

IDENTIFICATION

PRODUCT NAME: HIGH-SPEED READER/PUNCH TESTS
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HIGH SPEED READER/PUNCH TESTS
DHPCA VER A MARCH 1977

SEQ 0002

1.0 ABSTRACT

THE PCB-E HIGH-SPEED READER AND PUNCH TESTS ARE A TEST PACKAGE USED TO TEST THE TYPE PCB-E AND PCB-E HIGH-SPEED READER/PUNCH WHEN ATTACHED TO A PDP-8E SYSTEMS. THE TESTS REPAIR BASIC INPUT AND OUTPUT CONTROL LOGIC TESTS, READER AND PUNCH TESTS, READER AND PUNCH SPEED PRINTOUTS, AND PROVIDE MAINTENANCE LOOPS USEFUL IN ADJUSTING THE READER AND PUNCH.

THE AVAILABLE TEST PROGRAMS ARE:

PRG0 - BASIC READER AND READER CONTROL LOGIC TEST.
PRG1 - BASIC PUNCH AND PUNCH CONTROL LOGIC TEST.
PRG2 - READER TEST, SPECIAL BINARY COUNT PATTERN.
PRG3 - PUNCH TEST, SPECIAL BINARY COUNT PATTERN.
PRG4 - PUNCH VERIFY, SPECIAL BINARY COUNT PATTERN.
PRG5 - PUNCH TEST, RANDOM CHARACTERS.
PRG6 - PUNCH VERIFY, RANDOM CHARACTERS.
PRG7 - COMBINED READER-PUNCH TEST, SPECIAL BINARY COUNT PATTERN.
PRG10 - READ AMPLIFIER ADJUSTMENT LOOP, 1'S AND 0'S TAPE.
PRG11 - PUNCH ANY CHARACTER IN SR LOOP.
PRG12 - 1'S AND 0'S PUNCH LOOP.
PRG13 - READER SPEED PRINT LOOP.
PRG14 - PUNCH SPEED PRINT LOOP.
PRG15 - READ X CHARACTERS, STALL Y MS LOOP.

2.0 REQUIREMENTS

2.1 EQUIPMENT

PDP-8E WITH ASR33/35 TELETYPE, PRB-E READER, OR PRP-E PUNCH, OR PUB-E READER/PUNCH. THE FOLLOWING TAPES ARE REQUIRED IN CONJUNCTION WITH THIS TEST:

MAINDEC-GB-D2G1-PT
MAINDEC-GB-D2G2-PT
MAINDEC-GB-D2G4-PT

2.2 STORAGE

LOCATIONS 0000 THROUGH 4377 ARE USED.

2.3 PRELIMINARY PROGRAMS

ALL BASIC CPU AND TELETYPE MAINDEC'S MUST HAVE BEEN RUN SUCCESSFULLY.

3.0 LOADING PROCEDURE

THE BINARY LOADER IS USED TO LOAD THE PROGRAM.

4.0 USE PROCEDURES

THE FOLLOWING PAGES EXPLAIN IN DETAIL THE STEPS NECESSARY TO

RUN EACH PROGRAM.

4.1 PRG0 USE PROCEDURE

- A. INSURE THAT THE TELETYPE IS ON-LINE.
- B. LOAD READER WITH ALL 0'S TEST TAPE, PREFERABLY THE TAPE SHOULD BE SPLICED INTO A LOOP.
- C. LOAD ADDRESS 0200.
- D. SET SR TO 0000. PRESS START.
- E. PROGRAM HALTS AT LOC 0242 TO PERMIT SETTING OF SR OPTIONS. SET DESIRED OPTIONS AND PRESS CONTINUE.

PRG0 SR OPTIONS

- SR0 HALT AT ROUTINE END. ROUTINE NUMBER IN AC.
- SR1 SELECT ROUTINE WHOSE NUMBER IS SET IN SR0-SR11.
- SR2 LOOP PROGRAM.
- SR3 0=HALT ON ERROR. 1=DO NOT HALT ON ERROR.
- SR4 SKIP TEST AFTER ERROR.
- SR5 ENTER SCOPE LOOP AFTER ERROR.
- SR6 THROUGH ROUTINE NUMBER TO BE SELECTED.
- SR11

- F. THE PROGRAM RUNS AND HALTS AT PROGRAM END HALT. AT LOC 0305 UNLESS PREVENTED FROM ENDING BY ERRORS, OR SR OPTIONS.

4.2 PRG1 USE PROCEDURE

- A. INSURE THAT TELETYPE IS ON-LINE.
- B. MAKE PUNCH READY, INSURING THAT THERE ARE SEVERAL INCHES OF BLANK LEADER.
- C. LOAD ADDRESS 0200.
- D. SET SR TO 0001. PRESS START.
- E. PROGRAM HALTS AT LOC 0242 TO PERMIT SETTING OF SR OPTIONS. SET DESIRED OPTIONS AND PRESS CONTINUE.

PRG1 SR OPTIONS

- SR0 HALT AT ROUTINE END. ROUTINE NUMBER IN AC.
- SR1 SELECT ROUTINE WHOSE NUMBER IS SET IN SR0-SR11.
- SR2 LOOP PROGRAM.
- SR3 0=HALT ON ERROR. 1=DO NOT HALT ON ERROR.
- SR4 SKIP TEST AFTER ERROR.
- SR5 ENTER SCOPE LOOP AFTER ERROR.
- SR6 THROUGH ROUTINE NUMBER TO BE SELECTED.
- SR11

- F. THE PROGRAM RUNS TO COMPLETION AND HALTS AT PROGRAM END HALT AT LOC 0305, UNLESS PREVENTED FROM ENDING BY ERRORS, OR SR OPTIONS.

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NOTE

THE RESULTING PUNCHED TAPE MUST BE INSPECTED VISUALLY, EXCEPT FOR TWO 500 CHARACTER BLOCKS CONTAINING PUNCHES IN ALTERNATE CHANNELS. THE REMAINDER OF THE TAPE SHOULD BE BLANK.

4.3 PRG2 USE PROCEDURE

- A. INSURE THAT TELETYPE IS ON-LINE.
- B. LOAD READER WITH SPECIAL BINARY COUNT PATTERN TEST LOOP.
- C. LOAD ADDRESS 0200.
- D. SET SR TO 0002. PRESS START.
- E. THE PROGRAM RUNS CONTINUOUSLY UNLESS ERRORS OCCUR.

PRG2 SR OPTIONS

- SR3 0=HALT ON ERROR. SR3=1=NO HALT ON ERROR.
- SR6 0=STALL (RANDOM). SR6=1=RUN FULL SPEED.
- SR7 LOCK IN CURRENT STALL (SR6 MUST BE 0).

4.4 PRG3 USE PROCEDURE

- A. INSURE THAT TELETYPE IS ON-LINE.
- B. MAKE PUNCH READY.
- C. LOAD ADDRESS 0200.
- D. SET SR TO 0003. PRESS START.
- E. THE PROGRAM PUNCHES SPECIAL BINARY COUNT PATTERN CONTINUOUSLY UNTIL STOPPED BY USER.

PRG3 SR OPTIONS

- SR6 0=STALL (RANDOM). SR6=1=RUN FULL SPEED.
- SR7 LOCK ON STALL (SR6 MUST BE 0).

4.5 PRG4 USE PROCEDURE

- A. INSURE THAT TELETYPE IS ON-LINE.
- B. LOAD READER WITH TAPE PUNCHED BY PRG3. BLANK LEADER SHOULD BE UNDER READ STATION, WITH "UP" MARKER TO THE LEFT.
- C. LOAD ADDRESS 0200.
- D. SET SR TO 0004. PRESS START.
- E. THE PROGRAM READS CONTINUOUSLY UNTIL ERRORS OCCUR, OR UNTIL THE READER RUNS OUT OF TAPE.

PRG4 SR OPTIONS

- SR3 0=HALT ON ERROR. SR3=1=NO HALT ON ERROR.

DISREGARD ERRORS THAT OCCUR WHEN THE END OF SPECIAL BINARY COUNT PATTERN IS REACHED.

4.6 PRG5 USE PROCEDURE

- A. INSURE THAT TELETYPE IS ON-LINE.
- B. MAKE PUNCH READY.
- C. LOAD ADDRESS 0200.
- D. SET SR TO 0006. PRESS START.
- E. THE PROGRAM PUNCHES RANDOM CHARACTERS CONTINUOUSLY UNTIL STOPPED BY USER.

PRG5 SR OPTIONS

SR6 =0-STALL (RANDOM), SR6=1-RUN FULL SPEED.
SR7 LOCK ON STALL (SR6 MUST BE 0).

4.7 PRG6 USE PROCEDURE

- A. INSURE THAT TELETYPE IS ON-LINE.
- B. LOAD READER WITH TAPE PUNCHED BY PRG5. BLANK LEADER SHOULD BE UNDER READ STATION, WITH "UP" MARKER TO THE LEFT.
- C. LOAD ADDRESS 0200.
- D. SET SR TO 0006. PRESS START.
- E. THE PROGRAM READS CONTINUOUSLY UNTIL ERRORS OCCUR, OR UNTIL THE READER RUNS OUT OF TAPE.

PRG6 SR OPTIONS

SR3 =0-HALT ON ERROR, SR3=1-NO HALT ON ERROR.

NOTE

DISREGARD ERRORS THAT OCCUR WHEN THE END OF RANDOM CHARACTER DATA IS REACHED.

4.8 PRG7 USE PROCEDURE

- A. INSURE THAT TELETYPE IS ON-LINE.
- B. MAKE PUNCH READY, PUNCH ABOUT 20 INCHES (MAXIMUM) OF BLANK LEADER, AND LOAD READER WITH THE BLANK LEADER. THE PUNCH TO READER SLACK SHOULD NOT BE EXCESSIVE.
- C. LOAD ADDRESS 0200.
- D. SET SR TO 0007. PRESS START.
- E. THE PROGRAM PUNCHES AND READS SPECIAL BINARY COUNT PATTERN CONTINUOUSLY UNTIL ERROR OCCURS, OR SUPPLY OF TAPE IS EXHAUSTED.

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PRG7 SR OPTIONS

SR3 =0-HALT ON ERROR, SR3=1-NO HALT ON ERROR.
SR6 =0-STALL (RANDOM), SR6=1-FULL SPEED RUN.
SR7 LOCK ON CURRENT STALL (SR6 MUST BE 0).

4.9 PRG10 USE PROCEDURE

- A. INSURE THAT TELETYPE IS ON-LINE.
- B. LOAD READER WITH 11'S AND 0'S TEST TAPE LOOP.
- C. LOAD ADDRESS 0200.
- D. SET SR TO 0010. PRESS START.
- E. THE PROGRAM RUNS CONTINUOUSLY UNTIL STOPPED BY USER. WITH THE PROGRAM RUNNING, THE USER CAN ADJUST THE READ AND WRITE SPEEDS.
- F. A READ ERROR IS INDICATED BY AN ERROR PRINTOUT, CROPPING OF READER FLAG IS INDICATED BY 3 BELLS.

