRINT THE CHARACTER
8338 7253 1623 LISN11, TAD I XLISN1 /GET COMPARE VALUE
8339 7254 2223 ISZ XLISN1
8340 7255 7450 SNA
8341 7256 5264 JMP LISN31 /EXIT?
8342 7257 7500 SMA /YES
8343 7260 5274 JMP LISNUM /LOOK FOR OCTAL NUMBER
8344 7261 1305 TAD CHAREC /COMPARE
8345 7262 7640 SZA CLA /EQUAL?
8346 7263 5271 JMP LISN21 /NO
8347 7264 3714 LISN31, DCA XORS1
8348 7265 1623 TAD I XLISN1
8349 7266 3223 DCA XLISN1
8350 7267 1214 TAD XORS1
8351 7270 5623 JMP I XLISN1 /AC IS ZERO UNLESS OCTAL NUMBER
8352 7271 7200 LISN21, CLA

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8353 7272 2223 ISZ XLISN1
8354 7273 5253 JMP LISN11
8355 7274 7200 LISNUM, CLA /LOOK FOR OCTAL NUMBER
8356 7275 1305 TAD CHAREC
8357 7276 1367 TAD (-270
8358 7277 7500 SMA /IS IT LESS THAN 0?
8359 7300 5271 JMP LISN21 /NO, SO NOT AN OCTAL NUMBER
8360 7301 1366 TAD (10
8361 7302 7510 SPA /IS IT GREATER THAN ZERO?
8362 7303 5271 JMP LISN21 /NO, SO NOT A NUMBER
8363 7304 5264 JMP LISN31
8364
8365 7305 0000 CHAREC, 0
8366
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8369
8370 /*****
8371
8372 /END OF PASS ROUTINE
8373
8374
8375 7306 0000 XCIEOP, 0
8376 7307 6002 IOF
8377 7310 4432 C1CRLF / CONTROL TO JMP APTJ01,
8378 7311 4434 CIPRNT
8379 7312 7327 EOPIMES
8380 7313 2137 ISZ PASSNO /UPDATE PASS COMPLETED NUMBER
8381 7314 7000 NOP
8382 7315 1137 TAD PASSNO
8383 7316 4435 CIPRT4
8384 7317 4432 C1CRLF
8385 7320 4465 GETSR /CONTINUE?
8386 7321 0365 AND (0400
8387 7322 7640 SZA CLA
8388 7323 5337 JMP COMPST /NO-ASK SWITCH REG QUESTION,
8389 7324 4515 APTREP /IF UNDER APT CONTROL REPORT OK STATUS TO APT
8390 7325 6203 CDI 00
8391 7326 5764 JMP COREST
8392 7327 0516 EOPIMES, TEXT "END OF PASS "
8393 7330 0440
8394 7331 1706
8395 7332 4020
8396 7333 0123
8397 7334 2340
8398 7335 4040
8399 7336 4000
8393 7337 6203 COMPST, CDI 00
8394 7340 5773 JMP START
8395
8396 7341 6203 CIRST, CDI 00
8397 7342 5764 JMP COREST
8398
8399 7343 4323 SRIMESG, TEXT "#SR#"
8399 7344 2275

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8420 7345 8220
 8421 7346 7743
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 8401 7350 3607
 7351 4300
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 8404 7364 8201
 8405 7365 0400
 8406 7366 0010
 8407 7367 7510
 8408 7370 7555
 8409 7371 7775
 8410 7372 7560
 8411 7373 8200
 8412 7374 0177
 8413 7375 0212
 8414 7376 7151
 8415 7377 8215
 7400

PAGE

/*****

/TYPE THE ASCII CHARACTER IN THE AC

8422
 8423 7400 8000
 8424 7401 3213
 8425 7402 7000
 8426 7403 4273
 8427 7404 1213
 8428 7405 6040
 8429 7406 7200
 8430 7407 6041
 8431 7410 5207
 8432 7411 6042
 8433 7412 5600
 8434 5600
 8435
 8436 7413 0000
 8437
 8438
 8439
 8440
 8441
 8442
 8443
 8444
 8445
 8446 7414 0000
 8447 7415 7200
 8448 7416 4462
 8449 7417 1614
 8450 7420 3252

X1TYPE, 0 /CALL BY "TYPE"
 DCA CHAR1 /SAVE THE CHARACTER
 TYOUT1, NOP/JMP I X1TYPE /OVERWRITTEN IF RUNNING UNDER APT CONTROL.
 JMS CNTRIS /CONSOLE ACTIVE-CHECK FOR CONTROL S
 TAD CHAR1 /GET THE CHARACTER SAVED AND PRINT
 TLS
 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 7012
 8454 7424 7012
 8455 7425 7012
 8456 7426 4233
 8457 7427 1652
 8458 7430 4233
 8459 7431 2252
 8460 7432 5222
 8461 7433 0000
 8462 7434 6377
 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 0000
 8480
 8481
 8482
 8483
 8484 7453 0000
 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 0000
 8498 7467 0372
 8499 7470 1371
 8500 7471 4442
 8501 7472 5666
 8502
 8503
 8504
 8505

ISZ MESAG
 TAD I FOR10CK /SET UP RETURN
 RTR
 RTR
 RTR
 JMS MES1F
 TAD I FOR10CK
 JMS MES1F
 ISZ FOR10CK
 JMP ,=10
 MES1F, 0
 AND (77
 SNA /TERMINATOR (00)?
 JMP I MESAG /YES
 TAD (=43
 SNA /CRLF?
 JMP ,+7 /YES
 TAD (3
 SPA /200 OR 300
 TAD (100 /300
 TAD (240 /200
 TYPE1
 JMP I MES1F
 CICRLF
 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
 RTR
 PRN21
 TAD FOR10CK
 PRN21
 SPAC21
 JMP I X1PRN4

X1PRN1, 0 /CALL BY "PRN11"
 AND (7
 TAD (260
 TYPE1
 JMP I X1PRN1

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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 0001 KSF /SKIP ON CONSOLE KEYBOARD FLAG
0512 7475 5673 JMP I CNTRIS /RETURN TO TYPE ROUTINE-FLAG NOT SET
0513 7476 0034 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 0032 KCC /CLEAR KEYBOARD FLAG FROM *S
0519 7504 4306 JMS WAIT1QC /WAIT FOR CONTROL Q OR C
0520 7505 5673 JMP I CNTRIS /RETURN TO PRINT MESSAGE BEING TYPED
0521
0522 7506 0000 WAIT1QC, 0 /ROUTINE TO WAIT FOR CONTROL Q OR C
0523 7507 0031 KSF /WAIT FOR A CONTROL Q OR C TO EXIT
0524 7510 5307 JMP *-1 /
0525 7511 0036 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 CIRM /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 COMPST /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 WAIT1QC+1 /NO-WAIT FOR APPROPRIATE KEY
0536 7524 5706 JMP I WAIT1QC /RETURN TO WHENCE IT CAME
0537
0538
0539
0540 /PRINT THE TWO OCTAL NUMBERS IN THE AC 6 THRU 11
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

