

IDENTIFICATION

PRODUCT CODE: MAINDEC-8E=D2AB-D-(D)

PRODUCT TEST: PDP-8/E TELETYPE AND KLS ASYNCHRONOUS
DATA CONTROL TESTS

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1. ABSTRACT

THIS PROGRAM CONSISTS OF A PACKAGE OF TEST PROGRAMS FOR TESTING THE KLB LOGIC (EIA OR CURRENT) AND A TELETYPE. ONLY ONE TELETYPE MAY BE TESTED AT A TIME, THE TELETYPE TO BE TESTED CAN BE A KRS33, ASR33, KSR35, ASR35, OR KSR37.

THE TEST PROGRAMS ARE:

PRG0=BASIC TEST OF THE OUTPUT LOGIC (CURRENT)
PRG1=BASIC TEST OF THE OUTPUT AND INPUT LOGIC (LOOP AROUND)(EIA)
PRG2=BASIC TEST OF INPUT LOGIC (USES TTY READER)(CURRENT)
PRG3=READER TEST
PRG4=PRINTER TEST
PRG5=PUNCH TEST
PRG6=KEYBOARD TEST
PRG7=COMBINED TEST
PRG10=READER EXERCISER, BINARY COUNT PATTERN
PRG11=PRINTER EXERCISER
PRG12=BINARY COUNT TAPE GENERATOR

2. REQUIREMENTS

2.1 EQUIPMENT

- A.- PDP-8/E WITH AT LEAST 4K OF MEMORY
- B. FOR EIA A JUMPER TO CONNECT INPUT TO OUTPUT, SEE TEST EQUIPMENT 7,3,
- C. KSR33, ASR33, KSR35, ASR35 TO TEST AN 110 BAUD CURRENT OPTION.

2.2 STORAGE

LOCATIONS 0000 THROUGH 7600 ARE USED.

3. LOADING PROCEDURE

THE BINARY LOADER IS USED TO LOAD THE PROGRAM, REFER TO THE BINARY LOADER DOCUMENTATION IF UNFAMILIAR WITH ITS USE.

4. USE PROCEDURE

4.1 DEVICE CODE SELECTION

BEFORE ANY PROGRAM CAN BE RUN, THE PROGRAM MUST HAVE THE FOLLOWING INFORMATION:

1. TYPE OF TELETYPE (33, 35, OR 37) IF TESTING WITH A TELETYPE
2. DEVICE CODES ASSIGNED.
3. BAUD RATE OF DEVICE

TO PROVIDE THIS INFORMATION, PROCEED AS FOLLOWS:

A. SET LOCATION 0020 TO 1

1. 0000 FOR KSR OR ASR 33 TELETYPE
2. 0001 FOR KSR OR ASR 35 TELETYPE
3. 0002 FOR KSR 37 TELETYPE

B. SET LOCATION 0021 AS FOLLOWS:

1. LOAD ADDRESS 0021.
2. SET SR 0 THROUGH 5 TO THE DEVICE CODE OF THE KEYBOARD/READER TO BE TESTED.
(EG: READER CODE OF 03, SR0-5=03,
3. SET SR 6 THROUGH 11 TO THE DEVICE CODE OF THE PRINTER/PUNCH TO BE TESTED.
(EG: PRINTER CODE OF 04, SR6-11=04,
4. PRESS DEPOSIT.

C. SET LOCATION 0022 AS FOLLOWS:

1. LOAD ADDRESS 0022.
2. PLACE THE FOLLOWING IN THE SRI
0110 FOR 110 BAUD, OR
0150 FOR 150 BAUD, OR
0300 FOR 300 BAUD, OR
0600 FOR 600 BAUD, OR
1200 FOR 1200 BAUD.
3. PRESS DEPOSIT.

D. REFER TO INDIVIDUAL PROGRAM USE PROCEDURE.

4.2 PRG0 USE PROCEDURE

- A. PERFORM DEVICE SELECTION IF NOT PREVIOUSLY DONE,
REFER TO SECTION 4.1.
- B. INSURE THAT TELETYPE IS ON-LINE IF ON THE KLS BEING TESTED.
- C. INSURE THAT THERE IS PAPER IN TELEPRINTER,
- D. LOAD ADDRESS 0200.
- E. SET SR TO 0000.
- F. PRESS CLEAR AND CONTINUE.
- G. PROGRAM HALTS AT LOCATION 0236 TO PERMIT SETTING OF SR
OPTIONS. SET ANY DESIRED OPTIONS. NORMAL RUN IS WITH
SR=0000. PRESS CONTINUE.

PRG0 SR OPTIONS:

SR0=1 HALT AT END OF ROUTINE. ROUTINE NUMBER IN AC.
SR1=1 SELECT ROUTINE WHOSE NUMBER IS SET IN SR6 = SR11.
SR2=1 LOOP PROGRAM,
SR6 THROUGH SR11 ROUTINE NUMBER TO BE SELECTED,

- H. PROGRAM IS EXECUTED AND HALTS AT LOCATION 0300 PROGRAM END
HALT, IF NO LOOP OPTIONS ARE SET, AND IF NO ERROR OCCURRED.

4.3 PRG1 USE PROCEDURE

- A. PERFORM DEVICE SELECTION IF NOT PREVIOUSLY DONE,
REFER TO SECTION 4.1.
- B. CONNECT EIA OUTPUT TO EIA INPUT,
ON THE 40 PIN SIDE CONNECTOR, CONNECT=
PIN E TO PIN M
PIN F TO PIN J
- C. LOAD ADDRESS 0200.
- D. SET SR TO 0001.
- E. PRESS CLEAR AND CONTINUE.

(4.3 CONT'D)

- F. PROGRAM HALTS AT LOCATION 0236 TO PERMIT SETTING OF SR OPTIONS. SET ANY DESIRED OPTIONS. NORMAL RUN IS WITH SR=0000. PRESS CONTINUE.

PRG1 SR OPTIONS

SR0=1 HALT AT END OF ROUTINE, ROUTINE NUMBER IN AC.
SR1=1 SELECT ROUTINE WHOSE NUMBER IS SET IN SR6 = SR11.
SR2=1 LOOP PROGRAM.
SR6 THROUGH SR11 ROUTINE NUMBER TO BE SELECTED.

- G. PROGRAM IS EXECUTED AND HALTS AT LOCATION 0300 PROGRAM END HALT, IF NO LOOP OPTIONS ARE SET, AND IF NO ERRORS OCCUR.

4.4 PRG2 USE PROCEDURE

- A. PERFORM DEVICE SELECTION IF NOT PREVIOUSLY DONE. REFER TO SECTION 4.1.
- B. INSURE THAT TELETYPE IS ON-LINE.
- C. LOAD THE BINARY COUNT PATTERN TEST TAPE IN THE READER.
- D. TURN ON READER.
- E. LOAD ADDRESS 0200.
- F. SET SR TO 0002.
- G. PRESS CLEAR AND CONTINUE.
- H. PROGRAM HALTS AT LOCATION 0236 TO PERMIT SETTING OF SR OPTIONS. SET ANY DESIRED OPTIONS. NORMAL RUN IS WITH SR=0000. PRESS CONTINUE.

PRG2 SR OPTIONS

SR0=1 HALT AT END OF ROUTINE, ROUTINE NUMBER IN AC.
SR1=1 SELECT ROUTINE WHOSE NUMBER IS SET IN SR6 = SR11.
SR2=1 LOOP PROGRAM.
SR6 THROUGH SR11 ROUTINE NUMBER TO BE SELECTED.

- I. PROGRAM IS EXECUTED AND HALTS AT LOCATION 0300, PROGRAM END HALT, IF NO "LOOP" OPTIONS ARE SET, AND IF NO ERRORS OCCUR.

4.5

PRG3 USE PROCEDURE

- A. PERFORM DEVICE SELECTION IF NOT PREVIOUSLY DONE,
REFER TO SECTION 4.1.
- B. INSURE TELETYPE IS ON-LINE.
- C. LOAD BINARY COUNT PATTERN TEST TAPE IN READER.
- D. TURN ON READER.
- E. LOAD ADDRESS 0200.
- F. SET SR TO 0003.
- G. PRESS CLEAR AND CONTINUE.
- H. PROGRAM HALTS AT LOCATION 0236 TO PERMIT SETTING OF SR
OPTIONS. SET ANY DESIRED OPTIONS, NORMAL RUN IS WITH
SR=0200, PRESS CONTINUE.

PRG3 SR OPTIONS:

SR0=1 HALT AT END OF ROUTINE, ROUTINE NUMBER IN AC.
SR1=1 SELECT ROUTINE WHOSE NUMBER IS SET IN SR6 THROUGH
SR11.
SR2=1 LOOP PROGRAM.
SR6 THROUGH SR11 ROUTINE NUMBER TO BE SELECTED.

- I. PROGRAM IS EXECUTED AND HALTS AT LOCATION 0300 PROGRAM END
HALT, IF NO "LOOP" OPTIONS ARE SET, AND IF NO ERRORS OCCUR.

4.6

PRG4 USE PROCEDURE

- A. PERFORM DEVICE SELECTION IF NOT PREVIOUSLY DONE,
REFER TO SECTION 4.1.
- B. INSURE TELETYPE IS ON LINE.
- C. LOAD ADDRESS 0200.
- D. SET SR TO 0004.

(4.6 CONT'D)

- E. PRESS CLEAR AND CONTINUE.
- F. PROGRAM HALTS AT LOCATION 0236 TO PERMIT SETTING OF SR OPTIONS. SET ANY DESIRED OPTIONS, NORMAL RUN IS WITH SR=0000. PRESS CONTINUE.

PRG4 SR OPTIONS

SR0#1 HALT AT END OF ROUTINE, ROUTINE NUMBER IN AC,
SR1#1 SELECT ROUTINE WHOSE NUMBER IS SET IN SR6 = SR11.
SR2#1 LOOP PROGRAM,
\$R6 THROUGH SR11 ROUTINE NUMBER TO BE SELECTED,

- G. PROGRAM IS EXECUTED AND HALTS AT LOCATION 0300; PROGRAM END HALT IF NO "LOOP" OPTIONS ARE SET, AND IF NO ERRORS OCCUR.

4.7 PRG5 USE PROCEDURE

- A. PERFORM DEVICE SELECTION IF NOT PREVIOUSLY DONE. REFER TO SECTION 4.1.
- B. TURN ON TELETYPE PUNCH.
- C. WITH TELETYPE OFF-LINE, PUNCH A SECTION OF BLANK LEADER ABOUT 6 INCHES LONG, RETURN TO ON-LINE POSITION.
- D. LOAD LEADER IN READER, LEAVING VERY LITTLE SLACK BETWEEN PUNCH AND READER.
- E. TURN ON READER.
- F. LOAD ADDRESS 0200.
- G. SET SR TO 0005.
- H. PRESS CLEAR AND CONTINUE.
- I. PROGRAM BEGINS EXECUTION. SET SR5 TO A 1 IF YOU WISH TO STOP ON ERROR. SR5 SET TO A 0 WILL CAUSE PROGRAM TO HALT AT END OF DATA BLOCK IF ERRORS OCCURRED, THE AC WILL CONTAIN THE ERROR COUNT.
- J. THE PROGRAM RUNS CONTINUOUSLY, UNTIL STOPPED BY USER.

PRG6 USE PROCEDURE

- A. PERFORM DEVICE SELECTION IF NOT PREVIOUSLY DONE, REFER TO SECTION 4.1.
- B. INSURE TELETYPE IS ON-LINE.
- C. MAKE SURE THAT THE TELETYPE "PROCEED" LIGHT IS ON, IF TESTING A KSR37 KEYBOARD.
- D. LOAD ADDRESS 0200.
- E. SET SR TO 0006.
- F. PRESS CLEAR AND CONTINUE.
- G. PROGRAM TITLE IS TYPED, AND PROGRAM HALTS AT LOC 0236 TO PERMIT SETTING OF SR OPTIONS. SET ANY DESIRED OPTIONS. NORMAL RUN IS WITH SR=0000, PRESS CONTINUE.

PRG5 SR OPTIONS:

SR0=1 HALT AT END OF ROUTINE, ROUTINE NUMBER IN AC.
SR1=1 SELECT ROUTINE WHOSE NUMBER IS SET IN SR6 = SR11.
SR2=1 LOOP PROGRAM,
SR6 THROUGH SR11 ROUTINE NUMBER TO BE SELECTED.

- H. FOLLOW TYPED INSTRUCTIONS,
- I. WHEN PROGRAM IS COMPLETED, AND PROVIDED THAT NO SR OPTIONS PREVENT IT, THE PROGRAM STOPS AT PROGRAM END HALT AT LOC 0300.

NOTE

CORRECT OPERATION OF KEYBOARD IS VERIFIED BY USER CHECKING THAT THE PRINTED CHARACTERS MATCH WITH THE CHARACTERS KEYED.

PRG7 USE PROCEDURE

- A. PERFORM DEVICE SELECTION IF NOT PREVIOUSLY DONE, REFER TO SECTION 4.1.
- B. TURN ON TELETYPE PUNCH.
- C. THWITH TELETYPE OFF-LINE, PUNCH A SECTION OF BLANK LEADER ABOUT 6 INCHES LONG, RETURN TELETYPE TO ON-LINE POSITION.
- D. LOAD LEADER IN READER, LEAVING VERY LITTLE SLACK BETWEEN PUNCH AND READER.
- E. TURN ON READER.
- F. LOAD ADDRESS 0200.
- G. SET SR TO 0007.
- H. PRESS CLEAR AND CONTINUE.
- I. PROGRAM HALTS AT LOC 0236 TO PERMIT SETTING OF SR OPTIONS. SET ANY DESIRED OPTIONS, NORMAL RUN IS WITH SR=0200, TO HALT ON ERROR, PRESS CONTINUE.

PRG6 SR OPTIONS:

SR0#1 HALT AT END OF ROUTINE, ROUTINE NUMBER IN AC,
SR1#1 SELECT ROUTINE WHOSE NUMBER IS SET IN SR6 THROUGH SR11.
SR2#1 LOOP PROGRAM,
SR5#1 HALT ON ERROR, BAD CHARACTER IN AC,
SR5#0 HALT AT END OF DATA BLOCK IF ERRORS OCCURRED, ERROR COUNT IN AC,
SR6 THROUGH SR11 ROUTINE NUMBER TO BE SELECTED.

- J. PROGRAM IS EXECUTED AND HALTS AT PROGRAM END HALT AT LOC 0300 UNLESS PREVENTED FROM ENDING, BY SR OPTIONS, OR IF ERRORS OCCUR,

4.10 PRG10 USE PROCEDURE

-
- A. PERFORM DEVICE SELECTION IF NOT PREVIOUSLY DONE, REFER TO SECTION 4.1.
 - B. INSURE THAT TELETYPE IS ON-LINE.
 - C. LOAD BINARY COUNT PATTERN TEST TAPE IN READER.
 - D. TURN ON READER.
 - E. LOAD ADDRESS 0200,
 - F. SET SR TO 0010.
 - G. PRESS CLEAR AND CONTINUE.
 - H. PROGRAM RUNS CONTINUOUSLY UNTIL STOPPED BY USER, THE FOLLOWING SR OPTIONS MAY BE SET AT ANY TIME,

SR0=1 PROGRAM HALTS WITH ACCUMULATED ERROR COUNT IN AC,
SR3=1 PROGRAM READS TAPE AT FULL SPEED,
SR3=0 PROGRAM READS TAPE WITH RANDOM STALLS BETWEEN
CHARACTERS,
SR5=1 HALT ON ERROR, PROGRAM HALTS IF READ ERROR OCCURS.
BAD CHARACTER IS DISPLAYED IN AC,
SR6=0 NO HALT ON ERROR.

4.11 PRG11 USE PROCEDURE

-
- A. PERFORM DEVICE SELECTION IF NOT PREVIOUSLY DONE, REFER TO SECTION 4.1.
 - B. MAKE SURE THAT TELETYPE IS ON-LINE, AND IF KSR37, THAT KEYBOARD "PROCEED" LIGHT IS ON.
 - C. LOAD ADDRESS 0200,
 - D. SET SR TO 0011.
 - E. PRESS CLEAR AND CONTINUE.
 - F. THE PROGRAM IDENTIFIES ITSELF, AND REQUESTS DATA TO BE TYPED.
 - G. TYPE IN DATA AS FOLLOWS:
 - 1. TYPE THE 3 CHARACTERS TO BE TYPED AND A DELETE CODE (RUBOUT) IF YOUR WISH NOT TO STALL BETWEEN CHARACTERS OR,
 - 2. TYPE THE 3 CHARACTERS TO BE TYPED AND ANY OTHER CHARACTER OTHER THAN THE DELETE CODE TO STALL BETWEEN CHARACTERS.

(4.11 CONT'D)

- H. THE PROGRAM WILL CONTINUOUSLY TYPE LINES CONTAINING THE THREE DESIRED CHARACTERS.
- I. TO CHANGE THE CHARACTER TO BE TYPED, SET SR0 TO A 1. THE PROGRAM WILL REQUEST NEW DATA WHEN THE CURRENT LINE IS COMPLETED. TYPE IN THE DATA AS IN STEP G.

4.12 PRG12 USE PROCEDURE

- A. PERFORM DEVICE SELECTION IF NOT PREVIOUSLY DONE. REFER TO SECTION 4.1.
- B. INSURE TELETYPE IS ON-LINE.
- C. TURN OFF TELETYPE READER.
- D. LOAD BLANK TAPE IN PUNCH.
- E. TURN ON PUNCH.
- F. LOAD ADDRESS 0200.
- G. SET SR TO 0012.
- H. PRESS CLEAR AND CONTINUE.
- I. PROGRAM PUNCHES BINARY COUNT PATTERN TEST TAPE UNTIL STOPPED BY USER,

5. PROGRAM AND/OR OPERATOR ACTION

5.1 NORMAL HALTS

LOC 0236 SR SET HALT. OCCURRS TO PERMIT SETTING OF DESIRED OPTIONS. PRESS CONTINUE AFTER SETTING DESIRED OPTIONS. (PRG0,PRG1,PRG2).

LOC 0300 PROGRAM END HALT. OCCURS AT END OF PROGRAM, IF NO "LOOP" TYPE OPTION IS SET. SET DESIRED OPTIONS AND PRESS CONTINUE. THIS HALT REOCCURS IF NO OPTIONS ARE SET. (PRG0,PRG1,PRG2,PRG3, PRG4,PRG6,PRG10),

LOC 0324 ROUTINE END HALT. THIS HALT OCCURS AT END OF A TEST ROUTINE IF SR0 IS SET TO A 1. THE AC CONTAINS THE NUMBER OF ROUTINE JUST COMPLETED. (PRG0,PRG1,PRG2,PRG3,PRG4,PRG6, PRG10).

6. ERRORS

6.1 ERROR HALT AND DESCRIPTION

LOC 1524 AN ILLEGAL BAUD RATE WAS SELECTED. RESELECT THE BAUD RATE AND RESTART PROGRAM.

LOC 2103 PRG0, PRG1, AND PRG2 UNEXPECTED INTERRUPT ERROR HALT. A DEVICE OTHER THAN THE ONE BEING TESTED HAS CAUSED AN INTERRUPT. THE AC CONTAINS THE IOT CODE THAT DETECTED THE INTERRUPT (EG, 6031 FOR SYSTEM TELETYPE KEYBOARD). PRESS CONTINUE, THE PROGRAM WILL ATTEMPT TO CLEAR THE UNDESIRABLE FLAG. IF SUCCESSFUL, THIS HALT WILL NOT REOCCUR.

LOC 2237 PRG0, ROUTINE 0, ERROR HALT A. SPF INSTRUCTION FAILED TO SET PRINTER FLAG OR TSF INSTRUCTION FAILED TO SKIP ON PRINTER FLAG SET. PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES SPF AND THEN TSF CONTINUOUSLY. MANUAL RESTART

LOC 2244 PRG0, ROUTINE 0, ERROR HALT B. CAF INSTRUCTION FAILED TO CLEAR PRINTER FLAG OR TSF INSTRUCTION SKIPPED ON NO PRINTER FLAG. PRESSING CONTINUE ENTERS SCOPE LOOP THAT SETS PRINTER FLAG WITH SPF, AND THEN CAF AND TSF ARE ISSUED. MANUAL RESTART

LOC 2253 PRG0, ROUTINE 0, ERROR HALT C. CAF INSTRUCTION FAILED TO CLEAR AC AND/OR LINK. PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES CAF WITH AC AND LINK SET. MANUAL RESTART.

LOC 2262 PRG0, ROUTINE 0, ERROR HALT E. TCF INSTRUCTION FAILED TO CLEAR PRINTER FLAG. PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES TCF WITH THE PRINTER FLAG SET. MANUAL RESTART.

LOC 2315 PRG0, ROUTINE 1, ERROR HALT B. WITH THE PRINTER FLAG SET AND THE INTERRUPT ENABLED, NO INTERRUPT OCCURRED. PRESSING CONTINUE ENTERS SCOPE LOOP THAT TURNS ON INTERRUPT CONTINUOUSLY. MANUAL RESTART.

LOC 2415 PRG0, ROUTINE 2, ERROR HALT A. KIE INSTRUCTION FAILED TO DISABLE THE TELETYPE INTERRUPT ENABLE FLIP-FLOP. PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES KIE CONTINUOUSLY WITH AC 11=0. MANUAL RESTART.

LOC 2427 PRG0, ROUTINE 2, ERROR HALT B. SPI INSTRUCTION SKIPPED WITH FLAG SET AND TELETYPE INTERRUPT ENABLE FLIP-FLOP DISABLED. PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES SPI WITH PRINTER FLAG SET AND TTY INTERRUPT DISABLED. MANUAL RESTART.

(6.1 CONT'D)

- LOC 2435 PRGØ, ROUTINE 2, ERROR HALT C. SRQ INSTRUCTION SKIPPED WITH PRINTER FLAG SET AND TELETYPE INTERRUPT ENABLE FLIP-FLOP DISABLED. PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES SRQ WITH PRINTER FLAG SET AND TTY INTERRUPT DISABLED, MANUAL RESTART.
- LOC 2443 PRGØ, ROUTINE 2, ERROR HALT D. KIE INSTRUCTION FAILED TO ENABLE TELETYPE INTERRUPT FLIP-FLOP. PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES KIE CONTINUOUSLY WITH AC11#1, MANUAL RESTART,
- LOC 2456 PRGØ, ROUTINE 2, ERROR HALT E. SPI INSTRUCTION FAILED TO SKIP WITH PRINTER FLAG SET AND TTY INTERRUPT ENABLE FLIP-FLOP ENABLED. PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES SPI CONTINUOUSLY WITH PRINTER FLAG SET AND INTERRUPT ENABLED, MANUAL RESTART.
- LOC 2465 PRGØ, ROUTINE 2, ERROR HALT F. SRQ INSTRUCTION FAILED TO SKIP WITH PRINTER FLAG SET AND TTY INTERRUPT ENABLE FLIP-FLOP SET, PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES SRQ CONTINUOUSLY WITH PRINTER FLAG SET AND TTY INTERRUPT ENABLE FLIP-FLOP ENABLED, MANUAL RESTART,
- LOC 2474 PRGØ, ROUTINE 2, ERROR HALT G. CAF INSTRUCTION FAILED TO ENABLE TTY INTERRUPT ENABLE FLIP-FLOP. PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES CAF CONTINUOUSLY, MANUAL RESTART,
- LOC 2527 PRGØ, ROUTINE 3, ERROR HALT A. TPC INSTRUCTION FAILED TO SET PRINTER FLAG IN TWICE THE REQUIRED TIME FOR IT TO SET, PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES TPC AND DELAYS, CONTINUOUSLY, MANUAL RESTART.
- LOC 2534 PRGØ, ROUTINE 3, ERROR HALT B. TLS FAILED TO CLEAR PRINTER FLAG, PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES TLS CONTINUOUSLY WITH PRINTER FLAG SET, MANUAL RESTART,
- LOC 2540 PRGØ, ROUTINE 3, ERROR HALT C. TLS INSTRUCTION FAILED TO SET PRINTER FLAG IN TWICE THE REQUIRED TIME FOR IT TO SET, PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES TLS AND DELAYS, CONTINUOUSLY, MANUAL RESTART.

(6.1 CONT'D)

- LOC 2607 PRGØ, ROUTINE 4, ERROR HALT A. PRINTER FLAG SET PRIOR TO 9 BIT TIMES. (EG, 110 BAUD 9X9.09 MSEC = 81.81 MSEC AT WHICH TIME THE FLAG MUST BE SET, NOT PRIOR TO THIS TIME). EITHER THE PDP-8/E TIMING IS TOO SLOW OR THE TTY CLOCK TOO FAST. (IS THE SLOW CYCLE JUMPER REMOVED FROM THE PROCESSOR TIMING MODULE AND IS THE CORRECT BAUD RATE SELECTED IN LOC 227). PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES TLS CONTINUOUSLY. MANUAL RESTART.
- LOC 2614 PRGØ, ROUTINE 4, ERROR HALT B. PRINTER FLAG NOT SET AFTER 9.55 BIT TIMES. (EG, 110 BAUD 9.55X9.09 MSEC = 86.7 MSEC AT WHICH TIME THE FLAG MUST BE SET, NO LATER.) PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES TLS CONTINUOUSLY. MANUAL RESTART.
- LOC 2650 PRGØ, ROUTINE 5, ERROR HALT A. WHEN ISSUING BACK TO BACK TLS'S, FLAG SETTING PRIOR TO 11 BIT TIMES FOR 110 BAUD OR 12 BIT TIMES FOR MORE THAN 110 BAUD. PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES TLS CONTINUOUSLY. MANUAL RESTART.
- LOC 2652 PRGØ, ROUTINE 5, ERROR HALT B. WHEN ISSUING BACK TO BACK TLS'S, FLAG TAKING LONGER THAN 11 BIT TIMES TO SET FOR 110 BAUD OR 12 BIT TIMES FOR MORE THAN 110 BAUD. PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES TLS CONTINUOUSLY. MANUAL RESTART.
- LOC 2664 PRGØ, ROUTINE 6, ERROR HALT A. WITH LINK, ION, AND INT BUS EQUAL TO ZERO, AC DID NOT EQUAL ZERO AFTER ISSUING GTF. NO SCOPE LOOP. MANUAL RESTART.
- LOC 2671 PRGØ, ROUTINE 6, ERROR HALT B. GTF INSTRUCTION CLEARED THE LINK. NO SCOPE LOOP. MANUAL RESTART.
- LOC 2675 PRGØ, ROUTINE 6, ERROR HALT C. GTF INSTRUCTION FAILED TO BRING LINK INTO AC 0. NO SCOPE LOOP. MANUAL RESTART.
- LOC 2706 PRGØ, ROUTINE 6, ERROR HALT D. GTF INSTRUCTION FAILED TO BRING INT BUS INTO AC 2. NO SCOPE LOOP. MANUAL RESTART.
- LOC 2720 PRGØ, ROUTINE 6, ERROR HALT E. GTF INSTRUCTION CLEARED ION. NO SCOPE LOOP. MANUAL RESTART.
- LOC 2725 PRGØ, ROUTINE 6, ERROR HALT F. GTF INSTRUCTION FAILED TO BRING ION INTO AC 4. NO SCOPE LOOP. MANUAL RESTART.
- LOC 2744 PRGØ, ROUTINE 7, ERROR HALT A. RTF INSTRUCTION FAILED TO RESET LINK WITH AC 2=0. NO SCOPE LOOP. MANUAL RESTART.

(6.1 CONT'D)

- LOC 2750 PRG0, ROUTINE 7, ERROR HALT B. RTF INSTRUCTION FAILED TO SET LINK WITH AC0=1. NO SCOPE LOOP. MANUAL RESTART.
- LOC 2753 PRG0, ROUTINE 7, ERROR HALT C. RTF INSTRUCTION FAILED TO TURN THE INTERRUPT ON. NO SCOPE LOOP. MANUAL RESTART.
- LOC 3025 PRG1, ROUTINE 1, ERROR HALT A. RECEIVER FLAG NOT SETTING UPON COMPLETION OF ISSUING A TLS OR KSF FAILED TO SKIP ON RECEIVER FLAG SET. PRESSING CONTINUE ENTERS SCOPE LOOP THAT CLEARS THE RECEIVER FLAG AND ISSUES A TLS AND WAITS TWICE THE TIME FOR THE FLAG TO SET AND THEN ISSUES A KSF. MANUAL RESTART.
- LOC 3053 PRG1, ROUTINE 2, ERROR HALT A. SAME AS PRG1, ROUTINE 1, ERROR HALT A.
- LOC 3062 PRG1, ROUTINE 2, ERROR HALT B. KSF INSTRUCTION FAILED TO SKIP ON RECEIVER FLAG. PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES KSF CONTINUOUSLY. MANUAL RESTART.
- LOC 3113 PRG1, ROUTINE 3, ERROR HALT A. SAME AS PRG1, ROUTINE 1, ERROR HALT A.
- LOC 3122 PRG1, ROUTINE 3, ERROR HALT B. KSF INSTRUCTION SKIPPED ON RECEIVER FLAG NOT SET. PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES KSF WITH NO RECEIVER FLAG SET CONTINUOUSLY. MANUAL RESTART.
- LOC 3160 PRG1, ROUTINE 4, ERROR HALT A. THE READER FLAG FAILED TO CAUSE AN INTERRUPT. PRESSING CONTINUE ENTERS SCOPE LOOP THAT TURNS THE INTERRUPT ON CONTINUOUSLY. MANUAL RESTART.
- LOC 3230 PRG1, ROUTINE 5, ERROR HALT A. SRQ INSTRUCTION FAILED TO SKIP ON READER FLAG SET AND TELETYPE INTERRUPT ENABLE FLIP-FLOP ENABLED. PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES SRQ CONTINUOUSLY WITH TTY ENABLED AND READER FLAG SET. MANUAL RESTART.
- LOC 3235 PRG1, ROUTINE 5, ERROR HALT B. SPI INSTRUCTION FAILED TO SKIP ON READER FLAG SET AND TELETYPE INTERRUPT ENABLE FLIP-FLOP ENABLED. PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES SPI CONTINUOUSLY WITH TTY ENABLED AND READER FLAG SET. MANUAL RESTART.
- LOC 3242 PRG1, ROUTINE 5, ERROR HALT C. CAF INSTRUCTION FAILED TO CLEAR THE READER FLAG. PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES CAF CONTINUOUSLY WITH THE RECEIVER FLAG SET. MANUAL

(6.1 CONT'D)

- LOC 3257 PRG1, ROUTINE 5, ERROR HALT D, SRQ INSTRUCTION SKIPPED WITH NO RECEIVER FLAG SET, PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES SRQ INSTRUCTION CONTINUOUSLY, MANUAL RESTART.
- LOC 3264 PRG1, ROUTINE 5, ERROR HALT E, SPI INSTRUCTION SKIPPED WITH NO RECEIVER FLAG SET, PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES SPI CONTINUOUSLY WITH NO RECEIVER FLAG SET, MANUAL RESTART.
- LOC 3310 PRG1, ROUTINE 6, ERROR HALT A, RECEIVER FLAG NOT SETTING AT THE END OF 10 BIT TIMES FOR A NON 110 BAUD DEVICE OR 11 BIT TIMES FOR A 110 BAUD DEVICE. PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES TLS CONTINUOUSLY TO SET RECEIVER FLAG, MANUAL RESTART.
- LOC 3366 PRG1, ROUTINE 7 OR 10, ERROR HALT, DATA SENT DOES NOT COMPARE WITH THE DATA RECEIVED, M0 CONTAINS DATA THAT WAS SENT, AC CONTAINS THE DATA THAT WAS RECEIVED, PRESSING CONTINUE ENTERS SCOPE LOOP THAT SENDS THE DATA IN THE M0, MANUAL RESTART.
- LOC 3424 PRG1, ROUTINE 11, ERROR HALT A, KRS INSTRUCTION FAILED TO INCLUSIVE "OR" KBRD BUFFER WITH AC, PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES KRS CONTINUOUSLY, MANUAL RESTART.
- LOC 3464 PRG1, ROUTINE 12, ERROR HALT A, KRB INSTRUCTION FAILED TO "JAM TRANSFER" THE KBRD BUFFER INTO THE AC, PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES KRB CONTINUOUSLY, MANUAL RESTART.
- LOC 3474 PRG1, ROUTINE 12, ERROR HALT B, KRB INSTRUCTION FAILED TO CLEAR THE READER FLAG, PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES KRB CONTINUOUSLY WITH THE RECEIVER FLAG SET, MANUAL RESTART.
- LOC 3524 PRG1 OR PRG2, ROUTINES 0, ERROR HALT, KCC INSTRUCTION FAILED TO CLEAR THE AC, PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES KCC CONTINUOUSLY WITH AC=7777, MANUAL RESTART.
- LOC 3543 PRG2, ROUTINE 1, ERROR HALT, AFTER ISSUING A KCC INSTRUCTION AND WAITING TWICE THE AMOUNT OF TIME REQUIRED FOR THE RECEIVER FLAG TO SET, IT WAS NOT SET. PRESSING CONTINUE ENTERS A SCOPE LOOP THAT REPEATS THE TEST, MANUAL RESTART.
- LOC 3562 PRG2, ROUTINE 2, ERROR HALT A, SAME AS PRG 2, ROUTINE 1, ERROR HALT.