4.10 PRG11 USE PROCEDURE

- A. INSURE THAT TELETYPE IS ON-LINE.
- B. MAKE PUNCH READY.
- C. LOAD ADDRESS 0200.
- D. SET SR TO 0011. PRESS START.
- E. PROGRAM PUNCHES CONTINUOUSLY THE CODES SET IN SR SWITCHES 4 TO 11. THE SWITCHES MAY BE CHANGED WHILE RUNNING.

4.11 PRG12 USE PROCEDURE

- A. INSURE TELETYPE IS ON-LINE.
- B. MAKE PUNCH READY.
- C. LOAD ADDRESS 0200.
- D. SET SR TO 0012. PRESS START.
- E. PROGRAM PUNCHES 11'S AND 0'S TAPE CONTINUOUSLY.

PRG12 SR OPTIONS

SR6 =0-STALL (RANDOM), SR6=1-RUN FULL SPEED.
SR7 LOCK ON CURRENT STALL (SR6 MUST BE 0).

4.12 PRG13 USE PROCEDURE

PRG13 IS USED TO TIME THE HIGH SPEED READER WITH THE AID OF A WATCH WITH SWEEP SECOND HAND. THE READER CAN BE TIMED IN 2 WAYS:

- A. 30 SECOND TIMING. USED FOR APPROXIMATE SPEED SETTINGS.
- B. 300 SECOND TIMING (5 MINUTES) FOR ACCURATE AND FINAL VERIFICATION OF READER SPEED.

TO TIME THE READER PROCEED AS FOLLOWS:

- A. INSURE TELETYPE IS ON-LINE
- B. LOAD ANY TAPE IN READER
- C. LOAD ADDRESS 0200
- D. SET SR TO 0013
- E. FOR 30 SECOND TIMING, LEAVE SRI=0, FOR 300 SECOND TIMING, SET SRI TO A 1.
- F. PRESS START. READER WILL RUN CONTINUOUSLY. WHEN THE 30 OR 300 SECOND TIME IS UP, TURN ON SRC, AND THEN THEN TURN IT OFF. THE PROGRAM WILL TYPE OUT THE READER SPEED IN CHARACTERS PER SECOND (CPS)
- G. PROGRAM HALTS AT LOC 4230 AFTER PRINTOUT.
- H. TO RETIME THE READER, PRESS CONTINUE AFTER MAKING SURE THAT SRC IS OFF, AND THAT SRI IS SET TO THE CORRECT TIME BASE.

NOTE

ACCURATE READER SPEED MEASUREMENT DEPENDS ON THE USER'S ATTENTION TO THE STARTING AND STOPPING TIMES.

4.13 PRG14 USE PROCEDURE

PRG14 IS USED TO TIME THE HIGH SPEED PUNCH WITH THE AID OF A WATCH WITH SWEEP SECOND HAND. THE PUNCH IS TIMED OVER A PERIOD OF 60 SECONDS. TO TIME THE PUNCH, PROCEED AS FOLLOWS:

- A. INSURE TELETYPE IS ON-LINE
- B. MAKE PUNCH READY
- C. LOAD ADDRESS 0200
- D. SET SR TO 0014
- E. PRESS START. PUNCH RUNS CONTINUOUSLY.
- F. AFTER 60 SECONDS TURN ON SRC, AND THEN TURN IT OFF. THE PROGRAM WILL TYPE OUT THE PUNCH SPEED IN CHARACTERS PER SECOND (CPS).

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- G. PROGRAM HALTS AT LOC 4255 AFTER PRINTOUT.
- H. TO RETIME THE PUNCH, PRESS CONTINUE AFTER MAKING SURE THAT SRC IS OFF.

NOTE

ACCURATE PUNCH SPEED MEASUREMENT DEPENDS ON THE USER'S ATTENTION TO THE STARTING AND STOPPING TIMES.

- 4.14 PRG15 USE PROCEDURE
 - A. LOAD ANY TAPE IN READER.
 - B. LOAD ADDRESS 0200.
 - CL SET SR TO 0015. PRESS START.
 - D. PROGRAM HALTS AT LOC 4332.
 - E. SET SR SWITCHES 0 THROUGH 4 TO NUMBER OF CHARACTERS TO READ (1 TO 37 OCTAL).
 - F. SET SR SWITCHES 5 THROUGH 11 TO NUMBER OF MILLISECONDS TO STALL AFTER READING CHARACTERS (1 TO 177 OCTAL).
 - G. PRESS CONTINUE
 - H. PROGRAM RUNS CONTINUOUSLY, READING THE SPECIFIED NUMBER OF CHARACTERS, AND THEN STALLING FOR THE SPECIFIED NUMBER OF MILLISECONDS.

NOTE

THE NUMBER OF CHARACTERS READ AND/OR THE STALL COUNT MAY BE CHANGED AT ANY TIME. THIS PROGRAM DOES NOT CHECK FOR CORRECT DATA, IT IS INTENDED PRIMARILY AS AN AID IN ADJUSTING READER TIMINGS.

E. OPERATING PROCEDURES

E.1 PROGRAM AND/OR OPERATOR ACTION

E.1.1 NORMAL HALTS

- LOC 0242 SR OPTIONS HALT. THIS HALT OCCURS DURING EXECUTION OF PRGO AND PRG1 TO PERMIT SETTING OF DESIRED OPTIONS. PRESS CONTINUE TO PROCEED.
- LOC 0305 PROGRAM END HALT. OCCURS AT END OF PRGO AND PRG1 IF "LOOP PROGRAM" OPTION IS NOT SET. SET DESIRED OPTION(S) AND PRESS CONTINUE. IF NO OPTIONS ARE SET, THIS HALT REOCCURS.

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- LOC 0340 ROUTINE END HALT. OCCURS DURING EXECUTION OF PRGO AND PRG1 IF SRO IS 1.
- LOC 4230 THIS HALT OCCURS IN PRG13 AFTER PROGRAM TYPES THE READER SPEED IN CHARACTERS PER SECOND. TO RETIME THE READER, PRESS CONTINUE AFTER MAKING SURE THAT SRO IS OFF, AND THAT SRI IS SET TO THE CORRECT TIME BASE.
- LOC 4255 THIS HALT OCCURS IN PRG14 AFTER PROGRAM TYPES THE PUNCH SPEED IN CHARACTERS PER SECOND. TO RETIME THE PUNCH, PRESS CONTINUE AFTER MAKING SURE THAT SRO IS OFF.
- LOC 4332 PRG15 SR SET HALT. OCCURS TO PERMIT SETTING OF DESIRED CHARACTER AND STALL COUNT. SET SRO-4 TO NUMBER OF CHARACTERS TO BE READ. SET SR5-11 TO NUMBER OF MILLISECONDS TO STALL AFTER READING CHARACTERS, PRESS CONTINUE.

E.2 ERRORS

ERROR PRINTOUTS AND ERROR HALTS ARE USED IN THIS PROGRAM.

E.2.1 ERROR PRINTOUTS

ERROR PRINTOUTS ARE IDENTIFIED BY AN ASTERISK(*) PRECEDING THE PRINTOUT. MOST ERROR PRINTOUTS TAKE THE FORM:

*P00XX R00YY ZZZZZZZZZ

WHERE,

P00XX=PROGRAM NUMBER
R00YY=ROUTINE NUMBER IN THE PROGRAM
Y=A LETTER, INDICATES WHICH ERROR OCCURRED WITHIN A ROUTINE. IF NO LETTER IS PRINTED, ONLY ONE ERROR IS POSSIBLE IN THE ROUTINE
ZZZZZ=ADDITIONAL INFORMATION PRINTOUT.

FOLLOWING AN ERROR PRINTOUT THE PROGRAM HALTS IF SR3 (HALT-ON-ERROR OPTION) IS OFF, AND THE OPTION APPLIES TO THE PROGRAM.

*P0000 R0000

250 MS AFTER ISSUING RCF COMMAND (IOTC14) RSF DID NOT SKIP. FLAG IS NOT SET, OR RSF COMMAND FAILED TO SKIP.

*P0000 R0001

WITH READ FLAG = 1, RSF (IOT011) COMMAND FAILED TO SKIP.

*P0000 R0002

RRB(IOT012) FAILED TO CLEAR FLAG. OR RSF(IOT011) SKIPPED WITH FLAG = 0.

*P0000 R0003

SKIP NOT GENERATED WITH INTERRUPT OFF. OP 6D10 (RPE) MALFUNCTION.

*P0000 R0004

PCE (6U20) MALFUNCTION. INTERRUPT ENABLE NOT CLEARED.

*P0000 R0005

RRB(IOT012) COMMAND FAILED TO CLEAR FLAG.

*R0000 R0006

RFC(IOT014) FAILED TO CLEAR FLAG.

*P0000 R0007

RRB(IOT012) COMMAND RESULTED IN NON-ZERO CHARACTER SET INTO AC. SHOULD BE ALL 0'S. AN ALL 0'S TEST TAPE SHOULD BE IN THE READER.

*P0000 R00010A

UNEXPECTED INTERRUPT AFTER CLEARING READER PUNCH, TTY PUNCH, AND TTY READER. TURN OFF INTERRUPTING DEVICE.

*P0000 R00010B

WITH READER FLAG SET, READER FAILED TO INTERRUPT.

*P0000 R00011A

"STOP DELAY" NOT FIRING OR SET FOR TOO SHORT A DURATION, REFER TO SECTION 9 FOR TEST DESCRIPTION.

*P0000 R00011B

"STOP DELAY" TIME OUT IS TOO LONG. REFER TO SECTION 9 FOR TEST DESCRIPTION.

*P0001 R0000

PSF(IOT021) COMMAND SKIPPED WITH FLAG = 0. OR, LESS LIKELY.

MO1

PCF(IOT022) FAILED TO CLEAR FLAG.

*P0001 R0001

PSF(IOT021) FAILED TO SKIP WITH FLAG = 1. OR FLAG IS NOT SET.

*P0001 R0002

PCF(IOT022) FAILED TO CLEAR FLAG.

*P0001 R00010A

UNEXPECTED INTERRUPT AFTER CLEARING PUNCH, READER, TTY PUNCH, AND TTY READER. TURN OFF INTERRUPTING DEVICE.

*P0001 R00010B

WITH PUNCH FLAG SET, PUNCH FAILED TO INTERRUPT

*P0002 R0000	S/B	XXXX	WAS	YYYY
*P0004 R0000	S/B	XXXX	WAS	YYYY
*P0006 R0000	S/B	XXXX	WAS	YYYY
*P0007 R0000	S/B	XXXX	WAS	YYYY
*P0010 R0000	S/B	XXXX	WAS	YYYY

ONE OF THE ABOVE PRINTOUTS OCCURS DURING ITS RESPECTIVE PROGRAM WHEN THE DATA READ FROM PAPER TAPE AND THE EXPECTED DATA DO NOT MATCH. S/B XXXX REPRESENTS THE EXPECTED CHARACTER. WAS YYYY REPRESENTS THE CHARACTER READ.