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0561 7544 1253 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

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FIELD 0

[illegible][illegible]

0595 0200 *200
 0596
 0597 8888

AC	6255	BYT7	0007	CHGCHR	7032	CONTT	5704
ACISAV	6710	BYT8	0065	CHGMOD	6000	CPUDIS	6422
ACAIOT	5120	BLANK	0130	CHGUNT	6014	CPUDN	2134
ACCERR	5054	BR8M8	0036	CHKKB	2237	CPUMES	2210
ACDATA	0067	BSTLP	0012	CHKKSF	4516	CPUSDI	6400
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
ALR8M	6012	CIREST	0200	CIFOK1	3440	CPUT2	0400
ALRSU	6032	CIRM	7102	CKBR8Q	2271	CPUT3	0501
APIOW1	6713	CIR8T	7341	CKCON	6241	CPUT4	0600
APTICO	5600	CISWIT	4436	CKFLG	6233	CPUT5	0712
APTIER	7000	C8APT	4532	CKIMOD	5677	CPUT6	1026
APT3CK	2726	C8CRLF	4521	CKINDA	5704	CPUT7	1071
APTCOM	7333	C8ERR	4533	CKMF	3501	CRA	6210
APCT1	6751	C8GET	6703	CKMODE	5650	CRA81	7144
APCT2	6752	C8H3	4540	CKPTFG	6232	CUIPTR	5121
APCTX	6756	C8PRNT	4522	CKRFG	6227	DAT	0073
APCTY	6757	C8PRT4	4523	CKXMF	6224	DATPAT	6177
APTR	7000	C8RC	4537	CLCL	6136	DATSLU	2421
APTHW3	6143	C8REST	0201	CLCON	5713	DDERSL	2470
APTIM1	6747	C8RM	7105	CLKCT	5712	DECPRT	6104
APTIM2	6750	C8STAR	4534	CLKERR	5715	DELAY	4470
APTIMX	6754	C8SWIT	4524	CLKIR	5674	DELAY1	3251
APTIMY	6755	CAB	3366	CLLE	6135	DESLU	2462
APTOK	6732	CAC	3367	CLOOPA	3240	DF0	3013
APTOK1	6725	CAD	3363	CLREIF	4455	DF1	3025
APTON1	6701	CAE	3437	CLREPI	4471	DF2	3033
APTR	2513	CAF	6007	CLRERI	4457	DF3	3041
APTREP	4515	CAG	4625	CLREXI	4456	DF4	3047
ATIMLS	1466	CAM	7621	CLSK	6137	DF7	3017
ATIMMS	1467	CANTST	1000	CLSKWT	4541	DFLD	3207
BASEP	6055	CCDF	3300	CLUPEX	1547	DLCD0	6103
BDR1	0026	CDELTA	5714	CNT	0122	DLOP	2423
BDR2	0027	CDI	6203	CNT1	0123	DNF7	3226
BDR3	0030	CFSLU	4512	CNT1B1	7146	DONLOP	4447
BDRATE	3124	CH1KB	3320	CNTR1G	7140	DONT17	1435
BDNR8	3200	CH1KSF	4445	CNTR1S	7473	DOSIMU	1056
BDRSQ	2322	CH1R0	7045	CNTRLG	7141	DOSLU	6025
BDTA	4505	CH1R1	7053	CNTRL8	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	E0PRE	5026
BIT3	0062	CHARLP	2015	CONCH	4026	E1	5111
BIT4	0063	CHARR0	7050	CONCHK	4020	E10	5142
BIT5	0064	CHARR1	7054	CONST	6165	E100	5460
BIT6	0102	CHG1CH	7027	CONTDG	4512	E11	5126

E110	5503	EXISET	2224	HLTS	3314	JMSLOC	1435
E120	5535	EXITTA	4481	IR0	3064	K0	2416
E121	5546	EXMLT1	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	IFD0	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	FILCOR	4052	INSTRT	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	FLISAV	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	FRET	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
ENDTST	4530	GOOD	0132	IOF4	2625	KKRTN	4634
EOP1ME	7327	GR1SIM	1664	IOF5	2632	KLB	6037
EPRNTI	0135	GR2GR3	1704	IOF7	2637	KL5IM	4513
ERECL	0121	GRFSIM	1600	IOF8	2644	KMD1	6307
ERICLR	2220	GROUP2	1706	IOF9	2651	KNOP	3350
ERISST	2230	GROUP3	2000	IOFADD	3044	KRB	6036
ERR1ME	6331	GSR	2253	IOFLP	5010	KRB1	6306
ERRMES	5230	GTF	6004	IOFREC	3056	KRB2	6326
ERROR	4450	H1	5566	IOFTA	3043	KRS	6034
ETIMLL	1472	HANGER	5567	IOFTXMT	3066	KRS1	6304
ETIMLU	1473	HCW1	0021	ISSTBB	2700	KRS2	6324
ETIMMS	1471	HCW2	0022	ITOLOC	0166	KRTN	4627
EXICLR	2214	HCW3	0023	JMP1R	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
KSFAT	4452	LSAV1	7355	MLAP	6361	NXTPAT	1504
KSTOP	0066	LSAV2	7356	MLA	6506	NXTPTT	2131
KTEST	4660	LSAV3	7357	MLQP	6364	ODT1	0004
KTEST1	4661	LXCRST	6731	MMID	6277	ODT2	0005
L101	4231	M12CON	6076	MMQ	6464	ODT3	0006
L102	4266	M1AC	6424	MODAGN	5602	OERR	2130
L111	4461	M1FL	6440	MODE1	0027	OFONKI	2471
L112	4472	M1MQ	6432	MODE2	0006	OTZ	1405
LISAV1	7557	M1PC	6531	MODE3	0007	OUT	1724
LISAV2	7560	M1TN	6523	MODVAR	6071	OW1APT	6602
LISAV3	7561	M212	7310	MPC	6532	OWAPT	6602
L211	2023	M270	7304	MQ1SAV	6711	OWSET	0635
L61	3623	M3	7307	MQA	7501	PASSNO	0137
L62	3653	M43	7460	MQDATA	0070	PATCH	0141
LCD	6751	M8CON	6103	MQL	7421	PBRMS	6027
LCDATA	6071	MAC	6456	MQSAVE	6676	PC1SAV	6707
LCDF	3330	MBR	6512	MQWAS	0055	PCIE	6665
LENBAS	2146	MEMES	5210	MREC1	6350	PCLF	6662
LIS1NU	7274	MEOW	3007	MREC2	6353	PCLLOOP	2200
LISN	4525	MES1AC	6676	MREC3	6356	PCLP	6666
LISN1	7255	MES1F	7433	MSHDR	6457	PCPUM	0211
LISN11	7253	MES1FL	6704	MSLU	6467	PCPUNS	2200
LISN2	7273	MES1MQ	6701	MSPF	4502	PCSAVE	6674
LISN21	7271	MES1PC	6672	MTCF	4504	PERR	2135
LISN3	7266	MES1TN	6554	MTLS	4510	PFM	5011
LISN31	7264	MESAC	6663	MTN	6524	PFMES	5145
LISNF1	4437	MESACT	6547	MTPC	4506	PIMES	4352
LISNSR	6047	MESAG	7414	MTSB	4505	PMENES	5200
LISNUM	7276	MESAGF	7441	MTSF	4503	PMODE	2076
LKDATA	0071	MESAGX	7423	MTSK	4507	POINTB	0100
LKWA5	0056	MESBR	6563	MXMT1	6337	POINTC	0101
LL1	4406	MESEXP	6556	MXMT2	6342	POINTD	0102
LL2	4433	MESFL	6671	MXMT3	6345	POINTE	0103
LLLD	2257	MESHDR	6514	NDF	0074	POINTF	0104
LLXB	3125	MESINS	6543	NOCRF	7137	POINTR	0076
LOC1	0164	MESLK	6540	NOPI	4531	PPIM	3411
LOOP	4467	MESMQ	6666	NORDIS	6400	PPIMES	4342
LOOPA	0031	MESPC	6660	NORF	7136	PPRMS	7076
LOOPPC	4446	MESRC	6546	NORMDI	6400	PRDB	6667
LOPOON	2242	MESSLU	6557	NORMSQ	2276	PRDD	6150
LQ4TAB	4252	MESTN	6565	NORSLO	6446	PRETES	5000
LQ11	4207	MESXM	6537	NORX01	5053	PRN11	4441
LQ12	4224	MFL	6472	NOSIM0	3426	PRN21	4444
LQLS	6506	MGTF	3453	NOSIM1	4472	PRNT1	4526
LQMC	6503	MINS	6500	NSQBDR	0024	PRNT2	4530
LQMP	6502	MIOT	4463	NSTKS	4533	PROPLC	7102
LQPC	6504	MKCC	4476	NUMX	4070	PROPM3	7100
LQRB	6501	MKCF	4474	NUOK	2211	PRTBR3	6076
LQRE	6507	MKIE	4500	NXTDC	0214	PRTCMS	5442
LQRS	6505	MKR0	4501	NXTIOT	5040	PRTST	1400
LQSK	6500	MKRS	4477	NXTONE	1465	PSKF	6661