(6.1 CONT'D)

- LOC 3564 PRG2, ROUTINE 2, ERROR HALT B, WITH RECEIVER FLAG SET, KSF COMMAND FAILED TO SKIP. PRESSING CONTINUE ENTERS SCOPE LOOP THAT SKIPS ON FLAG CONTINUOUSLY, MANUAL RESTART.
- LOC 3621 PRG2, ROUTINE 3, ERROR HALT A. SAME AS PRG 2, ROUTINE 1, ERROR HALT.
- LOC 3623 PRG2, ROUTINE 3, ERROR HALT B. KCC FAILED TO RESET, OR KSF INSTRUCTION SKIPPED WITH FLAG=0. PRESSING CONTINUE ENTERS SCOPE LOOP THAT CLEARS THE FLAG AND SKIPS ON THE FLAG CONTINUOUSLY, MANUAL RESTART.
- LOC 3657 PRG2, ROUTINE 4, ERROR HALT, WITH READER FLAG=1 AND INTERRUPT ENABLED, NO INTERRUPT OCCURRED, PRESSING CONTINUE ENTERS SCOPE LOOP THAT TURNS INTERRUPT ON CONTINUOUSLY, MANUAL RESTART,
- LOC 3706 PRG2, ROUTINE 5, ERROR HALT, TIMING ERROR, FLAG NOT=1 103 MSEC AFTER KCC INSTRUCTION, PRESSING CONTINUE ENTERS SCOPE LOOP THAT READS TAPE CONTINUOUSLY, MANUAL RESTART.
- LOC 3747 PRG2, ROUTINE 6, ERROR HALT A. REREAD ERROR, A REREAD OF THE RBRD BUFFER DID NOT MATCH WITH THE ORIGINAL READ, NEW CHARACTER IS DISPLAYED IN AC, PRESS CONTINUE.
- LOC 3752 PRG2, ROUTINE 6, ERROR HALT B, FOLLOW UP HALT, TO PRG2, ROUTINE 6, ERROR HALT A, THE "OLD" CHARACTER IS DISPLAYED IN THE AC, PRESSING CONTINUE ENTERS SCOPE LOOP THAT READS THE TELETYPE BUFFER CONTINUOUSLY, MANUAL RESTART.
- LOC 3756 PRG2, ROUTINE 6, ERROR HALT C, KRS INSTRUCTION FAILED TO "INCLUSIVE OR" KBRD BUFFER WITH AC. PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES KRS CONTINUOUSLY WITH AC=7777, MANUAL RESTART.
- LOC 4015 PRG2, ROUTINE 7, ERROR HALT A, KCR INSTRUCTION CLEARED THE AC, PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES KCR CONTINUOUSLY WITH AC=7777, MANUAL RESTART.
- LOC 4021 PRG2, ROUTINE 7, ERROR HALT B, KCR INSTRUCTION FAILED TO CLEAR READER RUN, PRESSING CONTINUE ENTERS SCOPE LOOP THAT ISSUES KCR CONTINUOUSLY WITH READER RUN SET, MANUAL RESTART.
- LOC 4073 PRG2, ROUTINE 10, ERROR HALT A, KIE INSTRUCTION FAILED TO DISABLE TELETYPE INTERRUPT ENABLE FLIP-FLOP, PRESSING CONTINUE ENTERS A SCOPE LOOP THAT ISSUES KIE WITH AC=0 CONTINUOUSLY, MANUAL RESTART.

(6.1 CONT'D)

- LOC 4305 PRG2, ROUTINE 12, ERROR HALT C, KRB INSTRUCTION FAILED TO READ THE CORRECT DATA OFF OF TAPE. PRESS CONTINUE TO TRY TEST AGAIN. MANUAL RESTART.
- LOC 4337 PRG3, ROUTINE 0, ERROR HALT A, READ ERROR, BAD CHARACTER IN AC. PRESS CONTINUE.
- LOC 4342 PRG3, ROUTINE 0, ERROR HALT B, FOLLOW UP HALT. EXPECTED CHARACTER IN AC. PRESSING CONTINUE RESUMES TEST.
- LOC 4371 PRG3, ROUTINE 1, ERROR HALT A, READ ERROR, BAD CHARACTER IN AC. PRESS CONTINUE.
- LOC 4374 PRG3, ROUTINE 1, ERROR HALT B, FOLLOW UP HALT. EXPECTED CHARACTER IN AC. PRESSING CONTINUE RESUMES TEST.
- LOC 4427 PRG3, ROUTINE 2, ERROR HALT A, READ ERROR, BAD CHARACTER IN AC. PRESS CONTINUE.
- LOC 4432 PRG3, ROUTINE 2, ERROR HALT B, FOLLOW UP HALT. EXPECTED CHARACTER IN AC. PRESSING CONTINUE RESUMES TEST.
- LOC 5415 PRG6, ROUTINE 0, KSF COMMAND FAILED TO SKIP ON KEYBOARD FLAG. -PRESS CONTINUE TO ENTER SCOPE LOOP THAT SKIPS ON FLAG CONTINUOUSLY.
- LOC 5707 PRG10, READ ERROR HALT A, BAD CHARACTER IN AC. PRESS CONTINUE. HALT OCCURS IF SR5=1.
- LOC 5712 PRG10, READ ERROR HALT B, FOLLOW UP HALT TO PRG10 READ ERROR HALT A. EXPECTED CHARACTER IS DISPLAYED IN AC. TO PROCEED, PRESS CONTINUE.
- LOC 5717 PRG10, ERROR COUNT HALT. HALT OCCURS WHENEVER SR0 IS SET TO A 1. THE AC THEN CONTAINS THE ACCUMULATED ERROR COUNT, IF ANY. TO PROCEED, PRESS CONTINUE.

7. MISCELLANEOUS

7.1 EXECUTION TIME (MINUTES:SECONDS)

	110 CURRENT	110 EIA	150 EIA	300 EIA	600 EIA	1200 EIA
PRG01	1:31	1:31	1:03	2:32	3:21	3:19
PRG11	N/A	4:30	3:30	1:45	1:00	2:30
PRG21	2:47	N/A	N/A	N/A	N/A	N/A
PRG31	18:00	N/A	N/A	N/A	N/A	N/A
PRG41	28:00	N/A	N/A	N/A	N/A	N/A
PRG51	CONTINUOUS	N/A	N/A	N/A	N/A	N/A
PRG61	USER DEP.	N/A	N/A	N/A	N/A	N/A
PRG71	40:00	N/A	N/A	N/A	N/A	N/A
PRG10:	CONTINUOUS	N/A	N/A	N/A	N/A	N/A
PRG11:	USER DEP.	N/A	N/A	N/A	N/A	N/A
PRG12:	CONTINUOUS	N/A	N/A	N/A	N/A	N/A

7.2 TEST TAPES

MAINDEC=00=D2G3=PT BINARY COUNT PATTERN TEST TAPE IS PROVIDED WITH THIS PROGRAM. FOR CONVENIENCE OF USE, A TAPE LOOP SHOULD BE MADE, MAKING SURE THAT THE PATTERN IS MATCHED AT THE SPLIC POINT.

7.3 TEST EQUIPMENT

FOR TESTING OF THE EIA LOGIC THE INPUT MUST BE CONNECTED TO THE OUTPUT ON THE 40 PIN SIDE CONNECTOR WITH JUMPERS.

PIN E TO PIN M
PIN F TO PIN J

8. PROGRAM DESCRIPTION

8.1 PRG0 - BASIC OUTPUT LOGIC TESTS

THIS PROGRAM CONTAINS 8 ROUTINES NUMBERED FROM 0-7 (OCTAL)

RTN01 CHECKS THE ABILITY OF:
SPF TO SET PRINTER FLAG,
TSF TO SKIP ON PRINTER FLAG SET,
CAF TO CLEAR PRINTER FLAG, AC, AND LINK,
TCF TO CLEAR PRINTER FLAG,
TSF TO NOT SKIP ON PRINTER FLAG 0,
TEST IS DONE 100 TIMES.

RTN11 CHECKS THAT NO OTHER DEVICE CAN CAUSE AN INTERRUPT
AND THEN CHECKS THAT THE PRINTER FLAG IS CAPABLE OF
INTERRUPTING. TEST IS DONE 4000 TIMES.

RTN21 CHECKS THE ABILITY OF:
KIE TO DISABLE TTY INTERRUPT ENABLE FLIP-FLOP,
SPI TO NOT SKIP WITH NO TTY INTERRUPT REQUEST,
SRQ TO NOT SKIP WITH NO TTY INTERRUPT REQUEST,
KIE TO ENABLE TTY INTERRUPT ENABLE FLIP-FLOP,
SPI TO SKIP ON A TTY INTERRUPT REQUEST,
SRQ TO SKIP ON A TTY INTERRUPT REQUEST,
CAF TO ENABLE TTY INTERRUPT ENABLE FLIP-FLOP,
TEST IS DONE 4000 TIMES.

RTN31 CHECKS THE ABILITY OF:
TPC TO SET THE PRINTER FLAG,
TLS TO CLEAR THE PRINTER FLAG,
TLS TO SET THE PRINTER FLAG,
TEST IS DONE 100 TIMES.

RTN41 PRINTER TIMING TEST:
CHECKS THAT THE FLAG IS NOT SET JUST PRIOR TO
9 BIT TIMES AND THAT THE FLAG IS SET AT 9.5 BIT TIMES.
TEST IS DONE 100 TIMES.

RTN51 PRINTER TIMING TEST:
AFTER ISSUING A TLS AND WAITING FOR THE FLAG
TO SET ANOTHER TLS IS ISSUED AND THE FLAG IS
CHECKED JUST PRIOR TO 11 BIT TIMES FOR 110 BAND
AND 10 BIT TIMES FOR NON 110 BAND - THE FLAG
SHOULD NOT BE SET. THE FLAG IS CHECKED AGAIN 1/2
BIT TIME LATER AND THE FLAG SHOULD BE SET AT THIS
TIME. TEST IS DONE 100 TIMES.

RTN61 TEST OF GTF INSTRUCTION. TEST IS DONE 4000 TIMES.

RTN71 TEST OF RTF INSTRUCTION. TEST IS DONE 4000 TIMES.

8.2 PRC1 - BASIC EIA INPUT AND OUTPUT LOGIC TESTS

- NOTE1 ON THE 40 PIN SIDE CONNECTOR; PIN E MUST BE CONNECTED TO PIN M, PIN F MUST BE CONNECTED TO PIN J.
- RTN01 CHECKS THAT KCC WILL CLEAR THE AC, TEST IS DONE 100 TIMES.
- RTN11 TLS IS USED TO SEND DATA AND KSF CHECKS TO SEE IF THE RECEIVER FLAG SET UPON COMPLETION OF RECEIVING THE DATA. TEST IS DONE 100 TIMES.
- RTN21 TEST OF KSF TO SKIP ON RECEIVER FLAG CONSISTENTLY. TEST IS DONE 4000 TIMES.
- RTN31 TEST OF KSF TO NOT SKIP ON NO RECEIVER FLAG, TEST IS DONE 500 TIMES.
- RTN41 CHECKS THAT NO OTHER DEVICE CAN CAUSE AN INTERRUPT AND THAT THE READER FLAG WILL INTERRUPT. TEST IS DONE 1000 TIMES.
- RTN51 CHECKS THE ABILITY OF:
SRQ TO SKIP ON A READER INTERRUPT
SPI TO SKIP ON A READER INTERRUPT
CAF TO CLEAR KBRD/READER FLAG.
SRQ TO NOT SKIP ON NO READER FLAG
SPI TO NOT SKIP ON NO READER FLAG
TEST IS DONE 100 TIMES.
- RTN61 CHECKS THAT THE READER FLAG SETS NO LATER THAN THE REQUIRED TIME FOR IT TO SET.
110 BAUD = 100 MSEC.
150 BAUD = 66.7 MSEC.
300 BAUD = 33.3 MSEC.
600 BAUD = 16.7 MSEC.
1200 BAUD = 8.33 MSEC.
TEST IS DONE 100 TIMES.
- RTN71 CHECKS DATA HANDLING CAPABILITIES BY SENDING A NUMBER FOLLOWED BY ITS COMPLEMENT. TEST IS DONE 512 TIMES.
- RT101 CHECKS DATA HANDLING CAPABILITIES BY SENDING RANDOM NUMBERS. TEST IS DONE 512 TIMES.
- RTN11: CHECKS THAT KRS CAN "INCLUSIVE OR" READER BUFFER WITH AC, TEST IS DONE 500 TIMES.
- RTN12: CHECKS THAT KRB WILL "JAM TRANSFER" RECEIVER BUFFER TO AC, AND THAT KRB WILL CLEAR READER FLAG, TEST IS DONE 500 TIMES.

PRG2 - BASIC INPUT LOGIC TESTS

THIS PROGRAM CONTAINS 11 ROUTINES NUMBERED FROM 0 TO 12 (OCTAL).

RTN01 CHECKS THAT KCC COMMAND IS ABLE TO CLEAR THE AC. TEST IS DONE 1000 TIMES.

RTN11 ISSUES KCC, WAITS 200MS AND CHECKS THAT FLAG IS SET. A FAILURE TO SKIP INDICATES THAT THE FLAG IS NOT SET, OR THAT KSF COMMAND FAILED TO SKIP.

RTN21 WITH FLAG SET, CHECKS THAT KSF COMMAND SKIPS RELIABLY, DONE 500 TIMES.

RTN31 CHECKS THAT KSF COMMAND DOES NOT SKIP WITH FLAG RESET, DONE 500 TIMES.

RTN41 CHECKS THAT NO OTHER DEVICE CAN CAUSE AN INTERRUPT, AND THEN CHECKS THAT READER IS CAPABLE OF INTERRUPTING.

RTN51 TIMING TEST.

RTN61 READS A CHARACTER FROM TAPE AND SAVES IT. IT THEN REREADS THE TTI STATICALLY 1000 TIMES TO CHECK FOR CONSISTENT READING FROM TTI. 256 CHARACTERS ARE READ IN THIS MANNER.

RTN71 CHECKS THAT KCR DOES NOT CLEAR AC AND SETS READER FLAG, BIT DOES NOT SET READER RUN, DONE 100 TIMES.

RTN10: CHECKS THAT KIE WILL ENABLE AND DISABLE TTY INTERRUPT F,F, AND THAT SRQ AND SPI WILL AND WILL NOT SKIP, DONE 1000 TIMES

RTN11: CHECKS THAT CAF WILL ENABLE TTY INTERRUPT F,F, AND THAT IT WILL CLEAR AC, LINK, AND READER FLAG, DONE 100 TIMES.

RTN12: CHECKS THAT KRB CAN CLEAR THE READER FLAG AND THAT KRB CAN SET THE FLAG. ALSO KRB IS CHECKED FOR READING DATA, TEST IS DONE 256 TIMES.

8.4

PRG3 - READER TEST

THIS PROGRAM CONTAINS 3 ROUTINES NUMBERED FROM 0 TO 2.

- RTN01 READS 4095 CHARACTERS OF BINARY COUNT PATTERN, FULL SPEED,
- RTN11 READS 2000 CHARACTERS FO BINARY COUNT PATTERN WITH RANDOM STALLS BETWEEN CHARACTERS,
- RTN21 READS 100 RANDOM LENGTH CHARACTER BLOCKS, FIXED STALL BETWEEN CHARACTERS IN A BLOCK, THE STALL CHANGES FOR EACH BLOCK AND IS DETERMINED AT RANDOM,

8.5

PRG4 - PRINTER TEST

THIS PROGRAM CONTAINS 41 ROUTINES NUMBERED FROM 0 TO 50 (OCTAL).

- RTN01 CARRIAGE RETURN TEST, CHECKS ABILITY OF CARRIAGE RETURN TO PRINT POSITION 1 FROM ALL OTHER PRINT POSITIONS, NO PRINTING SHOULD OCCUR IN ANY PRINT POSITION OTHER THAN POSITION 1,
- RTN11 RIGHT MARGIN TEST, THIS TEST SHOWS WHEN THE RIGHT MARGIN IS NOT CORRECTLY ADJUSTED, THE TEST PRINTS 16 GROUPS OF ===I FOLLOWED BY CHARACTERS I=,
- RTN21 SPACE TEST, THE TEST PRINTS / IN ALTERNATE POSITIONS OF THE LINE, AFTER A DOUBLE CARRIAGE RETURN IT SCAPES TO THE BLANK POSITIONS AND PRINTS A LEFT SLANT SLASH, A DOUBLE CARRIAGE RETURN IS ISSUED AFTER PRINTING EACH LEFT SLANT SLASH,
- RTN31 LINE FEED TEST, THE TEST PRINTS A LEFT SLANT SLASH FOLLOWED BY A LINE FEED, FOLLOWED BY A RANDOM DELAY UNTIL 81 SLASHES HAVE BEEN PRINTED, THE RESULT SHOULD APPEAR TO BE A LEFT SLANTED LINE FROM POSITION 1 TO 81, VERTICAL SPACING VARIATIONS SHOULD BE APPARENT IF ADJUSTMENT IS REQUIRED,

(8.5 CONT'D)

ROUTINES 4 THROUGH 41 TYPES LINES CONTAINING 3 CHARACTERS AT
FULL SPEED AS FOLLOWS:

RTN41: ABC (CAPITALS)
RTN51: DEF "
RTN61: GHI "
RTN71: JKL "
RTN10: MNO "
RTN11: PQR "
RTN12: STU "
RTN13: VWX "
RTN14: YZB "
RTN15: 123
RTN16: 456
RTN17: 789
RTN20: !%"
RTN21: \$%&
RTN22: '()
RTN23: @+,
RTN24: =./
RTN25: !!<
RTN26: #>?
RTN27: @C\
RTN30: J↑ AND LEFT ARROW
RTN31: ABC (LOWER CASE) (KSR37 ONLY)
RTN32: DEF " "
RTN33: GHI " "
RTN34: JKL " "
RTN35: MNO " "
RTN36: PQR " "
RTN37: STU " "
RTN40: VWX " "
RTN41: YZ AND CODE 340 "

RTN42: TYPES LINE OF 4 CHARACTERS WHOSE CODE IS 373, 374, 375,
AND 376 (KSR37 ONLY).

RTN43: TYPES 2 LINES OF ALL CHARACTERS, FIRST LINE IS
TYPED AT FULL SPEED, AND THE 2ND LINE WITH RANDOM
STALLS BETWEEN CHARACTERS.

RTN44: TYPES 12 LINES OF ASR33 PRINTER WORST CASE PATTERN.
ALTERNATE LINES ARE TYPED WITH RANDOM STALLS BETWEEN
CHARACTERS. ROUTINE RUNS ONLY IF KSR33 OR ASR33 IS
PRESENT.

THE ASR33 WORST CASE PATTERN USED IS 'LEFT ARROW W/W
LEFT ARROW.

(8.5 CONT'D)

RTN45: TYPES 12 LINES OF ASR35 PRINTER WORST CASE PATTERN.
ALTERNATE LINES ARE TYPED WITH RANDOM STALLS BETWEEN
CHARACTERS. ROUTINE RUNS ONLY IF KSR35 OR ASR35 IS
PRESENT.

THE AST35 WORST CASE PATTERN USED IS 'E?G?C

RTN46: TYPES 12 LINES OF KSR37 PRINTER WORST CASE PATTERN.
ALTERNATE LINES ARE TYPED WITH RANDOM STALLS BETWEEN
CHARACTERS. ROUTINE RUNS ONLY IF KSR37 IS PRESENT.

THE KSR 37 WORST CASE PATTERN USED IS:

CAPITAL N, LOWER CASE Q, CAPITAL A, SWING DASH,
CAPITAL A, LOWER CASE Q,

RTN47: TAB TEST, EXECUTED FOR 37 OR 35 TELETYPE ONLY. THE
TEST IS RUN AFTER ROUTINE 3.

RTN50: BACKSPACE TEST, EXECUTED FOR KSR37 TELETYPE ONLY.
THIS TEST IS RUN AFTER ROUTINE 47.

8.6 PRG5 - PUNCH TEST

THIS PROGRAM TESTS THE PUNCH WITH A SPECIAL BINARY COUNT
PATTERN. EVERY BINARY COUNT CHARACTER PUNCHED IS FOLLOWED
BY ITS 1'S COMPLEMENT CHARACTER.

THE TEST SEQUENCE IS AS FOLLOWS:

- A) PUNCH LEADER (CODE 376)
- B) PUNCH SYNC CHARACTER (CODE 377)
- C) PUNCH DATA BLOCK AT FULL SPEED (512 CHARACTERS)
- D) PUNCH TRAILER (CODE 376)
- E) SYNC THE READER
- F) READ AND CHECK DATA BLOCK
- G) PUNCH LEADER (CODE 376)
- H) PUNCH SYNC CHARACTER (CODE 377)
- I) PUNCH DATA BLOCK WITH STALLS, (512 CHARACTERS)
- J) PUNCH TRAILER (CODE 376)
- K) SYNC THE READER
- L) READ AND CHECK DATA BLOCK
- M) REPEAT. (GO TO STEP A)

8.7 PRG6 - KEYBOARD TEST

THIS PROGRAM CONTAINS 3 ROUTINES NUMBERED FROM 0 TO 2.

RTN01 CHECKS THAT KSF COMMAND SKIPS WHEN FLAG=1. TEST
IS DONE 1000 TIMES.

RTN11 ECHO TEST, ANY CHARACTERS READ FROM KEYBOARD ARE
TYPED, CORRECT OPERATION VERIFICATION IS DONE VISUALLY
BY USER, READING A RUBOUT CHARACTER ENDS THE TEST.

RTN21 OCTAL EQUIVALENCE TEST, THE OCTAL EQUIVALENT OF ANY
CHARACTERS KEYED IS TYPED, READING A RUBOUT ENDS THE
TEST.

8.8 PRG7 - COMBINED READER, PRINT, PUNCH TEST

THIS PROGRAM CONTAINS 25 ROUTINES NUMBERED FROM 0 TO 32
(OCTAL), ALL ROUTINES USE THE FOLLOWING TEST SEQUENCE:

- A) FILL CORE WITH DATA TO BE PUNCHED/PRINTED.
- B) PUNCH LEADER.
- C) PUNCH SYNC. CHARACTER.
- D) PUNCH DATA BLOCK (NO DELAY BETWEEN CHARACTERS.)
- E) SYNC THE READER.
- F) READ/CHECK DATA BLOCK (RANDOM DELAY BETWEEN CHARACTERS).
- G) PUNCH DATA BLOCK (RANDOM DELAY BETWEEN CHARACTERS),
- H) READ DATA BLOCK (NO DELAY BETWEEN CHARACTERS).
- I) PUNCH TRAILER.
- J) WAIT FOR READER TO COMPLETE READING DATA BLOCK.
- K) END OF TEST SEQUENCE.

8.8 CONT'D)

RTN01: PUNCH/PRINT AND READ CHECK BLOCK OF ABC
RTN11: PUNCH/PRINT AND READ CHECK BLOCK OF DEF
RTN21: PUNCH/PRINT AND READ CHECK BLOCK OF GHI
RTN31: PUNCH/PRINT AND READ CHECK BLOCK OF JKL
RTN41: PUNCH/PRINT AND READ CHECK BLOCK OF MNO
RTN51: PUNCH/PRINT AND READ CHECK BLOCK OF PQR
RTN61: PUNCH/PRINT AND READ CHECK BLOCK OF STU
RTN71: PUNCH/PRINT AND READ CHECK BLOCK OF VWX
RTN10: PUNCH/PRINT AND READ CHECK BLOCK OF YZB
RTN11: PUNCH/PRINT AND READ CHECK BLOCK OF 123
RTN12: PUNCH/PRINT AND READ CHECK BLOCK OF 456
RTN13: PUNCH/PRINT AND READ CHECK BLOCK OF 789
RTN14: PUNCH/PRINT AND READ CHECK BLOCK OF !"#\$%&
RTN15: PUNCH/PRINT AND READ CHECK BLOCK OF ^<>`
RTN16: PUNCH/PRINT AND READ CHECK BLOCK OF ()
RTN17: PUNCH/PRINT AND READ CHECK BLOCK OF <>,
RTN20: PUNCH/PRINT AND READ CHECK BLOCK OF =,/
RTN21: PUNCH/PRINT AND READ CHECK BLOCK OF !!<
RTN22: PUNCH/PRINT AND READ CHECK BLOCK OF >>?
RTN23: PUNCH/PRINT AND READ CHECK BLOCK OF @<>
RTN24: PUNCH/PRINT AND READ CHECK BLOCK OF !@#
RTN25: PUNCH/PRINT AND READ CHECK BLOCK OF ALL PRINTABLE CHARACTERS
RTN26: PUNCH/PRINT AND READ CHECK BLOCK OF ASR35 PRINTER
WORST CASE PATTERN (<W/>)
RTN27: PUNCH/PRINT AND READ CHECK BLOCK OF ASR35 PRINTER
WORST CASE PATTERN, ([?C)
RTN30: PUNCH/PRINT AND READ CHECK BLOCKS OF SPACE;
RUBOUT (DATA: ALL 1'S, ALL 1'S, ALL 0'S).

8.9 PRG7 - READER EXERCISER, BINARY COUNT PATTERN

THE PROGRAM READS AND CHECKS A BINARY COUNT PATTERN TEST TAPE.
WITH PROGRAM RUNNING SETTING SR9 TO A 1 CAUSES PROGRAM TO HALT
AND DISPLAY THE ACCUMULATED ERROR COUNT IN AC. SR3 SET TO
A 1 GIVES FULL SPEED READING, SR3 SET TO A 0 CAUSES STALLS
BETWEEN CHARACTERS. SR5 SET TO A 1 WILL HALT THE PROGRAM WHEN
AN ERROR OCCURS, THE BAD CHARACTER IS THEN DISPLAYED IN THE
AC. PRESSING CONTINUE DISPLAYS THE EXPECTED CHARACTER.

8.10 PRG10 - PRINTER EXERCISER

THIS PROGRAM CONTINUOUSLY TYPES LINES OF ANY 3 CHARACTERS
KEYED BY USER. ON PROGRAM REQUEST THE USER KEYS IN THE 3
CHARACTERS TO BE TYPED, FOLLOWED BY A DELETE CODE IF FULL
SPEED TYPING IS DESIRED, OR BY ANY OTHER CHARACTER IF RANDOM
STALLS AFTER EACH CHARACTER ARE DESIRED.

8.11 PRG11 - TAPE GENERATOR - BINARY COUNT PATTERN

PUNCHES BINARY COUNT PATTERN TEST TAPE.

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/PDP-8/E TELETYPE CONTROL TEST, (KLB)

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/
/PRG0-BASIC OUTPUT CONTROL LOGIC TEST
/PRG1-BASIC OUTPUT AND INPUT LOGIC TEST (LOOP AROUND)
/PRG2-BASIC INPUT CONTROL LOGIC TEST - (USES READER)
/PRG3-READER TEST
/PRG4-PRINTER TEST
/PRG5-PUNCH TEST
/PRG6-KEYBOARD TEST
/PRG7-COMBINED TEST
/PRG10-READER EXERCISER, BINARY COUNT PATTERN.
/PRG11-PRINTER EXERCISER,
/PRG12-TAPE GENERATOR, BINARY COUNT PATTERN.
/
/
/*****
/BIT TIME TABLE:
/0110 BAUD 11 BITS @ 9.09 MSEC = 100 MSEC
/0150 BAUD 10 BITS @ 6.67 MSEC = 66.7 MSEC
/0300 BAUD 10 BITS @ 3.33 MSEC = 33.33 MSEC
/0600 BAUD 10 BITS @ 1.67 MSEC = 16.67 MSEC
/1200 BAUD 10 BITS @ .833 MSEC = 8.33 MSEC
/*****
/

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6001	ION=6001	/TURN INTERRUPT ON,
6002	IOP=6002	/TURN INTERRUPT OFF,
6003	SRQ=6003	/SKIP IF INTERRUPT REQUEST,
6004	GTF=6004	/GET INTERRUPT FLAGS
6005	RTF=6005	/RESTORE INTERRUPT FLAGS AND TURN INTERRUPT ON
6007	CAF=6007	/CLEAR ALL FLAGS, AC, LINK, AND ENABLE TTY INTERRUPT
6030	KCR=6030	/CLEAR KBRD FLAG BUT DO NOT SET RDR RUN
6031	KSF=6031	/SKIP IF KEYBOARD/READER FLAG = 1.
6032	KCC=6032	/CLEAR AC AND KBRD/READER FLAG, SET READER RUN.
6034	KRS=6034	/READ KEYBOARD/READER BUFFER STATIC
6035	KIE=6035	/ENABLE TTY INTERRUPT WHEN AC11 EQUALS 1
6036	KRB=6036	/CLEAR AC, READ KEYBOARD BUFFER, CLEAR /KEYBOARD FLAGS.
6040	SPF=6040	/SET PRINTER FLAG
6041	TSF=6041	/SKIP IF TELEPRINTER/PUNCH FLAG = 1.
6042	TCF=6042	/CLEAR TELEPRINTER/PUNCH FLAG,
6044	TPC=6044	/LOAD TELEPRINTER/PUNCH BUFFER
6045	SPI=6045	/SELECT AND PRINT,
6046	TLS=6046	/SKIP IF TTY INTERRUPT /LOAD TELEPRINTER/PUNCH BUFFER, /SELECT AND PRINT AND CLEAR /TELEPRINTER/PUNCH FLAG,
7002	BSW=7002	/SWAP BYTES IN AC,
7421	MQL=7421	/LOAD MQ FROM AC THEN CLEAR AC,
7621	CAM=7621	/CLEAR AC AND MQ,
7701	ACL=7701	/LOAD MQ INTO AC,
0000	OPEN=0	/PROGRAM MODIFIABLE.

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4577 SETLOC=JMS I [STCTR
4576 DELAY=JMS I [DLYMS
4575 CRLF=JMS I [CRLF
4574 MOVE=JMS I [MOVVE
4573 TYPE=JMS I [TYPSTG
6117 MTON=6117 /DC02. MULTIPLE TTY ON.
6127 MTRS=6127 /DC02. MULTIPLE TTY READ STATUS.
6115 MINT=6115 /DC02. MULTIPLE TTY INTERRUPT CONTROL.

4572 UKSF=JMS I [XKSF
4571 UKCC=JMS I [XKCC
4570 UKRS=JMS I [XKRS
4567 UKRB=JMS I [XKR8
4566 UTSF=JMS I [XTSF
4565 UTCF=JMS I [XTCF
4564 UTPC=JMS I [XTPC
4563 UTLS=JMS I [XTLS
4562 UKCR=JMS I [XKCR
4561 UKIE=JMS I [XKIE
4560 USPF=JMS I [XSPF
4557 USPI=JMS I [XSPI
4556 STALL=JMS I [STAL
4555 CKSR37=JMS I [CK37
4554 CKSR33=JMS I [CK33
4553 CKSR35=JMS I [CK35
6577 BLOCKA=END
6601 BLOCK1=BLOCKA+2
6711 BLOCKB=BLOCKA+112
6722 BLKBB=BLOCKA+123
6713 BLOCK2=BLOCKA+114
6724 BLK2=BLOCKA+125
7023 BLOCKC=BLOCKA+224
7034 BLKCC=BLOCKA+235
7577 DBLK=BLOCKA+1000
7631 M147=147 /*=103 DECIMAL.
0304 RRPP=0304

0000 0000 *0
0001 5001 0000 JMP 1
0002 0002 2
0003 0003 3
0005 0005 *5
0006 5402 0000 JMP ! 2
0006 0000 0
0016 0000 *16
0016 0000 OPEN /*AUTO INDEX.
0020 0000 *20
0020 0000 TTYTYP, OPEN
0021 0304 TTYIOT, RRPP

0022 0110 BAUDRT, 110

/CONSTANT TO DETERMINE IOT CODE
/PRESET FOR 23 READER AND 24 PUNCH.
/TO CHANGE IOT CODE SET THIS LOCATION
/TO: "RRPP" WHERE RR IS FOR
/THE READER AND PP IS FOR THE PUNCH.
/CONSTANT TO DETERMINE DELAY
/PRESET FOR BAUD.