PCF(IOT022) FAILED TO CLEAR FLAG.

*P0001 R0001

PSF(IOT021) FAILED TO SKIP WITH FLAG = 1. OR FLAG IS NOT SET.

*P0001 R0002

PCF(IOT022) FAILED TO CLEAR FLAG.

*P0001 R00010A

UNEXPECTED INTERRUPT AFTER CLEARING PUNCH, READER, TTY PUNCH, AND TTY READER. TURN OFF INTERRUPTING DEVICE.

*P0001 R00010B

WITH PUNCH FLAG SET, PUNCH FAILED TO INTERRUPT.

*P0002 R0000	S/B	XXXX	WAS	YYYY
*P0004 R0000	S/B	XXXX	WAS	YYYY
*P0006 R0000	S/B	XXXX	WAS	YYYY
*P0007 R0000	S/B	XXXX	WAS	YYYY
*P0010 R0000	S/B	XXXX	WAS	YYYY

ONE OF THE ABOVE PRINTOUTS OCCURS DURING ITS RESPECTIVE PROGRAM WHEN THE DATA READ FROM PAPER TAPE AND THE EXPECTED DATA DO NOT MATCH. S/B XXXX REPRESENTS THE EXPECTED CHARACTER, WAS YYYY REPRESENTS THE CHARACTER READ.

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INCORRECT RTN SELECTED

THIS PRINTOUT OCCURS DURING EXECUTION OF PRG0 AND PRG1 IF A NONEXISTENT ROUTINE IS SELECTED. THE PROGRAM HALTS, SET CORRECT ROUTINE NUMBER IN SR AND PRESS CONTINUE.

UNEXPECTED INTERRUPT

THIS PRINTOUT OCCURS DURING PRG7 EXECUTION. PROGRAM HALTS, TURN OFF INTERRUPTING DEVICE. PRESS CONTINUE.

6.2 ERROR HALTS

- L00 0201 INCORRECT PROGRAM NUMBER SELECTED. SET SR TO CORRECT NUMBER AND PRESS CONTINUE.
- L00 0266 INCORRECT ROUTINE NUMBER SELECTED. PRECEDED BY PRINTOUT. SET CORRECT ROUTINE NUMBER IN SR AND PRESS CONTINUE.
- L00 0732 UNEXPECTED INTERRUPT. PRECEDED BY PRINTOUT. OCCURS DURING PRG7 EXECUTION. TURN OFF INTERRUPTING DEVICE. PRESS CONTINUE.
- L00 1347 SYNC ERROR. OCCURS DURING PRG2 AND PRG7. IF PROGRAM IS UNABLE TO SYNC. PRESS CONTINUE TO RETRY.
- L00 1076 COMMON ERROR HALT. OCCURS AFTER ERROR PRINTOUT IF SR3=0 AND OPTION APPLIES TO PROGRAM BEING RUN. PRESS CONTINUE.
- L00 3631 PRG7. PUNCH COUNT HAS EXCEEDED 100. READER IS PROBABLY NOT RUNNING. RESTART PROGRAM.

7.0 RESTRICTIONS

7.1 STARTING RESTRICTIONS

THIS PROGRAM MUST BE STARTED AT L00 0200.

8.0 MISCELLANEOUS

8.1 EXECUTION TIME

PRG0 1 MINUTE 50 SECONDS
 PRG1 45 SECONDS
 PRG2 THROUGH PRG16 ARE CONTINUOUS RUNNING PROGRAMS.

8.2 TEST TAPES

MAINDEC-00-D2G4-PT SPECIAL BINARY COUNT PATTERN TEST TAPE IS PROVIDED WITH THIS PROGRAM. FOR EASE OF USE, THE TAPE SHOULD BE SPLICED INTO A LOOP INSURING THAT THE PATTERN IS MATCHED AT THE SPlice POINT. THE END OF A PATTERN IS INDICATED BY THE CHARACTERS: RUBOUT, ALL 0'S CHARACTER, ALL 0'S CHARACTER, AND THEN ANOTHER RUBOUT.

IT IS DESIRABLE TO SPLICE INTO LOOPS. MAINDEC-00-D2G1-PT AND MAINDEC-00-D2G2-PT TO FACILITATE TESTING.

9.0. PROGRAM DESCRIPTION

THIS PROGRAM CONSISTS OF 14 INDIVIDUAL PROGRAMS NUMBERED FROM 00 TO 15 (OCTAL). PROGRAMS ARE SELECTED BY MEANS OF THE SWITCH REGISTER (SR).

9.1 PRG0 - BASIC READER AND READER CONTROL LOGIC TEST

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

- RTN0 CHECKS THAT FLAG IS SET 250 MS AFTER ISSUING RFC COMMAND (IOT014). FAILURE TO SKIP ON FLAG COULD BE CAUSED BY FLAG NOT SET, OR PSF FAILURE TO SKIP. TEST IS DONE 200 TIMES.
- RTN1 CHECKS THAT RSF COMMAND (IOT011) SKIPS WITH FLAG = 1. TEST IS DONE 4095 TIMES.
- RTN2 CHECK THAT RSF COMMAND (IOT011) DOES NOT SKIP WITH FLAG = 0. DONE 4095 TIMES.
- RTN3 CHECKS FOR SKIP WITH INTERRUPT OFF. (DONE 2047 TIMES)
- RTN4 CHECKS THAT INTERRUPT ENABLE CAN BE CLEARED FOR READER. (DONE 4095 TIMES)
- RTN5 CHECKS THAT RRB COMMAND (IOT012) CLEARS THE FLAG. DONE 500 TIMES.
- RTN6 CHECKS THAT RFC COMMAND (IOT014) CLEARS THE FLAG. DONE 500 TIMES.
- RTN7 CHECKS ABILITY TO READ ALL 0'S CHARACTER. DONE 500 TIMES.
- RTN10 CHECKS FOR UNEXPECTED INTERRUPTS, AND THEN CHECKS THAT READER IS ABLE TO INTERRUPT.
- RTN11 THIS ROUTINE CHECKS THAT THE "STOP DELAY" IS NOT LESS THAN 10 MS. OR MORE THAN 250 MS. THE TEST SEQUENCE IS:

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- A. RFC (FETCH CHARACTER)
- B. WAIT FOR FLAG 1 (SHOULD BE SET IMMEDIATELY)
- C. DELAY 19 MS. (STOP DELAY SHOULD FIRE 6 MS AFTER STEP A.)
- D. RFC (FETCH CHARACTER. CLEAR FLAG.)
- E. DELAY 19 MS.
- F. SKIP ON FLAG. (IF SKIP OCCURS, THE "STOP DELAY" DID NOT FIRE, OR IS TOO SHORT).
- G. DELAY ADDITIONAL 212 MILLISECONDS.
- H. SKIP ON FLAG. (IF NO SKIP OCCURS, THE "STOP DELAY" IS TOO LONG.) TEST IS DONE 200 TIMES.

9.2 PRG1 - BASIC PUNCH AND PUNCH CONTROL LOGIC TEST

THIS PROGRAM CONTAINS NINE ROUTINES NUMBERED FROM 0 TO 10 (OCTAL).

- RTN0 CHECKS THAT PSF COMMAND (IOT021) DOES NOT SKIP WITH FLAG = 0.
- RTN1 CHECKS THAT PSF COMMAND (IOT021) SKIPS WITH FLAG = 1. DONE 4095 TIMES.
- RTN2 CHECKS THAT PCF COMMAND (IOT022) IS ABLE TO CLEAR THE FLAG. DONE 500 TIMES.
- RTN3 CHECKS FOR SKIP WITH INTERRUPT OFF. (DONE 2047 TIMES)
- RTN4 CHECKS THAT INTERRUPT ENABLE CAN BE CLEARED FOR PUNCH. (DONE 4095 TIMES)
- RTN5 TEST DONE 500 TIMES. VISUAL CHECK OF TAPE REQUIRED. CHECKS THAT PCF COMMAND (IOT022) IS ABLE TO CLEAR THE PUNCH BUFFER. THE TEST SEQUENCE IS:
 - A. ALL 1'S TO PUNCH BUFFER, AND PUNCH (PLS).
 - B. IMMEDIATELY CLEAR THE PUNCH BUFFER BY ISSUING PCF COMMAND. NO HOLES SHOULD BE PUNCHED EXCEPT FOR FEED-HOLE.
- RTN6 TEST IS DONE 500 TIMES. VISUAL CHECK OF TAPE REQUIRED. ROUTINE LOADS PUNCH BUFFER WITH 125 (8) AND PUNCHES. ALTERNATE HOLES SHOULD BE PUNCHED.
- RTN7 TEST IS DONE 500 TIMES. VISUAL CHECK OF TAPE REQUIRED. ROUTINE LOADS PUNCH BUFFER WITH 252(8) AND PUNCHES. ALTERNATE HOLES SHOULD BE PUNCHED.

- RTN10 CHECKS FOR UNEXPECTED INTERRUPTS, AND THEN CHECKS THAT PUNCH IS ABLE TO INTERRUPT.
- 9.3 PRG2 - READER TEST
THE READER IS TESTED USING A SPECIAL BINARY COUNT PATTERN TEST TAPE. THE PROGRAM IS CONTINUOUS RUNNING. ERRORS ARE INDICATED BY PRINTOUTS. NORMAL TEST MODE IS WITH RANDOM STALLS AFTER EVERY CHARACTER GROUP READ. SR6 = 1 GIVES FULL SPEED TESTING. SR7 = 1 LOCKS PROGRAM ON CURRENT STALL. (SR6 MUST BE 0). PROGRAM RESYNCS AFTER 5 ERRORS. THE LENGTH OF A CHARACTER GROUP IS RANDOM, BUT DOES NOT EXCEED 15 CHARACTERS.
- 9.4 PRG3 - PUNCH TEST, SPECIAL BINARY COUNT PATTERN
THIS CONTINUOUS RUNNING PROGRAM PUNCHES SPECIAL BINARY COUNT PATTERN. NORMAL TEST MODE IS WITH RANDOM STALLS AFTER EVERY CHARACTER PUNCHED. SR6 = 1 GIVES FULL SPEED PUNCHING. SR7 = 1 LOCKS PROGRAM ON THE CURRENT STALL. (SR6 MUST BE 0).
- 9.5 PRG4 - PUNCH VERIFY, BINARY COUNT PATTERN
THIS PROGRAM READS AND CHECKS THE TAPE PUNCHED DURING EXECUTION OF PRG3. ERRORS ARE INDICATED BY ERROR PRINTOUTS.
- 9.6 PRG5 - PUNCH TEST, RANDOM CHARACTERS
THIS CONTINUOUS RUNNING PROGRAM PUNCHES RANDOM CHARACTERS. NORMAL TEST MODE IS WITH RANDOM STALLS AFTER EVERY CHARACTER PUNCHED. SR6 = 1 GIVES FULL SPEED PUNCHING. SR7 = 1 LOCKS PROGRAM ON THE CURRENT STALL. (SR6 MUST BE 0).
- 9.7 PRG6 - PUNCH VERIFY, RANDOM CHARACTERS
THIS CONTINUOUS RUNNING PROGRAM READS AND CHECKS THE TAPE PUNCHED DURING EXECUTION OF PRG5. ERRORS ARE INDICATED BY ERROR PRINTOUTS.
- 9.8 PRG7 - COMBINED READER - PUNCH TEST
THIS CONTINUOUS RUNNING PROGRAM PUNCHES AND READ - CHECKS SPECIAL BINARY COUNT PATTERN. THE READER AND PUNCH WORK IN THE INTERRUPT MODE. NORMAL TEST MODE IS WITH RANDOM STALLS AFTER EVERY CHARACTER PUNCHED. SR6 = 1 GIVES FULL SPEED PUNCHING AND READING. SR7 = 1 LOCKS PROGRAM ON THE CURRENT STALL. (SR6 MUST BE 0.) THE READER RESYNCS ITSELF AUTOMATICALLY AFTER 5 ERRORS.
- 9.9 PRG10 - READ AMPLIFIER ADJUSTMENT LOOP
THIS CONTINUOUS RUNNING PROGRAM USES A 1'S AND 0'S TEST TAPE LOOP, AND PROVIDES A MEANS OF DETERMINING THE UPPER AND LOWER LIMITS OF CORRECT OPERATION OF THE READ AMPLIFIER OF THE PAPER TAPE READER. AFTER OBTAINING THE LIMITS THE POT CAN BE SET TO THE MIDDLE POSITION. READ ERRORS ARE INDICATED BY ERROR PRINT-