PSMES	0277	RKHERE	0133	SLULSU	1640	T21DN	1730
PSR	0020	S1SUBL	7547	SLUMES	3303	T2LA	3457
PS81	0142	SAVICH	7100	SLUMST	1600	T2LQ	4001
PS82	0134	SAVACH	6276	SLUREC	0127	T3	5121
PS83	0126	SAVCHR	7103	SLUXMT	0120	T3LA	3514
PS84	0117	SAVFLD	0061	SMES	0213	T3LQ	4112
PS8F	0060	SAVLOC	2420	SMOPE	5655	T4	5200
P8TB	0664	SBDP1	2675	SNUMX	4071	T4LA	3000
P8ED	2162	SBDP2	2671	SOMSKP	0060	T4LQ	4200
PTEST6	0000	SBDP3	2665	SPAC2	7215	T5	5254
QES1MK	7346	SD1	6065	SPAC21	4440	T5B	5260
QESTMK	7315	SD2	6071	SPACE2	4531	T5LA	3641
R1LK	7147	SD3	6073	SPACE2	7217	T5LQ	4257
R1SUBL	7547	SD4	6074	SPCIE	4516	T6	5326
RCNT	5441	SDATA	4525	SPE1	2054	T6LA	3670
RDF	6214	SDEVC	0025	SPE2	2060	T6LQ	4305
RDY	5047	SDN	6755	SPE3	2466	T7	5400
RE1TYP	7065	SEL	6750	SPF	6040	T70K	5444
REPAPT	2502	SER	6754	SPF1	6310	T7LA	4000
RE86OW	0024	SERUEI	6210	SPF2	6330	T7LO	4400
RE8TBR	3214	SETBDR	3150	SRIMES	7015	T7OW1	4021
RET	4447	SETEPI	4472	SRIGES	7015	T7OW2	4400
RETIAD	2417	SETERI	4461	SREC	4474	TABADD	3055
RETADD	4030	SETEXI	4460	SRMESG	7312	TABDON	4241
RETURN	2400	SETIF	6246	SRO	6003	TADI	3233
RETYPE	7064	SETSIM	1616	SSLUDI	6410	TBLPTR	6075
REYSEN	1735	SFLDS	4276	SSLUN	6511	TCF	6042
RFINT	6200	SFLGS	3664	SSUBLK	7335	TCF1	6332
RIB	6234	SHFTCT	0110	STAB	2746	TCF2	6332
RIF	6224	SHIFTI	5662	START	0200	TESAGG	2130
RLK	7150	SHIFTO	5633	STKS	0107	TESAGN	1502
RLOOP	4514	SHINDA	6131	STR	6753	TESLOC	0072
RMP	6244	SIMCK0	4520	SUNEI	6256	TESMES	3306
RPERR	3657	SIMCK1	4531	SVBDC	1470	TEST	0119
RPTBR	2523	SIMERR	2055	SWP	7521	TEST1	0221
ROEST	7021	SKON	6000	SXDRDA	6074	TEST10	1000
RSUBLK	7345	SKP1CH	6200	SXMT	4473	TEST11	1045
RTC1	5425	SKPCHK	2047	T1	5014	TEST12	1105
RTC12	5502	SKPCHN	6200	T10	5426	TEST13	1200
RTC1F	0113	SKPERR	5046	T10LS	4600	TEST14	1316
RTCM8	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	SLUCAP	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
RTFRP	3650	SLULER	2153	T1LQ	4005	TEST6	0606
RTRN	4635	SLULSL	1620	T2	5076	TEST7	0725