/PDP=8/E TELETYPE CONTROL TEST, (KLB) PAL10 V141 14-MAY-71 11:02 PAGE 1-2

/TO SELECT BAUD RATE DEPOSIT THE FOLLOWING:
/0110 FOR 110 BAUD.
/0150 FOR 150 BAUD.
/0300 FOR 300 BAUD.
/0600 FOR 600 BAUD.
/1200 FOR 1200 BAUD.
/*THE ABOVE ARE THE ONLY LEGAL BAUD RATES**

0023	0000	KSTART, OPEN	
0024	0000	DELAYM, OPEN	
0025	0263	CHAIN, CHAINN	
0026	1365	KFLAG, KFLAG	
0027	0474	DLCNT1, DLCNT	
0030	2012	S100, S100I	
0031	2000	S4000, S4000I	
0032	2005	S200, S200I	
0033	2126	TLCALL, TLCALI	
0034	2134	TLC37, TLC37I	
0035	2144	FBF, FBFI	
0036	0000	PRGNUM, OPEN	
0037	2200	PRGTAB, PRG0	
0040	3000	PRG1	
0041	3503	PRG2	
0042	4307	PRG3	
0043	4434	PRG4	
0044	5274	PRG5	
0045	5340	PRG6	
0046	5465	PRG7	
0047	5651	PRG10	
0050	5722	PRG11	
0051	5764	PRG12	
0052	0000	TEMP, OPEN	/WORK
0053	0000	TEMP1, OPEN	/LOCATIONS
0054	0000	CURTST, OPEN	/FOR CURRENT TEST ADDRESS
0055	0000	RTNNO, OPEN	/FOR CURRENT TEST NUMBER
0056	0000	NXTST, OPEN	/FOR NEXT TEST ADDRESS
0057	0000	MSCTR, OPEN	/MILLISECONDS COUNTER
0060	0000	MILCTR, OPEN	
0061	0000	MILI, OPEN	/7372 FOR 110 BAUD. /7522 FOR 150 BAUD. /7652 FOR 300 BAUD. /7726 FOR 600 BAUD. /7754 FOR 1200 BAUD.
0062	0000	CTRA, OPEN	
0063	0000	CTRB, OPEN	
0064	0000	STLID, OPEN	
0065	0530	SYNC, SYNC	/ENTRY TO SYNC TAPE RTN.
0066	0436	INPATT, IBIN	/ENTRY TO INITIATE PATTERN
0067	0444	GETPT, GTBIN	/ENTRY TO GET PATTERN CHAR.
0070	2513	CHECK, CHCK	
0071	0000	PFLAG, 0	
0072	1271	UOUT, OUT	
0073	1615	UTPLN3, TYPLN3	
0074	2112	UPUNCH, PUNCH	
0075	0600	UMOVE, MOVE	

/PDP-8/E TELETYPE CONTROL TEST. (KLB) PAL10 V141 14-MAY-71 11:02 PAGE 1-3

0076	0000	RBUSY,	0
0077	0000	AC,	0
0100	0000	LINK,	0
0101	0000	BLKCNT,	0
0102	0000	DELAYS,	0
0103	0000	ERRCR,	0
0104	0000	UTEMP,	0
0105	0000	UTEMP1,	0
0106	0000	UTEMP2,	0
0107	0215	CR,	215 /CARRIAGE RETURN
0110	0212	LF,	212 /LINE FEED
0111	0277	DLYMSK,	277
0112	0000	WTS6A,	OPEN

/CONTROL ROUTINE

0200	#200		
0200	7610	START, SKP CLA	
0201	7402	HLT	/INCORRECT PROGRAM NUMBER
0202	7621	CAM	/CLEAR AC AND MQ.
0203	4777	JMS SETRND	/SET UP RANDOM NUMBERS
0204	4776	JMS STBAUD	/SET UP LOC MIL1 FOR SELECTED BAUD RATE.
0205	7604	BORET, LAS	/READ SR
0206	0152	AND C17	/PROGRAM MASK = 17
0207	1131	TAD C=12	/PROGRAM LIMIT = =12
0210	7540	SMA SEA	/VALID PROGRAM NUMBER?
0211	5201	JMP START+1	/NO.
0212	7604	LAS	/YES, READ SR.
0213	0152	AND C17	
0214	4836	DCA PRGNUM	/SAVE PROGRAM NUMBER.
0215	4836	TAD PRGNUM	/DEVELOP PROGRAM START
0216	1158	TAD CPRCTAB	/ADDRESS AND STORE AT
0217	3852	DCA TEMP	/PRGADR.
0220	1452	TAD I TEMP	
0221	3235	DCA PRGADR	
0222	4775	JMS DVCSEL	/PERFORM IOT SELECTION
0223	7604	SLDC02, LAS	/SELECT DC02 UNIT
0224	0147	AND C7760	
0225	6117	MTON	
0226	7201	CLA IAC	
0227	6115	MINT	/ENABLE DC02 INTERRUPT
0230	4475	JMS I UMOVE	/INITIALIZE
0231	0005	5	/INTERRUPT.
0232	0001	1	/AREA.
0233	7776	=2	
0234	5635	JMP I ,+1	
0235	0000	PRGADR, OPEN	
0236	7602	SRSET, HLT CLA	
0237	7200	GETRDY, CLA	
0240	1023	TAD KSTART	/SET ADDRESS OF 1ST ROUTINE
0241	3056	DCA NXTST	/STORE AT NXTST
0242	4302	JMS FORWD	
0243	7604	LAS	/READ SR
0244	7004	RAL	
0245	7500	SMA	/ROUTINE SET? (SR1)

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0246	5454	JMP I CURTST	/NO, START WITH 1ST RTN
0247	7604	LAS	/YES
0250	0146	AND E77	/SR 6-11 ENABLE MASK.
0251	7041	CIA	
0252	1055	TAD RTNNO	
0253	7650	SNA CLA	/IS IT THIS RTN?
0254	5454	JMP I CURTST	/YES, GO DO IT
0255	1056	TAD NXTST	/NO
0256	7001	IAC	/IS THIS LAST TRN?
0257	7640	SEA CLA	/NO
0260	5242	JMP GETRDY+3	
0261	7402	INCRTN, HLT	/YES, INCORRECT ROUTINE NO.
0262	5237	JMP GETRDY	
0263	4317	CHAINN, JMS SHALT	/HALT? (SR0)
0264	7604	LAS	/READ SR
0265	7006	RTL	
0266	7630	SZL CLA	/SELECT ROUTINE? (SR1)
0267	5237	JMP GETRDY	/YES
0270	1056	TAD NXTST	
0271	7001	IAC	
0272	7640	SEA CLA	/LAST ROUTINE?
0273	5242	JMP GETRDY+3	/NO.
0274	7604	LAS	
0275	7006	RTL	
0276	7710	SPA CLA	/LOOP PROGRAM? (SR2)
0277	5237	JMP GETRDY	/YES
0300	7402	PRGEND, HLT	/END OF PROGRAM HALT
0301	5263	JMP CHAINN	
0302	0000	FORWD, 0	
0303	7300	CLA CLL	
0304	1456	TAD I NXTST	/GET NEXT RTN NO
0305	3055	DCA RTNNO	/STORE AT RTNNO
0306	2056	ISZ NXTST	
0307	1056	TAD NXTST	/SET CURRENT
0310	3052	DCA TEMP	/RTN NUMBER
0311	2056	ISZ NXTST	
0312	1056	TAD NXTST	/SET CURRENT
0313	3054	DCA CURTST	/RTN ADDR.
0314	1452	TAD I TEMP	/SET NEXT
0315	3056	DCA NXTST	/RTN ADDR.
0316	5702	JMP I FORWD	/EXIT
0317	0000	SHALT, 0	
0320	7604	LAS	/READ SR
0321	7700	SMA CLA	/HALT? (SR0)
0322	5717	JMP I SHALT	
0323	1055	TAD RTNNO	
0324	7402	HLT	/UNCONDITIONAL HALT (SR2 = 1)
0325	5717	JMP I SHALT	/EXIT,
0326	0000	STCTR, 0	
0327	7200	CLA	
0330	1726	TAD I STCTR	/GET CTR ADDR

/PDP-8/E TELETYPE CONTROL TEST, (KLB) PAL10 V141 14-MAY-71 11:22 PAGE 1-5

0331	3952	DCA TEMP	/AND SAVE AT TEMP
0332	2326	ISZ STCTR	
0333	1726	TAD I STCTR	/GET COUNT AND
0334	3452	DCA I TEMP	/STORE PER C(TEMP)
0335	2326	ISZ STCTR	
0336	5726	JMP I STCTR	/EXIT
0337	0000	DLYMS, 8	
0340	7300	CLA CLL	
0341	1024	TAD DELAYM	/GET MS COUNT
0342	3057	DCA MSCTR	/STORE IN MSCTR
0343	1061	TAD MIL1	/GET CONSTANT
0344	3060	DCA MILCTR	/STORE IN MILCTR
0345	2000	ISZ MILCTR	/DELAY FINISHED?
0346	5343	JMP ,=1	
0347	2057	ISZ MSCTR	/DONE DELAYING
0350	5343	JMP ,=5	
0351	5737	JMP I DLYMS	/EXIT
0352	0000	CK33, OPEN	/SUB TO CHECK FOR 33 TTY
0353	7200	CLA	
0354	1020	TAD TTYTYP	/GET TTY TYPE
0355	7650	SNA CLA	/33?
0356	2352	ISZ CK33	/YES.
0357	5752	JMP I CK33	
0360	0000	CK35, OPEN	/SUB TO CHECK FOR 35 TTY
0361	7240	CLA CMA	
0362	1020	TAD TTYTYP	/GET TTY TYPE
0363	7650	SNA CLA	/35?
0364	2360	ISZ CK35	/YES.
0365	5760	JMP I CK35	
0366	0000	CK37, OPEN	/SUB TO CHECK FOR 37 TTY
0367	7344	CLA CLL CMA RAL	/=2
0370	1020	TAD TTYTYP	/GET TTY TYPE.
0371	7650	SNA CLA	/37?
0372	2366	ISZ CK37	/YES.
0373	5766	JMP I CK37	
0375	6900		
0376	0504		
0377	1742		
	0400	PAGE	
0400	0000	RGNA, OPEN	/RANDOM NUMBER SUB A.
0401	7300	CLA CLL	
0402	1215	TAD RP1A	
0403	7005	RTL	
0404	1216	TAD RP2A	
0405	3215	DCA RP1A	
0406	1215	TAD RP1A	
0407	7006	RTL	
0410	1216	TAD RP2A	
1411	7006	RTL	

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0412 3216 DCA RP2A
0413 1215 TAD RP1A
0414 5600 JMP I RGNA /EXIT RGNA SUB.
0415 1233 RP1A, 1233
0416 7622 RP2A, 7622

0417 0000 RGNB, OPEN /RANDOM NUMBER SUB B.
0420 7300 CLA CLL
0421 1234 TAD RP1B
0422 7000 RTL
0423 1235 TAD RP2B
0424 3234 DCA RP1B
0425 1234 TAD RP1B
0426 7000 RTL
0427 1235 TAD RP2B
0428 7000 RTL
0429 3235 DCA RP2B
0430 1234 TAD RP1B
0431 5617 JMP I RGNB /EXIT RGNB SUB
0432 1233 RP1B, 1233
0433 7622 RP2B, 7622

/SUBROUTINE TO INITIALIZE BINARY COUNT PATTERN
0436 0000 IBIN, 0
0437 7200 CLA /SET PT0 = 0
0438 3242 DCA PT0
0441 3600 JMP I IBIN /EXIT
0442 0000 PT0, 0
0443 0000 PT1, 0

/SUBROUTINE TO PROVIDE NEXT BINARY COUNT PATTERN CHARACTER (IN AC)
0444 0000 GTBIN, 0
0445 7200 CLA
0446 3242 TAD PT0 /GET PT0
0447 3243 DCA PT1 /STORE AT PT1
0448 1243 TAD PT1 /GET PT1
0449 2001 IAC /INCREMENT ACCUMULATOR
0450 3145 AND E377 /LIMIT TO 8 BITS
0451 3242 DCA PT0 /STORE AT PT0
0452 1243 TAD PT1 /GET PT1
0453 5044 JMP I GTBIN /EXIT

/SUBROUTINE TO GENERATE RANDOM CHARACTER COUNT. (NOT MORE THAN 77(8))
0456 0000 CHRCNT, 0
0457 4200 JMS RGNA /GO GENERATE RANDOM NUMBER
0458 3146 AND E77 /REMOVE HIGH ORDER 6 BITS
0459 7450 SNA
0460 5257 JMP CHRCNT+1
0461 7041 CIA /2'S COMPLEMENT IT
0462 3273 DCA SCNT
0463 1656 TAD I CHRCNT
0464 3052 DCA TEMP
0465 1273 TAD SCNT
0466 3452 DCA I TEMP /STORE AT SPECIFIED ADDRESS
0471 2256 ISZ CHRCNT /SET UP EXIT

/RDP-8/E TELETYPE CONTROL TEST, (KL8) PAL10 V141 14-MAY-71 11:22 PAGE 1-7

0572 5656 JMP I CHRCNT /EXIT
0573 2000 SCNT, OPEN

/SUBROUTINE TO GENERATE RANDOM DELAY COUNT (NOT MORE THAN 3777(8)).

0474 0000 DLCNT, 0
0475 4200 JMS RGNA /GO GENERATE RANDOM NUMBER
0476 2111 AND DLYMSK /MASK OUT UNDESIRED BITS.
0477 7452 SNA /ZERO?
0500 5275 JMP DLCNT+1 /YES, GET ANOTHER NUMBER
0501 7041 CIA /2'S COMPLEMENT IT
0502 3024 DCA DELAYM
0503 5674 JMP I DLCNT /EXIT

/SUBROUTINE TO ASSIST IN SETTING UP MILL FOR DELAYS.

0504 0000 STBAUD, OPEN
0505 4777' JMS SETBAU /GO TO SETBAU
0506 7632 =150 / 150 BAUD.
0507 7500 =300 / 300 BAUD.
0510 7200 =600 / 600 BAUD.
0511 6600 =1200 /1200 BAUD.
0512 7672 =110 / 110 BAUD.

/SUBROUTINE TO COMPARE C(AC) TO CONTENTS STORED AT CALL+1

0513 0000 CHCK, 0
0514 3327 DCA WCHK /STORE AC AT WCHK
0515 1713 TAD I CHCK /GET COMPARE DATA
0516 7041 CIA /2'S COMPLEMENT IT
0517 1327 TAD WCHK /ADD C(WCHK)
0520 2313 ISZ CHCK /SET UP FOR UNEQUAL EXIT
0521 7648 SEA CLA /EQUAL (AC = 0)
0522 5325 JMP ,+3 /NO
0523 2313 ISZ CHCK /YES, SET UP FOR EQUAL EXIT
0524 5713 JMP I CHCK /EQUAL EXIT
0525 1327 TAD WCHK /RESTORE AC
0526 5713 JMP I CHCK /UNEQUAL EXIT
0527 0000 WCHK, 0

/SYNC ON TAPE SUBROUTINE

0530 0000 SYNK, 0
0531 4577 SETLOC /SET COUNT OF
0532 2550 CTSK /~256 (DEC) IN
0533 7400 =400 /CTS K
0534 4571 SYNKA, UKOC /CLEAR AC AND FLAG
0535 4572 UKSF /READY?
0536 5333 JMP ,+1 /NO, TEST AGAIN
0537 4570 UKRS /YES, READ
0540 1144 TAD I-377
0541 7640 SEA CLA /377?
0542 7410 SKP
0543 5732 JMP I SYNK /YES, EXIT
0544 2352 ISZ CTSK /BUMP CHAR CTR +1
0545 5334 JMP SYNKA /GO READ AGAIN
0546 7402 HLT /256 CHARS READ, CAN'T SYNC
0547 5331 JMP SYNK+1 /GO TO SRST

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0550	0000	CTSK,	0	/CHAR COUNTER
0551	0000	STAL,	OPEN	
0552	7200		CLA	
0553	1064		TAD STLID	
0554	7700		SMA CLA	/STALL?
0555	5751		JMP I STAL	/NO, EXIT
0556	4274		JMS DLQNT	/YES SET STALL COUNT
0557	4576		DELAY	/STALL
0560	5751		JMP I STAL	/EXIT
0561	0000	CRCCTR,	OPEN	
0562	0000	CRALF,	OPEN	
0563	7200		CLA	
0564	1762		TAD I CRALF	
0565	3361		DCA CRCCTR	
0566	2362		ISZ CRALF	
0567	4573		TYPE	
0570	6299		CARLF	
0571	2361		ISZ CRCCTR	
0572	5367		JMP .,"3	
0573	5762		JMP I CRALF	
0577	1513			
	0600		PAGE	

0600		PAGE		
/SUBROUTINE TO MOVE VARIABLE LENGTH DATA FIELDS				
0600	0000	MOVVE,	0	
0601	7200		CLA	
0602	1600		TAD I MOVVE	/GET "FROM ADDR" AND
0603	3223		DCA FADDR	/STORE AT FADDR
0604	2200		ISZ MOVVE	
0605	1600		TAD I MOVVE	/GET "TO ADDR" AND
0606	3224		DCA TADDR	/STORE AT TADDR.
0607	2200		ISZ MOVVE	
0610	1600		TAD I MOVVE	/GET "MOVE COUNT" AND
0611	3225		DCA MCTR	/STORE AT MCTR,
0612	2200		ISZ MOVVE	/SET UP FOR EXIT,
0613	7200	MOVEA,	CLA	
0614	1623		TAD I FADDR	/GET "FROM" WORD
0615	3624		DCA I TADDR	/STORE AT "TO" LOCATION
0616	2223		ISZ FADDR	/+1 TO "FROM" ADDR
0617	2224		ISZ TADDR	/+1 TO "TO" ADDR,
0620	2225		ISZ MCTR	/ALL WORDS MOVED?
0621	5213		JMP MOVEA	/NO, GO MOVE AGAIN
0622	5600		JMP I MOVVE	/YES, EXIT
0623	0000	FADDR,	0	
0624	0000	TADDR,	0	
0625	0000	MCTR,	0	
/TYPE CHARACTER STRING SUBROUTINE				
0626	0000	TYPSLG,	0	
0627	7200		CLA	
0630	1626		TAD I TYPSLG	/GET AND STORE
0631	3314		DCA TEMQ	/INITIAL ADDRESS

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0632	3316	DCA FLAG	/CLEAR FLAG,
0633	2226	ISZ TYPSTG	/SET UP EXIT
0634	1714	TSC1, TAD I TEMQ	/PICK UP DATA
0635	7002	BSW	
0636	4243	JMS TSC2	/GO TYPE 1ST CHARACTER
0637	1714	TAD I TEMQ	/PICK UP DATA
0640	4243	JMS TSC2	/GO TYPE 2ND CHARACTER
0641	2314	ISE TEMQ	/EVEN STRING ADDRESS
0642	5234	JMP TSC1	/GO BACK FOR MORE
0643	0000	TSC2, 0	
0644	9146	AND C77	/MASK OFF 6 BITS
0645	3315	DCA TEMR	/SAVE CHARACTER
0646	1316	TAD FLAG	/TEST "SPECIAL" FLAG.
0647	7648	SEA CLA	
0650	5260	JMP TYPSP	/SET TYPE SPECIAL
0651	1315	TAD TEMR	/NO, REGULAR CHARACTER
0652	7450	SNA	/ZERO?
0653	5256	JMP ,+3	/YES, SET FLAG.
0654	4271	JMS PRINT	/NO, PRINT IT.
0655	5643	JMP I TSC2	/RETURN.
0656	2316	ISZ FLAG	/SET "SPECIAL" FLAG.
0657	5643	JMP I TSC2	/EXIT
0660	3316	DCA FLAG	/CLEAR FLAG,
0661	1315	TAD TEMR	/TEST FOR 0.
0662	7450	SNA	/0?
0663	5643	JMP I TSC2	/IGNORE IT.
0664	1377	TAD (=77	
0665	7650	SNA CLA	/77?
0666	5626	JMP I TYPSTG	/YES, EXIT CODE.
0667	1315	TAD TEMR	
0670	5254	JMP TYPAT	
0671	0000	PRINT, OPEN	
0672	1376	TAD (=45	
0673	7640	SEA CLA	/IS IT 45?
0674	5300	JMP ,+4	/NO.
0675	1107	TAD CR	/YES, PRINT CR
0676	4474	JMS I UPUNCH	
0677	5671	JMP I PRINT	
0700	1315	TAD TEMR	
0701	1375	TAD (=43	
0702	7640	SEA CLA	/IS IT 43?
0703	5306	JMP ,+3	/NO.
0704	1110	TAD LF	/YES, TYPE LF
0705	5276	JMP PRINT+5	
0706	1315	TAD TEMR	
0707	1374	TAD (=40	
0710	7510	SPA	
0711	1143	TAD [100	
0712	1142	TAD [240	
0713	5276	JMP PRINT+5	
0714	2000	TEMQ, OPEN	
0715	0000	TEMR, OPEN	
0716	0000	FLAG, OPEN	

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0717	0000	XKSF,	OPEN	/SUB TO ISSUE KSF,
0720	6031		KSF	/KSF
0721	5717		JMP I XKSF	/NO SKIP
0722	2317		ISZ XKSF	/SKIP
0723	5717		JMP I XKSF	
0724	0000	XKCC,	OPEN	/SUB TO ISSUE KCC,
0725	6032		KCC	
0726	5724		JMP I XKCC	/EXIT
0727	7402		HLT	/KCC SKIPPED,
0730	0000	XKRS,	OPEN	/SUB TO ISSUE KRS,
0731	6034		KRS	
0732	5730		JMP I XKRS	/EXIT
0733	7402		HLT	/KRS SKIPPED,
0734	0000	XKRB,	OPEN	/SUB TO ISSUE KRB,
0735	6036		KRB	
0736	5734		JMP I XKRB	/EXIT
0737	7402		HLT	/KRB SKIPPED,
0740	0000	XTSF,	OPEN	/SUB TO ISSUE TSF,
0741	6041		TSF	/TSF
0742	5740		JMP I XTSF	/NO SKIP,
0743	2340		ISZ XTSF	/SKIP,
0744	5740		JMP I XTSF	
0745	0000	XTCF,	OPEN	/SUB TO ISSUE TCF,
0746	6042		TCF	
0747	5745		JMP I XTCF	/EXIT
0750	7402		HLT	/TCF SKIPPED,
0751	0000	XTLS,	OPEN	/SUB TO ISSUE TLS
0752	6046		TLS	
0753	5751		JMP I XTLS	/EXIT
0754	7402		HLT	/TLS SKIPPED,
0755	0000	XKCR,	OPEN	/SUB TO ISSUE KCR,
0756	6030		KCR	
0757	5755		JMP I XKCR	/EXIT
0760	7402		HLT	/KCR SKIPPED,
0761	0000	XKIE,	OPEN	/SUB TO ISSUE KIE,
0762	6035		KIE	
0763	5761		JMP I XKIE	/EXIT,
0764	7402		HLT	/KIE SKIPPED,
0765	0000	XSPI,	OPEN	/SUB TO ISSUE SPI,
0766	6045		SPI	/
0767	5765		JMP I XSPI	/NO SKIP
0770	2365		ISZ XSPI	
0771	5765		JMP I XSPI	/EXIT
0774	7740			
0775	7735			

/PDP=8/E TELETYPE CONTROL TEST. (KLB) PAL10 V141 14-MAY-71 11:02 PAGE 1-11

0776 7733
0777 7791
1000 PAGE

1000	1000	PAGE	
1000	0000	STBF,	OPEN /SUB TO SET UP BUFFER AREA.
1001	4574		MOVE /CRLF TO BLOCKA.
1002	0107		CR
1003	6577		BLOCKA
1004	7776		=2
1005	4555		CKSR37 /KSR37?
1006	5220		JMP ST33B /NO.
1007	4574		MOVE /CRLF TO BLKBB
1010	0107		CR
1011	6722		BLKBB
1012	7776		=2
1013	4574		MOVE /CRLF TO BLKCC.
1014	0107		CR
1015	7034		BLKCC
1016	7776		=2
1017	5600		JMP I STBF /EXIT STBF
1020	4574	ST33B,	MOVE /CRLF TO BLOCKB.
1021	0107		CR
1022	6711		BLOCKB
1023	7776		=2
1024	4574		MOVE /CRLF TO BLOCKC.
1025	0107		CR
1026	7023		BLOCKC
1027	7776		=2
1030	5600		JMP I STBF /EXIT STBF.
1031	0000	FBF3,	OPEN /SUB TO FILL CHAR BUFFER WITH
1032	7200		CLA /3 CHARACTERS SPECIFIED AT CALL+1.
1033	1631		TAD I FBF3
1034	3237		DCA ,+3
1035	2231		ISZ FBF3
1036	4574		MOVE
1037	0000		OPEN
1040	6601		BLOCK1
1041	7775		=3
1042	4555		CKSR37 /37?
1043	5255		JMP FBF33 /NO.
1044	4574		MOVE /YES.
1045	6601		BLOCK1
1046	6604		BLOCK1+3
1047	7662		=116
1050	4574		MOVE
1051	6601		BLOCK1
1052	6724		BLK2
1053	7657		=121
1054	5631		JMP I FBF3 /EXIT FBF3.
1055	4574		MOVE

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1056 6601 BLOCK1
1057 6604 BLOCK1+3
1060 7673 =105
1061 4574 MOVE
1062 6601 BLOCK1
1063 6713 BLOCK2
1064 7670 =110
1065 5631 JMP I FBF3 /EXIT FBF3,

1066 0000 FBALL, OPEN /FILL BUFFER WITH ALL CHARACTERS
1067 4555 CKSR37 /KSR37
1070 5302 JMP FBA33 /NO.
1071 4574 MOVE /YES.
1072 6107 A
1073 6601 BLOCK1
1074 7657 =121
1075 4574 MOVE
1076 6601 BLOCK1
1077 6724 BLK2
1100 7657 =121
1101 5666 JMP I FBALL /EXIT FBALL.
1102 4574 MOVE
1103 6107 A
1104 6601 BLOCK1
1105 7701 =77
1106 4574 MOVE
1107 6107 A
1110 6700 BLOCK1+77
1111 7767 =11
1112 4574 MOVE
1113 6601 BLOCK1
1114 6713 BLOCK2
1115 7670 =110
1116 5666 JMP I FBALL /EXIT FBALL

1117 0000 FW336, 0
1120 4574 MOVE /MOVE 6 CHARACTERS ARS33 PRINTER
1121 6065 A33WP6 /WORST CASE PATTERN TO
1122 6601 BLOCK1 /BLOCK1
1123 7772 =6
1124 4574 MOVE /FILL BLOCKS WITH PATTERN
1125 6601 BLOCK1
1126 6607 BLOCK1+6
1127 7676 =102
1130 4574 MOVE
1131 6601 BLOCK1
1132 6713 BLOCK2
1133 7670 =110
1134 5717 JMP I FW336 /EXIT

1135 0000 FW356, 0
1136 4574 MOVE /MOVE 6 CHARACTER ASR35 PRINTER
1137 6073 A35WP6 /WORST CASE PATTERN TO BLOCK1
1140 6601 BLOCK1
1141 7772 =6

/PDP-8/E TELETYPE CONTROL TEST, (KL8) PAL10 V141 14-MAY-71 11:08 PAGE 1-13

1142	4574	MOVE	/FILL BUFFER WITH PATTERN
1143	6601	BLOCK1	
1144	6607	BLOCK1+6	
1145	7676	=102	
1146	4574	MOVE	
1147	6601	BLOCK1	
1150	6713	BLOCK2	
1151	7670	=110	
1152	5735	JMP I FW356	/EXIT
1153	0000	FW376,	OPEN
1154	4574	MOVE	/MOVE 6 CHARACTER KSR37 PRINTER
1155	6101	A37WP6	/WORST CASE PATTERN TO BLOCK1.
1156	6601	BLOCK1	
1157	7772	=6	
1160	4574	MOVE	/FILL BUFFER WITH PATTERN
1161	6601	BLOCK1	
1162	6607	BLOCK1+6	
1163	7665	=113	
1164	5753	JMP I FW376	/EXIT
1165	0000	XSPF,	OPEN
1166	6040	SPF	
1167	5765	JMP I XSPF	/EXIT
1170	7402	HLT	/SPF SKIPPED.
1171	0000	XTPC,	OPEN
1172	6044	TPC	
1173	5771	JMP I XTPC	/EXIT
1174	7402	HLT	/TPC SKIPPED.
1200 PAGE			

1200	0000	PAGE	
/PUNCH 70 (CODE 376) CHARACTERS SUBROUTINE			
1201	4577	PLTLR, 0	/SET P70CTR TO -70
1202	1211	SETLOC	
1203	7672	P70CTR	
1204	1377	=106	
1205	4474	TAD (376	/GET 376 CODE
1206	2211	JMS I UPUNCH	/GO PUNCH IT
1207	5204	ISZ P70CTR	/ALL CHARACTERS PUNCHED?
1210	5600	JMP .-3	/NO, REPEAT.
1211	0000	JMP I PLTLR	/YES, EXIT.
P70CTR, 0			
/PUNCH SYNC CHARACTER SUBROUTINE (RUBOUT)			
1212	2000	PSYNC, 0	
1213	7240	CLA CMA	/SET AC TO 7777
1214	4474	JMS I UPUNCH	/PUNCH A RUBOUT
1215	5612	JMP I PSYNC	/EXIT.
/SYNC READER SUBROUTINE			

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1216	0000	RSYNC,	0	
1217	4577	SETLOC		/SET RSCTR TO -145
1220	1232	RSCTR		
1221	7557	-221		
1222	4343	JMS RRDY		/WAIT FOR READER NOT BUSY
1223	7240	CLA CMA		/READER NOT BUSY.
1224	3076	DCA RBUSY		/SET READER BUSY INDICATOR
1225	4577	SETLOC		/SET READER INTERRUPT
1226	1267	VCTR		/SERVICE RETURN ADDRESS.
1227	1233	RSSERV		
1230	6001	ION		/ENABLE INTERRUPT
1231	5616	JMP I RSYNC		/EXIT
1232	0000	RSCTR,	0	
1233	6036	RSSERV,	KRB	/READ
1234	1144	TAD [-377		/ADD MINUS RUBOUT
1235	7640	SZA CLA		/IS IT A RUBOUT?
1236	5245	JMP ,+7		/NO,
1237	3076	DCA RBUSY		/YES, CLEAR READER BUSY.
1240	7300	CLA CLL		
1241	1100	TAD LINK		
1242	7004	RAL		/RESTORE LINK
1243	1077	TAD AC		/RESTORE AC
1244	5400	JMP I 0		/RETURN
1245	2232	ISZ RSCTR		/145 CHARACTER READ?
1246	5472	JMP I UDOUT		/NO,
1247	7602	HLT CLA		/YES, NO SYNC.
1250	4577	SETLOC		/SET RSCTR TO -145
1251	1232	RSCTR		
1252	7557	-221		
1253	5472	JMP I UDOUT		/RETURN
1254	3077	INTSVC,	DCA AC	/SAVE AC
1255	7010	RAR		
1256	3100	DCA LINK		/SAVE LINK
1257	6041	INTSF,	TSF	/PUNCH/PRINTER?
1260	5264	JMP ,+4		/NO,
1261	6042	INTCF,	TCF	/YES, CLEAR FLAG.
1262	3071	DCA PFLAG		/CLEAR PFLAG
1263	5271	JMP OUT		/RETURN
1264	6031	INKSF,	KSF	/READER/KYBD?
1265	5270	JMP ,+3		/NO ERROR,
1266	5667	JMP I ,+1		/GO SERVICE READER
1267	0000	VCTR,	0	
1270	7402	HLT		/UNEXPECTED INTERRUPT
1271	7300	OUT,	CLA CLL	
1272	1100	TAD LINK		
1273	7004	RAL		/RESTORE LINK
1274	1077	TAD AC		/RESTORE AC,
1275	6001	ION		/ENABLE INTERRUPT
1276	5400	JMP I 0		/RETURN
1277	0000	PSTUP,	0	/PUNCH SETUP
1300	4577	SETLOC		/SET DATA ADDR
1301	1342	PADDR		

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1302	6577	BLOCKA	
1303	4574	MOVE	/SET BLOCK LENGTH
1304	0101	BLKCNT	
1305	1341	PCTR	
1306	7777	=1	
1307	5677	JMP I PSTUP	/EXIT
1310	0000	PDCR,	0
1311	7200	CLA	
1312	1742	TAD I PADDR	
1313	2342	ISZ PADDR	/UPDATE PADDR.
1314	4474	JMS I UPUNCH	/GO PUNCH/PRINT DATA
1315	5710	JMP I PDCR	/EXIT
1316	0000	PBLK,	0
1317	4277	JMS PSTUP	
1320	4310	JMS PDCR	/GO PUNCH CHARACTER
1321	2341	ISZ PCTR	/ALL CHARS PUNCHED?
1322	5320	JMP ,=2	/NO, REPEAT
1323	5716	JMP I PBLK	/YES, EXIT
1324	0000	PBLKR,	0
1325	4277	JMS PSTUP	/PUNCH DATA BLOCK RANDOM STALLS.
1326	4776	JMS RGNB	/GO DO SET UP
1327	0111	AND OLYMSK	/GET A RANDOM NUMBER
1328	7450	SNA	/REMOVE EXCESS BITS
1331	5326	JMP ,=3	/ZERO?
1332	7041	CIA	/YES, GET ANOTHER NUMBER
1333	3024	DCA DELAYM	/NO, 2'S COMPLEMENT IT.
1334	4576	DELAY	/PUT NUMBER IN DELAYM
1335	4310	JMS PDCR	/DELAY,
1336	2341	ISZ PCTR	/GO PUNCH CHARACTER
1337	5320	JMP PBLKR+2	/ALL CHARS PUNCHED?
1340	5724	JMP I PBLKR	/NO, REPEAT
1341	0000	PCTR,	0
1342	0000	PADDR,	0
1343	0000	RRDY,	0
1344	7200	CLA	
1345	1076	TAD RBUSY	/FETCH RBUSY,
1346	7640	SZA CLA	/READER BUSY?
1347	5345	JMP ,=2	/YES, TRY AGAIN
1350	5743	JMP I RRDY	/NO, EXIT
1351	0000	RSTUP,	0
1352	4343	JMS RRDY	
1353	2076	ISZ RBUSY	/WAIT FOR RDR NOT BUSY
1354	4577	SETLOC	/SET RBUSY INDICATOR
1355	1416	RADDR	
1356	6577	BLOCKA	/SET DATA ADDR
1357	4574	MOVE	
1360	3101	BLKCNT	/SET DATA BLOCK LENGTH
1361	1417	RBCTR	
1362	7777	=1	
1363	3775	DCA ERRCTR	/CLEAR ERRO. JUNTER

/PDP-8/E TELETYPE CONTROL TEST. (KL8) PAL10 V141 14-MAY-71 11:00 PAGE 1-16

1364 5751 JMP I RSTUP /EXIT.