E02

- OUTS. DROPPING OF THE READER FLAG BY OVERDRIVING OF THE FEED-HOLE AMPLIFIER IS INDICATED BY 3 BELLS FROM THE TELETYPE. THE READER IS THEN RESTARTED.
- 9.10 PRG11 - PUNCH ANY CHARACTER IN SR LOOP
THIS PROGRAM LOOP CONTINUOUSLY PUNCHES THE CODE SET IN SR4 THROUGH SR11. SR SWITCHES MAY BE CHANGED WHILE RUNNING.
- 9.11 PRG12 - ONES AND ZEROS PUNCH LOOP
THIS PROGRAM PUNCHES 1'S AND 0'S CONTINUOUSLY. NORMAL MODE IS WITH RANDOM STALLS AFTER EVERY CHARACTER PUNCHED. SR6 = 1 GIVES FULL SPEED PUNCHING. SR7 = 1 LOCKS PROGRAM ON CURRENT STALL. (SR6 MUST BE 0)
- 9.12 PRG13 - READER SPEED PRINT LOOP
THIS PROGRAM TYPES THE READER SPEED MEASURED OVER A 30 OR 300 SECOND PERIOD. THE USER CONTROLS THE MEASURING TIME WITH THE AID OF A WATCH WITH SWEEP SECOND HAND.
- 9.13 PRG14 - PUNCH SPEED PRINT LOOP
THIS PROGRAM TYPES THE PUNCH SPEED MEASURED OVER A 60 SECOND PERIOD. THE USER CONTROLS THE MEASURING TIME WITH THE AID OF A WATCH WITH SWEEP SECOND HAND.
- 9.14 PRG15 - READ X, STALL Y MS LOOP
THIS PROGRAM LOOP IS INTENDED AS AN AID IN ADJUSTING THE PAPER TAPE READER. THE USER SETS IN SR0 THROUGH SR4 THE NUMBER OF CHARACTERS TO BE READ (RANGE: 1 TO 37 OCTAL) AND IN SR5 THROUGH SR11 THE NUMBER OF MS TO STALL AFTER READING THE CHARACTERS (RANGE: 1 TO 177 OCTAL). THIS LOOP IS USEFUL IN ADJUSTING CLOCK TIMING, STROBE, ETC.
- 10.0 LISTING

PCB-E HIGH SPEED READER AND PUNCH TESTS.
 /PINDEX-08-DMPCA-A-0
 /DATE: MARCH 1977
 /COPYRIGHT 1977 DIGITAL EQUIPMENT CORP. MAYNARD, MASS. 01754
 /AUTHORS: BOB KOLLER/MATT TAFFEL/MARK SANDLER/STEVE JENSEN
 /PRG0-BASIC READER AND READER CONTROL LOGIC TEST. ALL 0'S TAPE
 /PRG1-BASIC PUNCH AND PUNCH CONTROL LOGIC TEST
 /PRG2-READER TEST. BINARY COUNT PATTERN
 /PRG3-PUNCH TEST. BINARY COUNT PATTERN
 /PRG4-PUNCH VERIFY. BINARY COUNT PATTERN
 /PRG5-PUNCH TEST. RANDOM CHARACTERS
 /PRG6-PUNCH VERIFY. RANDOM CHARACTERS
 /PRG7-COMBINED READER-PUNCH TEST. BINARY COUNT PATTERN
 /PRG10-READ AMPLIFIER ADJUSTMENT LOOP. ONES AND ZEROS TAPE.
 /PRG11-PUNCH ANY CHARACTER OR SR LOOP
 /PRG12-ONES AND ZEROS PUNCH LOOP.
 /PRG13-READER SPEED PRINT LOOP
 /PRG14-PUNCH SPEED PRINT LOOP
 /PRG15-READ X, STALL Y MSEC LOOP.

```

0000 0000 SKON=6000
0001 0000 SR0=6003
0002 0000 CRF=6007
0003 0010 RPE=6010
0004 0020 PC=6020
0005 0014 RCF=6014
0006 0024 PC=6024
0007 0000
0008 0000
0009 0000
0010 0000
0011 0000
0012 0000
0013 0000
0014 0000
0015 0000
0016 0000
0017 0000
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0019 0000
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0029 0000
0030 0000
0031 0000
0032 0000
0033 0000
0034 0000
0035 0000
0036 0000
0037 0000
0038 0000
0039 0000
0040 0000
0041 0000
    
```

```

SKON=6000
SR0=6003
CRF=6007
RPE=6010
PC=6020
RCF=6014
PC=6024
40
0000
0001
0002
0003
0004
0005
0006
0007
0008
0009
0010
0011
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0036
0037
0038
0039
0040
0041
    
```

USER PROGRAM START.

```

420
KSTART
DELAYN
COUNT
PC
LINK
CHAIN
SR
RANDOM
PRGNUM
PRGTRN
PRG0
PRG1
PRG2
PRG3
PRG4
PRG5
PRG6
PRG7
PRG10
PRG11
PRG12
PRG13
PRG14
PRG15
    
```

```

0042 4100
0043 4110
0044 4200
0045 4233
0046 4333
0047 0516
0048 0500
0049 0500
0050 0500
0051 0500
0052 0500
0053 0500
0054 0500
0055 0500
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0090 0500
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0096 0500
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0098 0500
0099 0500
    
```

```

PRG11
PRG12
PRG13
PRG14
PRG15
XTYPST, TYPSTG
CORLF, CORLF
LEARNR, LEARNR
LASCEN, LASCEN
LPRGN, LPRGN
LRRGN, LRRGN
LREAD, LREAD
LTPCH, LTPCH
LDR, LDR
LARK, LARK
LCHK, LCHK
LTSB, LTSB
ORCNT, ORCNT
LXNS, LXNS
LXNCA, LXNCA
LNPRAT, LNPRAT
GETPT, GETPT
GETPTR, GETPTR
CHECK, CHECK
DLYCNT, DLYCNT
PUNCH, PUNCH
MOVE, MOVE
USTCTR, USTCTR
LDRSR, LDRSR
USTCTA, USTCTA
USTCTB, USTCTB
USTDLM, USTDLM
DLYMS, DLYMS
LOUT, LOUT
DLYMSK, DLYMSK
SPMSK, SPMSK
LFL, LFL
LPTC, LPTC
LCHR1, LCHR1
LCHR2, LCHR2
LCHR3, LCHR3
LTEMP, LTEMP
LRTST, LRTST
RTNNO, RTNNO
LXTST, LXTST
LXCTR, LXCTR
LXCTA, LXCTA
LXCTB, LXCTB
LXCTC, LXCTC
LXCTD, LXCTD
LXCTE, LXCTE
LXCTF, LXCTF
LXCTG, LXCTG
LXCTH, LXCTH
LXCTI, LXCTI
LXCTJ, LXCTJ
LXCTK, LXCTK
LXCTL, LXCTL
LXCTM, LXCTM
LXCTN, LXCTN
LXCTO, LXCTO
LXCTP, LXCTP
LXCTQ, LXCTQ
LXCTR, LXCTR
LXCTV, LXCTV
LXCTW, LXCTW
LXCTX, LXCTX
LXCTY, LXCTY
LXCTZ, LXCTZ
    
```

CONSTANT FOR MILLISECOND 075

STORAGE NUMBER OF MILLISEC TO BE COUNTED
 MILLISECOND TAPE

0131 0000 TCHKW 0
 0132 0000 PCHCNT. 0
 0133 0000 ACTIND. 0
 0134 0000 DELTIM. 0
 0135 0000 MILLI. 0
 0136 0000 CTR. 0
 4000 SP0MSK=4000
 2000 SR1MSK=2000
 1000 SR2MSK=1000
 0400 SR3MSK=0400
 0200 SR4MSK=0200
 0100 SR5MSK=0100
 0040 SR6MSK=0040
 0020 SR7MSK=0020
 0017 SR8MSK=0017
 0377 PTMSK=0377
 4475 SETLOC=JMS I USTCTR
 4476 READSR=JMS I URCSR
 4477 SETA=JMS I USTCTA
 4500 SETB=JMS I USTCTB
 4502 DELAY=JMS I UOLYMS
 5503 OUT=JMP I LIOUT
 0140 A=0140
 0240 B=0240
 0000 NONE=0000
 4040 NOSUF=4040
 4501 SETOLM=JMS T TOLM
 4502 DELAY=JMS T TOLM
 5503 OUT=JMP I LIOUT
 0000 OPEN=0000

/*SET INT ENABLE FOR READER AND PUNCH
 /*SKIP IF RDR FLAG = 1
 /*READ READER BUFFER AND CLEAR FLAG
 /*CLEAR FLAG AND BUFFER AND FETCH CHARACTER
 /*RRB,RCC
 /*CLEAR INTERRUPT ENABLE FOR READER AND PUNCH
 /*SKIP IF PUNCH FLAG = 1
 /*CLEAR FLAG AND BUFFER
 /*LOAD BUFFER AND PUNCH CHARACTER
 /*PCF,PPC
 /*SKIP IF INTERRUPT ON AND TURN INTERRUPT OFF
 /*TURN INTERRUPT ON
 /*TURN INTERRUPT OFF
 /*SKIP ON INTERRUPT REQUEST
 /*GET FLAGS
 /*RESTORE FLAGS
 /*SKIP ON GREATER THAN FLAG
 /*CLEAR ALL FLAGS