TESTAB	2265	TWO1OC	7536	XC1SW	7013	XSEPI	4501
TESTF1	0124	TWOOCK	7164	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
TLOC	2266	UDONE	6053	XCDIL	4240	XVDLY	1667
TLOOP	6700	UEI	6205	XCF8LU	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		
TRNXP	2103	UNACON	6057	XGHW3	6346		
TS6OW1	0652	UNBCON	6064	XIOT	3000		
TS6OW2	0663	UNEI	6222	XKLSIM	4511		
TS6OW3	0664	UNEINT	6221	XLCIR	2144		
TS6OW4	0674	UNETMS	6303	XLSN	7225		
TS6OW5	0701	UNIT	6052	XLSN1	7223		
TS6OW6	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	0230	USEDIO	5064	XMKRS	2617		
TSF	6041	UX	6507	XMKSF	2605		
TSF1	6311	UXFR	6054	XMODE2	1660		
TSF2	6331	VAR	6164	XMSPF	2636		
TSFNAT	4451	VCDI	6274	XMTCF	2650		
TSK	6045	VDCTR	1700	XMTLS	2721		
TSK1	6315	VDELAY	4473	XMTPC	2707		
TSK2	6335	VMODE	2016	XMTSB	2655		
TSLOP	2226	WAIT	4464	XMTSF	2643		
TSCLL	0265	WAIT1Q	7506	XMTSK	2714		
TSICML	0273	WAITQC	7521	XNC	2047		
TSIOAB	6111	WATKSF	2346	XORS	7214		
TSIEND	2227	WATTSF	2333	XORS1	7214		
TSIAC	0253	WTCLSK	5427	XPRNT1	7477		
TSIN	2217	X1	4042	XPRNT2	7153		
TSIOT	5030	XIPRN1	7466	XPRNT4	7464		
TSILCM	0260	XIPRN2	7525	XR	6205		
TSILOP	0125	XIPRN4	7453	XRET	0112		
TSINO	0075	XITYPE	7400	XRETAD	4072		
TSINU	0140	XBAUD	3112	XRTF1	4066		
TSIPC	5657	XCICRL	7200	XSAV	3510		
TSYCN	7101	XCIROP	7306	XSCAF	3252		
TSYCNT	7104	XCIERR	6600	XSDF	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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BRMS	270#	2705#															
BSTLP	2761#	2771															
BSW	17#	372	644	653													
C1BY2	8048	8051#															
C1CRLF	3925#	4179	4184	6395	6400	6937	6942	7802	7805	7814	7863	7916	7920	7923			
	8204	8330	8377	8384	8474												
C1EOP	3943#	6722	7380	7532													
C1GET	8057	8074#	8081														
C1PRNT	3929#	418#	4182	6396	6398	6938	694#	7803	7815	7876	7880	7889	7896	7903			
	7921	7929	7950	796#	7967	8155	8176	8200	8250	8303	8378						
	3931#	7879	7883	7892	7899	7906	7942	7956	7963	7970	8158	8203	8383				
C1PRT4	2773	4091#															
C1REST	8171	8211#	8237	8529													
C1RM	8396#																
C1RST	3933#	8050															
C1SWIT	198#	3206															
CBAPT	180#	1414	1419	2448	2453	2531	2536	2766	2778	2902	2905	2914	2989	2996			
CBCLF	3004	3011	3023	3035	3076	3079	3207	3210	3336	3478	3634						
	200#	248	252	255	257	260	266	273	275	278	285	289	293	299			
CBERR	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	1107	1107	1107	1107	1107	1107			
	1519	1524	1526	1549	1556	1562	1569	1575	1582	1588	1595	1598	1605	1611			
	1678	1767	1776	1814	1823	1866	1897	1908	1929	1937	1941	1997	2057	2070			
	2086	2099	2175	2185	2190	2203	2218	2220	2289	2300	2317	2325	2390	2396			
	2503	2507	2511	2554	2557	2560	2564	2582	2586	2590	2593	2595	2598	2606			
	2610	2634	2640	2646	2649	2666	2671	2677	2695	2701	2723	2730	2895				
CBGET	3171	3187#	3197														
CBH3	210#	3212															
CBPRNT	182#	1415	1417	2449	2451	2532	2534	2779	2781	2903	2915	2925	2929	2933			
	2937	2941	2945	2949	2953	3012	3024	3041	3048	3055	3062	3069	3077	3085			
	3092	3208	3313	3339	3385	3451											
CBPRT4	184#	2#23	3044	3051	3058	3065	3072	3088	3095	3295	3335						
CBRC	208#	3565	3701														
CBREST	231#	8391	8397														
CBRM	3308	3348#	3372	3689													
CBSTAR	202#	230															
CBSWIT	186#	3166	3211														
CAB	1740	1781#															
CAC	1742	1782#															
CAD	1776#																
CAE	1823#																
CAF	38#	242	1009	1485	2350	2500	2504	2551	2579	2631	2643	3348	3730#	4957			
CAG	5748	5847	5942	6242	6518	6733	7408	8211									
	2289#																

SEQ 0197

CAM	21#	727	1140														
CAMTST	716	724#															
CCDF	1637	1664	1714#														
CCDLTA	2707	2719#	2727														
CDI	18#	2080	2772	2917	2955	7817	7820	8212	8390	8393	8396						
CFSLU	4020#	4359	4659	4676	4694	4723	4765	4949	4977	5028							
CHIKB	3975	5798#	5806														
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#														
CHAR2C	8322	8323	8332	8336	8344	8356	8365#										
CHARLP	4986#	5007															
CHARRW	329#	3302	3316#	3320													
CHARR1	3317	3320#															
CHG1CH	8162	8165#	8183	8184	8194	8197	8256										
CHGCHR	3299	3302#	3318	3319	3327	3330	3391										
CHGMOD	7526	7557#	7566	7567	7568												
CHGUNI	7528	7572#	7585	7586	7587												
CHKKB	177	1448#	1456														
CHKKSF	174#	1451	2891														
CIFCK	1753	1759	1761	1770	1773	1780#											
CIFCK1	1799	1805	1807	1817	1820	1830#											
CIFJMP	1752	1756	1758	1762#	1781												
CIFJMS	1782	179#	1802	1804	1808#												
CIFJPL	1756#	1792															
CIFJSL	1802#	1827															
CIFOK	1772	1779	1791#														
CIFOK1	1819	1826#															
CKBRSO	5176	5184#															
CKCON	7761	7784#															
CKFLG	2919	2922#	2956	7821													
CKIMOD	7474	7482#															
CKINDA	7480	7489#															
CKMF	1862	1867#															
CKMODE	7450	7457#															
CKPTFG	7758	7776#															
CKRFG	8590	7755	7772#														
CKXMG	5000	7752	7768#														
CLCL	46#	2555	2583	2607	2650	2660	2668	2691	2696								
CLCON	2704	2718#	2726	2729													
CLKCT	2692	2699	2702	2717#	2722												
CLKERR	2706	2709	2721#														
CLKIR	2689	2702#															
CLLE	47#	2588	2601	2636	2663	2698	2711										
CLOOPA	4031	5730#	5734														
CLREIF	3964#	4125	4148	4205	4233	4277	4358	4454	4499	4536	4575	4658	4675	4693			
	4722	4761	4948	4976													
CLREPI	3988#	5904	5921	5939	5955	5997	6040	6102	6212	6237	6272	6332	6421				
CLRERI	3968#	4477	4516	4553	5321												
CLREXI	3966#	4244	4290	4399	4460	4511	4545	5313									