/ROUTINE TO SET KEYBOARD FLAG,

1365 0000 KFLAG, OPEN
1366 4571 UKCC
1367 4572 UKSF
1370 5367 JMP .+1
1371 5765 JMP I KFLAG /EXIT WITH KEYBOARD FLAG SET.

1375 5721
1376 0417
1377 2376
1400 PAGE

1400 1400 PAGE
1400 0000 RDBLK, 0 /READ DATA BLOCK, FULL SPEED
1401 4777 JMS RSTUP /GO DO SETUP
1402 4577 SETLOC /SET READER SERVICE
1403 1267 VCTR /ADDRESS,
1404 1430 RDRSRV
1405 6001 ION /ENABLE INT.
1406 5600 JMP I RDBLK

1407 0000 RDBLKR, 0 /READ DATA BLOCK, RANDOM STALLS
1410 4777 JMS RSTUP /GO DO SETUP
1411 4577 SETLOC /SET READER SERVICE
1412 1267 VCTR /ADDRESS,
1413 1420 RDRSRV
1414 6001 ION /ENABLE INT.
1415 5607 JMP I RDBLKR /EXIT
1416 0000 RADDR, 0
1417 0000 RBCTR, 0

/READER SERVICE ROUTINES

1420 7200 RDRSRV, CLA /GET A RANDOM NUMBER
1421 4776 JMS RGNA
1422 0111 AND DLYMSK /REMOVE EXCESS BITS
1423 7450 SNA /ZERO?
1424 5221 JMP .+3 /YES, GET ANOTHER NUMBER
1425 7041 CIA /NO, 2'S COMPLEMENT IT.
1426 3102 DCA DELAYS /STORE RANDOM NUMBER IN DELAYS.
1427 4274 JMS DLMSR /STALL,
1430 1616 RDRSRV, TAD I RAQDR /GET EXPECTED CHARACTER
1431 3235 DCA SB /STORE AT SB
1432 2216 ISZ RADDR /UPDATE RADDR
1433 6036 IN0, KRB /READ CHARACTER
1434 4470 JMS I CHECK /GO CHECK IT,
1435 0000 SB, /
1436 5240 JMP ERROR /ERROR
1437 5256 JMP RUDONE /GOOD.

1440 3103 ERROR, DCA ERRCR /STORE BAD CHARACTER

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1441	2775'	JSZ ERRCTR	/INCREMENT ERROR COUNTER
1442	5245	JMP ,+3	
1443	7240	CLA CLA	/OFLOW, 7777 TO AC
1444	3775'	DCA ERRCTR	/RESTORE TO 7777,
1445	7684	LAS	/READ SR
1446	0143	AND C100	
1447	7650	SNA CLA	
1450	5256	JMP RUDONE	
1451	1103	TAD ERRCR	
1452	7402	HLT	
1453	7208	CLA	
1454	1235	TAD SB	
1455	7402	HLT	
1456	2217	RUDONE, ISZ RBCTR	/GOOD CHAR IN AC
1457	5472	JMP I UDOUT	/ALL DONE?
1458	7208	CLA	/NO, TO MAINLINE
1461	1775'	TAD ERRCTR	/YES,
1462	7650	SNA CLA	/GET C(ERRCTR)
1463	5266	JMP ,+3	/ANY ERROR?
1464	1775'	TAD ERRCTR	/NO,
1465	7402	HLT	/YES,
1466	7308	CLA CLL	/NUMBER OF ERRORS IN AC.
1467	5076	DCA RBUZY	
1470	1100	TAD LINK	
1471	7004	RAL	
1472	1077	TAD AC	
1473	5400	JMP I 0	
1474	0000	DLMSR, 0	
1475	7300	CLA CLL	
1476	1102	TAD DELAYS	
1477	3311	DCA RCTRA	/GET AND STORE MSEC
1500	5701	JMP I ,+1	/DELAY COUNT
1501	1502	,+1	
1502	1061	TAD MIL1	
1503	3312	DCA RCTRB	/GET AND STORE
1504	2312	ISZ RCTRB	/1MS CONSTANT
1505	5304	JMP ,+1	/DELAYED 1 MS?
1506	2311	ISZ RCTRA	/NO,
1507	5300	JMP ,+7	/YES, DONE DELAYING?
1510	5674	JMP I DLMSR	/NO,
1511	0000	RCTRA, 0	
1512	0000	RCTRB, 0	

/SUBROUTINE TO SET LOCATION FOR THE PARTICULAR SELECTED BAUD RATE.

1513	0000	SETBAU, OPEN	/
1514	1374	TAD (~5	/7773
1515	3052	DCA TEMP	/STORE IT IN TEMP.
1516	1022	TAD BAUDRT	/GET DEPOSITED BAUD RATE.
1517	1713	TAD I SETBAU	/GET A RATE FROM THE TABLE.
1520	7650	SNA CLA	/ARE THEY EQUAL?
1521	5327	JMP LOBAUD	/YES, GO SET LOC MIL1 FOR THAT BAUD RATE.
1522	2052	ISZ TEMP	/NO, +1 TO P
1523	7610	SKP CLA	/SKIP

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1524	7402	HLT	/ILLEGAL BAUD RATE, RESET BAUDRT AND RESTART
1525	2313	ISZ SETBAU	/PROGRAM AT 0200, /+1 TO SETBAU IN ORDER TO PULL NEXT BAUD RATE /FROM THE TABLE OF BAUD RATES.
1526	5316	JMP SETBAU+3	/SEE IF NEXT BAUD RATE IS THE ONE.
1527	1373	LDBAUD, TAO (=406	/110 BAUD CONSTANT FOR THE DELAY
1530	3061	DCA MIL1	/STORE IT.
1531	2052	ISZ TEMP	/+1 TO TEMP, WAS THIS THE BAUD RATE?
1532	7610	SKP CLA	/SKIP
1533	5772'	JMP BDRET	/YES, EXIT WITH AC=0,
1534	1141	TAO C=24	/1200 BAUD CONSTANT FOR THE DELAY.
1535	3061	DCA MIL1	/STORE IT.
1536	2052	ISZ TEMP	/WAS THIS THE SELECTED RATE?
1537	7610	SKP CLA	/NO,
1540	5772'	JMP BDRET	/YES, EXIT WITH MIL1 SET AND AC<0
1541	7240	CLA CMA	/AC = -1
1542	1061	TAD MIL1	/GET BACK MIL1.
1543	7104	CLL RAL	/MULTIPLY BY 2
1544	5335	JMP .-7	/SEE IF NEXT BAUD RATE IS THE ONE.

/PUNCH TEST NORMAL TEST SEQUENCE ROUTINE

1545	0000	NTST,	0	
1546	7200		CLA	/CLEAR RBUSY
1547	3076		DCA RBUSY	
1550	1745		TAD I NTST	/SELECT PUNCH MODE
1551	3354		DCA NTSTA	
1552	4771'		JMS PLTLR	/PUNCH LEADER
1553	4770'		JMS PSYNC	/PUNCH SYNC CHARACTER
1554	0000	NTSTA,	0	
1555	4767'		JMS RSYNC	/SYNC READER
1556	4200		JMS RDBLK	/READ DATA BLOCK
1557	4771'		JMS PLTLR	/PUNCH TRAILER
1560	4766'		JMS RRDY	/WAIT FOR RDR NOT BUSY
1561	5425		JMP I CHAIN	/CHAIN
1562	5555	RM33A,	TEXT '====I@?'	
1563	5555			
1564	1100			
1565	7700			

1566	1343
1567	1216
1570	1212
1571	1200
1572	0205
1573	7372
1574	7773
1575	5721
1576	2400
1577	1351
	1600

1600		PAGE
/COMBINED TEST NORMAL TEST SEQUENCE		
1600	0000	CNTST, 0
1601	7200	CLA /CLEAR RBUSY
1602	3076	DCA RBUSY
1603	4777	JMS PLTLR /PUNCH LEADER
1604	4776	JMS PSYNC /PUNCH SYNC CHARACTER
1605	4775	JMS PBLK /PUNCH DATA BLOCK (NO STALLS)
1606	4774	JMS RSYNC /SYNC READER
1607	4773	JMS RDBLKR /READ DATA BLOCK (STALLS)
1608	4772	JMS PBLKR /PUNCH DATA BLOCK (STALLS)
1609	4771	JMS RDBLK /READ DATA BLOCK (NO STALLS)
1610	4777	JMS PLTLR /PUNCH TRAILER
1611	4770	JMS RRDY /WAIT FOR READER NOT BUSY
1612	5425	JMP I CHAIN /CHAIN
/TYPE LINE OF 3 CHARACTERS (NO DELAY)		
1615	0000	TYPLN3, 0
1616	7200	CLA
1617	3026	DCA STLID /CLEAR STLID
1618	1615	TAD I TYPLN3 /SET AND STORE
1619	3224	DCA ,+3 /ADDRESS OF DATA
1620	2215	ISZ TYPLN3
1621	4767	JMS FBFS /GO FILL BUFFER WITH 3 CHARACTERS
1622	0000	0
1623	4227	JMS TYPLN /GO TYPE LINE
1624	5615	JMP I TYPLN /EXIT
/TYPE LINE OF ASCII PRINTABLE CHARACTERS		
1627	0000	TYPLN, 0
1628	4555	CKSR37 /KSR377
1629	1148	TAD [11 /NO,
1630	1137	TAD [=125 /YES,
1631	3247	DCA TCTR /=76, OR =85
1632	4577	SETLOC /SET FETCH TO ADDRESS
1633	1646	FETCH /OF BLOCKA,
1634	6577	BLOCKA
1635	4556	TYPEA, STALL
1636	1646	TAD I FETCH /YES, SET CHARACTER
1637	4474	JMS I UPUNCH /GO PRINT CHARACTER
1638	2246	ISZ FETCH /SET UP FOR NEXT CHARACTER
1639	2247	ISZ TCTR /DONE?
1640	5237	JMP TYPEA /NO, REPEAT
1641	5627	JMP I TYPLN /YES, EXIT.
1642	0000	FETCH, 0
1643	0000	TCTR, 0
1644	ASCCN, 0	
1645	1650	TAD I ASCCN
1646	3306	DCA WASC
1647	2250	ISZ ASCCN
1648	1650	TAD I ASCCN
1649	3307	DCA SASC
1650	2250	ISZ ASCCN
1651	1366	TAD (7700

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1660	0706	AND I WASC	
1661	7112	RTR CLL	
1662	7012	RTR	
1663	7012	RTR	
1664	4273	JMS CNV	
1665	2307	ISZ SASC	
1666	1366	TAD (7700	
1667	7040	CMA	
1670	0706	AND I WASC	
1671	4273	JMS CNV	
1672	5650	JMP I ASCCN	
1673	0000	CNV, Ø	
1674	3310	DCA ASCT	
1675	1310	TAD ASCT	
1676	7006	RTL	
1677	7004	RAL	
1700	0365	AND (707	
1701	1310	TAD ASCT	
1702	0365	AND (707	
1703	1364	TAD (6060	
1704	3707	DCA I SASC	
1705	5673	JMP I CNV	
1706	0000	WASC, Ø	
1707	0000	SASC, Ø	
1710	0000	ASCT, Ø	
1711	0000	SINPT, OPEN	/SUB TO INITIALIZE SGET SUB.
1712	7200	CLA	
1713	3316	DCA SPT0	/ZERO SPT0
1714	3320	DCA SPIND	/ZERO SPIND
1715	5711	JMP I SINPT	/EXIT
1716	0000	SPT0, OPEN	
1717	0000	SPT1, OPEN	
1720	0000	SPIND, OPEN	
1721	0000	SGET, OPEN	/"SPECIAL" BINARY COUNT /PATTERN SUBROUTINE.
1722	7320	CLA STL	
1723	2320	ISZ SPIND	
1724	7340	CLA CMA CLL	
1725	3320	DCA SPIND	
1726	1316	TAD SPT0	
1727	7420	SNL	
1730	5333	JMP ,+3	
1731	7041	CIA	
1732	7410	SKP	
1733	7040	CMA	
1734	3316	DCA SPT0	
1735	1145	TAD [377	
1736	0316	AND SPT0	
1737	3317	DCA SPT1	
1740	1317	TAD SPT1	
1741	5721	JMP I SGET	/EXIT SGET SUB.

/SUBROUTINE TO INITIALIZE RANDOM NUMBER GENERATORS.

1742 0000 SETRND, OPEN

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1743	1363	TAD (1233)
1744	3762'	DCA RP1A
1745	1363	TAD (1233)
1746	3761'	DCA RP1B
1747	1360	TAD (7622)
1750	3757'	DCA RP2A
1751	1360	TAD (7622)
1752	3756'	DCA RP2B
1753	5742	JMP I SETRND /EXIT, AC=0
1756	0435	
1757	0416	
1760	7622	
1761	0434	
1762	0415	
1763	1233	
1764	6060	
1765	0707	
1766	7700	
1767	1031	
1770	1343	
1771	1400	
1772	1324	
1773	1407	
1774	1216	
1775	1316	
1776	1212	
1777	1200	
2000	2000	PAGE

/ROUTINE TO SET CTRA EQUAL TO =7640 (=4000 DECIMAL).

2000	0000	S4000I, OPEN
2001	4577	SETLOC /SET COUNT OF
2002	0062	CTRA /=-4000 DECIMAL
2003	0140	=7640 /IN CTRA,
2004	5600	JMP I S4000I /EXIT, AC=0,

/ROUTINE TO SET DELAYM TO =310, (=200 DECIMAL).

2005	0000	S200I, OPEN
2006	4577	SETLOC /SET COUNT OF
2007	0024	DELAYM /=200 DECIMAL
2010	7470	=310 /IN DELAYM,
2011	5605	JMP I S200I /EXIT WITH AC=0.

/ROUTINE TO SET CTRA EQUAL TO =144 (-100 DECIMAL).

2012	0000	S100I, OPEN
2013	4577	SETLOC /SET COUNT OF
2014	0062	CTRA /=-100 DECIM
2015	7634	=144 /IN CTRA,

2016 5612 JMP I \$100I /EXIT, AC=0,

/ROUTINE TO DETERMINE DEVICE CAUSING UNEXPECTED INTERRUPT.

2017	0000	INTFND, OPEN		
2020	7200	CLA		
2021	6031	INTKSF, KSF		/KEYBOARD/READER?
2022	7410	SKP		/NO,
2023	4276	JMS	HLTD	/GO BOLT AND DISPLAY IOT
2024	6041	INTTSF, TSF		/TTY PRINTER/PUNCH?
2025	7410	SKP		/NO,
2026	4276	JMS	HLTD	/GO BOLT AND DISPLAY IOT
2027	6011	RSF		/H,S, READER?
2028	7410	SKP		/NO,
2029	4276	JMS	HLTD	/HALT AND DISPLAY IOT
2032	6021	PSF		/H,S, PUNCH?
2033	7410	SKP		/NO,
2034	4276	JMS	HLTD	/HALT AND DISPLAY IOT
2035	6401	6401		/PT08/LT08 UNIT 1 IN?
2036	7410	SKP		/NO,
2037	4276	JMS	HLTD	/HALT AND DISPLAY IOT
2040	6411	6411		/PT08/LT08 UNIT 1 OUT?
2041	7410	SKP		/NO,
2042	4276	JMS	HLTD	/HALT AND DISPLAY IOT
2043	6421	6421		/PT08/LT08 UNIT 2 IN?
2044	7410	SKP		/NO,
2045	4276	JMS	HLTD	/HALT AND DISPLAY IOT
2046	6431	6431		/PT08/LT08 UNIT 2 OUT?
2047	7410	SKP		/NO,
2050	4276	JMS	HLTD	/HALT AND DISPLAY IOT
2051	6441	6441		/PT08/LT08 UNIT 3 IN?
2052	7410	SKP		/NO,
2053	4276	JMS	HLTD	/HALT AND DISPLAY IOT
2054	6451	6451		/PT08/LT08 UNIT 3 OUT?
2055	7410	SKP		/NO,
2056	4276	JMS	HLTD	/HALT AND DISPLAY IOT
2057	6461	6461		/PT08/LT08 UNIT 4 IN?
2060	7410	SKP		/NO,
2061	4276	JMS	HLTD	/HALT AND DISPLAY IOT
2062	6471	6471		/PT08/LT08 UNIT 4 OUT?
2063	7410	SKP		/NO,
2064	4276	JMS	HLTD	/HALT AND DISPLAY IOT
2065	6111	6111		/PT08/LT08 UNIT 5 OR DC02 IN?
2066	7410	SKP		/NO,
2067	4276	JMS	HLTD	/HALT AND DISPLAY IOT
2070	6121	6121		/PT08/LT08 UNIT 5 OR DC02 OUT?
2071	5275	JMP	,+4	/NO,
2072	4276	JMS	HLTD	/HALT AND DISPLAY IOT
2073	7777	7777		/DON'T KNOW WHAT DEVICE
2074	7777	7777		/CAUSED THE INTERRUPT.
2075	4276	JMS	HLTD	/HALT AND DISPLAY ALL 1'S.
2076	0000	OPEN		
2077	1276	TAD	HLTD	
2100	1311	TAD	M3	
2101	3276	DCA	HLTD	

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2102	1676	TAD I	MLTD	/GET IOT THAT CAUSED SKIP
2103	7402	HLT		/AND HALT. IOT IN AC.
2104	7001	IAC		
2105	3306	DCA ,+1		
2106	0000	OPEN		
2107	7200	CLA		
2108	5617	JMP I	INTFND	/EXIT
2111	7775	M3,	=3	
2112	0000	PUNCH,	OPEN	
2113	2071	ISZ PFLAG		/SET PFLAG,
2114	6046	OUT0,	TLS	/PUNCH/PRINT.
2115	7200	CLA		
2116	1071	TAD PFLAG		/GET C(PFLAG).
2117	7650	SNA CLA		/FLAG RESET?
2120	5323	JMP OUT2		/YES
2121	6041	OUT1,	TSF	/NO. FLAG UP?
2122	5316	JMP ,+6		/NO.
2123	6042	OUT2,	TCF	/YES. CLEAR PRINTER FLAG.
2124	3071	DCA PFLAG		/CLEAR PFLAG.
2125	5712	JMP I PUNCH		/EXIT, AC=0,

/ROUTINE TO CONTROL THE CHARACTERS TO BE TYPED ON ALL TTY'S.

2126	0000	TLCALI,	OPEN	
2127	1726		TAD I TLCALI	/GET FIRST LETTER TO BE TYPED
2130	3332		DCA ,+2	/SAVE IT.
2131	4473		JMS I UTPLN3	/GO TYPE SAVED LETTER + NEXT 2.
2132	0000		OPEN	/FIRST LETTER TO BE TYPED.
2133	5425		JMP I CHAIN	/CHAIN

/ROUTINE TO CONTROL THE CHARACTER TO BE TYPED ON A "37".

2134	0000	TLC37I,	OPEN	/GET FIRST LETTER TO BE TYPED
2135	1734		TAD I TLC37I	
2136	3342		DCA ,+4	/SAVE IT.
2137	4555		CKSR37	/IS IT A "37"?
2140	5425		JMP I CHAIN	/NO. CHAIN
2141	4473		JMS I UTPLN3	/YES. GO TYPE LETTER + NEXT 2
2142	0000		OPEN	/FIRST LETTER TO BE TYPED.
2143	5425		JMP I CHAIN	/CHAIN

/CONTROL ROUTINE TO FILL A BUFFER WITH CHARACTERS.

2144	0000	FBF1,	OPEN	/GET DATA
2145	7300		CLA CLL	
2146	1744		TAD I FBF1	
2147	3351		DCA ,+2	/SAVE IT
2150	4777'		JMS FBF3	/GO FILL A BUFFER-
2151	0000		OPEN	/WITH THIS +NEXT 2 CHAR
2152	4776'		JMS CNTST	/GO TO COMBINED TEST SEQUENCE

/ROUTINE TO CONTROL TYPING A LINE W. JUT STALLS

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/AND THEN ONE WITH STALLS.

2153	0000	WOSWS,	OPEN	
2154	3064	DCA STLID	/ZERO STALL INDICATOR.	
2155	4775'	JMS TYPLN	/TYPE LINE WITHOUT STALLS	
2156	7240	CLA CMA	/7777	
2157	3064	DCA STLID	/SET STALL INDICATOR	
2158	4775'	JMS TYPLN	/TYPE LINE WITH STALLS	
2161	5753	JMP I WOSWS	/EXIT.	

/SUBROUTINE TO MARK TAB POSITIONS.

2162	0000	MTABP,	OPEN	
2163	3062	DCA CTRA		
2164	4573	TYPE	/MARK TAB POSITIONS	
2165	6300	TBMRK		
2166	4573	TYPE		
2167	6306	TBMRK1		
2170	2062	ISZ CTRA		
2171	5366	JMP ,+3		
2172	5762	JMP I MTABP	/EXIT.	

2175	1627		
2176	1600		
2177	1031		
	2200	PAGE	

/PROGRAM 0, BASIC TEST OF THE OUTPUT LOGIC.

/THE INSTRUCTIONS TESTED ARE:

/ SPF SET PRINTER FLAG,
/ TSF SKIP IF PRINTER FLAG IS SET,
/ TCF CLEAR PRINTER FLAG,
/ CAF CLEAR FLAGS, AC, LINK, AND ENABLE TTY INTERRUPT.
/ TPC CHECK THAT PRINTER FLAG WILL SET,
/ TLS CHECK THAT IT CLEARS PRINTER FLAG AND SETS PRINTER FLAG.

2200	4577	PRGO,	SETLOC	/SET KSTART TO INITIAL
2201	0023		KSTART	/ROUTINE ADDRESS.
2202	2205		POTS0	
2203	5604	JMP I	,+1	/GO START TEST
2204	0236		SRSET	

/TEST 0 CHECKS THE ABILITY OF
/SPF TO SET THE PRINTER FLAG,
/TSF TO SKIP ON PRINTER FLAG SET,
/CAF TO CLEAR PRINTER FLAG, AC, AND LINK,
/TCF TO CLEAR PRINTER FLAG,
/TSF TO NOT SKIP ON PRINTER FLAG EQUAL TO ZERO.

2205	0000	POTS0,	0	
2206	2270		POTS1	
2207	4432	JMS I S200		/SET DELAYM TO DELAY TWICE

/10 BIT TIMES FOR AN NON 110
 /BAUD DEVICE AND TWICE 11 BIT
 /TIMES FOR AN 110 BAUD DEVICE.
 /SEE BIT TIME TABLE AT BEGINNING
 /OF PROGRAM,

2210	4430	JMS I \$100	/SET UP TO DO TEST 100 TIMES.
2211	4560	POTS0A, USPF	/SET PRINTER FLAG
2212	4566	UTSF	/FLAG SET?
2213	5237	JMP POE0A	/NO, SPF OR TSF FAILED
2214	7360	POTS0B, CLA CMA CLL CML	/AC AND LINK = 1
2215	6887	CAF	/YES, NOW CLEAR IT.
2216	4576	DELAY	/GO DELAY
2217	4566	UTSF	/FLAG SET?
2218	7410	SKP	/NO, CONTINUE TEST
2221	5244	JMP POE0B	/YES, CAF OR TSF FAILED
2222	7420	POTS0C, SNL	/LINK SET?
2223	7440	SEA	/NO, AC SET?
2224	5230	JMP POE0C	/YES, CAF FAILED TO CLEAR AC AND/OR LINK
2225	4560	POTS0D, USPF	/SET PRINTER FLAG
2226	4566	UTSF	/PRINTER FLAG SET?
2227	5237	JMP POE0A	/NO, SPF OR TSF FAILED
2228	4565	POTS0E, UTCF	/YES, CLEAR PRINTER FLAG
2231	4566	UTSF	/PRINTER FLAG SET?
2232	7610	SKP CLA	/NO, OK.
2233	5262	JMP POE0E	/YES, TCF FAILED TO CLEAR PRINTER FLAG.
2234	2862	ISE CTRA	/DONE TEST 100 TIMES?
2235	5211	JMP POTS0A	/NO, REPEAT TEST
2236	5425	JMP I CHAIN	/YES, CHAIN NOW

/ERROR HLTS FOR POTS0.

2237	7402	POE0A, HLT	/SPF FAILED TO SET PRINTER FLAG /OR TSF FAILED TO SKIP.
		/SCOPE LOOP, PRESS CONTINUE TO ENTER.	
2240	4560	USPF	/SET PRINTER FLAG
2241	4566	UTSF	/IS IT SET?
2242	5240	JMP POE0A+1	/NO, REPEAT.
2243	5240	JMP POE0A+1	/YES, REPEAT.

2244	7402	POE0B, HLT	/CAF FAILED TO CLEAR PRINTER FLAG /OR TSF SKIPPED.
		/SCOPE LOOP, PRESS CONTINUE TO ENTER.	
2245	4560	USPF	/SET PRINTER FLAG
2246	6887	CAF	/CLEAR FLAGS
2247	4576	DELAY	/DELAY
2250	4566	UTSF	/FLAG SET?
2251	5245	JMP POE0B+1	/NO, REPEAT.
2252	5245	JMP POE0B+1	/YES, REPEAT.

2253	7402	POE0C, HLT	/CAF FAILED TO CLEAR AC AND/OR LINK
		/SCOPE LOOP, PRESS CONTINUE TO ENTER	
2254	7360	CLA CMA CLL CML	/LI NO AC SET
2255	6887	CAF	/CLE

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2256	7420	SNL	/LINK SET?
2257	7440	SZA	/AC CLEAR
2260	5254	JMP P0E0C+1	/AC OR LINK SET. REPEAT
2261	5254	JMP P0E0C+1	/REPEAT.
2262	7402	P0E0E, HLT	/TCF FAILED TO CLEAR PRINTER FLAG /OR TSF SKIPPED.
		/SCOPE LOOP. PRESS CONTINUE TO ENTER.	
2263	4560	USPF	/SET PRINTER FLAG
2264	4565	UTCF	/CLEAR PRINTER FLAG
2265	4566	UTSF	/FLAG SET?
2266	5263	JMP P0E0E+1	/NO, REPEAT.
2267	5263	JMP P0E0E+1	/YES, REPEAT.

/THIS ROUTINE CHECKS THAT NO OTHER DEVICE CAN CAUSE AN INTERRUPT
/AND THEN CHECKS THAT THE PUNCH/PRINTER FLAG CAN CAUSE AN INTERRUPT.

2270	0001	P0TS1, 1	
2271	2327	P0TS2	
2272	4577	SETLOC	/SET INTERRUPT RETURN
2273	0002	2	/TO P0E1A.
2274	2304	P0E1A	
2275	6007	CAF	/ATTEMPT TO CLEAR ALL FLAGS
2276	4560	USPF	/SET PRINTER FLAG
2277	4565	UTCF	/CLEAR PRINTER FLAG
2300	6001	ION	/ENABLE INTERRUPT
2301	7000	NOP	/
2302	6002	IOF	/DISABLE INTERRUPT
2303	5306	JMP ,+3	
2304	4777	P0E1A, JMS -INTFD	/UNEXPECTED INTERRUPT
2305	5275	JMP P0TS1A	/TRY AGAIN
2306	4431	JMS I 54000	/SET UP TO DO TEST 4000 TIMES.
2307	4577	SETLOC	/SET INTERRUPT RETURN
2310	0002	2	/TO P0TS1C
2311	2324	P0TS1C	
2312	4560	USPF	/SET PRINTER FLAG
2313	6001	ION	/ENABLE INTERRUPT
2314	7000	NOP	/NO INTERRUPT
2315	7402	P0E1B, HLT	/PRINTER FLAG FAILED TO INTERRUPT /OR INTERRUPT MALFUNCTION /SET INTERRUPT RETURN
2316	4577	SETLOC	/ TO P0TS1C-1
2317	0002	2	
2320	2323	P0TS1C-1	/ENABLE INTERRUPT (SCOPE LOOP)
2321	6001	ION	/INTERRUPT
2322	7000	NOP	
2323	5321	JMP ,+2	
2324	2062	P0TS1C, ISZ CTRA	/DONE 4000 TIMES?
2325	5313	JMP P0TS1B	/NO, REPEAT TEST.
2326	5425	JMP I CHAIN	/YES, CHAIN

/TEST 2 CHECKS THE ABILITY OF:
 /KIE TO DISABLE TTY INTERRUPT ENABLE FLIP FLOP.
 /SPI TO NOT SKIP WITH NO TTY INTERRUPT REQUEST.
 /SRQ TO NOT SKIP WITH NO TTY INTERRUPT REQUEST.
 /KIE TO ENABLE TTY INTERRUPT ENABLE FLIP FLOP.
 /SPI TO SKIP ON A TTY INTERRUPT REQUEST.
 /SRQ TO SKIP ON A TTY INTERRUPT REQUEST.
 /CAF TO ENABLE TTY INTERRUPT ENABLE FLIP FLOP.

2327	0002	POTS2:	2	
2330	2504		POTS3	
2331	4431		JMS I \$4000	/SET UP TO DO TEST 4000 TIMES.
2332	4577	POTS2A,	SETLOC	/SET INTERRUPT RETURN
2333	0002		2	/TO POE2A
2334	2415		POE2A	
2335	6887		CAF	/CLEAR EVERYTHING AND ENABLE INT ENABLE F.F.
2336	4561		UKIE	/DISABLE INTERRUPT ENABLE FF
2337	4568		USPF	/SET PRINTER FLAG.
2338	6881		ION	/TURN INTERRUPT ON.
2341	7000		NOP	/
2342	4557	POTS2B:	USPI	/SKIP IF TTY INTERRUPT REQUEST
2343	7610		SKP	/
2344	5776		JMP	/USPI SKIPPED
2345	6883	POTS2C:	SRQ	/SKIP IF INTERRUPT REQUEST
2346	7610		SKP	/
2347	5775		JMP	/SRQ SKIPPED
2350	4577	POTS2D:	SETLOC	/SET INTERRUPT RETURN
2351	0002		2	/TO POTS2E
2352	2400		POTS2E	
2353	4568		USPF	/SET PRINTER FLAG
2354	7201		CLA IAC	/AC11 = 1.
2355	4561		UKIE	/ENABLE TTY INTERRUPT ENABLE F.F.
2356	6881		ION	/TURN INTERRUPT ON.
2357	7000		NOP	/INTERRUPT AT END OF THIS INSTRUCTION
2360	5774		JMP	/KIE FAILED TO ENABLE TTY INTERRUPT F.F.
2374	2443			
2375	2435			
2376	2427			
2377	2017			
2400	2400		PAGE	
2400	4557	POTS2E:	USPI	
2401	5256		JMP	/TTY INTERRUPT REQUEST?
2402	6003	POTS2F:	SRQ	/NO, SPI FAILED TO SKIP.
2403	5265		JMP	/IS THERE AN INTERRUPT REQUEST?
2404	7300	POTS2G:	CLA CLL	/NO, SRQ FAILED TO SKIP.
2405	4561		UKIE	/AC + LINK = 0
2406	6887		CAF	/DISABLE TTY INTERRUPT ENABLE F.F.
2407	4568		USPF	/CLEAR EVERYTHING AND ENABLE TTY INTERRUPT F.F.
2408	4557		USPI	/SET PRINTER FLAG.
2411	5274		JMP	/SKIP IF INTERRUPT REQUEST
2412	2062		ISZ	/CAF FAILED TO ENABLE TTY INTERRUPT ENABLE F.F.
2413	5777		JMP	/DONE 4000 TIMES?
2414	5425		JMP I	/NOT REPEAT TEST .