0200 *200
 0130 STAT. SKT
 0131 HLT CLR /*INCORRECT PROGRAM
 0132 LAB /*READ SR

102

500 0001

0093 0177 AND I17 /*MASK ALL BUT LAST 4 BITS
 0094 1176 JAO I=10 /*VALID PROGRAM?
 0095 754-0 JAO SZAR /*NO, GO TO ERROR HALT.
 0096 5801-1 JMB START+1 /*YES, REREAD SR
 0097 7601-1 LABS /*
 0100 0177 AND I17 /*
 0101 1360-1 OCA PRGNUM /*DEVELOP PROGRAM ADDRESS
 0102 1360-1 JAO PRGNUM /*
 0103 1360-1 OCA I PRGCTAB /*
 0104 1360-1 JAO I TEMP /*
 0105 1360-1 OCA I PRGCTAB /*STORE DEVELOPER ADDRESS.
 0106 1360-1 JAO I MOVE /*START AREA BY DEVELOPER
 0107 1360-1 OCA I MOVE /*AREA.
 0108 1360-1 JAO I MOVE /*
 0109 1360-1 OCA I MOVE /*GO TO TEMP
 0110 1360-1 JAO I MOVE /*CLEAR WORK AREA
 0111 1360-1 OCA I MOVE /*
 0112 1360-1 JAO I MOVE /*
 0113 1360-1 OCA I MOVE /*
 0114 1360-1 JAO I MOVE /*
 0115 1360-1 OCA I MOVE /*
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 0197 1360-1 OCA I MOVE /*
 0198 1360-1 JAO I MOVE /*
 0199 1360-1 OCA I MOVE /*
 0200 1360-1 JAO I MOVE /*

/*JUMP TO SELECTED PROGRAM
 /*SET ADDRESS OF 1ST ROUTINE
 /*STORE AT NEXT
 /*READ SR
 /*ROUTINE SELECT? SR1
 /*NO, START WITH 1ST SR1.
 /*YES
 /*IS IT THIS RYND
 /*NO, GO TO IT
 /*IS THIS LAST RYND
 /*NO
 /*YES, INCORRECT ROUTINE NO.
 /*READ SR
 /*READ SR

0272	7006	RTL	CLA		
0273	7630	SZL	CLA		
0274	6243	JMS	GETRDY		ROUTINE SELECT? (SR1)
0275	1117	TRO	NXTST		/YES
0276	7001	IAC			
0277	7640	SZA	CLA		LAST ROUTINE?
0300	6246	JMS	GETRDY+3		/NO
0301	7277	READSR	OSR		
0302	7277	RTL	CLA		LOOP PROGRAM? (SR2)
0303	7277	JMS	GETRDY		/YES
0304	7277	JMS	GETRDY		/END OF PROGRAM HALT
0305	7277	JMS	GETRDY		
0306	7277	JMS	GETRDY		
0307	7277	JMS	GETRDY		
0308	7277	JMS	GETRDY		
0309	7277	JMS	GETRDY		
0310	7277	JMS	GETRDY		
0311	7277	JMS	GETRDY		
0312	7277	JMS	GETRDY		
0313	7277	JMS	GETRDY		
0314	7277	JMS	GETRDY		
0315	7277	JMS	GETRDY		
0316	7277	JMS	GETRDY		
0317	7277	JMS	GETRDY		
0318	7277	JMS	GETRDY		
0319	7277	JMS	GETRDY		
0320	7277	JMS	GETRDY		
0321	7277	JMS	GETRDY		
0322	7277	JMS	GETRDY		
0323	7277	JMS	GETRDY		
0324	7277	JMS	GETRDY		
0325	7277	JMS	GETRDY		
0326	7277	JMS	GETRDY		
0327	7277	JMS	GETRDY		
0328	7277	JMS	GETRDY		
0329	7277	JMS	GETRDY		
0330	7277	JMS	GETRDY		
0331	7277	JMS	GETRDY		
0332	7277	JMS	GETRDY		
0333	7277	JMS	GETRDY		
0334	7277	JMS	GETRDY		
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0344	7277	JMS	GETRDY		
0345	7277	JMS	GETRDY		
0346	7277	JMS	GETRDY		
0347	7277	JMS	GETRDY		
0348	7277	JMS	GETRDY		
0349	7277	JMS	GETRDY		
0350	7277	JMS	GETRDY		
0351	7277	JMS	GETRDY		
0352	7277	JMS	GETRDY		
0353	7277	JMS	GETRDY		
0354	7277	JMS	GETRDY		
0355	7277	JMS	GETRDY		
0356	7277	JMS	GETRDY		
0357	7277	JMS	GETRDY		
0358	7277	JMS	GETRDY		
0359	7277	JMS	GETRDY		
0360	7277	JMS	GETRDY		
0361	7277	JMS	GETRDY		
0362	7277	JMS	GETRDY		
0363	7277	JMS	GETRDY		
0364	7277	JMS	GETRDY		
0365	7277	JMS	GETRDY		
0366	7277	JMS	GETRDY		
0367	7277	JMS	GETRDY		
0368	7277	JMS	GETRDY		
0369	7277	JMS	GETRDY		
0370	7277	JMS	GETRDY		
0371	7277	JMS	GETRDY		
0372	7277	JMS	GETRDY		
0373	7277	JMS	GETRDY		
0374	7277	JMS	GETRDY		
0375	7277	JMS	GETRDY		
0376	7277	JMS	GETRDY		
0377	7277	JMS	GETRDY		
0378	7277	JMS	GETRDY		
0379	7277	JMS	GETRDY		
0380	7277	JMS	GETRDY		
0381	7277	JMS	GETRDY		
0382	7277	JMS	GETRDY		
0383	7277	JMS	GETRDY		
0384	7277	JMS	GETRDY		
0385	7277	JMS	GETRDY		
0386	7277	JMS	GETRDY		
0387	7277	JMS	GETRDY		
0388	7277	JMS	GETRDY		
0389	7277	JMS	GETRDY		
0390	7277	JMS	GETRDY		
0391	7277	JMS	GETRDY		
0392	7277	JMS	GETRDY		
0393	7277	JMS	GETRDY		
0394	7277	JMS	GETRDY		
0395	7277	JMS	GETRDY		
0396	7277	JMS	GETRDY		
0397	7277	JMS	GETRDY		
0398	7277	JMS	GETRDY		
0399	7277	JMS	GETRDY		
0400	7277	JMS	GETRDY		

0416	0417	+	I		
0417	1106	TAD	MILI		GET I MS CONSTANT
0420	3121	DCA	MILCTR		STORE IN MILCTR
0421	3121	ISZ	MILCTR		DELAYED I MSEC?
0422	3121	JMP	-1		
0423	3120	ISZ	MSCTR		DONE DELAYING?
0424	3121	JMP	-5		
0425	5511	JMP	I DLYMS		EXIT
0426	0000				
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331 0502 3210 3210
332 0503 0765 0765
333 0504 5432 5432
334 0505 2107 2107
335 0506 7654 7654
336 0507 4321 4321
337 0510 1076 1076
338 0511 7257 7257
339 0512 0000 0000
340
341
342
343
344 0513 0000 /SUBROUTINE TO GENERATE RANDOM DELAY COUNT
345 0514 4427 /DLCNT. 0
346 0515 0174 /JMS I RANDNO /GO GENERATE RANDOM NUMBER
347 0516 7041 /AND I177 /MASK OUT UNDESIED BITS.
348 0517 3021 /CIA /2'S COMPLEMENT IT
349 0520 5713 /DCA DELAYM /EXIT
350
351
352
353 0521 0000 /SUBROUTINE TO COMPARE C(AC) TO CONTENTS STORED AT CALL+1
354 0522 3335 /CHK. 0
355 0523 1721 /DCA WCHK /STORE AC AT WCHK
356 0524 7041 /TAD I CHCK /GET COMPARE DATA
357 0525 1335 /CIA /2'S COMPLEMENT IT
358 0526 2321 /TAD WCHK /ADD C(WCHK)
359 0527 7640 /ISZ CHCK /SET UP FOR UNEQUAL EXIT
360 0530 5333 /SZA CLA /EQUAL (AC = 0)
361 0531 2321 /JMP +3 /NO
362 0532 5721 /ISZ CHCK /YES. SET UP FOR EQUAL EXIT
363 0533 1335 /JMP I CHCK /EQUAL EXIT
364 0534 5721 /TAD WCHK /RESTORE AC
365 0535 0000 /JMP I CHCK /UNEQUAL EXIT
366
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369 0536 0000 /SUBROUTINE TO MOVE VARIABLE LENGTH DATA FIELDS
370 0537 7200 /MOVE. 0
371 0540 1736 /CLA /GET "FROM ADDR" AND
372 0541 3361 /DCA FADDR /STORE AT FADDR
373 0542 2336 /ISZ MOVE
374 0543 1736 /TAD I MOVE /GET "TO ADDR" AND
375 0544 3362 /DCA TADDR /STORE AT TADDR.
376 0545 2336 /ISZ MOVE
377 0546 1736 /TAD I MOVE /GET "MOVE COUNT" AND
378 0547 3363 /DCA MCTR /STORE AT MCTR.
379 0550 2336 /ISZ MOVE /SET UP FOR EXIT.
380 0551 7200 /MOVEA. CLA
381 0552 1761 /DCA I FADDR /GET "FROM" WORD
382 0553 3762 /DCA I TADDR /STORE AT "TO" LOCATION
383 0554 2361 /ISZ FADDR /+1 TO "FROM" ADDR
384 0555 2362 /ISZ TADDR /+1 TO "TO" ADDR
385 0556 2363 /ISZ MCTR /ALL WORDS MOVED?
386 0557 5351 /JMP MOVEA /NO. GO MOVE AGAIN
387 0560 5736 /JMP I MOVE /YES. EXIT