SEQ 0198

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CNT1	4046#	4072	4080	5236	5249	5262		
CNT1S1	8241	8258#						
CNTRIG	8239	8253#						
CNTRIS	8426	8510#	8512	8517	8520			
CNTRLG	3374	3385#						
CNTRLS	3525	3670#	3672	3677	3680			
CNTRS	3314	3390#						
CNTRS1	3376	3393#						
COMP	4055#	6770	6781	6807				
COMPST	8167	8388	8393#	8532				
CONCH	1986#	2001	2003	2005				
CONCHK	1973	1980#						
CONST	7713	7717	7719	7726#				
CONTOG	2199	2205#	2221					
CONTI	2710#	2732						
CPUDIS	3009#	3162						
CPUDN	1129	1404#						
CPUMES	1416	1421#						
CPUSOI	2994#	3157						
CPUT1	241#							
CPUT10	845#							
CPUT11	883	889#						
CPUT12	928#							
CPUT13	973#							
CPUT14	1074#							
CPUT15	1120#							
CPUT2	377	386#						
CPUT3	479#							
CPUT4	550	564#						
CPUT5	665#							
CPUT6	752#							
CPUT7	799#							
CRA	7753#	7769						
CTRS1	8173	8255#						
CUIPTR	2355	2359	2362	2434#				
DAT	155#	1669	1670	1677				
DATPAT	216#	1137	1359	1380	1387	1394		
DATSLU	3961	5300#	5331	5332	5333			
DDERSL	5342	5345#	7873					
DECPRT	2822	2826#						
DELAY	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

DFLD	1640#	1651	1654	1656	1657	1659											
DLCDB	7459	7657#															
DLOP	4953	5302#	5305														
DNF7	1640	1055#															
DONLOP	3952#	4136	4174	4222	4267	4313	4419	4487	4527	4561	4649	4663	4681	4703			
	4748	4837	4958	5078	5896	5931	5965	6032	6065	6110	6173	6228	6249	6314			
	6353	6385	6468	6588	6607	6626	6645	6665	6685	6834	6892	6930	7008	7098			
	7146	7203	7241	7273	7310	7374	7530										
DONT17	4743	4748#															
DOSIMU	1217#																
DOSLU	2754	2759	2772#														
DOSWAP	1297	1300#															
OVCTAB	5573#	5639															
OXOR8	7484	7658#															
E0	6873#																
E0PRE	6746#																
E1	6885#																
E10	6928#																
E100	7264	7272#															
E11	6915#																
E110	7294	7308#															
E120	7367#																
E121	7370#																
E122	7373#																
E124	7335	7357#															
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E2	6888#																
E20	6967#																
E21	6969#																
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E28	7007#																
E2PRE	6749#																
E3	6891#																
E40	7091#																
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E4PRE	6833#																
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E52	7141#																
E53	7133#																
E54	7139#																
E55	7145#																
E56	7127#																
E60	7172	7181#															
E61	7198#																
E62	7200#																
E63	7202#																
E70	7243#																

SEQ 0200

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EIFCLR	3965	5147#	5152										
ENDSLD	5537	5544#	5641#										
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	2611	2651	2679	2712									2561
EOPIME	8379	8392#											
EPNRTI	4056#	6491	6496	7756									
ERECEI	4044#	5134	5144	5150	7753								
ERICLR	3969	5132#	5135										
ERISE7	3973	5142#	5145										
ERRIME	7827#	7922											
ERRMES	2470#	3078											
ERROR	3903	3954#	4129	4132	4135	4153	4157	4160	4163	4167	4170	4173	4211
	4210	4221	4238	4241	4246	4248	4250	4256	4259	4263	4266	4283	4286
	4294	4297	4302	4305	4309	4312	4351	4355	4367	4369	4371	4382	4384
	4393	4395	4397	4402	4404	4406	4410	4415	4418	4462	4464	4471	4474
	4479	4481	4486	4507	4509	4515	4519	4521	4526	4544	4547	4552	4555
	4583	4587	4591	4596	4601	4606	4611	4616	4621	4626	4628	4630	4637
	4644	4646	4779	4795	4800	4805	4991	5019	5048	5065	5073	5091	5312
	5320	5323	5343	5401	5413	5419	5426	5432	5438	5450	5477	5483	5495
	5884	5888	5890	5895	5907	5911	5915	5923	5925	5930	5957	5959	5964
	6004	6008	6010	6012	6020	6025	6029	6046	6049	6053	6062	6080	6085
	6096	6101	6105	6109	6147	6150	6156	6158	6162	6168	6171	6190	6206
	6219	6225	6240	6280	6283	6286	6289	6297	6313	6338	6344	6348	6352
	6378	6383	6504	6530	6574	6581	6584	6587	6595	6599	6603	6606	6614
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	6746	6749	6815	6833	6873	6885	6888	6891	6915	6928	6967	6969	6971
	6982	6984	6997	7007	7007	7068	7091	7127	7129	7133	7135	7139	7141
	7181	7190	7200	7202	7240	7272	7308	7357	7367	7370	7373	7390	7425
	7442	7491	7498	7507	7513	7521	7525	7678	7685	7763			7434
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ETIMLU	4789#	4802	4819	4830									
ETIMMS	4785#	4799	4804	4813	4820								
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EXIOT	2361	2371#	2384										
EXIOTL	2370	2399#											
EXISET	3971	5137#	5140										
EXITLA	6471#												
EXMITI	4043#	5129	5139	5149	7750								
EXMT1	1484#												
EXMT10	2021	2040#											
EXMT11	2107	2127#											
EXMT12	2214	2265#											
EXMT13	2309#												
EXMT14	2327	2348#											
EXMT2	1538#												
EXMT3	1615	1633#											
EXMT4	1713#												
EXMT5	1829	1839#											
EXMT6	1973	1990#											
EXMT7	1932	1963#											
EXS17	4982	5032	5059	5078#									
FDWRD	1969#	1975	1976	1978									
FILCOR	1970	2007#	2018										
FILLER	3396#	3435											
FILLR1	8261#	8289											
FILVAR	7563	7578	7592	7600	7708#	7709	7711	7712	7714	7723			
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FIXLKG	179	2460#	2467										
FL1SAV	7905	8006	8069#	8078									
FLDON	7323	7375#											
FLMES	6939	7010#											
FLSAVE	3057	3131	3181#	3190									
FORIOC	8450	8452	8457	8459	8479#	8485	8486	8491					
FOROCK	3610	3612	3617	3619	3639#	3645	3646	3651					
FRET	2158	2217#											
FS1MES	7816	7826#											
FSAV	1857	1858	1865	1875#									
FSMES	2916	2960#											
FVLCT	7716	7721	7727#										
FVLOOP	7717#	7722											
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GETSR	3980#	4099	5166	5836	6719	8021	8046	8053	8157	8186	8202	8385	
GOOD	4053#	6799	6800	6811	6851	6909	6992	6993	6998	7003	7065	7082	7083
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GR2CR3	1228	1246#											
GRFSIM	1162	1169#											
GROUP2	1248#												
GROUP3	1247	1280#											
GSR	5163	5165	5166#										
GTF	30#	976	997	1045	1856	1898	1912	1921	2059	2088	2192	3130	3734#
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HANCER	7387	7396#											
HCW1	97#												
HCW2	99#												
HCW3	101#	3601	3703	3585	5364	5510	8227						
HCW3MS	3249#	3702											
HLT	16#	150	1737	1739	1741	3731#	5286						
HLTS	1736#	1746	1747										
IB0	1545#												
IB1	1551#												
IB2	1564#												
IB3	1577#												
IB7	1600#												
IBSF	1601	1696#											
IBSF1	1793#												
ICDI	2082#												
IEH	2920	2990	3005	3036	3147	3164#							
IEH1	7822	7864	7869	7884	8024	8046#							
IPDF	2131	2136#	2138	2197	2200	2210	2211	2212					
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INIT1	4103	5086#	5616										
INITL	6275	6301#											