/OK .

/ERROR HLTS FOR P0TS2.

2415	7402	P0E2A, HLT		/KIE FAILED TO DISABLE TTY INTERRUPT /ENABLE FLIP-FLOP.
/SCOPE LOOP. PRESS CONTINUE TO ENTER.				
2416	4577	SETLOC		/SET INTERRUPT RETURN
2417	0002	2		/TO P0E2A+1
2420	2416	P0E2A+1		
2421	6007	CAF		/CLEAR
2422	4561	UKIE		/DISABLE TTY INTERRUPT ENABLE F.F.
2423	4560	USPF		/SET PRINTER FLAG
2424	6001	ION		/TURN INTERRUPT ON.
2425	7000	NOP		
2426	5216	JMP	P0E2A+1	/REPEAT TEST.
2427	7602	P0E2B, HLT	CLA	/SPI SKIPPED WITH FLAG SET /AND INTERRUPT ENABLE DISABLED.
/SCOPE LOOP. PRESS CONTINUE TO ENTER.				
2430	4561	UKIE		/DISABLE INTERRUPT ENABLE
2431	4560	USPF		/SET PRINTER FLAG
2432	4557	USPI		/SKIP IF TTY INT REQUEST,
2433	5230	JMP	P0E2B+1	/REPEAT.
2434	5230	JMP	P0E2B+1	/REPEAT.
2435	7602	P0E2C, HLT	CLA	/SRQ SKIPPED WITH FLAG SET /AND INTERRUPT ENABLE DISABLED.
/SCOPE LOOP. PRESS CONTINUE TO ENTER.				
2436	4561	UKIE		/DISABLE INTERRUPT ENABLE
2437	4560	USPF		/SET PRINTER FLAG
2440	6003	SRQ		/SKIP IF INTERRUPT REQUEST
2441	5236	JMP	P0E2C+1	/REPEAT.
2442	5236	JMP	P0E2C+1	/REPEAT.
2443	7402	P0E2D, HLT		/KIE FAILED TO ENABLE TTY INTERRUPT F.F.
/SCOPE LOOP. PRESS CONTINUE TO ENTER.				
2444	4577	SETLOC		/SET INTERRUPT RETURN
2445	0002	2		/TO P0E2D+4
2446	2447	P0E2D+4		
2447	4561	UKIE		/DISABLE TTY
2450	7201	CLA IAC		/AC11 = 1
2451	4561	UKIE		/ENABLE TTY
2452	4560	USPF		/SET PRINTER FLAG
2453	6001	ION		/TURN INTERRUPT ON
2454	7000	NOP		
2455	5247	JMP	P0E2D+4	/REPEAT
2456	7402	P0E2E, HLT		/SPI FAILED TO SKIP.
/SCOPE LOOP. PRESS CONTINUE TO ENTER.				
2457	7201	CLA IAC		/AC11 = 1
2460	4561	UKIE		/ENABLE TTY
2461	4560	USPF		/SET PRINTER FLAG
2462	4557	USPI		/SKIP IF INTERRUPT REQUEST
2463	5257	JMP	P0E2E+1	/REPEAT.

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2464 5257 JMP PØE2E+1 /REPEAT.

2465 7402 PØE2F, HLT /SRQ FAILED TO SKIP.
/SCOPE LOOP. PRESS CONTINUE TO ENTER.
2466 7201 CLA IAC /AC11 = 1
2467 4561 UKIE /ENABLE TTY
2468 4560 USPF /SET PRINTER FLAG
2469 6003 SRQ /SKIP IF INTERRUPT REQUEST
2470 5266 JMP PØE2F+1 /REPEAT.
2471 5266 JMP PØE2F+1 /REPEAT.

2474 7402 PØE2G, HLT /CAF FAILED TO ENABLE TTY INTERRUPT
/ENABLE FLIP FLOP.
/SCOPE LOOP. PRESS CONTINUE TO ENTER.
2475 7300 CLA CLL /CLEAR
2476 4561 UKIE /DISABLE TTY.
2477 6007 CAF /ENABLE TTY INTERRUPT ENABLE F.F.
2478 4568 USPF /SET PRINTER FLAG
2479 4557 USPI /TTY INTERRUPT REQUEST?
2480 5275 JMP PØE2G+1 /NO, REPEAT.
2481 5275 JMP PØE2G+1 /YES, REPEAT.

/TEST 3 CHECKS THE ABILITY OF:
/TPC TO SET THE PRINTER FLAG,
/TLS TO CLEAR PRINTER FLAG,
/TLS TO SET PRINTER FLAG,
PØTS3: J
PØTS4
JMS I S100
JMS I S200
/SET UP TO DO TEST 100 TIMES.
/SET DELAYM TO DELAY TWICE
/10 BIT TIMES FOR AN NON 110
/BAUD DEVICE AND TWICE 11 BIT
/TIMES FOR AN 110 BAUD DEVICE.
/SEE BIT TIME TABLE AT BEGINNING
/OF PROGRAM.

2504 6003
2505 2544
2506 4438
2507 4432
PØTS3A, UTPC /CLEAR PRINTER FLAG
UTPC /PRINT
DELAY /DELAY TWICE MAX TIME
UTSF /FLAG SET, IT SHOULD BE.
JMP PØE3A /FLAG NOT SET.
PØTS3B, UTLS /CLEAR + SET PRINTER FLAG.
UTSF /FLAG SET?
SKP CLA /NO, OK
JMP PØE3B /YES
PØTS3C, DELAY /DELAY TWICE BAUD RATE.
UTSF /FLAG SET?
JMP PØE3C /NO
ISZ CTRA /YES, DONE 100 TIMES
JMP PØTS3A /NO, DO TEST AGAIN
JMP I CHAIN /EXIT
PØE3A, HLT CLA /TPL FAILED TO SET PRINTER FLAG.

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2530 4565 /SCOPE LOOP, PRESS CONTINUE TO ENTER.
2531 4564 UTCP /CLEAR PRINTER FLAG
2532 4576 DELAY /SET FLAG BY BEGINNING OF 12TH BIT
2533 5330 JMP , -3 /WAIT
2534 7602 P0E3B, HLT CLA /REPEAT,
2535 4560 /SCOPE LOOP, PRESS CONTINUE TO ENTER.
2536 4563 USPF /SET PRINTER FLAG
2537 5335 UTLS /CLEAR PRINTER FLAG AT TPS,
JMP , -2
2540 7602 P0E3C, HLT CLA /TLS FAILED TO CLEAR PRINTER FLAG.
2541 4563 /SCOPE LOOP, PRESS CONTINUE TO ENTER.
2542 4576 UTLS /PRINT
2543 5341 DELAY /DELAY TWICE BAUD RATE.
JMP P0E3C+1 /REPEAT,

2544 0004 /PUNCH, PRINTER TIMING TEST,
P0TS4, 4
2545 2616 P0TS5
2546 4430 JMS I \$100 /SET UP TO DO TEST 100 TIMES,
2547 4577 P0TS4A, SETLOC /SET DELAYM
2550 0024 DELAYM /TO =81 (DEC)
2551 7657 -121
2552 1022 TAD BAUDRT /GET BAUD RATE.
2553 1136 TAD [=110 /ADD A -110 TO IT,
2554 7650 SNA CLA /IS IT 110 BAUD WE'RE WORKING WITH?
2555 5360 JMP , +3 /YES, LEAVE DELAYM ALONE.
2556 1135 TAD [=130 /NO, CHANGE DELAYM TO -88 (DEC).
2557 3024 DCA DELAYM /DELAYM NOW SET TO -88 DECIMAL.
2560 4563 UTLS /PRINT
2561 4576 DELAY /DELAY A LITTLE LESS THAN 9 BIT TIMES
2562 4566 UTSF /FLAG SET
2563 7410 SKP /NO, OK
2564 5776' JMP P0E4A /YES,
2565 4577 P0TS4B, SETLOC /SET DELAYM
2566 0024 DELAYM /TO =7 (DEC)
2567 7771 -7 /
2570 4576 DELAY /DELAY SO WE'RE PAST THE 9.5 BIT TIME POINT
2571 4566 UTSF /FLAG SET?
2572 5775' JMP P0E4B /NO
2573 5774' JMP P0TS4C /CROSS PAGE
2574 2600
2575 2614
2576 2607
2577 2332
2600 PAGE
2600 4577 P0TS4C, SETLOC
2601 0024 DELAYM
2602 7761 -17
2603 4576 DELAY /DELAY SO WE'RE PAST THE END,

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2604	2062	JSZ	CTRA	/DONE 100 TIMES?	
2605	5777'	JMP	POTS4A	/NO, DO TEST AGAIN	
2606	5425	JMP I	CHAIN	/CHAIN	
2607	7662	P0E4A,	HLT	CLA	/PROCESSOR TIMING TOO SLOW OR FLAG /SETTING TOO SOON. (IS THE SLOW CYCLE /JUMPER REMOVED FROM THE PROCESSOR /TIMING MODULE? IS THE WRONG BAUD RATE SELECTED? /SCOPE LOOP. PRESS CONTINUE TO ENTER.
2610	4563	UTLS			/START PRINTER
2611	4566	UTSF			/FLAG SET
2612	5211	JMP	,=1		/NO, CHECK AGAIN
2613	5210	JMP	,=3		/REPEAT
2614	7602	P0E4B,	HLT	CLA	/FLAG NOT SETTING IN REQUIRED TIME. /SCOPE LOOP. PRESS CONTINUE TO ENTER.
2615	5210	JMP	P0E4A+1		/GO TO SCOPE LOOP.

/TEST TO CHECK THAT THE PUNCH/PRINTER FLAG SETS AT THE PROPER TIME.

2616	0005	POTS5:	5	
2617	2654	POTS6		
2620	4430	JMS I \$100		
2621	4563	UTLS		
2622	4566	UTSF		
2623	5222	JMP ,=1		/FLAG SET?
2624	4577	POTS5A,	SETLOC	/SET DELAYM TO
2625	0024	DELAYM		/-98 DECIMAL.
2626	7636	=142		/
2627	4563	UTLS		/PRINT
2630	4576	DELAY		/DELAY
2631	4566	UTSF		/FLAG SET?
2632	7610	SKP CLA		/NO, OK.
2633	5250	JMP P0E5A		/YES, ERROR.
2634	4577	POTS5B,	SETLOC	/SET DELAYM TO
2635	0024	DELAYM		/-4 DECIMAL.
2636	7774	=4		/
2637	4576	DELAY		/DELAY
2640	4566	UTSF		/FLAG NOW SET?
2641	5252	JMP P0E5B		/NO, ERROR.
2642	4576	DELAY		
2643	4576	DELAY		
2644	4576	DELAY		
2645	2062	JSZ CTRA		/TEST DONE?
2646	5221	JMP POTS5A-3		/NO, REPEAT.
2647	5425	JMP I CHAIN		/YES, CHAIN.
2650	7402	P0E5A,	HLT	/FLAG SETTING TO SOON. /SCOPE LOOP. PRESS CONTINUE TO ENTER.
2651	5210	JMP P0E4A+1		
2652	7402	P0E5B,	HLT	/FLAG NOT SETTING SOON ENOUGH. /SCOPE LOOP. PRESS CONTINUE TO ENT

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2653 5251 JMP P0E5A+1

/TEST OF GTF, TEST IS DONE
/4000 TIMES.

2654	2006	P0T6,	6	
2655	2732	P0T7		
2656	4431	JMS I S4000	/SET UP TO DO TEST 4000 TIMES.	
2657	6007	P0T6A, CAF	/CLEAR ALL FLAGS, AC, LINK, AND ENABLE TTY INTERRUPT.	
2660	7040	CMA		
2661	6004	GTF	/GET INTERRUPT FLAGS	
2662	0331	AND K5200	/MASK,	
2663	7440	SZA		
2664	7402	P0E6A, HLT	/GTF FAILED,	
2665	7360	P0T6B, CLL CMA CML	/SET LINK AND AC,	
2666	6004	GTF	/GET INTERRUPT FLAGS. (AC SHOULD EQUAL 4200).	
2667	0331	AND K5200	/MASK,	
2670	7420	SNL		
2671	7402	P0E6B, HLT	/GTF CLEARED LINK.	
2672	7104	P0T6C, CLL RAL	/(AC SHOULD EQUAL ZERO, LINK SHOULD EQUAL 1).	
2673	7430	SZL		
2674	7440	SZA		
2675	7402	P0E6C, HLT	/GTF DID NOT GET LINK.	
2676	6007	P0T6D, CAF	/CLEAR ALL FLAGS, AC, LINK, AND ENABLE TTY INTERRUPT.	
2677	4560	USPF	/SET PRINTER FLAG.	
2700	6004	GTF	/GET INTERRUPT FLAGS.	
2701	0331	AND K5200	/MASK,	
2702	7006	RTL	/PUT INTERRUPT BUS = (AC SHOULD EQUAL 1000)	
2703	7004	RAL	/-FLAG INTO LINK, (AC SHOULD EQUAL ZERO).	
2704	7430	SZL	/IS LINK 1?	
2705	7440	SZA	/IS AC ZERO?	
2706	7402	P0E6D, HLT	/GTF FAILED TO GET INTERRUPT BUS,	
2707	4577	P0T6E, SETLOC	/SET INTERRUPT RETURN LOCATION	
2710	0002	2		
2711	2721	P0T6F		
2712	6007	CAF	/CLEAR ALL FLAGS.	
2713	6001	ION	/TURN INTERRUPT ON	
2714	6004	GTF	/GET INTERRUPT FLAGS.	
2715	0331	AND K5200		
2716	4560	USPF	/SET PRINTER FLAG,	
2717	7000	NOP	/(INTERRUPT),	
2720	7402	P0E6E, HLT	/GTF CLEARED ION.	
2721	7102	P0T6F, CLL BSW	/PUT ION = (AC SHOULD EQUAL 2002),	
2722	7012	RTR	/-FLAG INTO LINK, (AC SHOULD EQUAL 0020).	
2723	7430	SZL	/LINK 1?	
2724	7440	SZA	/AC ZERO?	
2725	7402	P0E6F, HLT	/GTF FAILED TO GET ION.	
2726	2062	ISZ CTRA	/TEST DONE?	
2727	5257	JMP P0T6A	/NO, REPEAT,	
2730	5425	JMP I CHAIN		
2731	5200	K5200, 5200		

/TEST OF RTF. TEST IS DONE
/4000 TIMES.

2732	0007	P0T7,	7	
2733	7777		7777	
2734	4431	JMS I \$4000		/SET UP TO DO TEST 4000 TIMES.
2735	4577	SETLOC		/SET INTERRUPT RETURN
2736	0002	2		/TO P0T7C+3,
2737	2754	P0T7C+3		
2740	7320	P0T7A,	CLA CLL CML	/AC EQUALS ZERO, LINK EQUALS 1.
2741	6005		RTF	/RESTORE FLAGS,
2742	7420		SNL	/LINK SET?
2743	7440		SEA	/AC ZERO?
2744	7402	P0E7A:	HLT	/RTF FAILED TO RESTORE LINK.
2745	7330	P0T7B:	CLA CLL CML RAR	/AC EQUALS 4000
2746	6005		RTF	/RESTORE FLAGS, (LINK).
2747	7420		SNL	/LINK RESTORED?
2750	7402	P0E7B:	HLT	/RTF FAILED TO RESTORE LINK.
2751	4580	P0T7C:	USPF	/SET PRINTER FLAG.
2752	7000		NOP	/(INTERRUPT),
2753	7402	P0E7C:	HLT	/RTF DID NOT SET ION.
2754	2062		ISZ CTRA	/TEST DONE?
2755	5340		JMP P0T7A	/NO, REPEAT,
2756	3425		JMP I CHAIN	

2777 2547
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/PROGRAM 1, LOOP AROUND INPUT TEST, OUTPUT MUST
/BE CONNECTED TO INPUT.
/PROGRAM CHECKS INPUT AND OUTPUT IOT'S, INTERRUPT AND TIMING.

3000	4577	PRG1,	SETLOC
3001	0023		KSTART
3002	3005		P1TS0
3003	5604		JMP I ,+1
3004	0236		SRSET

/ISSUE KCC WITH AC=7777, AC SHOULD GO TO 0.
/AC NOT 0 INDICATES KCC FAILURE, TEST IS
/DONE 4000 TIMES.

3005	0000	P1TS0,	0
3006	3010		P1TS1
3007	4777		JMS P2TS0A

/ISSUE TLS AND THEN KCC, WAIT TWICE OR 11 BIT TIMES
/(SEE TABLE AT BEGINNING OF PROGRAM, JR FLAG TO SET.

/SKIP ON FLAG. FAILURE TO SKIP INDICATES THE THE
 /FLAG IS NOT SET, OR KSF FAILURE. TEST IS DONE 127
 /TIMES.

3010 0001 P1TS1, 1
 3011 3034 P1TS2
 3012 4430 JMS I \$100 /SET UP TO DO TEST 100 TIMES.
 3013 4432 JMS I \$200 /SET DELAYM TO DELAY TWICE
 /10 BIT TIMES FOR AN NON 110
 /BAUD DEVICE AND TWICE 11 BIT
 /TIMES FOR AN 110 BAUD DEVICE.
 /SEE BIT TIME TABLE AT BEGINNING
 /OF PROGRAM,

3014 4571 P1TS1A, UKCC /CLEAR AC AND KBD FLAG.
 3015 4563 UTLS /SEND.
 3016 4576 DELAY /DELAY TWICE 10 OR 11 BIT TIMES.
 3017 4572 UKSF /FLAG SET?
 3020 5225 JMP P1E1A /NO,
 3021 2062 JSZ CTRA /YES, TEST DONE 100 TIMES?
 3022 5214 JMP P1TS1A /NO, REPEAT.
 3023 6007 CAF /CLEAR
 3024 5425 JMP I CHAIN /CHAIN.

3025 7602 P1E1A, HLT CLA /FLAG NOT SET OR KSF FAILURE.
 /SCOPE LOOP. PRESS CONTINUE TO ENTER.

3026 4571 UKCC
 3027 4563 UTLS
 3030 4576 DELAY /DELAY TWICE 10 OR 11 BIT TIMES
 3031 4572 UKSF /FLAG SET?
 3032 5226 JMP ,=4 /NO, REPEAT
 3033 5226 JMP ,=5 /YES, REPEAT.

/ISSUE TLS AND THEN KCC. WAIT TWICE 10 OR 11 BIT TIMES
 /(SEE TABLE AT BEGINNING OF PROGRAM) FOR FLAG TO SET.
 /SKIP ON FLAG 4000 TIMES TO VERIFY CONSISTENT SKIPPING.

3034 0002 P1TS2, 2
 3035 3066 P1TS3
 3036 4432 JMS I \$200 /SET DELAYM TO DELAY TWICE
 /10 BIT TIMES FOR AN NON 110
 /BAUD DEVICE AND TWICE 11 BIT
 /TIMES FOR AN 110 BAUD DEVICE.
 /SEE BIT TIME TABLE AT BEGINNING
 /OF PROGRAM,

3037 4431 JMS I \$4000 /SET UP TO DO TEST 4000 TIMES.
 3040 4571 P1TS2A, UKCC /CLEAR AC AND KBD FLAG.
 3041 4563 UTLS /SEND.
 3042 4576 DELAY /DELAY TWICE 10 OR 11 BIT TIMES.
 3043 4565 UTCF /CLEAR TELEPRINTER FLAG.
 3044 4572 UKSF /KEYBOARD FLAG SET?
 3045 5253 JMP P1E2A /NO,
 3046 4572 P1TS2B, UKSF /YES, KEYBOARD FLAG SET?
 3047 5262 JMP P1E2B /NO,

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3050 2062 ISZ CTRA /YES, DONE 4000 TIMES?
3051 5246 JMP P1TS2B /NO, REPEAT
3052 5425 JMP I CHAIN /CHAIN

3053 7602 P1E2A, HLT CLA /FLAG NOT SET OR KSF FAILED TO SKIP,
/SCOPE LOOP. PRESS CONTINUE TO ENTER.

3054 4571 UKCC
3055 4563 UTLS
3056 4572 UKSF
3057 4576 DELAY
3060 5254 JMP ,=4
3061 5260 JMP ,=1

3062 7602 P1E2B, HLT CLA /KSF FAILED TO SKIP.
/SCOPE LOOP. PRESS CONTINUE TO ENTER.

3063 4572 UKSF
3064 5263 JMP ,=1
3065 5263 JMP ,=2

/ISSUE TLS AND THEN KCC, WAIT TWICE MAXIMUM BIT RATE FOR
/FLAG TO SET, RESET FLAG (TLS AND THEN KCC) AND SKIP ON FLAG
/500 TIMES TO VERIFY NO SKIP OCCURS WITH FLAG = 2.

3066 0003 P1TS3, S
3067 3126 P1TS4
3070 4577 SETLOC /SET COUNT OF
3071 0062 CTRA /-500 (DEC)
3072 7014 ,=764 /IN CTRA.
3073 4432 JMS I \$200 /SET DELAYM TO DELAY TWICE
/10 BIT TIMES FOR AN NON 110
/BAUD DEVICE AND TWICE 11 BIT
/TIMES FOR AN 110 BAUD DEVICE.
/SEE BIT TIME TABLE AT BEGINNING
/OF PROGRAM.

3074 4571 P1TS3A, UKCC /CLEAR AC AND KBRD FLAG.
3075 4563 UTLS /SEND.
3076 4576 DELAY /DELAY TWICE 10 OR 11 BIT TIMES
3077 4572 UKSF /FLAG SET.
3100 5313 JMP P1E3A /NO.
3101 4571 UKCC /CLEAR AND AND KBRD FLAG.
3102 4563 UTLS /YES, SEND DATA.
3103 4572 UKSF /FLAG SET
3104 5306 JMP ,=2 /NO, OK
3105 5322 JMP P1E3B /YES.
3106 4566 UTSF /PRINTER FLAG SET?
3107 5306 JMP ,-1 /NO, WAIT TO CONTINUE TEST.
3110 2062 ISZ CTRA /DONE 500 TIMES?
3111 5301 JMP ,=10 /NO REPEAT TEST
3112 5425 JMP I CHAIN /CHAIN.

3113 7602 P1E3A, HLT CLA /FLAG NOT SET OR KSF FAILED.

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/SCOPE LOOP, PRESS CONTINUE TO ENTER.

3114	4563	UTLS	/SEND
3115	4571	UKCC	/CLEAR AC AND KBRD FLAG
3116	4576	DELAY	
3117	4572	UKSF	
3120	5314	JMP ,+4	
3121	5320	JMP ,+1	

3122 7602 P1E3B, HLT CLA /KSF SKIPPED ON NO FLAG.
/SCOPE LOOP, PRESS CONTINUE TO ENTER,

3123	4563	UTLS	
3124	4426	JMS I KBFLAG	
3125	5323	JMP P1E3B+1	

/THIS ROUTINE CHECKS THAT NO OTHER DEVICE CAN CAUSE AN INTERRUPT,
/AND THEN CHECKS THAT THE READER FLAG IS CAPABLE OF INTERRUPTING.

3126	0004	P1TS4, 4	
3127	3200	P1TS5	
3130	4577	SETLOC	/SET INTERRUPT RETURN
3131	0002	2	/TO P1E4A
3132	3143	P1E4A	/
3133	4563	P1TS4A, UTLS	/SEND
3134	4426	JMS I KBFLAG	
3135	4565	UTCF	/CLEAR PRINTER FLAG.
3136	4571	UKCC	/CLEAR READER FLAG
3137	6001	ION	/TURN INTERRUPT ON.
3140	7000	NOP	/
3141	6002	IOF	/TURN INTERRUPT OFF.
3142	5345	JMP ,+3	/SKIP OVER.
3143	4776	P1E4A, JMS INTFND	/UNEXPECTED INTERRUPT.
3144	5333	JMP P1TS4A	/TRY AGAIN.
3145	4577	SETLOC	/SET COUNT OF
3146	0062	CTRA	/=1000 (DEC)
3147	6030	=1750	/IN CTRA,
3150	4577	SETLOC	/SET INTERRUPT RETURN
3151	0002	2	
3152	3167	P1TS4C	
3153	4563	P1TS4B, UTLS	/SEND
3154	4426	JMS I KBFLAG	
3155	4565	UTCF	/CLEAR PRINTER FLAG.
3156	6001	ION	/INTERRUPT ON.
3157	7000	NOP	/SHOULD INTERRUPT
3160	7402	HLT	/READER FLAG FAILED TO INTERRUPT OR /INTERRUPT SYSTEM MALFUNCTION.
3161	4577	SETLOC	/SET INTERRUPT RETURN
3162	0002	2	
3163	3166	P1TS4C+1	
/SCOPE LOOP, PRESS CONTINUE TO ENTER.			
3164	6001	ION	
3165	7000	NOP	
3166	5364	JMP ,+2	
3167	2062	P1TS4C, ISZ CTRA	/DONE 1000 TIMES YET?
3170	5353	JMP P1TS4B	/NO, REPEAT

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3171 6007 CAF /EXIT
3172 5425 JMP I CHAIN /EXIT.

3176 2017
3177 3513
3200 PAGE

/TEST 5 CHECKS THE ABILITY OF:
/SRQ TO SKIP ON AN INTERRUPT REQUEST.
/SPI TO SKIP ON A TTY INTERRUPT REQUEST.
/CAF TO CLEAR KBRD/READER FLAG.
/SRQ TO NOT SKIP ON NO INTERRUPT REQUEST.
/SPI TO NOT SKIP ON NO TTY INTERRUPT REQUEST.

3200 0005 P1TS5, 5
3201 3271 P1TS6
3202 4430 JMS I \$100 /SET UP TO DO TEST 100 TIMES.
3203 6007 CAF /CLEAR AND ENABLE INTERRUPT ENABLE FF
3204 4563 P1TS5A, UTLS /SEND
3205 4426 JMS I KBFLAG /CLEAR PRINTER FLAG.
3206 4565 UTCF /INTERRUPT REQUEST?
3207 6003 SRQ /NO,
3210 5230 JMP P1E5A /YES, TTY INTERRUPT REQUEST?
3211 4557 P1TS5B, USPI /NO,
3212 5235 JMP P1E5B /YES, CLEAR FLAG.
3213 6007 CAF /FLAG SET?
3214 4572 UKSF /NO, OK
3215 7610 SKP CLA /FLAG SET FOR SOME REASON.
3216 5242 JMP P1E5C /INTERRUPT REQUEST?
3217 6003 P1TS5D, SRQ /NO, OK
3220 7610 SKP CLA /
3221 5257 JMP P1E5D /TTY INTERRUPT REQUEST PRESENT?
3222 4557 P1TS5E, USPI /NO, OK
3223 7610 SKP CLA /
3224 5264 JMP P1E5E /TEST DONE 100 TIMES?
3225 2062 ISZ CTRA /NO, REPEAT,
3226 5204 JMP P1TS5A /CHAIN.
3227 5425 JMP I CHAIN

3230 7602 P1E5A, HLT CLA /SRQ FAILED TO SKIP ON KBRD. FLAG,
/SCOPE LOOP. PRESS CONTINUE TO ENTER.
JMS P1E5
3231 4250 SRQ
3232 6003 JMP .=2
3233 5231 JMP .=1

3235 7602 P1E5B, HLT CLA /SPI FAILED TO SKIP ON KBRD FLAG,
/SCOPE LOOP. PRESS CONTINUE TO ENTER.
JMS P1E5
3236 4250 USPI
3237 4557 JMP .=2
3240 5236 JMP .=1
3241 5240

3242 7602 P1E5C, HLT CLA /CAF FAILED TO CLEAR KBRD FLAG.
/SCOPE LOOP, PRESS CONTINUE TO ENTER.
3243 4250 JMS P1E5
3244 6007 CAF
3245 4566 UTSF
3246 5243 JMP P1E5C+1
3247 5243 JMP P1E5C+1

3250 0000 P1E5, OPEN /ROUTINE TO SET KBRD FLAG.
3251 7201 CLA IAC
3252 4561 UKIE
3253 4563 UTLS
3254 4426 JMS I KBFLAG
3255 4565 UTCF
3256 5650 JMP I P1E5 /EXIT

3257 7602 P1E5D, HLT CLA /SRQ SKIPPED WITH NO FLAG.
/SCOPE LOOP, PRESS CONTINUE TO ENTER.
3260 6007 CAF
3261 6003 SRQ
3262 5260 JMP P1E5D+1
3263 5260 JMP P1E5D+1

3264 7602 P1E5E, HLT CLA /SPI SKIPPED WITH NO FLAG.
/SCOPE LOOP, PRESS CONTINUE TO ENTER.
3265 6007 CAF
3266 4557 USPI
3267 5265 JMP P1E5E+1
3270 5265 JMP P1E5E+1

/READER TIMING TEST. CHECKS THAT READER FLAG IS = 1 NO
/LATER THAN THE TIME FOR THE FLAG TO SET.

3271 0006 P1TS6, 6
3272 3314 P1TS7
3273 4430 JMS I S100 /SET UP TO DO TEST 100 TIMES.
3274 4577 SETLOC /SET DELAYM
3275 0024 DELAYM /TO -103 DECIMAL
3276 7631 M147 /
3277 4563 P1TS6A, UTLS /SEND
3300 4571 UKCC /RECEIVE
3301 4576 DELAY /DELAY 10-11 BIT TIMES
3302 4565 UTCF /CLEAR TELEPRINTER FLAG
3303 4572 UKSF /KB RD FLAG SET?
3304 5310 JMP P1E6A /FLAG NOT SET
3305 2062 ISZ CTRA /DONE 100 TIMES YET?
3306 5277 JMP P1TS6A
3307 5425 JMP I CHAIN /CHAIN.

3310 7602 P1E6A, HLT CLA /FLAG NOT SETTING IN REQUIRED TIME.

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/SCOPE LOOP. PRESS CONTINUE TO ENTER.

3311 4563 UTLS
3312 4426 JMS I KBFLAG
3313 5311 JMP P1E6A+1

/TEST OF KEYBOARD AND PUNCH BUFFER USING
/KRS AND KCC TO RECEIVE AND TPC AND TCF
/TO SEND. A SPECIAL BINARY COUNT PATTERN
/IS USED.

3314 0007 P1TS7, 7
3315 3325 P1T10
3316 4577 SETLOC /SET COUNT OF
3317 0062 CTRA /=512 (DEC)
3320 7000 =1000 /IN CTRA,
3321 4777' JMS SINPT /INITIALIZE SPECIAL BIN COUNT.
3322 4776' P1TS7A, JMS SGET /GET A NUMBER
3323 4337 JMS TRDATA /TRANSFER DATA AND CHECK.
3324 5322 JMP P1TS7A /REPEAT

/TEST OF KEYBOARD AND PUNCH BUFFERS USING RANDOM DATA.

3325 0010 P1T10, 10
3326 3400 P1T11
3327 4577 SETLOC /SET COUNT OF
3330 0062 CTRA /=512 (DEC)
3331 7000 =1000 /IN CTRA,
3332 4775' JMS SETRND /INITIALIZE RANDOM NUMBER GENERATOR,
3333 4774' P1T10A, JMS RGNB /GET A RANDOM NUMBER.
3334 0145 AND L377 /MASK,
3335 4337 JMS TRDATA /TRANSFER DATA AND CHECK.
3336 5333 JMP P1T10A /REPEAT

/SUBROUTINE USED BY P1TS7 AND P1T10

3337 0000 TRDATA, OPEN
3340 3346 QCA HOLD1
3341 1346 TAD HOLD1
3342 7421 MQL /STORE GOOD DATA IN MQ.
3343 7701 ACL /RELOAD AC WITH THE GOOD
3344 4353 JMS SNDREC /TRANSMIT AND RECEIVE
3345 4470 JMS I CHECK /DID I RECEIVE WHAT I SENT?
3346 0000 HOLD1, OPEN /WHAT I SENT,
3347 5366 JMP P1E710 /RECEIVED NOT SAME AS SENT.
3350 2062 ISZ CTRA /DONE?
3351 5737 JMP I TRDATA /NO,
3352 5425 JMP I CHAIN /YES, CHAIN,

/ROUTINE TO SEND AND RECEIVE DATA.