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M02

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386 0561 0000 FADDR. 0
387 0562 0000 TADDR. 0
388 0563 0000 MCTR. 0
389
390
391 0600 PAGE
392 0601 CRLF. 0
393 0602 0000 /CRLF SUBROUTINE
394 0603 0000 /TAD I CRLF /GET NUMBER OF CRLF'S
395 0604 0000 /AND SAVE
396 0605 0000 /ISZ CRLF
397 0606 0000 /JMS I XTPST /GO CRLF
398 0607 0000 /DCA CTR /ALL DONE?
399 0608 0000 /MTR /NO
400 0609 0000 /I CRLF /YES. EXIT.
401 0610 0000 /CR
402 0611 0000 /LF
403 0612 0000 /END CODE
404
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0561	0000	FADDR,	0	
0562	0000	TADDR,	0	
0563	0000	MCTR,	0	
	0600	PAGE		
	0000	CRLF,	0	
	0001	CLA		/ORLF SUBROUTINE
	0002	TAD I CRLF		/GET NUMBER OF CRLF'S
	0003	DCA CRCTR		AND SAVE
	0004	ISZ CRLF		
	0005	JMS I XTYPST		/GO CRLF
	0006	+4		
	0007	ISZ CRCTR		/ALL DONE?
	0008	JMP -3		/NO
	0009	JMP I CRLF		/YES, EXIT.
	0010	0015		/CR
	0011	0012		/LF
	0012	0001		/END CODE
	0000	CRCTR,	0	
	0000	TYPSTG,	0	
	0000	CLA		
	0001	TAD I TYPSTG		/GET AND STORE
	0002	DCA TEMQ		/INITIAL ADDRESS
	0003	DCA FLAG		/CLEAR FLAG
	0004	ISZ TYPSTG		
	0005	TAD I TEMQ		/SET DATA
	0006	RTR		/ROTATE RIGHT 6.
	0007	RTR		
	0008	RTR		
	0009	JMS TSC2		/GO TYPE CHARACTER
	0010	TAD I TEMQ		/GET DATA
	0011	JMS TSC2		/GO TYPE CHARACTER
	0012	ISZ TEMQ		/INCR STRING ADDR
	0013	JMS TSC1		/GO BACK FOR M4CE
	0014	0000		
	0015	TSC2,	0	
	0016	AND I77		/MASK OFF 6 BITS
	0017	DCA TEMR		/SAVE CHARACTER
	0018	TAD FLAG		
	0019	ISZ CLA		/TEST FLAG
	0020	JMP TYPSP		/SET
	0021	TAD TEMR		/NOT SET
	0022	SNA		/ZERO?
	0023	JMP +3		/YES, SET FLAG
	0024	JMS PRINT		/NO, PRINT IT.
	0025	JMP I TSC2		/RETURN
	0026	ISZ FLAG		/SET FLAG
	0027	JMP I TSC2		/EXIT
	0028	DCA FLAG		/CLEAR FLAG
	0029	TAD TEMR		
	0030	CLA		
	0031	SNA		/ZERO?
	0032	JMP TYPAT		/YES, TYPE "B"
	0033	TAD TEMR		
	0034	SNA		
	0035	JMP I TYPSTG		/IS IT 0?
	0036			/YES, EXIT CODE

N02

PCB-E HIGH SPEED READER AND PUNCH TESTS.

PALID V142A 4-FEB-77

10:03 PAGE 1-8

SEQ 0025

0563	1170	TAD (SMA		/SMA TO SWITCH
0564	1279	DCA SWITCH		
0565	1364	TAD TEMR		/GET CHARACTER
0566	1424	TAD PRINT		/PRINT IT
0567	1484	TAD (SPA		
0568	1544	DCA SWITCH		/SPA TO SWITCH
0569	1604	JMP I TSC2		/RETURN
		PRINT,		
		TAD I=40		
		ISZ		
		TAD I=30		
		TAD I=20		
		TAD I=10		
		PRINT		
		SWITCH,		
		TAD I=40		
		ISZ		
		TAD I=30		
		TAD I=20		
		TAD I=10		
		PRINT		
		INTSVC,		
		DCA AC		/SAVE AC
		RAR		
		DCA LINK		/SAVE LINK
		RSP		/READER?
		JMP +3		/NO
		JMP I +1		/YES
		PVCTR,		
		PSF		/PUNCH?
		JMP +4		/NO
		JMS I+STALL		/STALL IF DESIRED.
		JMP I +1		/YES.
		PVCTR,		
		KSF		/TTY READER /KYBC?
		JMP +3		/NO
		KCC		/YES.
		OUT		
		TSP		/TO MAINLINE
		JMP +4		/TTY PRINTER /PUNCH?
		TCP		/NO
		DCA PFLAG		/YES.
		ONEKIT,		
		OUT		/TO MAINLINE
		JMS I XTYPST		/PRINT ERROR MESSAGE
		UNINT		
		HALT		/HALT, UNEXPECTED INTERRUPT
		OUT,		
		CLA		
		CLA		
		TAD LINK		
		RAR		
		TAD AC		/RESTORE LINK
		TAD		/RESTORE AC
		TCP		
		JMP I 0		/EXIT INTERRUPT
		PCBCLR,		
		PCF		
		PCG		
		PCD		
		PCF		
		PCG		
		PCD		

496	1000	PAGE		
497	0000	ASCCN,	0	
498	1001		CLA	
499	1002		TAD I ASCCN	
500	1003		DCA MASC	
501	1004		ISZ ASCCN	
502	1005		TAD I ASCCN	
503	1006		DCA SASC	
504	1007		ISZ ASCCN	
505	1010		TAD I 7700	
506	1011		RND I MASC	
507	1012		RTR CLL	
508	1013		RTR	
509	1014		RTR	
510	1015		JMS CNV	
511	1016		ISZ SASC	
512	1017		TAD I 7700	
513	1020		CMA	
514	1021		RND I MASC	
515	1022		JMS CNV	
516	1023		JMP I ASCCN	
517	1024	CNV,	0	
518	1025		DCA ASCT	
519	1026		TAD ASCT	
520	1027		RTR	
521	1030		RTR	
522	1031		RND (707	
523	1032		TAD ASCT	
524	1033		RND (707	
525	1034		TAD I 6060	
526	1035		DCA I SASC	
527	1036		JMP I CNV	
528	1037		0	
529	1040	MASC,	0	
530	1041	SASC,	0	
531	1042	ASCT,	0	
532	1043	ASCT,	0	
533	1044	STDLYM,	0	
534	1045		CLA	
535	1046		TAD I STDLYM	
536	1047		DCA DELAYM	
537	1048		ISZ STDLYM	
538	1049		JMP I STDLYM	
539	1050		0	
540	1051	ERROR,	0	
541	1052		JMS I URASCCN	
542	1053		RND M	
543	1054		PRNUM	
544	1055		PRNUM	
545	1056		JMS I URASCCN	
546	1057		RTRNO	
547	1058		ENLMB	
548	1059		TAD I ERROR	
549	1060		DCA I SFAOR	
550	1061		JMS I XTYPST	
551	1062		ENLMB	
552	1063		ISZ ERROR	
553	1064		TAD I ERROR	

```

SUBROUTINE TO CONVERT
A WORD TO PRINTABLE ASCII

/SET DELAYM SUB.
/SET DELAYM TO
NUMBER SPECIFIED
/AT CALL+1
/EXIT
/CONVERT PROGRAM
NUMBER TO PRINTABLE
/OCTAL
/CONVERT ROUTINE
NUMBER TO PRINTABLE
/OCTAL
/GET ERROR SUFFIX AND
STORE AT SUFFX
/PRINT ERROR NUMBER
/GET ADDRESS OF ADDITIONAL
    
```

554	1065	7450	SNA	
555	1066	5272	JMS	
556	1067	3271	DCA +4	
557	1070	4447	JMS I XTYPST	
558	1071	0000	0	
559	1072	4475	READSR	
560	1073	0157	RND I SR3MSK	
561	1074	7650	SNA CLA	
562	1075	7402	HLT	
563	1076	4475	READSR	
564	1077	0157	RND I SR4MSK	
565	1100	7650	SZA CLA	
566	1101	5426	JMP I CHAIN	
567	1102	4475	READSR	
568	1103	0157	RND I SR5MSK	
569	1104	7650	SZA CLA	
570	1106	8251	ISZ ERROR	
571	1107	8251	ISZ ERROR	
572	1108	5650	JMP I ERROR	
573	1110	1476	SFAOR,	
574	1111	0000	SUFFX	
575	1112	7200	STCTA,	
576	1113	1711	CLA	
577	1114	3122	TAD I STCTA	
578	1115	3122	DCA CTRB	
579	1116	8211	ISZ STCTA	
580	1117	8711	JMP I STCTA	
581	1118	0000	0	
582	1120	7200	STCTB,	
583	1121	1717	CLA	
584	1122	3123	TAD I STCTB	
585	1123	3123	DCA CTRB	
586	1124	8717	ISZ STCTB	
587	1125	8717	JMP I STCTB	
588	1126	0000	0	
589	1127	4475	READSR	
590	1128	0155	RND I SR6MSK	
591	1130	7640	SZA CLA	
592	1131	5725	JMP I STALL	
593	1132	4475	READSR	
594	1133	0154	RND I SR7MSK	
595	1134	7640	SZA CLA	
596	1135	7410	SKP	
597	1136	4475	JMS I DLYCNT	
598	1137	1021	TAD DELAYM	
599	1140	7440	SZA	
600	1141	4502	DELAY	
601	1142	5725	JMP I STALL	
602	1143	0000	0	
603	1144	4471	JMS I CHECK	
604	1145	0000	0	
605	1146	535	JMP +3	
606	1147	2343	ISZ TCHK	
607	1150	5743	JMP I TCHK	
608	1151	3131	DCA TCHK	
609	1152	4450	JMS I URASCCN	
610	1153	1145	TSD	

```

/PRINTOUT. ZERO?
/YES.
/NO. PRINT IT.
/HALT ON EROR? (SR3)
/YES. (SR3=0)
/SKIP TEST? (SR4)
/YES.
/ENTER SCOPE LOOP?
/YES.
/SET CTRB TO
NUMBER SPECIFIED
/AT CALL+1
/EXIT
/SET CTRB TO
NUMBER SPECIFIED
/AT CALL+1
/EXIT
/RANDOM STALL SUBROUTINE
/STALL? (SR6)
/NO. EXIT
/LOCK ON STALL?
/YES.
/NO. RANDOM STALL.
/STALL
/EXIT
/CHECK THAT CTRB AND CTSB ARE
EQUAL
/OK
/STORE BAD CHARACTER
    
```


936	2011	2036	POT1		
937			/CHECKS	THAT FLAG=1 250MS. AFTER RFC (IOT014), INDICATING THAT	
938			/READER	IS ADVANCING.	
939	2012	4477	SETA		/-200 TO CTRA
940	2013	7470	-310		
941	2014	4501	SETDLM		/-250 TO DELAY
942	2015	7406	-372		
943	2016	6014	POT0A,	RFC	/CLEAR FLAG, FETCH CHAR (IOT014)
944	2017	4502	DELAY		/DELAY 75 MS
945	2020	6011	RSF		/SKIP IF FLAG=1 (IOT011)
946	2021	5225	JMP POE0		
947	2022	2122	ISZ CTRA		/DON?
948	2023	5216	JMP POT0A		/NO, REPEAT
949	2024	5425	JMP I CHAIN		/YES, CHAIN
950	2025	4451	JMS I UERROR		/GO TO ERROR SUBROUTINE
951	2026	4040	NOSUF		/NO PRINTOUT SUFFIX
952	2027	0000	NONE		/NO PRINTOUT
953	2030	5222	JMP POT0A+4		/CONTINUE TEST
954	2031	4501	SETDLM		/SCOPE LOOP
955	2032	7764	-14		
956	2033	6014	RFC		/FETCH CHAR (IOT014)
957	2034	4502	DELAY		/DELAY 12 MS.
958	2035	5233	JMP -2		
959	2036	0001	POT1,	1	
960	2037	2064	POT2		
961			/WITH FLAG=1, SKIP ON FLAG 4095	TIMES TO CHECK FOR RELIABLE SKIPPING	
962	2040	4477	SETA		/-4095 TO CTRA
963	2041	0001	-7777		
964	2042	6014	RFC		/FETCH CHAR (IOT014)
965	2043	6011	RSF		/SKIP ON FLAG (IOT011)
966	2044	5243	JMP -1		/REPEAT
967	2045	6011	POT1A,	RSF	/SKIP ON FLAG (IOT011)
968	2046	5252	JMP POE1		/ERROR
969	2047	2122	ISZ CTRA		/DONE 4095 TIMES?
970	2050	5245	JMP POT1A		/NO, REPEAT TEST
971	2051	5425	JMP I CHAIN		/YES, CHAIN
972	2052	4451	JMS I UERROR		/GO TO ERROR SUBROUTINE
973	2053	4040	NOSUF		/NO PRINTOUT SUFFIX
974	2054	0000	NONE		/NO PRINTOUT
975	2055	5244	JMP POT1A+2		/CONTINUE TEST