SEQ 0201

SEQ 0202

[illegible]

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K215	3433	3445#														
K240	3631	3638#														
K2525	127#	428	429	430	470	565	570	580	592	605	609	695	864	914		
		929	938	1383												
K260	3659	3663#														
K3	3628	3637#														
K4000	128#	546	987	3364												
K5252	129#	438	439	440	471	572	587	598	600	698	803	832	847	893		
K5253	130#	468	920	932	943											
K7	365#	3664#														
K7600	998	1145#														
K77	124#	643	3622													
K7700	131#	652	1127													
K7777	132#	387	404	417	418	449	455	462	463	666	754	779	784	808		
	819	852	866	898	916											
KB1CHK	3974#	5164	8018	8448												
KBCHK	170#	1439	3141	3608												
KCC	3367	3678	3747#	5411	8030	8232	8518									
KCC1	3780#															
KCC2	3809#															
KCDF	4074	4077#	5284													
KCF	3745#	4943	5399	5766												
KCF1	3778#	4980	5768													
KCF2	3807#	5770														
KFL00	172#	2278														
KIE	1450	1454	3749#	5423	5774	5800	5804	7173	7231	7265	7295	7336				
KIE1	32#	1010	3782#	5775												
KIE2	34#	1011	3811#	5776												
KIOT	2352	2432#														
KISZIT	5102#	5013														
KJILD	5161	5181#	5652	5843	6730											
KJMP3	2463	2468#														
KKRTN	2275	2300#														
KLB	3752#	5042	5046	5714	5724	5732	8025	8138								
KLSIM	4028#	6172	6227	6309	6384											
KMD1	3785#	4909														
KNOP	1717	1765#														
KRB	2792	3467	3685	3751#	5430	8319	8525									
KRB1	3784#	5020	5049													
KRB2	3813#															
KRS	3673	3748#	5417	8513												
KRS1	3781#															

L101	2066	2071#																		
L102	2095	2101#																		
L111	2171	2177#																		
L112	2181	2187#																		
L1SAV1	8558	8568	8576#																	
L1SAV2	8560	8570	8577#																	
L1SAV3	8562	8572	8578#																	
L211	4989	4993#																		
L61	1904	1909#																		
L62	1918	1934#																		
LCD	3863#	6969	6911	6918	6965	7047	7057	7123	7124	7176	7195	7233	7269	7297						
	7298	7348	7349	7363	7430															
LCDATA	7429	7457	7639#																	
LCDF	1733	1748#																		
LENBAS	4996	5000#																		
LIS1NU	8343	8355#																		
LISN	188#	330#	3370																	
LISN1	3464	3479	3483	3486#	3502															
LISN11	8316	8331	8335	8338#	8354															
LISN2	3494	3500#	3507	3510																
LISN21	8346	8352#	8359	8362																
LISN3	3489	3495#	3511																	
LISN31	8341	8347#	8363																	
LISNFI	3935#	8163	8235																	
LISNSR	2768	2789#	2794																	
LISNUM	3491	3503#																		
LKDATA	153#	1143	1217	1363	1399	3021	3033	3071												
LKWS	139#	1159	1315	3020																
LL1	6426#	6445																		
LL2	6447#	6467																		
LLLD	5159	5170#	5189	5014	5653	5844	6731													
LLXB	5025	5033#																		
LOC1	4068	4085#																		
LOOP	3984#	4360	4456	4501	4538	4577	5302	5303												
LOOPA	3922#	5713	5725	5733																
LOOPPC	3950#	4121	4145	4202	4230	4274	4333	4451	4496	4533	4572	4655	4671	4690						
	4719	4757	4933	4973	5078	5903	5938	5996	6039	6074	6143	6181	6236	6271						
	6331	6362	6420	6562	6592	6611	6630	6649	6669	6732	6847	6908	6963	7045						
	7111	7169	7227	7261	7291	7320	7406													
LOPDON	3953	5157#	5181																	
LO4TAH	6273	6318#																		
LOI1	6278#	6304																		
LOI2	6293#	6306																		
LOLS	3896#	5949	6153	6164	6183	6192	6199	6209	6221	6240	6276	6310	6336	6339						
	6423	6476	6544	6565																
LOMC	3893#	6319	6346	6365	6568	6612	6651													
LOMP	3892#	6278	6293	6318	6342	6570	6593	6650	6670	6738	7410	7437	7496	7516						
	7523																			
LOPC	3894#	6320	6350	6431	6452	6567	6631	6671	7581	7583										
LORB	3890#	6284	6295	6311	6373	6375	6434	6455	6571	6579										
LORE	3897#	4946	6166	6226	6321	6380	6566	6577	6600	6619	6638	6658	6678	7411						
	7603	7605																		
LORS	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								
	44#	2951	3738#	3889#	6148	6157	6160	6169	6224	6281	6312	6367	6585	6594						
	6624	6613	6623	6632	6642	6652	6662	6672	6682	7776										
LQTA8	6274	6300	6301	6305	6317#															
LSAV1	3541	3551	3558#																	
LSAV2	3543	3553	3559#																	
LSAV3	3545	3555	3560#																	
LXC8ST	3216#	3602																		
M12CON	7594	7647#																		
M1AC	7812	7860	7888#	7893	7911															
M1FL	7813	7862	7907#	7907	7913															
M1HQ	7861	7895#	7900	7912																
M1PC	7809	7925	7966#	7971																
M1TN	7806	7924	7959#	7964																
M212	3472	3513#																		
M270	3505	3509#																		
M3	3475	3512#																		
M43	3625	3636#																		
M8CON	7560	7565	7656#																	
MAC	2912	2986	2999	3016	3028	3040#	3045													
MBR	7915	7949#	7957																	
MEMES	2450	2456#																		
MEDW	1482#																			
MES1AC	7890	8063#																		
MES1F	8456	8458	8461#	8473	8475															
MES1FL	7901	8065#																		
MES1HQ	7897	8064#																		
MES1PC	7960	8061#																		
MES1TN	7961	7976#																		
MESAC	3042	3175#																		
MESACT	3013	3101#																		
MESAG	3930	8446#	8449	8451	8464	8559	8571													
MESAGF	3616	3618	3621#	3633	3635															
MESAGX	183	3542	3554	3607#	3609	3611	3624													
MESBK	7951	7978#																		
MESFXP	3025	3102#																		
MESFL	3056	3177#																		
MESHDR	2985	2994	3009	3075#	3082															
MESINS	3063	3100#																		
MESLK	3070	3099#																		
MESWG	3049	3176#																		
MESFC	3093	3174#																		
MESRC	7881	7975#																		
MESSLU	7930	7977#																		
MESLN	3086	3103#																		
MESXM	7877	7974#																		
MFL	2913	2988	3054#	3059																
MGTf	1845#	1871																		
MINS	2995	3010	3061#	3066																
MLOT	3976#	5539	5546																	
MKCC	4002#	4482	4585	4648																
MKCF	3998#	4407	4411	4603	4632															
MKIE	4006#	4154	4208	4252	4279	4289	4299	4580	5234	5354										