3353 0000 SNDREC, OPEN
3354 4565 UTCP
3355 4564 UTPC
3356 4571 UKCC

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3357 4572 UKSF
3360 5357 JMP ,=1
3361 7200 CLA /JUST IN CASE
3362 4570 UKRS
3363 4566 UTSE
3364 5363 JMP ,=1
3365 5753 JMP I SNDREC /EXIT WITH RECEIVED DATA IN AC,

/COMMON HLT FOR P1TS7 AND P1T10.

3366 7492 P1E710, HLT /DATA RECEIVED DOES NOT
/AGREE WITH DATA SENT.
/MQ CONTAINS DATA THAT WAS SENT.
/AC CONTAINS DATA THAT WAS RECEIVED.

/SCOPE LOOP. PRESS CONTINUE TO ENTER.

3367 7781 ACL
3370 4353 JMS SNDREC
3371 5367 JMP P1E710+1 /STAY IN LOOP.

3374 0417
3375 1742
3376 1721
3377 1711
3400 PAGE

/TEST OF KRS TO DO AN "OR" BY READING
/RANDOM DATA FROM KBRD BUFFER INTO AC
/EQUAL TO 7777. TEST IS DONE 500 TIMES.

3400 0011 P1T11, 11
3401 3435 P1T12
3402 4577 SETLOC /SET COUNT OF
3403 0062 CTRA /=500 (DEC)
3404 7014 =764 /IN CTRA.
3405 6007 P1T11A, CAF /CLEAR THE WORLD.
3406 4777' JMS RGNB /GET A RANDOM NUMBER
3407 7421 MQL /STORE IT IN MQ
3410 7701 ACL /RELOAD AC
3411 4563 UTLS /
3412 4566 UTSE /FLAG SET YET?
3413 5212 JMP ,=1 /NO, WAIT.
3414 7240 CLA CMA /7777 TO AC
3415 4570 UKRS /READ KBRD BUFFER.
3416 7040 CMA /AC SHOULD NOW EQUAL 0
3417 7440 SZA /DOES IT = 0?
3420 5224 JMP P1E11A /NO.
3421 2062 ISZ CTRA /DONE 500 TIMES YET?
3422 5205 JMP P1T11A /NO, REPEAT
3423 5425 JMP I CHAIN /YES CHAIN.

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3424 7402 P1E11A, HLT /KRS FAILED TO "OR" KBRD WITH AC
/SCOPE LOOP. PRESS CONTINUE TO ENTER.
3425 6007 CAF
3426 7701 ACL /MG TO AC
3427 4563 UTLS
3430 4566 UTSF
3431 5230 JMP .+1
3432 7240 CLA CMA
3433 4570 UKRS
3434 5225 JMP P1E11A+1

/TEST OF KRB

3435 0012 P1T12, 12
3436 7777 7777
3437 4430 JMS I \$100
3440 4577 SETLOC /SET DELAYM
3441 0024 DELAYM /TO =103 DEC,
3442 7631 M147
3443 6007 P1T12A, CAF /CLEAR THE WORLD.
3444 1134 TAD [252 /AC =252
3445 4563 UTLS /SEND
3446 4566 UTSF /DONE SENDING YET?
3447 5246 JMP .+1 /NO
3448 7240 CLA CMA /7777
3450 4567 UKRB /CLEAR AC, FLAG AND READ BUFFER.
3452 7041 CMA IAC /CHANGE TO A NEGATIVE NUMBER
3453 1134 TAD [252 /ADD SENT DATA TO AC
3454 7440 SEA /WERE THEY EQUAL?
3455 5264 JMP P1E12A /NO
3456 4572 P1T12B, UKSF /FLAG CLEAR?
3457 7610 SKP CLA /YES
3460 5274 JMP P1E12B /NO,
3461 2062 ISZ CTRA /DONE TEST YET?
3462 5243 JMP P1T12A /NO, REPEAT
3463 5425 JMP I CHAIN /YES, CHAIN.

3464 7402 P1E12A, HLT /KRB FAILED TO JAM READER BUFFER TO AC.
/SCOPE LOOP, PRESS CONTINUE TO ENTER.
3465 6007 CAF /CLEAR THE WORLD.
3466 1134 TAD [252
3467 4563 UTLS
3470 4566 UTSF
3471 5270 JMP .+1
3472 4567 UKRB
3473 5265 JMP P1E12A+1

3474 7402 P1E12B, HLT /KRB FAILED TO CLEAR READER FLAG.
/SCOPE LOOP, PRESS CONTINUE TO ENTER.
3475 6007 CAF
3476 4563 UTLS
3477 4566 UTSF
3500 5277 JMP .+1
3501 4567 UKRB
3502 5275 JMP P1E12B+1

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/PROGRAM 2, ASR 33/35 TELETYPE BASIC INPUT TESTS.
/PROGRAM CHECKS INPUT IOT'S, INTERRUPT, AND READER TIMING

3503	4577	PRG2,	SETLOC	/SET KSTART TO INITIAL
3504	0023		KSTART	/ROUTINE ADDRESS.
3505	3510		P2TS0	
3506	5707		JMP I ,+1	/GO START TEST
3507	0236		SRSET	

/ISSUE KCC WITH AC=7777. AC SHOULD GO TO 0.
/AC NOT 0 INDICATES KCC FAILURE. TEST IS DONE 100 TIMES.

3510	0000	P2TS0,	0	
3511	3530		P2TS1	
3512	4313		JMS P2TS0A	
3513	0000	P2TS0A,	OPEN	
3514	4431		JMS I S4000	/SET UP TO DO TEST 4000 TIMES.
3515	7240		CLA CMA	/SET AC TO 7777
3516	4571		UKCC	/CLEAR AC AND FLAG
3517	7440		SEA	/IS AC = 0?
3520	5324		JMP P2E0	/NO, ERROR, GO TO P2E0
3521	2062		ISZ CTRA	/DONE?
3522	5315		JMP ,=2	/NO, REPEAT
3523	5425		JMP I CHAIN	/CHAIN
3524	7402	P2E0,	HLT	/TST0 ERR HALT, KCC DID /NOT RESULT IN AC = 0
3525	7240		CLA CMA	/SET A TO 7777
3526	4571		UKCC	/CLEAR AC AND FLAG
3527	5325		JMP ,=2	/REPEAT

/ISSUE KCC, WAIT TWICE 10-11 BIT TIMES FOR FLAG TO SET.
/SKIP ON FLAG, FAILURE TO SKIP INDICATES
/THAT FLAG IS NOT SET, OR KSF FAILURE.
/TEST IS DONE 100 TIMES.

3530	0001	P2TS1,	1	
3531	3545		P2TS2	
3532	4432		JMS I S200	/SET DELAYM TO DELAY TWICE /10 BIT TIMES FOR AN NON 110 /BAUD DEVICE AND TWICE 11 BIT /TIMES FOR AN 110 BAUD DEVICE. /SEE BIT TIME TABLE AT BEGINNING /OF PROGRAM.

3533	4430	P2TS1A,	JMS I S100	/SET UP TO DO TEST 100 TIMES.
3534	4571	P2TS1B,	UKCC	/CLEAR AC AND FLAG
3535	4576		DELAY	/GO DELAY
3536	4572		UKSF	/SKIP ON FLAG = 1
3537	5343		JMP P2E1	/ERROR, GO TO E1
3540	2062		ISZ CTRA	/ALL DONE?
3541	5334		JMP P2TS1B	/NO, REPEAT
3542	5425		JMP I CHAIN	/CHAIN
3543	7402	P2E1,	HLT	/TST1 ERROR HALT, FLAG IS NOT /SET, OR KSF FAILED

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3544 5333 JMP P2TS1A /RESTARTING TEST,

/ISSUE KCC, WAIT TWICE 10-11 BIT TIMES FOR FLAG TO BE SET.
/SKIP ON FLAG 1000 TIMES TO VERIFY CONSISTENT SKIPPING.

3545 0002 P2TS2, 2
3546 3600 P2TS3
3547 4432 JMS I S200 /SET DELAYM TO DELAY TWICE
/10 BIT TIMES FOR AN NON 110
/BAUD DEVICE AND TWICE 11 BIT
/TIMES FOR AN 110 BAUD DEVICE.
/SEE BIT TIME TABLE AT BEGINNING
/OF PROGRAM.

3550 4431 JMS I S4000 /SET UP TO DO TEST 4000 TIMES.
3551 4571 P2TS2A, UKCC /CLEAR AC AND FLAG
3552 4576 DELAY /GO DELAY
3553 4572 UKSF /SKIP ON FLAG = 1
3554 5362 JMP P2E2A /DID NOT SKIP, GO TO E2A
3555 4572 UKSF /SKIP ON FLAG = 1
3556 5364 JMP P2E2B /DID NOT SKIP, GO TO E2B
3557 2862 ISZ CTRA /ALL DONE?
3560 5355 JMP ,=8 /NO, REPEAT
3561 5425 JMP I CHAIN /CHAIN
3562 7402 P2E2A, HLT /TST2 ERROR HALT, FLAG
/NOT SET OR KSF FAILURE.

3563 5351 JMP P2TS2A
3564 7402 P2E2B, HLT /TST2 ERR HALT B,
/KSF FAILURE
3565 4572 UKSF /SKIP ON FLAG = 1
3566 5365 JMP ,=1 /REPEAT
3567 5365 JMP ,=2 /REPEAT

3577 0417
3600 PAGE

/ISSUE KCC, WAIT TWICE 10-11 BIT TIMES FOR FLAG TO SET.
/VERIFY THAT FLAG IS SET, RESET FLAG (KCC) AND
/SKIP ON FLAG 500 TIMES TO VERIFY THAT NO
/SKIP OCCURS WITH FLAG = 0.

3600 0003 P2TS3, 3
3601 3630 P2TS4
3602 4432 JMS I S200 /SET DELAYM TO DELAY TWICE
/10 BIT TIMES FOR AN NON 110
/BAUD DEVICE AND TWICE 11 BIT
/TIMES FOR AN 110 BAUD DEVICE.
/SEE BIT TIME TABLE AT BEGINNING
/OF PROGRAM.

3603 4577 SETLOC
3604 0062 CTRA /SET COUNT
/=-500 (DEC)

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3605	7014	=764	/CTRA
3606	4571	P2TS3A,	UKCC /CLEAR FLAG
3607	4576	DELAY	/GO DELAY
3610	4572	UKSF	/READY?
3611	5221	JMP P2E3A	/NO, ERROR
3612	4571	UKCC	/YES, RESET FLAG
3613	4572	UKSF	/READY?
3614	5216	JMP ,+2	/NO, OK
3615	5223	JMP P2E3B	/YES, ERROR
3616	2062	ISZ CTRA	/ALL DONE TESTING?
3617	5213	JMP ,+4	/NO, REPEAT
3620	5425	JMP I CHAIN	/YES, CHAIN
3621	7402	P2E3A,	HLT /TST3 ERR HALT A, FLAG
			/NOT SET OR KSF FAILURE
3622	5206	JMP P2TS3A	/TRY AGAIN
3623	7402	P2E3B,	HLT /TST3 ERR HALT B, FLAG
			/FAILED TO RESET, OR KSF
			/SKIPPED ERRONEOUSLY.

/TURN OFF READER BEFORE ENTERING

/SCOPE LOOP,

3624	4571	UKCC	/CLEAR FLAG AND AC
3625	4572	UKSF	/SKIP ON FLAG = 1
3626	5224	JMP ,+2	/REPEAT
3627	5224	JMP ,+3	/REPEAT

/THIS ROUTINE CHECKS THAT NO OTHER DEVICE CAN CAUSE AN INTERRUPT,
/AND THEN CHECKS THAT THE READER FLAG IS CAPABLE OF INTERRUPTING.

3630	0004	P2TS4,	4	
3631	3671	P2TS5		
3632	4577	SETLOC		/SET INTERRUPT RETURN
3633	0002	2		/TO P2E4A,
3634	3644	P2E4A		
3635	4565	UTCF		/CLEAR PUNCH/PRINTER FLAG
3636	4426	JMS I KBFLAG		
3637	4571	UKCC		/CLEAR READER FLAG
3640	6001	ION		/ENABLE INTERRUPT
3641	7000	NOP		
3642	6002	IOF		/TURN OFF INTERRUPT
3643	5246	JMP ,+3		
3644	4777	P2E4A,	JMS INTFND	/UNEXPECTED INTERRUPT
3645	5235	JMP P2TS4A		/TRY AGAIN
3646	4431	JMS I S4000		/SET UP TO DO TEST 4000 TIMES.
3647	4577	SETLOC		/SET INTERRUPT RETURN
3650	0002	2		/TO P2TS4C,
3651	3666	P2TS4C		
3652	4571	UKCC		
3653	4572	UKSF		/WAIT FOR READER FLAG
3654	5253	JMP ,+1		/TO SET
3655	6001	P2TS4B,	ION	/ENABLE INTERRUPT
3656	7000	NOP		
3657	7402	P2E4B,	HLT	/READER FLAG FAILED TO INTERRUPT, /OR INTERRUPT SYSTEM MALFUNCTION
3660	4577	SETLOC		/SET INTERRUPT RETURN

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3661 0002 2 /TO P2TS4C=1,
3662 3665 P2TS4C=1
/SCOPE LOOP
3663 6001 ION
3664 7000 NOP
3665 5263 JMP .=2
/
3666 2062 P2TS4C, ISZ CTRA /DONE?
3667 5255 JMP P2TS4B /NO, REPEAT
3670 5425 JMP I CHAIN

/READER TIMING TEST, CHECKS THAT READER FLAG IS #1 NO
/LATER THAN 103 MILLISECONDS AFTER KCC INSTRUCTION IS ISSUED,

3671 0005 P2TS5, 5
3672 3711 P2TS6
3673 4577 SETLOC /SET DELAYM
3674 0024 DELAYM /TO .=103
3675 7631 M147
3676 4430 JMS I \$100 /SET UP TO DO TEST 100 TIMES.
3677 4571 P2TS5A, UKCC /START READER, CLEAR PC FLAG
3700 4576 DELAY /GO DELAY 103 MILLISECS
3701 4572 UKSF
3702 5306 JMP P2E5
3703 2062 ISZ CTRA
3704 5277 JMP P2TSSA
3705 5425 JMP I CHAIN
3706 7402 P2E5, HLT /TSTS5 ERR HALT, FLAG NOT=1
/103 MSECS AFTER KCC INSTRUCTION.
3707 4426 JMS I KBFLAG
3710 5305 JMP .=3 /YES, REPEAT.

/READ 256 DIFFERENT CHARACTERS, EACH CHARACTER IS READ 1000 TIMES
/TO VERIFY CONSISTENCY OF READING FROM TTI.

3711 0006 P2TS6, 6
3712 3762 P2TS7
3713 4577 SETLOC /SET COUNT OF
3714 0062 CTRA /=256(DEC)
3715 7400 =400 /IN CTRA
3716 4426 P2TS6A, JMS I KBFLAG /READ CHARACTER.
3717 4570 UKRS /SAVE AT WTS6A,
3720 3112 DCA WTS6A /SET COUNT OF
3721 4577 SETLOC /CTRBR
3722 0063 CTRB /=1000 (DEC) IN
3723 6030 =1750
3724 7200 P2TS6B, CLA /READ CHARACTER.
3725 4570 UKRS /STORE IN MQ
3726 7421 MQL /GET IT BACK TO THE AC.
3727 7701 ACL /2'S COMPLEMENT IT
3730 7041 CIA

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3731	1112	TAD WTS6A	/ADD EXPECTED CHAR.
3732	7640	SZA CLA	/RESULT 0?
3733	5346	JMP P2E6A	/NO, ERROR, GO TO E6A.
3734	7240	P2TS6C, CLA CMA	
3735	4570	UKRS	/READ CHARACTER
3736	7040	CMA	
3737	7440	SZA	/AC STILL 7777
3740	5356	JMP P2E6C	/NO, ERROR GO TO P2E6C.
3741	2063	ISZ CTRB	/READ CHAR 1000 TIMES?
3742	5324	JMP P2TS6B	/NO, GO READ IT AGAIN.
3743	2062	ISZ CTRA	/YES, READ 256 DIFF. CHARS?
3744	5316	JMP P2TS6A	/NO,
3745	5425	JMP I CHAIN	/YES, CHAIN
3746	7701	P2E6A, ACL	
3747	7402	HLT	/MQ TO AC, /TST6 ERR HALT A, AC DISPLAYS /INCORRECTLY READ CHAR, DEPRESS /KEY CONTINUE
3750	7200	CLA	
3751	1112	TAD WTS6A	
3752	7402	P2E6B, HLT	/TST6 ERR HALT B, AC DISPLAYS /WHAT THE CORRECT CHAR SHOULD /BE.
3753	7200	CLA	
3754	4570	UKRS	/READ CHARACTER
3755	5353	JMP .=2	/LOOP BACK
3756	7402	P2E6C, HLT	/KRS FAILED TO "ORG" KBRD BUFFER WITH AC. /SCOPE LOOP, PRESS CONTINUE TO ENTER.
3757	7240	CLA CMA	
3760	4570	UKRS	
3761	5357	JMP P2E6C+1	

/ISSUE KCC, WAIT FOR FLAG TO SET, ISSUE KCR WITH
/AC=7777 AND DELAY 200 MSEC'S. AC NOT 7777 OR KBRD
/FLAG SET INDICATES A KCR FAILURE. TEST IS DONE
/100 TIMES.

3762	0007	P2TS7, 7	
3763	4030	P2T10	
3764	4430	JMS I \$100	/SET UP TO DO TEST 100 TIMES.
3765	4432	JMS I \$200	/SET DELAYM TO DELAY TWICE /10 BIT TIMES FOR AN NON 110 /BAUD DEVICE AND TWICE 11 BIT /TIMES FOR AN 110 BAUD DEVICE. /SEE BIT TIME TABLE AT BEGINNING /OF PROGRAM.
3766	5776'	JMP P2TS7A	

3776 4000
3777 2017
4000

4000	4426	P2TS7A,	JMS I KBFLAG	
4001	7240	CLA CMA	/AC=7777,	
4002	4562	UKCR	/CLEAR READER FLAG.	
4003	7040	CMA	/AC SHOULD EQUAL ZERO NOW.	
4004	7440	SZA	/RESULT 0?	
4005	5215	JMP P2E7A	/NO, ERROR, GO TO P2E7A.	
4006	4576	P2TS7B,	DELAY	/GO DELAY 200 MILLISECS.
4007	4572	UKSF	/READER FLAG SET?	
4010	7410	SKP	/NO.	
4011	5221	JMP P2E7B	/YES, READER FLAG SET. ERROR, GO TO P2E7B.	
4012	2062	ISZ CTRA	/TEST DONE?	
4013	5200	JMP P2TS7A	/NO, REPEAT,	
4014	5425	JMP I CHAIN		
4015	7402	P2E7A,	HLT	/KCR CLEARED AC.
		/SCOPE	LOOP, PRESS CONTINUE TO ENTER.	
4016	7240	CLA CMA	/AC=7777, (SCOPE LOOP).	
4017	4562	UKCR	/CLEAR READER RUN, SHOULD NOT CLEAR AC.	
4020	5216	JMP .-2	/REPEAT.	
4021	7402	P2E7B,	HLT	/KCR DID NOT CLEAR READER FLAG
		/SCOPE	LOOP, PRESS CONTINUE TO ENTER.	
4022	4426	JMS I KBFLAG		
4023	4562	UKCR	/CLEAR READER RUN.	
4024	4576	DELAY	/GO DELAY 200 MILLISECS	
4025	4572	UKSF		
4026	5222	JMP P2E7B+1	/REPEAT.	
4027	5222	JMP P2E7B+1	/REPEAT.	

/ISSUE KCC, WAIT FOR FLAG TO SET, ISSUE KIE WITH
 /AC11=0 THEN TURN THE INTERRUPT ON, AN INTERRUPT AT THIS TIME
 /INDICATES A KIE FAILURE, WITH THE FLAG STILL SET ISSUE
 /SRQ AND SPI, A SKIP BY EITHER INDICATES A FAILURE.
 /ISSUE KIE WITH AC11=1 AND THE INTERRUPT ON, NO INTERRUPT
 /INDICATES A KIE FAILURE, ISSUE SRQ AND THEN SPI. FAILURE OF
 /EITHER TO SKIP INDICATES A FAILURE, THIS TEST IS DONE 4000 TIMES.

4030	0010	P2T10,	10	
4031	4153	P2T11		
4032	4431	JMS I S4000	/SET UP TO DO TEST 4000 TIMES.	
4033	4426	JMS I KBFLAG		
4034	4577	P2T10A,	SETLOC	/SET INTERRUPT RETURN LOCATION
4035	0002	2		/TO P2E10A.
4036	4073	P2E10A		
4037	4572	UKSF		
4040	5233	JMP P2T10A=1		
4041	7200	CLA	/AC=0	
4042	4561	UKIE	/DISABLE TTY INTERRUPT	
4043	6001	ION	/TURN INTERRUPT ON	
4044	7000	NOP		
4045	6002	P2T10B,	IOF	/TURN INTERRUPT OFF.
4046	6003	SRQ		/SKIP IF INTERRUPT REQUEST.
4047	7410	SKP		

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4050	5307	JMP P2E10B	/ERROR, SRQ FAILED, GO TO P2E10B.
4051	4557	P2T10C, USPI	/SKIP IF TTY INTERRUPT.
4052	7410	SKP	
4053	5315	JMP P2E10C	/ERROR, SPI FAILED, GO TO P2E10C.
4054	4577	P2T10D, SETLOC	/SET INTERRUPT RETURN LOCATION
4055	0002	2	/TO P2T10E
4056	4064	P2T10E	
4057	7201	CLA IAC	/AC11=1
4060	4561	UKIE	/ENABLE TTY INTERRUPT.
4061	6001	ION	/TURN INTERRUPT ON.
4062	7000	NOP	/((SHOULD INTERRUPT)).
4063	5323	JMP P2E10D	/ERROR, GO TO P2E10D.
4064	6003	P2T10E, SRQ	/SKIP IF INTERRUPT REQUEST.
4065	5335	JMP P2E10E	/ERROR, GO TO P2E10E.
4066	4557	P2T10F, USPI	/SKIP IF TTY INTERRUPT.
4067	5344	JMP P2E10F	/ERROR, GO TO P2E10F.
4070	2062	ISZ CTRA	/DONE.
4071	5234	JMP P2T10A	/NO, REPEAT.
4072	5425	JMP I CHAIN	
4073	7402	P2E10A, HLT	/KIE FAILED TO DISABLE TTY.
		/SCOPE LOOP, PRESS CONTINUE TO ENTER.	
4074	4572	UKSF	/IS READER FLAG SET?
4075	4777	JMS INTFND	/NO, UNEXPECTED INTERRUPT.
4076	4577	SETLOC	/SET INTERRUPT RETURN LOCATION
4077	0002	2	/TO P2E10A+1.
4100	4074	P2E10A+1	
4101	4426	JMS I KBFLAG	/((SCOPE LOOP)).
4102	7200	CLA	
4103	4561	UKIE	/DISABLE TTY INTERRUPT.
4104	6001	ION	/INTERRUPT ON.
4105	7000	NOP	
4106	5274	JMP P2E10A+1	/REPEAT.
4107	7602	P2E10B, HLT CLA	/SRQ SKIPPED WITH TTY DISABLED.
		/SCOPE LOOP, PRESS CONTINUE TO ENTER.	
4110	4426	JMS I KBFLAG	
4111	4561	UKIE	
4112	6003	SRQ	/SKIP IF INTERRUPT, (AC11=0). REQUEST, ((SHOULD NOT SKIP))
4113	5310	JMP P2E10B+1	/REPEAT
4114	5310	JMP P2E10B+1	/REPEAT
4115	7602	P2E10C, HLT CLA	/SPI SKIPPED WITH TTY DISABLED.
		/SCOPE LOOP, PRESS CONTINUE TO ENTER.	
4116	4426	JMS I KBFLAG	
4117	4561	UKIE	/DISABLE TTY INTERRUPT, (AC11=0).
4120	4557	USPI	/SKIP IF TTY INTERRUPT REQUEST ((SHOULD NOT SKIP)).
4121	5316	JMP P2E10C+1	/REPEAT.
4122	5316	JMP P2E10C+1	/REPEAT.
4123	7402	P2E10D, HLT	/KIE FAILED TO ENABLE TTY INTERRUPT WITH AC11=1.
		/SCOPE LOOP, PRESS CONTINUE TO ENTER.	
4124	4577	SETLOC	/SET INTERRUPT RETURN LOCATION

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4125 0002 2 /TO P2E10D+4,
4126 4127 P2E10D+4
4127 7201 CLA IAC /(SCOPE LOOP),
4130 4561 UKIE /ENABLE TTY INTERRUPT.
4131 4426 JMS I KBFLAG
4132 6001 ION /TURN INTERRUPT ON.
4133 7000 NOP
4134 5327 JMP P2E10D+4 /REPEAT.

4135 7402 P2E10E, HLT /SRQ FAILED TO SKIP,
/SCOPE LOOP. PRESS CONTINUE TO ENTER.
4136 7201 CLA IAC /(SCOPE LOOP),
4137 4561 UKIE /ENABLE TTY INTERRUPT.
4140 4426 JMS I KBFLAG
4141 6003 SRQ /SKIP IF INTERRUPT REQUEST.
4142 5336 JMP P2E10E+1 /REPEAT,
4143 5336 JMP P2E10E+1 /REPEAT.

4144 7402 P2E10F, HLT /SPI FAILED TO SKIP,
/SCOPE LOOP. PRESS CONTINUE TO ENTER.
4145 7201 CLA IAC /(SCOPE LOOP),
4146 4561 UKIE /ENABLE TTY INTERRUPT.
4147 4426 JMS I KBFLAG
4150 4557 USPI /SKIP IF TTY INTERRUPT.
4151 5345 JMP P2E10F+1 /REPEAT,
4152 5351 JMP .+1 /REPEAT,

/ISSUE KIE WITH AC11=0 TO DISABLE TTY.
/ISSUE CAF WITH AC, LINK, AND READER FLAG SET.
/TTY NOT ENABLED, OR AC AND LINK NOT
/ZERO INDICATES A FAILURE. TEST IS DONE 100 TIMES.

4153 0011 P2T11, 11
4154 4233 P2T12
4155 4430 JMS I \$100 /SET UP TO DO TEST 100 TIMES.
4156 4432 JMS I \$200 /SET DELAYM TO DELAY TWICE
/11 BIT TIMES FOR AN NON 110
/BAUD DEVICE AND TWICE 11 BIT
/TIMES FOR AN 110 BAUD DEVICE.
/SEE BIT TIME TABLE AT BEGINNING
/OF PROGRAM,

4157 4561 P2T11A, UKIE /DISABLE TTY (AC 11=0).
4160 4426 JMS I KBFLAG
4161 7360 CLA CMA CLL CML /AC AND LINK SET,
4162 6007 CAF /CLEAR ALL FLAGS, AC, LINK, AND ENABLE TTY.
4163 7420 SNL
4164 7440 SZA
4165 5776' JMP P2E11A /ERROR, GO TO P2E11A.
4166 4576 P2T11B, DELAY /GO DELAY 202 MILLI SEC.
4167 4572 UKSF /DID FLAG C UP?
4170 7610 SKP CLA

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4171 5775' JMP P2E11B /YES, ERROR, GO TO P2E11B.
4172 5774' JMP P2T11C /CROSS PAGE

4174 4200
4175 4215
4176 4206
4177 2017
4200 PAGE

4200 4426 P2T11C, JMS I KBFLAG
4201 4557 USPI /SKIP IF TTY INTERRUPT REQUEST.
4202 5224 JMP P2E11C /ERROR, GO TO P2E11C.

4203 2062 ISZ CTRA /TEST DONE?
4204 5777' JMP P2T11A /NO, REPEAT.
4205 5425 JMP I CHAIN

4206 7402 P2E11A, HLT /CAF FAILED TO CLEAR AC AND LINK,
/SCOPE LOOP, PRESS CONTINUE TO ENTER,
CLA CMA CLL CML /(SCOPE LOOP).
4207 7360 CAF /CLEAR ALL FLAGS, AC, LINK, AND ENABLE TTY.
4210 6007 SNL
4211 7420 SZA
4212 7440
4213 5207 JMP P2E11A+1 /REPEAT,
4214 5207 JMP P2E11A+1 /REPEAT,

4215 7402 P2E11B, HLT /CAF DID NOT CLEAR FLAG OR FLAG SET AFTER BEING CLEARED.
/SCOPE LOOP, PRESS CONTINUE TO ENTER,
JMS I KBFLAG
4216 4426 CAF /CLEAR THE FLAG.
4217 6007 DELAY /GO DELAY 200 MILLISEC.
4220 4576 UKSF /FLAG SET?
4221 4572 5216 JMP P2E11B+1 /REPEAT
4222 5216 JMP P2E11B+1 /REPEAT

4224 7602 P2E11C, HLT CLA /CAF FAILED TO ENABLE TTY.
/SCOPE LOOP, PRESS CONTINUE TO ENTER,
UKIE /DISABLE TTY, (AC11=0)
4226 6007 CAF /ENABLE TTY.
4227 4426 JMS I KBFLAG
4230 4557 USPI /SKIP IF INT REQUEST FROM TTY.
4231 5225 JMP P2E11C+1 /REPEAT
4232 5225 JMP P2E11C+1 /REPEAT,

/TEST OF KRB INSTRUCTION.

4233 0012 P2T12, 12
4234 7777 7777
4235 4577 SETLOC /SET COUNT OF
4236 0062 CTRA /*256 DECIMAL
4237 7400 ~400 /IN CTRA
4240 4577 SETLOC /SET DELAYM

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4241	0024	DELAYM	/TO -103
4242	7631	M147	/DECIMAL.
4243	4426	JMS I KBFLAG	
4244	4570	UKRS	/GET THE CHARACTER.
4245	3112	DCA WT56A	/SAVE IT
4246	4426	JMS I KBFLAG	/ADVANCE TAPE AND BRING NEW CHARACTER INTO BUFFER.
4247	1145	P2T12A, TAD C377	
4250	4567	UKRB	/READ BUFFER,CLEAR FLAG, ADVANCE TAPE
4251	4572	UKSF	/FLAG CLEAR?
4252	7410	SKP	/YES, OK,
4253	5276	JMP P2E12A	/NO, ERROR,
4254	3104	DCA UTEMP	
4255	4576	P2T12B, DELAY	/DELAY 10 OR 11 BIT TIMES
4256	4572	UKSF	/FLAG NOW SET?
4257	5303	JMP P2E12B	/NO, ERROR,
4260	1112	P2T12C, TAD WT56A	/GET GOOD.
4261	7421	MQL	/MQ CONTAINS GOOD DATA
4262	7701	ACL	/RELOAD AC WITH GOOD FROM MQ.
4263	7001	IAC	/ADD ONE TO IT.
4264	3112	DCA WT56A	/SAVE IT
4265	1112	TAD WT56A	/GET IT BACK.
4266	5145	AND C377	/KEEP DESIRED DATA.
4267	7041	CMA IAC	/NEGATE IT.
4270	1104	TAD UTEMP	/ADD LAST READ CHARACTER TO IT.
4271	7640	SZA CLA	/ARE THEY EQUAL.
4272	5305	JMP P2E12C	/NO, ERROR
4273	2062	ISE CTRA	/DONE?
4274	5247	JMP P2T12A	/NO, REPEAT,
4275	5425	JMP I CHAIN	/YES, CHAIN.
4276	7402	P2E12A, HLT	/KRB FAILED TO CLEAR READER FLAG.
			/SCOPE LOOP. PRESS CONTINUE TO ENTER.
4277	4426	JMS I KBFLAG	
4300	4567	UKRB	
4301	4576	DELAY	
4302	5277	JMP P2E12A+1	
4303	7402	P2E12B, HLT	/KRB FAILED TO SET FLAG.
			/SCOPE LOOP. PRESS CONTINUE TO ENTER.
4304	5277	JMP P2E12A+1	
4305	7402	P2E12C, HLT	/KRB FAILED TO READ CORRECT DATA.
			/PRESS CONTINUE TO TRY TEST AGAIN.
4306	5235	JMP P2T12+2	/TRY TEST AGAIN.