976	2056	6014	POT15,	RFC	/START SCOPE LOOP, FETCH CHAR (IOT014)
977	2057	6011	RSF		/SKIP ON FLAG (IOT011)
978	2060	5257	JMP -1		/REPEAT
979	2061	5011	RSF		/SKIP ON FLAG (IOT011)
980	2062	5251	JMP -1		/REPEAT
981	2063	5251	JMP -2		/REPEAT
982	2064	0002	POT2,	0	
983	2065	2105	POT3		
984			/CHECKS	THAT IOT011 DOES NOT SKIP WITH FLAG=0.	
985	2067	4477	SETA		/-4095 TO CTRA
986	2068	0001	-7777		
987	2069	6014	RRB		/CLEAR FLAG
988	2070	6011	RSF		/SKIP ON FLAG=1(IOT011)
989	2071	4040	JMP POT20K		/OK
990	2072	4040	JMS I UERROR		/ERROR, GO TO ERROR SUB
991	2073	4040	NOSUF		/NO PRINTOUT SUFFIX
992	2074	0000	NONE		/NO PRINTOUT
993	2075	3302	JMP POT20K		/CONTINUE TEST
994	2077	6011	RSF		/START SCOPE LOOP, SKIP ON FLAG
995	2080	6011	JMP -1		/REPEAT
996	2081	6011	JMP -2		/REPEAT
997	2080	6011	ISZ CTRA		/DONE 4095 TIMES?
998	2083	6011	JMP POT2A		/NO, REPEAT
999	2084	6425	JMP I CHAIN		/YES, CHAIN
1000			/ROUTINE TO CHECK FOR SKIP WITH INTERRUPT DISABLED		
1001			POT3,	3	
1002	2086	0003	POT4		
1003	2087	4000	TAD	(4000	
1004	2088	3123	CCA	COUNT	
1005	2089	1376	TAD	(7773	
1006	2090	0006	CCA	CTR	
1007	2091	0006	YOP		
1008	2092	0006	CLP		
1009	2093	7205	CCA	MILLI	
1010	2094	7205	ISZ	MILLI	
1011	2095	0006	JMP -1		
1012	2096	0006	ISZ	CTR	
1013	2097	0006	JMP -3		
1014	2098	0006	TAD	(2260	/4.55 MS CONSTANT
1015	2099	0006	CCA	DELTIM	
1016	2100	0006	CAF		
1017	2101	0006	JMP		/READ
1018	2102	0006	JMS	TIM	
1019	2103	0006	RSF		/SKIP IF READER FLAG SET
1020	2104	0006	JMP	POE3	/FLAG DID NOT SET
1021	2105	0006	RPE		
1022	2106	0006	SRA		/SHOULD SKIP HERE IF INT REC
1023	2107	0006	JMP	POE3	/REPORT ERROR
1024	2108	0006	ISZ	COUNT	
1025	2109	0006	JMP	POT3+4	
1026	2110	0006	JMP	I CHAIN	
1027	2111	0006	JMS	I UERROR	
1028	2112	0006	NOSUF		
1029	2113	0006	NONE		
1030	2114	0006	JMP	POT3+2	

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1031 02142 5311 JMP POT3+4
1032 02143 6002 POT3S, IOF
1033 02144 6011 RSF
1034 02145 5344 JMP -1
1035 02146 6011 RSF
1036 02147 5346 JMP -1
1037 02148 5346 JMP -2
1038 02149 0000 TIM, 0
1039 02150 5313 ISZ DELTIM
1040 02151 5352 JMP -1
1041 02154 5751 JMP I TIM
1042
1043 02175 2250
1044 02176 7773
1045 02177 4000
1046 2200 0004 PAGE
1047 02201 2400 /ROUTINE TO CHECK THAT INTERRUPT ENALBE CAN BE CLEARED FOR READER.
1048 02202 6002 POT4, 4
1049 02203 1234 POTS
1050 02204 3235 IOF
1051 02205 6007 TAD R7770 RCNT2
1052 02206 6010 OCA /INIT. # OF ITERATIONS
1053 02207 6020 CAF /ENABLE INTERRUPT
1054 02208 6010 RPE
1055 02210 6001 PCE
1056 02211 6014 ION /READ
1057 02212 6000 RCF
1058 02213 5224 SKON
1059 02214 6003 JMP PDE4 /INTERRUPT NOT ON
1060 02215 7410 SRQ /SKIP IF INT REQ GENERATED
1061 02216 5224 SKP /NO INT REQ
1062 02217 2022 JMP PDE4 /INT REQ GENERATED
1063 02220 5205 ISZ COUNT /RELIABILITY SETUP
1064 02221 2235 POT4A, JMP LOOP /CONTINUE
1065 02222 5205 ISZ RCNT2
1066 02223 5425 JMP I CHAIN
1067 02224 4451 POE4, JMS I UERROR
1068 02226 4040 NOSUF
1069 02227 0000 NONE
1070 02227 5425 JMP I CHAIN
1071 02230 6010 POT4S, PPE
1072 02231 4502 DELAY
1073 02232 6020 PCE
1074 02233 5230 JMP -3
1075
1076 02234 7770 R7770, 7770
1077 02235 7770 RCNT2, 7770
1078
1079 PAGE
1080 2400 0005 POTS, 5
1081 2401 8430 POT5,
1082 /CHECKS IOTD12 (RRB) FOR ABILITY TO CLEAR FLAG.
1083 2402 4477 SETA /-500 TO CTRA
1084 2403 7014 -764

```

M03

```

1085 02404 6014 POT5A, RFC /FETCH CHAR (IOTD14)
1086 02405 6002 RSF /WAIT FOR FLAG=1
1087 02406 6005 JMP -1
1088 02407 6012 RRB CLEAR FLAG (IOTD12)
1089 02410 6001 RSF /SKIP ON FLAG=1
1090 02411 6001 JMP POT5B /OK
1091 02411 6001 JMS I UERROR /ERROR, GO TO ERROR SUB.
1092 02411 6001 NOSUF /NO PRINTOUT SUFFIX
1093 02411 6001 NONE /NO PRINTOUT
1094 02411 6001 JMP POT5B /CONTINUE TEST
1095 02411 6001 RFC POT5S, /START SCOPE LOOP, FETCH CHAR
1096 02411 6001 RSF /WAIT FOR FLAG=1
1097 02411 6001 JMP -1
1098 02411 6001 RRB /CLEAR FLAG (IOTD12)
1099 02411 6001 RSF /SKIP IF FLAG=1
1100 02411 6001 JMP -5 /NO, IOTD12 CLEARED IT, READ AGAIN
1101 02411 6001 JMP -3 /IOTD12 FAILED, REPEAT IOTD12.
1102 02411 6001 POT5B, ISZ CTRA /DONE?
1103 02411 6001 JMS POT5A /NO, REPEAT
1104 02411 6001 JMP I CHAIN /YES, CHAIN
1105
1106 02411 6001 POT6, 6
1107 02411 6001 POT7, 7
1108 /CHECKS THAT IOTD14 CLEARS FLAG. /-500 TO CTRA.
1109 SETA -764
1110
1111 02411 6001 POT6A, RFC /FETCH CLEAR (IOTD14)
1112 02411 6001 RSF /WAIT FOR FLAG=1.
1113 02411 6001 JMP -1
1114 02411 6001 RFC /CLEAR FLAG WITH IOTD14
1115 02411 6001 RSF /SKIP IN FLAG=1.
1116 02411 6001 JMP POT6B /OK FLAG IS 0.
1117 02411 6001 JMS I UERROR /ERROR FLAG=1, GO TO ERROR SUB.
1118 02411 6001 NOSUF /NO PRINTOUT SUFFIX
1119 02411 6001 NONE /NO PRINTOUT
1120 02411 6001 JMP POT6B /CONTINUE TEST
1121 02411 6001 DELAY /START SCOPE LOOP, DELAY 20 MS.
1122 02411 6001 RFC POT6S, /FETCH CHAR (IOTD14)
1123 02411 6001 RSF /WAIT FOR FLAG=1.
1124 02411 6001 JMP -1
1125 02411 6001 JMP -3 /GO CLEAR FLAG AND FETCH CHAR.
1126 02411 6001 POT6B, ISZ CTRA /DONE?
1127 02411 6001 JMS POT6A /NO, REPEAT
1128 02411 6001 JMP I CHAIN /YES, CHAIN
1129
1130 PAGE
1131 02400 2500 POT7, 7
1132 02401 8430 POT10,
1133 /CHECKS ABILITY TO READ ALL D'S CHARACTERS.
1134 02402 4477 SETA /-500 TO CTRA
1135 02403 7014 -764
1136 02404 6014 POT7A, RFC /FETCH CHAR (IOTD14)
1137 02405 6002 RSF /WAIT FOR FLAG=1.
1138 02406 6005 JMP -1
1139 02407 6001 RRB
1140 02408 6001 /READ BUFFER