SEQ 0206

KMRB	4008#	4522	4589	5324													SLO 0207
MKRS	4008#	4517	4593														
MKGf	4008#	4127	4151	4161	4171	4219	4264	4310	4413	4484	4518	4524	4558	4598			
	5251																
MLAP	2950#	2967#															
MLK	3003	3022	3034	3068#	3073												
MLQP	2954	2968#															
NMID	2958#	3209															
MMQ	2997	3002	3019	3031	3047#	3052											
MODAGN	7407#	7527	7529														
MODE1	3852#	4109	4763	5009													
MODE2	3851#	5033	5057														
MODE3	3854#																
MODVAR	7558	7564	7593	7638#													
MPC	2909	3001	3091#	3096													
MQLISAV	7898	8008	8068#	8076													
MOA	20#	707	1298	1301	3132	3736#	8007										
MODATA	152#	1146	1220	1362	1393	3000#											
MOL	19#	667	686	696	706	1294	1304	1676	1774	1821	1864	1906	1935	1939			
	1995	2068	2097	2173	2183	2201	238#	2394	2728	3189	3735#	4793	4798	4803			
	5071	5089	6428	6449	6801	6926	7084	7500	8077								
MQSAVE	3001	3018	3030	3050	3133	3180#	3180										
MQWAS	138#	1161	1334	3017													
NREC1	2938	2964#															
NREC2	2942	2965#															
NREC3	2946	2966#															
MSHDR	7859	7910	7919#	7926													
MSLU	7914	7928#	7943														
MSPF	4010#	4155	4209	4243	4281	4365	4459	4608									
MTCF	4014#	4164	4200	4306	4398	4466	4510	4548	4613	4631	4647	5316					
MTLS	4022#	4327	4329	4372	4385	4465	4505	4542	4639	4770	4773	5310					
MTN	2906	3080	3084#	3089													
MTPC	4010#	4426	4428	4623													
MTRB	4016#	5626															
MTSF	4012#	4130	4156	4165	4210	4216	4236	4245	4255	4261	4282	4291	4301	4307			
	4366	4374	4387	4416	4461	4469	4618	4771	5239								
	4020#	4133	4158	4168	4212	4239	4247	4257	4284	4293	4303	4368	4396	4403			
MTSK	4478	4634															

	1965	1977	1982	1991	1994	2004	2008	2022*	SEQ 0208
NSTKS	168	2223#	2226						
NUMX	1965	1977	1982						
NUOK	511#	5121#							
NXTDC	4106#	5105							
NXTIOT	2380#	2392	2398						
NXTONE	1123#	1402							
NXTONN	1367	1402#							
NXTPAT	1140#	1401							
NXTPIT	1400	1401#							
ODT1	60#								
ODT2	61#								
ODT3	62#								
OERR	5026	5063#	5067						
OFONKI	5230	5348#	5357						
OTZ	4724#	4734							
OUT	1262#	1276	1280	1283	1284				
OW1APT	3595	8003#							
OWAPT	3128#	3589							
OWSET	4348	4357	4358#						
PASSNO	3214	4050#	8380	8382					
PATCH	4065#	4066	4082	4083	4097	4766	4835	5049	6726
PBRMS	2760	2777#	2783						
PC1SAV	7808	7874	7969	8011	8031	8036	8041	8066#	
PCIE	3881#	5758	5974	6093	6473				
PCLF	3978#	5879	5892	5912	5926	5940	5950	5960	6015
PCLOOP	3951	5112#	5116	5121	5123				
PCLP	3883#	6044	6057	6430	6451				
PCPUM	239#								
PCPUMS	239	1413#	1420						
PCSARE	2908	3094	3136	3148	3153	3158	3178#		
PERR	5055	5069#	5076						
PFM	6728#								
PFMES	6728	6936#	6943						
PIMES	6397	6403#							
PHEMES	1482	2447#	2454						
PMODE	5034	5036#	5056	5060	5061	5070			
POINTB	160#	853	860	867	940				
POINTC	160	161#	854	865	901	902	911	915	919
POINTD	143	162#	939						
POINTE	163#	1080							
POINTF	164#	1105							
POINTR	158#	846	892						
PPIH	5045#								
PPIHES	5045	6394#	6401						
PPRMS	3293	3333	3338#	3341					
PRDB	3084#	6006	6022	6026	6051	6059	6102	6106	6433
PRDD	2837	2844	2850	2856	2863#	2864	2866	2868	2869
PRETES	5839	6481	6719#						
PRN11	3939#	8546	8548						
PRN21	3945#	8490	8492						
PRNT1	190#	3409	3411						
PRNT2	194#	2842	2848	2854	2860	3650	3652		
PROPLC	3291	3294	3316	3321	3325	3334	3343#		

[illegible]

RCTC5	2652	2659#										
RTCT6	2680	2687#										
RTF	31#	989	1055	1895	1910	1919	2055	2139	2320	3733#		
RTFRP	1930#	1942										
RTRN	172	2290	2301#									
RXHERE	4054#	6743	6757	684#	7321							
S1SUBL	8234	8556#	8563									
SAVICH	8185	8189	8207#									
SAVAC	28R9	2R96	2910	2957#								
SAVCHR	3320	3324	3344#									
SAVFLD	142#	984	988	1054								
SAVLUC	5280	5291	5296#									
SBDR1	5457	5469#										
SBDR2	5460	5465#										
SBDR3	5461#											
SD1	2006#	2028										
SD2	2010#											
SD3	2012#											
SD4	2013#											
SDATA	2160	2167	2174	2194	2195	2202	2216#					
SDEVG	3918#	5555	5565	5651								
SDN	3867#	6761	6831	6889	6966	6979	6994	7128	7131	7197	7299	7365 7524
SEL	3861#	7421										
SER	3866#	6747	6886	6970	6983	7004	7140	7143	7201	7371	7677	7683
SERUEI	2902#	3152										
SETBOR	5641	5649#	5668	8049								
SETEPI	3990#	5918	5952	6207								
SETERI	3972#	4390	4467	4512	4549	5317						
SETEXI	3970#	4242	4287	4364	4458	4504	4541	5308				
SETIF	7766	7770	7774	7778	7781	7790#						
SETSIM	1103#											
SFLDS	2061	2062	2069	2090	2091	2098	2109#					
SFLGS	1899	1900	1907	1913	1914	1922	1923	1936	1940	1943#		
SHFTCT	7419	7445	7447	7465	7468	7471	7663#	7674				
SHIFTI	7467#	7476	7479	7486	7584	7606						
SHIFTO	7443#	7463	7582	7604								
SHINDA	7466	7692#	7704									
SIMCKO	5851	6523#										
SIMCK1	6400	6533#										
SIMERR	1344	1350#										
SKON	26#	1017	1024	1028	1036	1059	1525					
SKP1CH	4098	4036	5850	6727	7744#							
SKPCBK	1300#											
SKPCHN	50	2465	2889#									
SKPERP	2374	2386#										
SKPLRC	6197	6207#										
SKPPED	140#	1141	1152	1241	1265	1288	1340					
SLCDTA	7641#	7671	7673									
SLOOPA	3985	5722#	5726									
SLU2MC	3927#	4100	4762	4986	5008	5035						