/PROGRAM 3, ASR33/35 TELETYPE READER TEST, CHECKS ABILITY OF READER
/TO CORRECTLY READ AT FULL SPEED AND WITH RANDOM STALLS.
PRG3, SETLOC /SET KSTART TO INITIAL
KSTART /ROUTINE ADDRESS.
P3TS0
JMP I .+1 /GO START
SRSET

/PDP=8/E TELETYPE CONTROL TEST, (KLB) PAL10 V141 14-MAY-71 11:32 PAGE 1-52

/READ 4095 CHARACTERS, AT FULL SPEED, MATCHING EACH CHARACTER
/READ AGAINST COUNT PATTERN

/
4314 0000 P3TS2, 0
4315 4344 P3TS1
4316 4465 JMS I SYNC /GO SYNC TAPE
4317 4577 SETLOC /SET COUNT OF
4320 0062 CTRA /=4095(DEC) IN
4321 0001 =7777 /CTRA
4322 4571 UKCC /START READER
4323 4466 JMS I INPATT /GO INITIALIZE PATTERN
4324 4467 P3TS0A, JMS I GETPT /GET PATTERN CHARACTER
4325 3332 DCA SB0 /STORE AT SB0
4326 4572 UKSF /READY?
4327 3326 JMP .-1 /NO, TEST AGAIN
4330 4567 UKRB /YES, READ CHARACTER
4331 4470 JMS I CHECK /GO CHECK FOR CORRECT MATCH
4332 0000 SB0, 0 /CORRECT CHAR HERE
4333 5337 JMP P3E0 /ERROR, GO TO P3E0
4334 2062 P3T0B, ISE CTRA /OK, ALL DONE?
4335 5324 JMP P3TS0A /NO, REPEAT
4336 5425 JMP I CHAIN /YES, CHAIN
4337 7402 P3E0, HLT /TST10 ERR HALT, AC CONTAINS
/CHAR THAT DID NOT MATCH
/AGAINST PATTERN, EPRESS
/KEY CONTINUE

4340 7200 CLA
4341 1332 TAD SB0 /GET CORRECT CHARACTER
4342 7402 HLT /AC CONTAINS THE EXPECTED CHARACTER
4343 5334 JMP P3T0B

/READ 2000 CHARACTERS WITH RANDOM DELAY BETWEEN CHARACTERS,
/MATCH EACH CHARACTER READ AGAINST COUNT PATTERN

/
4344 0001 P3TS1, 1
4345 4400 P3TS2
4346 4465 JMS I SYNC /TO SYNC TAPE
4347 4577 SETLOC /SET COUNT OF
4350 0062 CTRA /=2000 (DEC) IN
4351 4060 =3720 /CTRA
4352 4571 UKCC /START READER
4353 4466 JMS I INPATT /INITIALIZE PATTERN
4354 4467 P3TS1A, JMS I GETPT /GET PATTERN CHARACTER
4355 3364 DCA SB1 /STORE AT SB1
4356 4427 JMS I DLCNT1 /GENERATE RANDOM DELAY
4357 4576 DELAY /DELAY
4360 4572 UKSF /READY?
4361 5360 JMP .-1 /NO, TEST AGAIN
4362 4567 UKRB /YES, READ CHARACTER
4363 4470 JMS I CHECK /GO CHECK FOR CORRECT MATCH

4364 0000 SB1, 2 /CORRECT CHAR HERE

/PDP-8/E TELETYPE CONTROL TEST, (KLB) PAL10 V141 14-MAY-71 11:32 PAGE 1-53

4365	5371	JMP P3E1	/ERROR, GO TO P3E1
4366	2062	P3T1B, ISZ CTRA	/OK, ALL DONE?
4367	5354	JMP P3TS1A	/NO,
4370	5425	JMP I CHAIN	/YES, CHAIN
4371	7402	P3E1, HLT	/TST1 ERR HALT, AC CONTAINS /CHARACTER THAT DID NOT MATCH /AGAINST PATTERN, DEPRESS /KEYCONTINUE
4372	7200	CLA	
4373	1364	TAD SB1	/GET CORRECT CHARACTER
4374	7402	HLT	/AC CONTAINS THE EXPECTED /CHARACTER
4375	5366	JMP P3T1B	
4377	4157		
	4400	PAGE	

/READ WITH RANDOM STALL BETWEEN RANDOM CHARACTER GROUPS
/100 GROUPS READ,

4400	0002	P3TS2, 2	
4401	7777	7777	
4402	4465	JMS I SYNC	/GO SYNC TAPE
4403	4430	JMS I S100	/SET UP TO DO TEST 100 TIMES.
4404	4571	UKCC	/START READER
4405	4466	JMS I INPATT	/INITIALIZE PATTERN
4406	4427	P3TS2A, JMS I DLCNT1	/SET RANDOM DELAY
4407	4777	JMS CHRCNT	/SET RANDOM CHARACTER
4410	0063	CTRB	/COUNT IN CTRB
4411	4467	P3TS2B, JMS I GETPT	/GET PATTERN CHARACTER
4412	3220	OCA SB2	/AND STORE AT SB2
4413	4576	DELAY	/GO DELAY NO OF
4414	4572	UKSF	/READY?
4415	5214	JMP .-1	/NO, TEST AGAIN
4416	4567	UKRB	/READ CHARACTER
4417	4470	JMS I CHECK	/CHECK FOR CORRECT MATCH
4420	0000	SB2, 0	/AGAINST SB2 CONTENTS
4421	5227	JMP P3E2	/ERROR, GO TO P3E2
4422	2063	ISZ CTRB	/OK, ALL CHARS FOR GROUP DONE?
4423	5211	JMP P3TS2B	/NO
4424	2062	P3T2C, ISZ CTRA	/YES, ALL GROUPS DONE?
4425	5206	JMP P3TS2A	/NO
4426	5425	JMP I CHAIN	/YES, CHAIN
4427	7402	P3E2, HLT	/TST2 ERROR HALT, AC CONTAINS CHAR THAT /DID NOT MATCH AGAINST PATTERN, DEPRESS KEY /CONTINUE
4430	7200	CLA	
4431	1220	TAD SB2	/GET CORRECT CHARACTER
4432	7402	HLT	/AC CONTAINS THE EXPTECTED CHARACTER
4433	5224	JMP P3T2C	

/PROGRAM 4.

4434	4776'	PRG4,	JMS STBF	/SET UP BUFFER AREA
4435	4577		SETLOC	/SET KSTART TO INITIAL
4436	8023		KSTART	/ROUTINE ADDRESS
4437	4442		P4TS0	
4440	5641		JMP I ,+1	/GO START PROGRAM
4441	0236		SRSET	
			/CARRIAGE RETURN TEST	
4442	0000	P4TS0,	0	
4443	4475		P4TS1	
4444	4555		CKSR37	/KSR37?
4445	1140		TAD C11	/NO.
4446	1375		TAD C-122	/YES
4447	7421		MQL	/STORE IN MQ,
4450	4573		TYPE	/PRINT TEST TITLE
4451	6327		CRTST	
4452	1133		TAD C334	/GET "\\" CODE
4453	4474		JMS I UPUNCH	/PRINT IT
4454	7701		ACL	/MQ TO AC.
4455	3104		DCA UTEMP	
4456	2104	CRTSTA,	ISE UTEMP	/ALL DONE?
4457	7410		SKP	/NO
4460	5425		JMP I CHAIN	/YES, CHAIN
4461	1124	CRTSTB,	TAD UTEMP	
4462	3105		DCA UTEMP1	/UTEMP TO UTEMP1
4463	1142		TAD C240	/GET "SPACE" CODE
4464	4474		JMS I UPUNCH	/PRINT IT
4465	2105		ISE UTEMP1	/SPACED NO. OF TIMES IN UTEMP1?
4466	5263		JMP .+3	/NO, SO SPACE AGAIN
4467	1107		TAD CR	/YES, GET "CR" CODE.
4470	4474		JMS I UPUNCH	/PRINT IT.
4471	4474		JMS I UPUNCH	/DUMMY CYCLE.
4472	1132		TAD C257	/SET "/" CODE
4473	4474		JMS I UPUNCH	/PRINT IT
4474	5256		JMP CRTSTA	/GO TO CRTSTA

/RIGHT MARGIN TEST

4475	0001	P4TS1,	1	
4476	4525		P4TS2	
4477	7200		CLA	
4500	1131		TAD C=16	
4501	7421		MQL	
4502	1130		TAD CRM33B	
4503	3323		DCA RMB	
4504	4555		CKSR37	/KSR37?
4505	5312		JMP .+5	/NO,
4506	1127		TAD C=17	/YES,
4507	7421		MQL	
4510	1126		TAD CRM37A	
4511	3323		DCA RMB	

/PDP-8/E TELETYPE CONTROL TEST, (KL8) PAL10 V141 14-MAY-71 11:32 PAGE 1-55

4512	4573	TYPE	/PRINT TEST TITLE
4513	6337	RMTST	
4514	7701	ACL	
4515	3104	DCA UTEMP	
4516	4573	RMTSTA, TYPE	/PRINT ---- I
4517	1562	RM33A	
4520	2104	ISZ UTEMP	/DONE TIMES?
4521	5316	JMP RMTSTA	/NO, SO DO IT AGAIN
4522	4573	TYPE	/YES, PRINT -I-
4523	0000	RMB, OPEN	
4524	5425	JMP I CHAIN	/CHAIN

/SPACE TEST

4525	0002	P4TS2, 2	
4526	4690	P4TS3	
4527	4573	TYPE	/PRINT TEST TITLE
4528	6324	SPTST	
4529	4555	CKSR37	/KSR37?
4530	1125	TAD E5	/NO
4531	1124	TAD E=51	/YES
4532	3104	DCA UTEMP	/=36 TO UTEMP
4533	4573	SPTSTA, TYPE	/PRINT \, SPACE
4534	6324	SPTSTC	
4535	2104	ISZ UTEMP	/DONE 36 TIMES?
4536	5335	JMP SPTSTA	/NO, SO DO IT AGAIN.
4537	4555	CKSR37	/KSR37?
4538	1123	TAD E4	/NO
4539	1122	TAD E=50	/YES
4540	3104	DCA UTEMP	/=36 TO UTEMP
4541	1374	TAD E=1	/GET =1
4542	3105	DCA UTEMP1	/AC TO UTEMP1
4543	1105	TAD UTEMP1	/UTEMP1
4544	3106	DCA UTEMP2	/TO UTEMP2
4545	1107	TAD CR	/GET "CR" CODE
4546	4474	JMS I UPUNCH	/PRINT IT
4547	4474	JMS I UPUNCH	/DUMMY CYCLE
4548	1142	TAD E240	/GET "SPACE" CODE
4549	4474	JMS I UPUNCH	/PRINT IT
4550	2106	ISZ UTEMP2	/DONE SPACING?
4551	5354	JMP .-3	/NO,
4552	1132	TAD E257	/GET "/" CODE
4553	4474	JMS I UPUNCH	/PRINT IT
4554	2104	ISZ UTEMP	/DONE 36 TIMES?
4555	7410	SKP	/NO,
4556	5425	JMP I CHAIN	/YES, CHAIN
4557	7344	CLA CLL CMA RAL	/=2 TO AC
4558	1105	TAD UTEMP1	/ADD C(UTEMP1)
4559	5346	JMP SPTSTB	/GO TO SPTSTB

4574 7777
4575 7656
4576 1000
4577 0456
4600

/LINE FEED TEST
4600 0003 P4TS3, 3
4601 5122 P4TS47
4602 7240 CLA CMA /SET STALL
4603 3064 DCA STLID /INDICATOR
4604 4573 TYPE /PRINT TEST TITLE
4605 6366 LFTST
4606 4555 CKSR37 /KSR371
4607 1140 TAD C11 /NO.
4610 1377 TAD C=121 /YES.

4611 3104 DCA UTEMP
4612 1133 LFTSTA, TAD C334 /GET "\\" CODE
4613 4474 JMS I UPUNCH /PRINT IT
4614 1110 TAD LF /GET "LF" CODE
4615 4474 JMS I UPUNCH /PRINT IT
4616 2104 ISZ UTEMP /DONE?
4617 7410 SKP /NO.
4620 5425 JMP I CHAIN /YES. CHAIN
4621 4556 STALL
4622 5212 JMP LFTSTA /GO TO LFTSTA

/TYPE LINE OF CHARACTERS ABC
4623 0004 P4TS4, 4
4624 4631 P4TS5
4625 4573 TYPE /PRINT TITLE
4626 6376 CHRTST
4627 4433 JMS I TLCALL /PRINT LINE
4630 6107 A

/TYPE LINE OF CHARACTERS DEF
4631 0005 P4TS5, 5
4632 4635 P4TS6
4633 4433 JMS I TLCALL
4634 6112 D

/TYPE LINE OF CHARACTERS GHI
4635 0006 P4TS6, 6
4636 4641 P4TS7
4637 4433 JMS I TLCALL
4640 6115 G

/TYPE LINE OF CHARACTERS JKL
4641 0007 P4TS7, 7
4642 4645 P4TS10
4643 4433 JMS I TLCALL
4644 6120 J

/TYPE LINE OF CHARACTERS MNO
4645 0010 P4TS10, 10
4646 4651 P4TS11

/PDP-8/E TELETYPE CONTROL TEST, (KLB) PAL10 V141 14-MAY-71 11:00 PAGE 1-57

4647 4433 JMS I TLCALL
4650 6123 M
/TYPE LINE OF CHARACTERS POR
4651 0011 P4TS11, 11
4652 4655 P4TS12
4653 4433 JMS I TLCALL
4654 6126 P
/TYPE LINE OF CHARACTERS STU
4655 0012 P4TS12, 12
4656 4661 P4TS13
4657 4433 JMS I TLCALL
4660 6131 S
/TYPE LINE OF CHARACTERS VWX
4661 0013 P4TS13, 13
4662 4665 P4TS14
4663 4433 JMS I TLCALL
4664 6134 V
/TYPE LINE OF CHARACTERS YZD
4665 0014 P4TS14, 14
4666 4671 P4TS15
4667 4433 JMS I TLCALL
4670 6137 Y
/TYPE LINE OF CHARACTERS 123
4671 6015 P4TS15, 15
4672 4675 P4TS16
4673 4433 JMS I TLCALL
4674 6142 ONE
/TYPE LINE OF CHARACTERS 456
4675 0016 P4TS16, 16
4676 4701 P4TS17
4677 4433 JMS I TLCALL
4700 6143 FOUR
/TYPE LINE OF CHARACTERS 789
4701 0017 P4TS17, 17
4702 4705 P4TS20
4703 4433 JMS I TLCALL
4704 6150 SEVEN
/TYPE LINE OF CHARACTERS !%"
4705 0020 P4TS20, 20
4706 4711 P4TS21
4707 4433 JMS I TLCALL
4710 6153 C241
/TYPE LINE OF CHARACTERS \$%&
4711 0021 P4TS21, 21
4712 4715 P4TS22
4713 4433 JMS I TLCALL
4714 6156 C244
/TYPE LINE OF CHARACTERS '()'
4715 0022 P4TS22, 22
4716 4721 P4TS23
4717 4433 JMS I TLCALL
4720 6161 C247
/TYPE LINE OF CHARACTERS **,
4721 0023 P4TS23, 23
4722 4725 P4TS24

/PDP-8/E TELETYPE CONTROL TEST. (KL8) PAL10 V141 14-MAY-71 11:22 PAGE 1-58

4723 4433 JMS I TLCALL
4724 6164 C252

/TYPE LINE OF CHARACTERS =,(
4725 0024 P4TS24, 24

4726 4731 P4TS25
4727 4433 JMS I TLCALL

4730 6167 C255

/TYPE LINE OF CHARACTERS !!<
4731 0025 P4TS25, 25

4732 4735 P4TS26
4733 4433 JMS I TLCALL

4734 6172 C272

/TYPE LINE OF CHARACTERS =>?
4735 0026 P4TS26, 26

4736 4741 P4TS27
4737 4433 JMS I TLCALL

4740 6175 C275

/TYPE LINE OF CHARACTERS # \\
4741 0027 P4TS27, 27

4742 4745 P4TS30
4743 4433 JMS I TLCALL

4744 6200 C300

/TYPE LINE OF CHARACTERS]+ AND LEFT ARROW
4745 0030 P4TS30, 30

4746 4751 P4TS31
4747 4433 JMS I TLCALL

4750 6203 C335

/TYPE LINE OF SMALL A, B, AND C
4751 0031 P4TS31, 31

4752 4755 P4TS32
4753 4434 JMS I TLC37

4754 6206 SA

/TYPE LINE OF SMALL D, E, AND F
4755 0032 P4TS32, 32

4756 4761 P4TS33
4757 4434 JMS I TLC37

4760 6211 SD

/TYPE LINE OF SMALL G, H, AND I
4761 0033 P4TS33, 33

4762 5000 P4TS34
4763 4434 JMS I TLC37

4764 6214 SG

4777 7657 PAGE
5000 5000

/TYPE LINE OF SMALL J, K, AND L
5000 0034 P4TS34, 34

5001 5004 P4TS35
5002 4434 JMS I TLC37

5003 6217 SJ

5004 0035 /TYPE LINE OF SMALL M, N, AND O
P4TS35, 35
5005 5010 P4TS36
5006 4434 JMS I TLC37
5007 6222 SM
/TYPE LINE OF SMALL P, Q, AND R
5010 0036 P4TS36, 36
5011 5014 P4TS37
5012 4434 JMS I TLC37
5013 6225 SP
/TYPE LINE OF SMALL S, T, AND U
5014 0037 P4TS37, 37
5015 5020 P4TS40
5016 4434 JMS I TLC37
5017 6230 SS
/TYPE LINE OF SMALL V, W, AND X
5020 0040 P4TS40, 40
5021 5024 P4TS41
5022 4434 JMS I TLC37
5023 6233 SV
/TYPE LINE OF SMALL Y, AND Z, AND CODE 340 CHARACTER.
5024 0041 P4TS41, 41
5025 5030 P4TS42
5026 4434 JMS I TLC37
5027 6236 SY
/TYPE LINE OF CHARACTERS WHOSE CODE IS 373, 374, 375, 376,
5030 0042 P4TS42, 42
5031 5047 P4TS43
5032 4555 CKSR37 /KSR37?
5033 5425 JMP I CHAIN /NO, BYPASS TEST
5034 4574 MOVE
5035 6241 C373
5036 6601 BLOCK1
5037 7774 =4
5040 4574 MOVE
5041 6601 BLOCK1
5042 6605 BLOCK1+4
5043 7663 =115
5044 3064 DCA STLID
5045 4777 JMS TYPLN
5046 5425 JMP I CHAIN
/TYPE 2 LINES OF ALL CHARACTERS, 1ST LINE NO DELAY, 2ND LINE WITH STALLS.
5047 0043 P4TS43, 43
5050 5054 P4TS44
5051 4776 JMS FBALL /FILL BUFFER WITH ALL CHARS.
5052 4775 JMS WOSWS
5053 5425 JMP I CHAIN /CHAIN
/TYPE 12 LINES OF ASR33 WORST CASE PATTERN, ALTERNATE LINES WITH STALLS.
5054 2044 P4TS44, 44
5055 5072 P4TS45

/PDP-8/E TELETYPE CONTROL TEST, (KL8) PAL10 V141 14-MAY-71 11:02 PAGE 1-62

5056	4573	TYPE	/PRINT TITLE
5057	6412	WCPTST	
5060	4554	CKSR33	/33?
5061	5425	JMP I CHAIN	/NO
5062	4774	JMS FW336	/PATTERN TO BUFFER
5063	4577	SETLOC	/=6 TO CTRA
5064	0062	CTRA	
5065	7772	=6	
5066	4775	P4T44A, JMS WOSWS	
5067	2062	ISZ CTRA	
5070	5266	JMP P4T44A	/NO, REPEAT
5071	5425	JMP I CHAIN	/YES, CHAIN

/TYPE 12 LINES OF ASR35 WORST CASE PATTERN, ALTERNATE LINES WITH STALLS.

5072	0045	P4TS45, 45	
5073	5106	P4TS46	
5074	4553	CKSR35	/35?
5075	5425	JMP I CHAIN	/NO,
5076	4773	JMS FW356	/PATTERN TO BUFFER
5077	4577	SETLOC	/=6 TO CTRA
5100	0062	CTRA	
5101	7772	=6	
5102	4775	P4T45A, JMS WOSWS	
5103	2062	ISZ CTRA	/ALL LINES TYPED?
5104	5302	JMP P4T45A	/NO, REPEAT
5105	5425	JMP I CHAIN	/YES, CHAIN

/TYPE 12 LINES OF KSR37 WORST CASE PATTERN, ALTERNATE LINES WITH STALLS.

5106	0046	P4TS46, 46	
5107	7777	7777	
5110	4555	CKSR37	/37?
5111	5425	JMP I CHAIN	/NO, BYPASS TEST,
5112	4772	JMS FW376	/YES, PATTERN TO BUFFER
5113	4577	SETLOC	/=6 TO CTRA
5114	0062	CTRA	
5115	7772	=6	
5116	4775	P4T46A, JMS WOSWS	
5117	2062	ISZ CTRA	/ALL LINES TYPED?
5120	5316	JMP P4T46A	/NO, REPEAT
5121	5425	JMP I CHAIN	/YES, CHAIN

/KSR37, KSR35, OR ASR35 TAB TEST

5122	0047	P4TS47, 47	
5123	5231	P4TS50	
5124	4555	CKSR37	/KSR37?
5125	5346	JMP TBTB	/NO,
5126	4573	TYPE	/YES, TYPE TITLE
5127	6267	TBTST	
5130	1121	TAD (=11	/=9 TO CTRA
5131	4771	JMS MTABP	/GO TO SUB TO MARK TAB POSITIONS,
5132	1370	TAD (=12	/SET TAB COUNT
5133	3340	DCA TBCNT	/TO =10
5134	1367	TAD (=7	/YES, =7 TO CTRA
5135	3062	DCA CTRA	

/PDP-8/E TELETYPE CONTROL TEST, (KL8) PAL10 V141 14-MAY-71 11:00 PAGE 1-61

5136	3361	DCA SPCNT	/2 TO SPACE COUNT
5137	4766'	JMS TABP	/GO TAB AND PRINT SLASH 9 TIMES.
5140	0000	TBCNT, OPEN	/TAB COUNT.
5141	2062	ISZ CTRA	/DONE?
5142	7410	SKP	/NO,
5143	5425	JMP I CHAIN	/YES, CHAIN
5144	2361	ISZ SPCNT	/INCREMENT SPACE COUNT
5145	5337	JMP TBTA+3	/REPEAT
5146	4553	TBTB, CKSR35	/KSR, ASR35?
5147	5425	JMP I CHAIN	/NO, BYPASS TEST
5150	4573	TYPE	/YES, TYPE TITLE
5151	6267	TBTST	
5152	1367	TAD (=7	/=7 TO CTRA
5153	4771'	JMS MTABP	/GO TO SUB TO MARK TAB POSITIONS.
5154	4573	TYPE	/YES,
5155	6301	TBMRK+1	
5156	1121	TAD [=11	/SET TAB COUNT
5157	3340	DCA TBCNT	/TO =9
5160	5334	JMP TBTA	
5161	0000	SPCNT, OPEN	
5162	0000	SPCTR, OPEN	

5166	5201		
5167	7771		
5170	7766		
5171	2162		
5172	1153		
5173	1135		
5174	1117		
5175	2153		
5176	1066		
5177	1627		
	5200	PAGE	

5200	0000	TABCTR, OPEN	
5201	0000	TABP, OPEN	
5202	1601	TAD I TABP	/SET TABCTR
5203	3200	DCA TABCTR	
5204	2201	ISZ TABP	
5205	4575	CRLF	/CRLF ONCE
5206	7777	=1	
5207	1777'	SPAC, TAD SPCNT	/GET SPACE COUNT
5210	7450	SNA	/?
5211	5220	JMP TABPA	/YES, DON'T SPACE
5212	7041	CIA	/NO, NEGATE COUNT
5213	3776'	DCA SPCTR	
5214	1142	TAD [=240	/SPACE
5215	4474	JMS I UPUNCH	
5216	2776'	ISZ SPCTR	/DONE SPACING?
5217	5214	JMP ,=3	/NO, SPACE AGAIN
5220	1140	TABPA, TAD [=11	/GET TAB CODE
5221	4474	JMS I UPUNCH	/OUTPUT TO TELEPRINTER
5222	4474	JMS I UPUNCH	/DUMMY CYCL
5223	4474	JMS I UPUNCH	/DUMMY CYCL

/PDP=8/E TELETYPE CONTROL TEST. (KLB) PAL10 V141 14-MAY-71 11:00 PAGE 1-62

5224	1132	TAD C257	/GET "/" CODE
5225	4474	JMS I UPUNCH	/AND TYPE IT
5226	2200	ISZ TABCTR	/DONE?
5227	5207	JMP SPAC	/NO, REPEAT
5230	5601	JMP I TABP	/YES, EXIT

/KSR37 BACKSPACE TEST.

5231	0050	P4TS50, 50	
5232	4623	P4TS4	
5233	4555	CKSR37	/KSR37?
5234	5425	JMP I CHAIN	/NO
5235	4573	TYPE	/YES, TYPE TITLE
5236	6293	BKSPT	
5237	1124	TAD L=51	
5240	3062	DCA CTRA	
5241	4573	TYPE	/TYPE ALTERNATE U'S.
5242	6574	BKSU	
5243	2062	ISZ CTRA	/DONE?
5244	5241	JMP .=3	/NO,
5245	1375	TAD L=47	
5246	3062	DCA CTRA	
5247	4263	JMS BKSPC	/BACKSPACE TWICE
5250	7776	=2	
5251	1774	TAD C252	/TYPE "*"
5252	4474	JMS I UPUNCH	
5253	4263	JMS BKSPC	/BACKSPACE THRICE
5254	7775	=3	
5255	1774	TAD C252	/TYPE "**"
5256	4474	JMS I UPUNCH	
5257	2062	ISZ CTRA	/DONE 39 TIMES?
5260	5253	JMP .=5	/NO,
5261	5425	JMP I CHAIN	/YES, CHAIN
5262	0000	BKSCTR, OPEN	
5263	0000	BKSPC, OPEN	
5264	1663	TAD I BKSPC	/GET BACKSPACE COUNT
5265	3262	DCA BKSCTR	/AND STORE AT BKSCTR
5266	2263	ISZ BKSPC	/SET UP EXIT
5267	1373	TAD (210	/GET BACKSPACE CODE
5270	4474	JMS I UPUNCH	/OUTPUT TO TELEPRINTER
5271	2262	ISZ BKSCTR	/DONE BACKSPACING?
5272	5267	JMP .=3	/NO, REPEAT
5273	5663	JMP I BKSPC	/YES, EXIT

/PROGRAM 5, PUNCH TEST

5274	4577	PRG5, SETLOC	/SET INTERRUPT SERVICE ADDRESS
5275	0002	2	/TO INTSVC
5276	1254	INTSVC	
5277	4577	SETLOC	/SET DATA BLOCK
5300	0101	BLKCNT	/LENGTH TO
5301	7000	=1000	
5302	4571	UKCC	

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5303	1372	TAD (BLOCKA	/SET UP ADDRESS TO
5304	3104	DCA UTEMP	/STORE DATA,
5305	1371	TAD (=1000	
5306	3062	DCA CTRA	
5307	4770	JMS SINPT	/INITIALIZE SPECIAL COUNT PATTERN
5310	4767	JMS SGET	/GET CHARACTER
5311	3504	DCA I UTEMP	/STORE IT
5312	2104	ISZ UTEMP	/INCREMENT PINTER.
5313	2062	ISZ CTRA	/DONE 512 CHARACTERS?
5314	5310	JMP ,+4	/NO, REPEAT
5315	4372	UKSF	
5316	5315	JMP ,+1	
5317	7200	PRG5A,	/YES, CLEAR READY BUSY
5320	3076	DCA RBUSY	
5321	4766	JMS PLTLR	/PUNCH LEADER
5322	4765	JMS PSYNC	/PUNCH SYNC CHARACTER
5323	4764	JMS PBLK	/PUNCH DATA BLOCK FULL SPEED.
5324	4766	JMS PLTLR	/PUNCH TRAILER
5325	4763	JMS RSYNC	/SYNC READER
5326	4762	JMS RDBLK	/READ DATA BLOCK
5327	4761	JMS RRDY	/WAIT FOR READER NOT BUSY
5330	4766	JMS PLTLR	/PUNCH LEADER
5331	4765	JMS PSYNC	/PUNCH SYNC CHARACTER
5332	4760	JMS PBLKR	/PUNCH DATA BLOCK (WITH STALLS).
5333	4766	JMS PLTLR	/PUNCH TRAILER
5334	4763	JMS RSYNC	/SYNC READER
5335	4762	JMS RDBLK	/READ DATA BLOCK
5336	4761	JMS RRDY	/WAIT FOR READER NOT BUSY
5337	5347	JMP PRG5A	/REPEAT.

/PROGRAM 6, KEYBOARD TEST

5340	4577	PRG6,	SETLOC	/SET KSTART TO INITIAL
5341	0023		KSTART	/ROUTINE ADDRESS
5342	5400		P6T0	
5343	4573		TYPE	/PRINT
5344	6432		KMSG1	
5345	5746		JMP I ,+1	
5346	0236		SRSET	

5360	1324
5361	1343
5362	1400
5363	1216
5364	1316
5365	1212
5366	1200
5367	1721
5370	1711
5371	7000
5372	6577
5373	0210
5374	6164
5375	7731
5376	5162

5377 5161
5400 PAGE

/CLEAR AC AND FLAG (KCC), WAIT FOR FLAG TO SET, WITH FLAG SET, SKIP /ON FLAG 4999 TIMES, KSF SHOULD SKIP EVERY TIME.

5409	8868	
5401	5424	P6T1
5402	4431	JMS I S46000
5403	4571	UKCC
5404	4570	TYPE
5405	6443	KMSG2
5406	4572	UKSF
5407	5296	JMP ,=1
5408	5297	/READY?
5409	5298	UKSF
5410	5299	JMP P6E8
5411	5290	/READY, SKIP ON FLAG
5412	5291	JMP CTRA
5413	5292	/ALL DONE?
5414	5293	JMP ,=S
5415	5294	/NO, REPEAT
5416	5295	JMP I CHAIN
5417	5296	/YES, CHAIN
5418	7568	P6E8, MLT CLA
5419	5297	/KSF FAILURE
5420	5298	UKSF
5421	5299	JMP ,=S
5422	5290	/SKIPS ON FLAG
5423	5291	JMP ,=S
5424	5292	/CONTINUOUSLY

/ECHO TEST CHARACTER RECEIVED FROM KEYBOARD IS TYPED. THE /CHARACTER TYPED SHOULD MATCH CHARACTER KEYED. RUBCUT CHARCTER /ENDS ROUTINE.

5425	5293	P6T1,
5426	4573	1
5427	4572	P6Y2
5428	5226	UKCC
5429	4567	TYPE
5430	4566	KMSG3
5431	5232	UKSF
5432	4566	JMP ,=1
5433	5232	/READY?
5434	1144	UKRB
5435	7440	JMP ,=1
5436	5226	UTLS
5437	5425	UTSF
		/PRINT IT
		UKSF
		JMP ,=1
		/PRINTER READY?
		TAD C=377
		SEA
		JMP P6T1A
		/IS IT RUBOUT?
		JMP I CHAIN
		/NO
		/YES, CHAIN

/OCTAL EQUIVALENT TEST, THE OCTAL EQUIVALENT OF ANY /CHARACTER KEYED IS PRINTED, RUBOUT ENDS ROUTINE.

5440	0002	P6T2,
5441	7777	2
5442	4571	7777
5443	4573	UKCC
		TYPE
		/CLEAR AC AND FLAG
		/PRINT TITLE AND

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5444	6521	KMSG4	/INSTRUCTION
5445	4573	TYPE	
5446	6462	KMSG3A	
5447	4572	P6T2A,	UKSF /FLAG 17
5450	5247	JMP ,+1	/NO, WAIT
5451	4567	UKRB	/YES, READ KEYBOARD
5452	3112	DCA WTS6A	/STORE CHARACTER
5453	4777	JMS ASCON	/CONVERT CHARACTER
5454	8112	WTS6A	/TO PRINTABLE OCTAL.
5455	6541	OCTEOV	
5456	4573	TYPE	/PRINT CHARACTER
5457	6537	KMSG5	
5460	1112	TAD WTS6A	
5461	1144	TAD C=377	
5462	7648	SEA CLA	/WAS IT A SUBROUTINE?
5463	5247	JMP P6T2A	/NO:
5464	8425	JMP I CHAIN	/YES, CHAIN

/PROGRAM 7, COMBINED READER, PRINTER, PUNCH TEST.