SLUDIS	7868#	8044																
SLUEND	5114	5812#	8042															
SLULER	5002	5087#	5095															
SLULSL	4815	4868#																
SLULSU	4818	4886#																
SLUMES	4181	5784#																
SLUMST	4812	4850#																
SLURLC	4054#	4990	5000	5021	5022	5050	5051	5064	5072	5088	5325	5329	7882					
SLUXMT	4049#	4660	4678	4696	4700	4725	4728	4732	4737	4740	4744	4951	4984	5309				
	5327	7878																
SMES	4104#																	
SMORE	7452	7455	7462#															
SNUMX	1988	1989	1996	2023#														
SOMSKP	141#	1142	1253	1257	1261	1263												
SPAC2	3939	8302#	8305															
SPAC21	3937#	8493																
SPACE2	196#	3653																
SPACX2	197	3450#	3453															
SPCIE	4034#	5905	5917	5941	5998	6041	6422											
SPE1	1346#	3155																
SPE2	1354#	3160																
SPE3	5343#	8038																
SPF	37#	2232	3759#	5436														
SPF1	3709#																	
SPF2	3817#																	
SR1MES	8156	8281	8399#															
SR1QES	8155#	8178																
SREC	6435	6436	6456	6457	6484#	6503												
SRMESG	3517#	3566																
SRQ	29#	1065																
SSLUDI	7873#	8040																
SSLUN	7940	7941	7947#	7953	7954	7955												
SSUBLK	3369	3539#	3546															
STAB	5503	5504	5518#															
STARI	230#	3304	3692	8394														
STKS	167#	1643	1646	1679	1682	1732	1743	1755	1791	1801	1826	1870	1971	1998				
	2074	2104	2129	2205	2225													
STR	3865#	6744	6883	6968	6981	6999	7134	7137	7199	7368	7489	7497						
SUNFI	7802#	8035																
SVBDC	4784#	4810	4811	4814	4817													
SWP	22#	672	680	687	697	713	724	732	744	1147	1160	1221	1329					
SXDROA	7642#	7695	7698															
SXMT	6426	6427	6429	6439	6442	6447	6448	6450	6460	6463	6483#							
T1	6732#																	
T10	7227#																	
T10LS	6540	6562#																
T11	7261#																	
T11LS	6592#																	
T12	7291#																	
T12LS	6611#																	
T13	7311	7324#																
T13LS	6630#																	
T14LS	6643#																	

SEQ 0211

T14S	7378	7405#																
T15LS	6669#																	
T1LA	5878#	6545																
T1LO	5861	5865	6143#	6531														
T2	6847#																	
T21DW	4940	4945	4958#															
T2LA	5903#																	
T2LO	6181#																	
T3	6854	6908#																
T3LA	5938#																	
T3LO	6236#																	
T4	6931	6963#																
T4LA	5966	5996#																
T4LO	6250	6271#																
T5	7009	7045#																
T5B	7050#	7097																
T5LA	6039#																	
T5LO	6315	6331#																
T6	7111#																	
T6LA	6074#																	
T6LO	6362#																	
T7	7147	7169#																
T7OK	7230	7241#																
T7LA	6111	6121#																
T7LO	6125	6390	6420#															
T7OW1	6122	6387	6437#	6537														
T7OW2	6124	6389	6458#															
TABADD	5502	5514	5515	5535	5541	5542	5548	5582#	5610									
TABDON	6303	6308#																
TADI	1645	1661#																
TBLPTR	2765	2815#	2820	2826														
TCF	2310	3531	3761#	5448	5767	8432												
TCF1	3791#	5769																
TCF2	3819#	5771																
TESAGG	1371	1376	1403#															
TESAGN	1136#	1403																
TESLOC	145	154#	755	760	766	767	773	778	785	786	790	875	879	960				
	965																	
TESMES	4183	5785#	6399	6941														
TEST	173#	1242	1270	1295	1299	1306												
TEST1	4121#	5194																
TEST10	4451#	5201																
TEST11	4496#	5202																
TEST12	4533#	5203																
TEST13	4572#	5204	5350															
TEST14	4655#	5205	5220															
TEST15	4671#	5206	5221															
TEST16	4690#	5207	5222															
TEST17	4719#	5208																
TEST2	4145#	5195																
TEST20	4757#	5223																
TEST21	4933#	5209																
TEST22	4973#	5210																

SEQ 0212

[illegible]

TSTNU	4059#	4092	4123	4147	4204	4232	4276	4332	4431	4453	4498	4535	4574	4657	SEQ 0214
	4674	4692	4721	4759	4935	4975	5119	5615	5654	6479	6564	6687	7379	7531	
	7962														
TSTPC	7456	7461	7464#												
TTYICN	8160	8193	8208#												
TTYICNT	3297	3326	3345#												
TWOIOC	8542	8543	8547	8551#											
TWOOCK	3405	3406	3410	3414#											
TYOUT	3524#	3592													
TYOUT1	3597	8425#													
TYPE	192#	2867	3380	3434	3439	3485	3632	3660							
TYPE1	3941#	8245	8288	8293	8337	8472	8500								
U1	7939#	7946													
UDATA	7615#	7700													
UDONE	7436	7493	7515	7613#	7703										
UEI	2895#	3150													
UEIMES	2904	2959#													
UL1	2924	2927#													
UL2	2928	2931#													
UL3	2932	2935#													
UL4	2936	2939#													
UL5	2940	2943#													
UL6	2944	2947#													
UL7	2948	2951#													
UNACON	7602	7620#													
UNBCON	7575	7580	7629#												
UNEI	7763#	8033													
UNEINT	7762#	7773	7782	7786											
UNETMS	7804	7825#													
UNIT	7420	7612#													
UNVAR	7573	7579	7601	7611#											
UOUT	7494	7616#	7702												
UPARR1	8251	8401#													
UPARRG	3386	3519#													
UPSTK	1674	1679#													
USEDIO	2354	2404#													
UX	7934	7945#													
UXFR	7495	7614#													
VAR	7710	7718	7720	7725#											
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XC8BIA	203	3205#	3216						
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SEQ 0215

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SEQ 0222

SEQ 0225

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SEQ 0226

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