5465	4577	PRG7,	SETLOC /SET INTERRUPT SERVICE
5466	0002		2 /ADDRESS TO INTSVC
5467	1234		INTSVC
5470	4577	SETLOC	/SET DATA BLOCK LENGTH
5471	8101	BLKCNT	/TO =150
5472	7552		-226
5473	4426	JMS I KBFLAG	
5474	4776	JMS STBF	/SET UP BUFFER AREA
5475	4577	SETLOC	/SET KSTART TO INITIAL
5476	0023	KSTART	/ROUTINE ADDRESS
5477	5502	P7T0	
5500	5701	JMP I ,+1	/START PROGRAM
5501	0236	SRSET	
5502	0000	P7T0,	0
5503	5506	P7T1	
5504	4435	JMS I FBF	/DATA1 ABC
5505	6107	A	
5506	0001	P7T1,	1
5507	5512	P7T2	
5510	4435	JMS I FBF	/DATA1 DEF
5511	6112	D	
5512	0002	P7T2,	2
5513	5516	P7T3	
5514	4435	JMS I FBF	/DATA1 GHI
5515	6115	G	
5516	0003	P7T3,	3
5517	5522	P7T4	
5520	4435	JMS I FBF	/DATA1 JKL
5521	6120	J	
5522	0004	P7T4,	4
5523	5526	P7T5	
5524	4435	JMS I FBF	/DATA1 MNO
525	6123	M	
5526	0005	P7T5,	5

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5527	5532	P7T6	
5530	4435	JMS I FBF	/DATA1 PQR
5531	6126	P	
5532	0006	P7T6,	6
5533	5536	P7T7	
5534	4435	JMS I FBF	/DATA1 STU
5535	6131	S	
5536	0007	P7T7,	7
5537	5542	P7T10	
5540	4435	JMS I FBF	/DATA1 VWX
5541	6134	V	
5542	0010	P7T10,	10
5543	5546	P7T11	
5544	4435	JMS I FBF	/DATA1 YZ0
5545	6137	Y	
5546	0011	P7T11,	11
5547	5552	P7T12	
5550	4435	JMS I FBF	/DATA1 123
5551	6142	ONE	
5552	0012	P7T12,	12
5553	5556	P7T13	
5554	4435	JMS I FBF	/DATA1 456
5555	6145	FOUR	
5556	0013	P7T13,	13
5557	5562	P7T14	
5560	4435	JMS I FBF	/DATA1 789
5561	6150	SEVEN	
5562	0014	P7T14,	14
5563	5566	P7T15	
5564	4435	JMS I FBF	/DATA1 !%"
5565	6153	C241	
5566	0015	P7T15,	15
5567	5572	P7T16	
5570	4435	JMS I FBF	/DATA1 \$%&
5571	6156	C244	
5572	0016	P7T16,	16
5573	5600	P7T17	
5574	4435	JMS I FBF	/DATA1 '()
5575	6161	C247	
5576	1000		
5577	1650		
	5600	PAGE	
5600	0017	P7T17,	17
5601	5604	P7T20	
5602	4435	JMS I FBF	/DATA1 **,
5603	6164	C252	
5604	0020	P7T20,	20
5605	5610	P7T21	
5606	4435	JMS I FBF	/DATA1 =,/
5607	6167	C255	
5610	0021	P7T21,	21
5611	5614	P7T22	

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5612	4435	JMS I FBF	/DATA1 :)<
5613	6172	C272	
5614	0022	P7T22,	22
5615	5620	P7T23	
5616	4435	JMS I FBF	/DATA1 =>?
5617	6175	C275	
5620	0023	P7T23,	23
5621	5624	P7T24	
5622	4435	JMS I FBF	/DATA1 @\n
5623	6200	C300	
5624	0024	P7T24,	24
5625	5630	P7T25	
5626	4435	JMS I FBF	/DATA1]^ AND LEFT ARROW
5627	6203	C335	
5630	0025	P7T25,	25
5631	5634	P7T26	
5632	4777'	JMS FBALL	/DATA1 ALL PRINTABLE ASCII
5633	4776'	JMS CNTST	

5634	0026	P7T26,	26
5635	5640	P7T27	
5636	4775'	JMS FW336	/DATA1 ASR33 PRINTER WORST CASE
5637	4776'	JMS CNTST	/PATTERN
5640	0027	P7T27,	27
5641	5644	P7T30	
5642	4774'	JMS FW356	/DATA1 ASR35 PRINTER WORST CASE
5643	4776'	JMS CNTST	/PATTERN
5644	0030	P7T30,	30
5645	7777	7777	
5646	4773'	JMS FBF3	/DATA1 1'S AND 0'S
5647	6245	C377	
5650	4776'	JMS CNTST	

/PROGRAM 10. READS COUNT PATTERN.

5651	4465	PRG10,	JMS I SYNC	/SYNC TAPE
5652	3321		DCA ERRCTR	/CLEAR ERROR COUNTER
5653	4466		JMS I INPATT	/INITIALIZE PATTERN.
5654	4571		UKCC	/START READER
5655	7604	SRT0A,	LAS	/READ SR
5656	0120		AND L400	
5657	7650		SNA CLA	/STALL? (SR3=0)
5660	7040		CMA	/YES
5661	3064		DCA STLID	/NO
5662	4467	SRT0B,	JMS I GETPT	/GET PATTERN CHAR,
5663	3273		DCA SBSP	/STORE AT SBSP,
5664	4556		STALL	/STALL
5665	4572		UKSF	/READY?
5666	5265		JMP .-1	/TEST AGAIN,
5667	4567		UKRB	/READ, CLEAR AC AND FLAG.
5670	3103		DCA ERRCR	
5671	1103		TAD ERRCR	

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5672	4470	JMS I CHECK	/GO CHECK CHARACTER WORD.
5673	0000	SBSP, 0	/
5674	7410	SKP	/ERROR, NO MATCH, GO INC. ERRCNT
5675	5313	JMP HLTTST	/CK,
5676	2321	ERRCNT, ISZ ERRCTR	/INCREMENT ERROR COUNTER
5677	5302	JMP ,+3	
5700	7240	CLA CMA	/CFLOW, RESET TO 7777.
5701	3321	DCA ERRCTR	
5702	7604	LAS	/READ SR,
5703	0143	AND E100	
5704	7650	SNA CLA	/HALT ON ERROR? (SR5)
5705	5313	JMP HLTTST	/NO,
5706	1103	TAD ERRCR	/YES, GET BAD CHAR,
5707	7402	HLT	
5710	7200	CLA	
5711	1273	TAD SBSP	/GET GOOD CHARACTER
5712	7402	HLT	
5713	7604	HLTTST, LAS	/READ SR
5714	7700	SMA CLA	/HALT? (SR0)
5715	5255	JMP SRT0A	/NO,
5716	1321	TAD ERRCTR	/GET ERROR COUNT
5717	7402	HLT	/HALT, ERROR COUNT IN AC
5720	5255	JMP SRT0A	
5721	0000	ERRCTR, 0	/ERROR COUNTER

/PROGRAM 11. PRINTER EXERCISER, TYPES LINES OF ANY 3 CHARACTERS
/WITH STALLS, OR FULL SPEED, KEYBOARD CONTROLLED.

5722	4772'	PRG11, JMS STBF	
5723	4573	TYPE	
5724	6546	P11MG1	
5725	1371	PRG11A, TAD (BLOCK1-1	
5726	3016	DCA 16	
5727	4573	TYPE	
5730	6562	P11MG2	
5731	4353	JMS GKBKR	
5732	3416	DCA I 16	
5733	4353	JMS GKBKR	
5734	3416	DCA I 16	
5735	4353	JMS GKBKR	
5736	3416	DCA I 16	
5737	4353	JMS GKBKR	
5740	1144	TAD E=377	
5741	7640	SEA CLA	/STALL?
5742	7240	CLA CMA	/YES,
5743	3064	DCA STLIC	/NO,
5744	4773'	JMS FBF3	/SET UP LINE.
5745	6601	BLOCK1	
5746	4770'	JMS TYPLN	/TYPE LINE OF CHARACTERS
5747	7604	LAS	/READ SR,
5750	7700	SMA CLA	/CHANGE DATA? (SR2=1)
5751	5346	JMP ,+3	/NO,
5752	5325	JMP PRG11A	/YES,
5753	0000	GKBKR, OPEN	/SUB TO GET KEYBOARD CHARACTER,
5754	4572	UKSF	/WAIT FOR FLAG.

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5755	5354	JMP .~1	
5756	4567	UKRB	/READ CHARACTER.
5757	7421	MQL	/STORE CHARACTER.
5760	7701	ACL	/GET IT BACK.
5761	4474	JMS I UPUNCH	/ECHO IT.
5762	7701	ACL	/GET CHARACTER AGAIN.
5763	5723	JMP I GKBCR	/EXIT

/PROGRAM 12. PUNCHES BINARY COUNT PATTERN.

5764	4466	PRG12, JMS I INPATT	/INITIALIZE BINARY COUNT PATTERN
5765	4467	JMS I GETPT	/GET BINARY COUNT CHARACTER.
5766	4474	JMS I UPUNCH	/PUNCH CHARACTER
5767	5365	JMP .~2	/REPEAT.

5770	1627		
5771	6600		
5772	1000		
5773	1031		
5774	1135		
5775	1117		
5776	1600		
5777	1066		
	6000	PAGE	

6000	5000	DVCSEL, OPEN	/DEVICE CODE SELECT ROUTINE.
6001	1117	TAD CINTAB	/GET START ADDR OF INPUT IOT TABLE,
6002	3052	DCA TEMP	/AND SAVE AT TEMP,
6003	1021	TAD TTYIOT	/OBTAIN NEW INPUT IOT AND
6004	7012	RTR	/STORE AT UTEMP.
6005	7010	RAR	
6006	0116	AND E0770	
6007	3104	DCA UTEMP	
6010	4222	JMS DVCOM	
6011	1115	TAD COUTTAB	/PERFORM INPUT IOT SELECTION,
6012	3052	DCA TEMP	/GET START ADDR OF OUTPUT IOT TABLE,
6013	1021	TAD TTYIOT	/AND OBTAIN NEW OUTPUT IOT AND
6014	7006	RTL	/OBTAIN NEW OUTPUT IOT AND
6015	7004	RAL	/STORE AT UTEMP.
6016	0116	AND E0770	
6017	3104	DCA UTEMP	
6020	4222	JMS DVCOM	
6021	5600	JMP I DVCSEL	/PERFORM OUTPUT IOT SELECTION.
6022	0000	DVCOM, OPEN	/EXIT DVCSEL,
6023	1452	TAD I TEMP	/COMMON SUB TO SELECT IOT'S.
6024	7450	SNA	
6025	5622	JMP I DVCOM	
6026	3105	DCA UTEMP1	
6027	1505	TAD I UTEMP1	
6030	2114	AND E7007	/REMOVE OLD DEVICE CODE.
6031	1104	TAD UTEMP	/INSERT NEW DEVICE CODE.
6032	3505	DCA I UTEMP1	/PUT BACK NEW IOT CODE.
6033	2052	ISZ TEMP	/SET R FOR NEXT IOT CODE.
6034	5223	JMP DVCOM+1	

6035	0720	INTAB,	XKSF+1
6036	0725		XKCC+1
6037	0731		XKRS+1
6040	0735		XKRB+1
6041	0756		XKCR+1
6042	0762		XKIE+1
6043	2021		INTKSF
6044	1233		RSSERV
6045	1264		INKSF
6046	1433		INO
6047	0000		0
6050	0741	OUTTAB,	XTSF+1
6051	0746		XTCF+1
6052	1172		XTPC+1
6053	0752		XTLS+1
6054	1166		XSPF+1
6055	0766		XSPI+1
6056	1261		INTCF
6057	1257		INTSF
6060	2024		INTTSF
6061	2114		OUT0
6062	2121		OUT1
6063	2123		OUT2
6064	0000		0
6065	0247	A33WP6,	0247
6066	0337		0337
6067	0327		0327
6070	0257		0257
6071	0327		0327
6072	0337		0337
6073	0247	A35WP6,	0247
6074	0333		0333
6075	0277		0277
6076	0303		0303
6077	0277		0277
6100	0333		0333
6101	0316	A37WP6,	0316
6102	0361		0361
6103	0301		0301
6104	0376		0376
6105	0301		0301
6106	0361		0361
6107	0301	A,	301
6110	0302		302
6111	0303		303
6112	0304	D,	304
6113	0305		305
6114	0306		306
6115	0307	G,	307

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6116	0310	310	
6117	0311	311	
6120	0312	J,	312
6121	0313		313
6122	0314		314
6123	0315	M,	315
6124	0316		316
6125	0317		317
6126	0320	P,	320
6127	0321		321
6130	0322		322
6131	0323	S,	323
6132	0324		324
6133	0325		325
6134	0326	V,	326
6135	0327		327
6136	0330		330
6137	0331	Y,	331
6140	0332		332
6141	0260		260
6142	0261		261
6143	0262		262
6144	0263		263
6145	0264	ONE,	264
6146	0265		265
6147	0266		266
6150	0267	SEVEN,	267
6151	0270		270
6152	0271		271
6153	0241	C241,	241
6154	0242		242
6155	0243		243
6156	0244	C244,	244
6157	0245		245
6160	0246		246
6161	0247	C247,	247
6162	0250		250
6163	0251		251
6164	0252	C252,	252
6165	0253		253
6166	0254		254
6167	0255	C255,	255
6170	0256		256
6171	0257		257
6172	0272	C272,	272
6173	0273		273
6174	0274		274
6175	0275	C275,	275
6176	0276		276
6177	0277		277
6200	0300	C300,	300
6201	0333		333
6202	0334		334
6203	0335	C335,	335

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6204	0336		336
6205	0337		337
6206	2341	SA,	341
6207	0342		342
6210	0343		343
6211	0344	SD,	344
6212	0345		345
6213	0346		346
6214	0347	SG,	347
6215	0350		350
6216	0351		351
6217	0352	SJ,	352
6220	0353		353
6221	0354		354
6222	0355	SM,	355
6223	0356		356
6224	0357		357
6225	0360	SP,	360
6226	0361		361
6227	0362		362
6230	0363	SS,	363
6231	0364		364
6232	0365		365
6233	0366	SV,	366
6234	0367		367
6235	0370		370
6236	0371	SY,	371
6237	0372		372
6240	0340		340
6241	0373	C373,	373
6242	0374		374
6243	0375		375
6244	0376		376
6245	0377	C377,	377
6246	0000		000
6247	0377		377
6250	4543	CARLF,	TEXT '%%#@?'
6251	0077		
6252	0000		
6253	4543	BKSPT,	TEXT '%%%BACKSPACE TEST%%%@?'
6254	4302		
6255	0103		
6256	1323		
6257	2001		
6260	0305		
6261	4024		
6262	0523		
6263	2445		
6264	4343		
6265	0077		
6266	2000		
6267	4543	TBTST,	TEXT '%%%TAB TEST%%%@?'
6270	4324		
6271	0102		

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6272 4024
6273 0523
6274 2445
6275 4343
6276 0077
6277 2000
6300 4040 TBMRK, TEXT ' /@? '
6301 4040
6302 4040
6303 4040
6304 5700
6305 7700
6306 4040 TBMRK1, TEXT ' /@? '
6307 4040
6310 4040
6311 4057
6312 0077
6313 0000
6314 5511 RM33B, TEXT ' =I-@? '
6315 5500
6316 7700
6317 5555 RM37A, TEXT ' ----I-@? '
6320 5555
6321 1155
6322 1100
6323 7700
6324 3440 SPTSTC, TEXT ' \ @? '
6325 0077
6326 0000
6327 4543 CRTST, TEXT ' %##CR TEST%##@? '
6330 4303
6331 2240
6332 2405
6333 2324
6334 4543
6335 4300
6336 7700
6337 4543 RMTST, TEXT ' %##RIGHT MARGIN TEST%##@? '
6340 4322
6341 1107
6342 1024
6343 4015
6344 0122
6345 2711
6346 1640
6347 2405
6350 2324
6351 4543
6352 4300
6353 7700
6354 4543 SPTST, TEXT ' %##SPACE TEST%##@? '
6355 4323
6356 2001
6357 0305
6360 4024

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6361 0523
6362 2445
6363 4343
6364 2077
6365 2000
6366 4543 LFTST, TEXT '%%&F TEST%%@?'
6367 4314
6370 0640
6371 2405
6372 2324
6373 4543
6374 4300
6375 7700
6376 4543 CHRTST, TEXT '%%&CHARACTER TESTS%%@?'
6377 4303
6400 1001
6401 2201
6402 0324
6403 0522
6404 4024
6405 0523
6406 2423
6407 4543
6410 4300
6411 7700
6412 4543 WCPTST, TEXT '%%&WORST CASE PATTERN TEST%%@?'
6413 4327
6414 1722
6415 2324
6416 4003
6417 0123
6420 0540
6421 2001
6422 2424
6423 0522
6424 1640
6425 2405
6426 2324
6427 4543
6430 4300
6431 7700
6432 4543 KMSG1, TEXT '%%&KYBD TEST%%@?'
6433 4313
6434 3102
6435 0440
6436 2405
6437 2324
6440 4543
6441 0077
6442 0000
6443 4543 KMSG2, TEXT '%%&PRESS A KEY%%@?'
6444 2022
6445 2523
6446 2340
6447 0140

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6450 1305
6451 3145
6452 4300
6453 7700
6454 4543 KMSG3, TEXT '%#ECHO TEST'
6455 0503
6456 1017
6457 4024
6460 0523
6461 2400
6462 4543 KMSG3A, TEXT '%#CHARACTER KEYED WILL BE TYPED.'
6463 0310
6464 0122
6465 0103
6466 2405
6467 2240
6470 1305
6471 3105
6472 0440
6473 2711
6474 1414
6475 4002
6476 0540
6477 2431
6500 2005
6501 0456
6502 0000
6503 4543 TEXT '%#RUBOUT ENDS ROUTINE.%#@?'
6504 2225
6505 0217
6506 2524
6507 4005
6510 1004
6511 2340
6512 2217
6513 2524
6514 1116
6515 0556
6516 4543
6517 4300
6520 7700
6521 4543 KMSG4, TEXT '%#OCTAL EQUIVALENT TEST@?'
6522 4317
6523 2324
6524 2114
6525 4005
6526 2125
6527 1126
6530 0114
6531 0516
6532 2440
6533 2425
6534 2324
6535 0077
6536 0000

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6537 4543 KMSG5, TEXT ' %#'
6540 2000
6541 4040 OCTEQV, TEXT ' ' '%#@?'
6542 4040
6543 4543
6544 2077
6545 0000
6546 4543 P11MG1, TEXT ' %#PRINTER EXERCISER%#@?'
6547 2022
6550 1116
6551 2405
6552 2240
6553 0530
6554 0522
6555 0311
6556 2305
6557 2245
6560 4300
6561 7700
6562 4543 P11MG2, TEXT ' %#TYPE IN DATA 1@?'
6563 2431
6564 2005
6565 4011
6566 1640
6567 0401
6570 2401
6571 4072
6572 0077
6573 0000
6574 2540 BKSU, TEXT ' U @?'
6575 0077
6576 0000
6577 0000 END, 0 /BEG OF 100 WORD BUFFER

\$

0114 7007
0115 6050
0116 0770
0117 6035
0120 0400
0121 7767
0122 7730
0123 0004
0124 7727
0125 0005
0126 6317
0127 7761
0130 6314
0131 7762
0132 7257
0133 2334
0134 2252
0135 7650
0136 7670
0137 7653

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0140 0011
0141 7754
0142 0240
0143 0100
0144 7401
0145 0377
0146 0077
0147 7760
0150 0037
0151 7766
0152 0017
0153 0360
0154 2352
0155 0366
0156 0551
0157 0765
0160 1165
0161 0761
0162 0755
0163 0751
0164 1171
0165 0745
0166 0740
0167 0734
0170 0730
0171 0724
0172 0717
0173 0626
0174 0600
0175 0562
0176 0337
0177 0326

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4000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4100 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111

4200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4300 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111

4400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4500 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111 00001111

4600 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
4700 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111000 70000001

5000 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
5100 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11100011 11111111

5200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
5300 11111111 11111111 11111111 11111111 11111111 11111110 00000000 11111111 11111111

5400 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
5500 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111

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

5800 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
6100 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111

6200 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111
6300 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111 11111111

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

6600
6700

7000
7100

7200
7300

7400
7500

7600
7700

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A	6107	CR	0107	IN2	1433	NXTST	2256
A33WP6	6065	CRALF	0562	INCRTN	2261	OCTEGV	6541
A35WP6	6073	CRCTR	0561	INKSF	1264	ONE	6142
A37WP6	6101	CRLF	4575	INPATT	2066	OPEN	2227
AC	2077	CRTST	6327	INTAB	6035	OUT	1271
ACL	7701	CRTSTA	4456	INTCF	1261	OUT2	2114
ASCCN	1650	CRTSTB	4461	INTEND	2017	OUT1	2121
ASCT	1710	CTRA	0062	INTKSF	2021	OUT2	2123
BAUORT	0022	CTR8	0063	INTSF	1257	OUTTAB	6052
BDRRET	2205	CTSK	0550	INTSVC	1254	P	6126
BKSCTR	5262	CURTST	0054	INTTSF	2024	P0E0A	2237
BKSPC	5263	D	6112	IOF	8002	P0E0B	2244
BKSPT	6253	DBLK	7577	ION	6001	P0E0C	2253
BKSU	6574	DELAY	4576	J	6120	P0E0E	2262
BLK2	6724	DELAYM	0024	K5208	2731	P0E1A	2324
BLKBB	6722	DELAYS	0102	KBFLAG	0026	P0E1B	2315
BLKCC	7034	DLCNT	0474	KCC	6032	P0E2A	2415
BLKCONT	0101	DLCNT1	0027	KCR	6030	P0E2B	2427
BLOCK1	6601	DLMSR	1474	KFLAG	1365	P0E2C	2435
BLOCK2	6713	DLYMS	0337	KIE	6035	P0E2D	2443
BLOCKA	6577	DLYMSK	0111	KMSG1	6432	P0E2E	2456
BLOCKB	6711	DVCOM	6022	KMSG2	6443	P0E2F	2465
BLOCKC	7023	DVCSEL	6000	KMSG3	6454	P0E2G	2474
SSW	7002	END	6577	KMSG3A	6462	P0E3A	2527
C241	6153	ERRCNT	5676	KMSG4	6521	P0E3B	2534
C244	6156	ERRCR	0103	KMSG5	6537	P0E3C	2542
C247	6161	ERRCTR	5721	KRB	6036	P0E4A	2607
C252	6164	ERROR	1440	KRS	6034	P0E4B	2614
C255	6167	FADDR	0623	KSF	6031	P0E5A	2650
C272	6172	FBAJ33	1102	KSTART	0023	P0E5B	2652
C275	6175	FBALL	1066	LDGAUD	1527	P0E6A	2664
C300	6200	FBF	0035	LF	0110	P0E6B	2671
C335	6203	FBF3	1031	LFTST	6366	P0E6C	2675
C373	6241	FBF33	1055	LFTSTA	4612	P0E6D	2726
C377	6245	FBFI	2144	LINK	0100	P0E6E	2723
CAF	6007	FETCH	1646	M	6123	P0E6F	2725
CAM	7621	FLAG	0716	M147	7631	P0E7A	2744
CARLF	6250	FORWD	0302	M3	2111	P0E7B	2752
CHAIN	0025	FOUR	6145	MCTR	3625	P0E7C	2753
CHAINN	2263	FW336	1117	MIL1	2061	P0T6	2654
CHCK	2513	FW356	1135	MILCTR	0060	P0T6A	2657
CHECK	0070	FW376	1153	MINT	6115	P0T6B	2665
CHRCNT	2456	G	6115	MOVE	4574	P0T6C	2672
CHRTST	6376	GETPT	0067	MOVEA	0613	P0T6D	2676
CK33	2352	GETRDY	0237	MOVVE	0600	P0T6E	2727
CK35	0360	GKBCR	5753	MOL	7421	P2T6F	2721
CK37	0366	GTBIN	0444	MSCTR	0057	F0T7	2732
CKSR33	4554	GTF	6004	MTABP	2162	P0T7A	2740
CKSR35	4553	HLTD	2076	MTON	6117	P0T7B	2745
CKSR37	4555	HLTTST	5713	MTRS	6127	P2T7C	2751
CNTST	1600	HOLD1	3346	NTST	1545	P2TSD	2225
CNV	1673	IBIN	0436	NTSTA	1554	P2TSDA	2211

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P0TS0B	2214	P1T12B	3456	P2T12C	4051	P4TS12	4645
P0TS0C	2222	P1TS0	3005	P2T12D	4054	P4TS11	4651
P0TS0D	2225	P1TS1	3012	P2T12E	4064	P4TS12	4655
P0TS0E	2230	P1TS1A	3014	P2T12F	4066	P4TS13	4661
P0TS1	2270	P1TS2	3034	P2T11	4153	P4TS14	4665
P0TS1A	2275	P1TS2A	3040	P2T11A	4157	P4TS15	4671
P0TS1B	2313	P1TS2B	3046	P2T11B	4166	P4TS16	4675
P0TS1C	2324	P1TS3	3066	P2T11C	4220	P4TS17	4721
P0TS2	2327	P1TS3A	3074	P2T12	4233	P4TS2	4525
P0TS2A	2332	P1TS4	3126	P2T12A	4247	P4TS20	4725
P0TS2B	2342	P1TS4A	3133	P2T12B	4255	P4TS21	4711
P0TS2C	2345	P1TS4B	3153	P2T12C	4260	P4TS22	4715
P0TS2D	2350	P1TS4C	3167	P2T50	3510	P4TS23	4721
P0TS2E	2400	P1TS5	3200	P2TS0A	3513	P4TS24	4725
P0TS2F	2402	P1TS5A	3204	P2TS1	3530	P4TS25	4731
P0TS2G	2404	P1TS5B	3211	P2TS1A	3533	P4TS26	4735
P0TS3	2504	P1TS5C	3213	P2TS1B	3534	P4TS27	4741
P0TS3A	2510	P1TS5D	3217	P2TS2	3545	P4TS3	4602
P0TS3B	2515	P1TS5E	3222	P2TS2A	3551	P4TS32	4745
P0TS3C	2521	P1TS6	3271	P2TS3	3600	P4TS31	4751
P0TS4	2544	P1TS6A	3277	P2TS3A	3606	P4TS32	4755
P0TS4A	2547	P1TS7	3314	P2TS4	3630	P4TS33	4761
P0TS4B	2565	P1TS7A	3322	P2TS4A	3635	P4TS34	5000
P0TS4C	2600	P2E0	3524	P2TS4B	3655	P4TS35	5204
P0TS5	2616	P2E1	3543	P2TS4C	3666	P4TS36	5010
P0TS5A	2624	P2E10A	4073	P2TS5	3671	P4TS37	5214
P0TS5B	2634	P2E10B	4107	P2TS5A	3677	P4TS4	4623
P11MG1	6546	P2E10C	4115	P2TS6	3711	P4TS40	5220
P11MG2	6562	P2E10D	4123	P2TS6A	3716	P4TS41	5224
P1E11A	3424	P2E10E	4135	P2TS6B	3724	P4TS42	5030
P1E12A	3464	P2E10F	4144	P2TS6C	3734	P4TS43	5047
P1E12B	3474	P2E11A	4206	P2TS7	3762	P4TS44	5054
P1E1A	3025	P2E11B	4215	P2TS7A	4000	P4TS45	5072
P1E2A	3053	P2E11C	4224	P2TS7B	4006	P4TS46	5136
P1E2B	3062	P2E12A	4276	P3E0	4337	P4TS47	5122
P1E3A	3113	P2E12B	4303	P3E1	4371	P4TS5	4631
P1E3B	3122	P2E12C	4305	P3E2	4427	P4TS50	5231
P1E4A	3143	P2E2A	3562	P3T0B	4334	P4TS6	4635
P1E5	3250	P2E2B	3564	P3T1B	4366	P4TS7	4641
P1E5A	3230	P2E3A	3621	P3T2C	4424	P6E0	5415
P1E5B	3235	P2E3B	3623	P3TS0	4314	P6T0	5422
P1E5C	3242	P2E4A	3644	P3TS0A	4324	P6T1	5421
P1E5D	3257	P2E4B	3657	P3TS1	4344	P6T1A	5426
P1E5E	3264	P2E5	3706	P3TS1A	4354	P6T2	5442
P1E6A	3310	P2E6A	3746	P3TS2	4422	P6T2A	5447
P1E710	3366	P2E6B	3752	P3TS2A	4436	P72CTR	1211
P1T10	3325	P2E6C	3756	P3TS2B	4411	P7T0	5532
P1T10A	3333	P2E7A	4015	P4T44A	5066	P7T1	5536
P1T11	3400	P2E7B	4021	P4T45A	5102	P7T12	5542
P1T11A	3405	P2T10	4030	P4T46A	5116	P7T11	5546
P1T12	3435	P2T10A	4034	P4TS0	4442	P7T12	5552
P1T12A	3443	P2T10B	4045	P4TS1	4475	P7T13	5556

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P7T14	5562	RCTRA	1511	SLDC22	3223	TLCAL-I	2126
P7T15	5566	RCTR B	1512	SM	6222	TLCALL	2233
P7T16	5572	RDBLK	1402	SNDREC	3353	TLS	6245
P7T17	5600	RDBLKR	1407	SP	6225	TPC	6244
P7T2	5512	RDRSRV	1422	SPAC	5207	TRDATA	3337
P7T20	5604	RDSRV	1432	SPCNT	5161	TSC1	2634
P7T21	5610	RGNA	0400	SPCTR	5162	TSC2	2643
P7T22	5614	RGNB	0417	SPF	6040	TSF	6241
P7T23	5620	RM33A	1562	SPI	6045	TTYIOT	2221
P7T24	5624	RM33B	6314	SPIND	1722	TTYTYP	2222
P7T25	5630	RM37A	6317	SPT0	1716	TYPAT	2654
P7T26	5634	RMB	4523	SPT1	1717	TYPE	4573
P7T27	5640	RMTST	6337	SPTST	6354	TYPEA	1637
P7T3	5516	RMTSTA	4516	SPTSTA	4535	TYPLN	1627
P7T30	5644	RP1A	0415	SPTSTB	4546	TYPLN3	1615
P7T4	5522	RP1B	0434	SPTSTC	6324	TYPSP	0668
P7T5	5526	RP2A	0416	SRQ	6003	TYPSTG	2626
P7T6	5532	RP2B	0435	SRSET	0236	UKCC	4571
P7T7	5536	RRDY	1343	SRT0A	5655	UKCR	4562
PADDR	1342	RRPP	0304	SRT0B	5662	UKIE	4561
PBLK	1316	RSCTR	1232	SS	6230	UKRB	4567
PBLKR	1324	RSSERV	1233	ST33B	1020	UKRS	4573
PCTR	1341	RSTUP	1351	STAL	0551	UKSF	4572
PDCR	1310	RSYNC	1216	STALL	4556	UMOVE	2075
PFLAG	0071	RTF	6005	START	0200	UOUT	0072
PLTLR	1200	RTNNO	0055	STBAUD	0504	UPUNCH	2074
PRG0	2200	RUDONE	1456	GTBF	1002	USPF	4560
PRG1	3000	S	6131	STCTR	0326	USPI	4557
PRG10	5651	S100	0030	STLID	0064	UTCF	4565
PRG11	5722	S100I	2012	SV	6233	UTEMP	0104
PRG11A	5725	S200	0032	SY	6236	UTEMP1	0105
PRG12	5764	S200I	2005	SYNC	0065	UTEMP2	0106
PRG2	3503	S4000	0031	SYNK	0530	UTLS	4563
PRG3	4307	S4000I	2000	SYNKA	0534	UTPC	4564
PRG4	4434	SA	6206	TABCTR	5200	UTPLN3	2273
PRG5	5274	SASC	1707	TABP	5201	UTSF	4566
PRG5A	5317	SB	1435	TABPA	5222	V	6134
PRG6	5340	SB0	4332	TADDR	0624	VCTR	1267
PRG7	5465	SB1	4364	TBCNT	5140	WASC	1706
PRGADR	2235	SB2	4420	TBMRK	6300	WCHK	2527
PRGEND	2300	SBSP	5673	TBMRK1	6306	WCPTST	6412
PRGNUM	0036	SCNT	0473	TBT A	5134	WOSWS	2153
PRGIAB	0037	SD	6211	TBTB	5146	WTS6A	2112
PRINT	2671	SETBAU	1513	TBTST	6267	XKCC	2724
PSTUP	1277	SETLOC	4577	TCF	6042	XKCR	2755
PSYNC	1212	SETRND	1742	TCTR	1647	XKIE	2751
PT0	0442	SEVEN	6152	TEMP	0052	XKRB	2734
PT1	2443	SG	6214	TEMP1	0053	XKRS	2730
PUNCH	2112	SGET	1721	TEMQ	2714	XKSF	2717
RADDR	1416	SHALT	0317	TEMR	2715	XSPF	1165
RBCTR	1417	SINPT	1711	TLC37	0034	XSPI	2765
RBUSY	2076	SJ	6217	TLC37I	2134	XTCF	2745

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XTLS	2751
XTPC	1171
XTSF	2740
Y	6137

ERRORS DETECTED 0

LINKS GENERATED 109

RUN-TIME: 34 SECONDS

3K CORE USED