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1140 0000 6014 POT5A, RFC /FETCH CHAR (IOTO14)
1141 0001 6011 RSP /WAIT FOR FLAG=1
1142 0002 6012 JMB -1
1143 0003 6013 RRB /CLEAR FLAG (IOTO12)
1144 0004 6014 RSP /SKIP ON FLAG=1
1145 0005 6015 JMB POT5B /OK
1146 0006 6016 JMS I LERROR /ERROR, GO TO ERROR SUB.
1147 0007 6017 NOSUF /NO PRINTOUT SUFFIX
1148 0008 6018 NONE /NO PRINTOUT
1149 0009 6019 JMB POT5B /CONTINUE TEST
1150 0010 6020 RFC /START SCOPE LOOP. FETCH CHAR
1151 0011 6021 RSP /WAIT FOR FLAG=1
1152 0012 6022 JMB -1
1153 0013 6023 RRB /CLEAR FLAG (IOTO12)
1154 0014 6024 RSP /SKIP IF FLAG=1
1155 0015 6025 JMB -5 /NO, IOTO12 CLEARED IT. READ AGAIN
1156 0016 6026 JMB -3 /IOTO12 FAILED, REPEAT INTO12.
1157 0017 6027 ISZ CTRA /DONE?
1158 0018 6028 JMB POT5A /NO REPEAT
1159 0019 6029 JMB I CHAIN /YES, CHAIN
1160 0020 6030
1161 0021 6031 POT7 /CHECKS THAT IOTO14 CLEARS FLAG.
1162 0022 6032 SETA -500 TO CTRA.
1163 0023 6033 RFB
1164 0024 6034 RFB /FETCH CLEAR (IOTO14)
1165 0025 6035 RSP /WAIT FOR FLAG=1.
1166 0026 6036 JMB -1
1167 0027 6037 RFC /CLEAR FLAG WITH IOTO14
1168 0028 6038 RSP /SKIP IN FLAG=1.
1169 0029 6039 JMB POT6B /OK FLAG IS 0.
1170 0030 6040 JMS I UERROR /ERROR FLAG=1, GO TO ERROR SUB.
1171 0031 6041 NOSUF /NO PRINTOUT SUFFIX
1172 0032 6042 NONE /NO PRINTOUT
1173 0033 6043 JMB POT6B /CONTINUE TEST
1174 0034 6044 DELAY /START SCOPE LOOP. DELAY 20 MS.
1175 0035 6045 RFB /FETCH CHAR (IOTO14)
1176 0036 6046 RSP /WAIT FOR FLAG=1.
1177 0037 6047 JMB -1
1178 0038 6048 JMB -3 /GO CLEAR FLAG AND FETCH CHAR.
1179 0039 6049 ISZ CTRA /DONE?
1180 0040 6050 JMB POT6A /NO REPEAT
1181 0041 6051 JMB I CHAIN /YES, CHAIN
1182 0042 6052
1183 0043 6053 PAGE 7
1184 0044 6054 POT7, 7
1185 0045 6055 POT10 /CHECKS ABILITY TO READ ALL 0'S CHARACTERS
1186 0046 6056 SETA -500 TO CTRA
1187 0047 6057 RFB
1188 0048 6058 RFB /FETCH CHAR (IOTO14)
1189 0049 6059 JMB -1 /WAIT FOR FLAG=1.
1190 0050 6060 CLA
1191 0051 6061 RRB /READ BUFFER

```

N03

```

1140 0000 3236 DCA POT74B /SAVE
1141 0001 3237 TRD POT74B
1142 0002 3238 SZA CLA /RESULT 0?
1143 0003 3239 JMB POE7 /ERROR, DID NOT READ 0'S CHAR.
1144 0004 3240 ISZ CTRA /DONE?
1145 0005 3241 JMB POT7A /NO, REPEAT
1146 0006 3242 JMB I CHAIN /YES CHAIN
1147 0007 3243 JMS I UASCCN
1148 0008 3244 POT74A
1149 0009 3245 SS
1150 0010 3246 JMS I UASCCN
1151 0011 3247 POT74B
1152 0012 3248 JMB
1153 0013 3249 JMS I LERROR /GO TO ERROR SUBROUTINE
1154 0014 3250 NOSUF /NO SUFFIX
1155 0015 3251 SBNAS /PRINT S/B AND WAS.
1156 0016 3252 JMB POT7B /CONTINUE TEST
1157 0017 3253 CLA
1158 0018 3254 RRB /READ BUFFER. PC S/B 7400
1159 0019 3255 JMB -2 /REPEAT
1160 0020 3256 GDD
1161 0021 3257 POT74B, GDD
1162 0022 3258 POT10, IS
1163 0023 3259 POT11
1164 0024 3260 /CHECKS ABILITY OF READER FLAG TO CAUSE AN INTERRUPT.
1165 0025 3261 SETLCC /SET INTERRUPT RETURN TO
1166 0026 3262 POE10A /POE10A
1167 0027 3263 ACC
1168 0028 3264 SZA /CLEAR TTY READER FLAG.
1169 0029 3265 RFB /CLEAR TTY PRINTER FLAG.
1170 0030 3266 RFB /CLEAR PUNCH FLAG.
1171 0031 3267 RRB /CLEAR READER FLAG.
1172 0032 3268 ZCN /ENABLE INTERRUPT
1173 0033 3269 NOP /NO OP.
1174 0034 3270 JMB /TURN OFF INTERRUPT
1175 0035 3271 JMS POT10B
1176 0036 3272 JMS I LERROR /GO TO ERROR SUB.
1177 0037 3273 NONE /SUFFIX B.
1178 0038 3274 JMB POT10A /NO PRINTOUT.
1179 0039 3275 JMB POT10A /REPEAT TEST.
1180 0040 3276 SETA /REPEAT TEST.
1181 0041 3277 -777 /-4095 TO CTRA
1182 0042 3278 SETLCC /SET INTERRUPT RETURN
1183 0043 3279 POT10E /POT10E.
1184 0044 3280 RRB
1185 0045 3281 RRB /SET INTERRUPT ENABLE
1186 0046 3282 RFB /FETCH CHAR (IOTO14)
1187 0047 3283 RFB /WAIT FOR FLAG=1.
1188 0048 3284 JMB -1
1189 0049 3285 JMB /ENABLE INTERRUPT
1190 0050 3286 JMS I LERROR /TURN OFF INTERRUPT
1191 0051 3287 JMS I LERROR /GO TO ERROR SUB
1192 0052 3288 SZA /SUFFIX B.

```

INCH TESTS.

NONE
 JMP POT10E
 SETLOC
 POT10D
 RSC
 RSC
 JMP .-1
 NONE
 JMS .-2
 JMS .-3
 ISZ CTRA
 POT10C
 RSC
 JMS I CHAIN
 JMS I CHAIN
 TEST
 11, 11
 7777
 SETA
 -310
 JMS DLY250
 SETDLM
 RSC
 RSC
 JMS .-1
 DELAY
 RSC
 DELAY
 RSC
 JMS POT11B
 JMS I UERROR
 NONE
 JMS POT11A
 JMS POT11S
 JMS DLY212
 RSC
 RSC
 JMS +4
 ISZ CTRA
 POT11A
 JMS I CHAIN
 JMS I UERROR
 NONE
 JMS POT11C
 SETDLM
 -17
 RSC
 JMS
 DELAY
 RSC
 JMS .-1
 NONE
 JMS POT11C
 SETDLM
 -17
 RSC
 JMS
 DELAY
 RSC
 JMS .-1

/CONTINUE TEST
 /SET INTERRUPT RETURN TO
 /POT10D.
 /FETCH CLEAR
 /WAIT FOR FLAG=1
 /ENABLE INTERRUPT
 /DONE?
 /NO, REPEAT.
 /CLEAR INTERRUPT ENABLE
 /YES, CHAIN.
 /TEST #
 /LAST TEST
 /-200 TO CTRA
 /INITIAL DELAY.
 /-19 TO DELAYM.
 /FETCH CHAR.
 /WAIT FOR FLAG.
 /DELAY 19 MSECS TO CAUSE
 /STOP DELAY TO FIRE. FETCH CHAR.
 /DELAY 19 MORE MSECS.
 /CHECK FLAG.
 /FLAG NOT UP, OK
 /ERROR, FLAG SHOULD NOT BE UP
 /30 MSECS AFTER "STOP DELAY"
 /FIRES.
 /CONTINUE TEST.
 /GO TO SCOPE LOOP.
 /DELAY ADDITIONAL 212 MSECS.
 /FLAG UP?
 /NO, ERROR.
 /DONE 500
 /NO, REPEAT.
 /YES, CHAIN.
 /ERROR, FLAG NOT UP 250 MSECS
 /AFTER "STOP DELAY" FIRED.
 /SET DELAYM FOR 15 MSECS.
 /FETCH CHAR.
 /FLAG 1?
 /YES, DELAY 15 MSECS.
 /FETCH CHAR.
 /WAIT FOR FLAG.

ED READER AND PUNCH TESTS.

5361 DLY212, 0 JMS .-4
 0000 SETDLM
 4501 -324
 7454 DELAY
 4502 JMS I DLY212
 5755 DLY250, 0
 0000 SETDLM
 4501 -372
 7405 DELAY
 4502 JMS I DLY250
 5773
 3000
 PAGE PROGRAM 1, BASIC PUNCH AND CONTROL LOGIC TEST
 PRG1. SETLOC /SET KSTART TO
 KSTART /INITIAL ROUTINE
 PIT0 /ADDRESS
 SETLOC /SET SR MASK
 SRMSK
 7717 /GET STARTED
 JMS I .+1
 SRSET
 PIT0. PIT1
 0 THAT PSF (IOT021) DOES NOT SKIP WITH FLAG = 1
 /CHECKS SETA /-4095 TO CTRA
 -7777
 PIT0A. PCF /CLEAR FLAG
 PSF /SKIP IF FLAG=1 (IOT021)
 JMS PIT0B /NO SKIP, OK
 JMS I UERROR /SKIP ERROR, GO TO ERROR SUB
 NONE /NO SUFFIX
 NOSUF /NO PRINTOUT
 PIT0S. JMS PIT0B /CONTINUE TEST.
 PCF /CLEAR FLAG
 PSF /SKIP IF FLAG=1
 JMS .-1
 JMS .-2 /DONE?
 ISZ CTRA /NO, REPEAT
 JMS PIT0A /YES, CHAIN
 JMS I CHAIN
 PIT1. PIT2
 0 THAT PSF (IOT021) SKIPS WITH FLAG=1 IF FLAG=1.
 /CHECKS SETA /-4095 TO DELAYM
 -7777
 SETDLM
 -7777
 CLA CLL /CLEAR PUNCH FLAG, LOAD BUFFER
 PCF /LOAD BUFFER AND PUNCH
 PPC /DELAY 4095 MILLISECONDS
 DELAY /SKIP IF FLAG=1. SHOULD BE 1
 PSF /NO, SKIP, ERROR.
 JMS PIE1

004

SEQ 0041

PCB

0000
 0100
 0200
 0300
 0400
 0500
 0600
 0700
 1000
 1100
 1200
 1300
 1400
 1500
 1600
 1700
 2000
 2100
 2200
 2300
 2400
 2500
 2600
 2700
 3000
 3100
 3200
 3300
 3400
 3500
 3600

```

2122 2122 ISZ CTR4 /DONE?
0024 JMF PIT1A /NO REPEAT
0425 JMF I CHAIN /YES CHAIN
4461 PIE1. JMS I UERROR /GO TO ERROR SUBROUTINE
4040 NOSUF /NO SUFFIX
0030 NONE /NO PRINTOUT
5246 JMF PIT19 /CONTINUE TEST
7200
PIT15. OLD /CLEAR FLAG AND BUFFER
PCF /SKIP IF FLAG=1
PCF /LOAD AND PUNCH
PCF /REPEAT
JMF :-1 /REPEAT
JMF :-2 /REPEAT
PIT2.
PIT3
/CHECKS THAT PCF (IOT022) IS ABLE TO CLEAR THE FLAG
SETA 7-500 TO CTR4
724
PIT2A. CLA /CLEAR LOAD AND PUNCH
PLS /WAIT FOR FLAG=1
PUS
JMF :-1
PCF /CLEAR FLAG (IOT022)
PCF /SKIP IF FLAG=1
JMF PIT2B /NO SKIP OK
JMS I UERROR /SKIP ERROR GO TO ERRCR SUB
4461 NOSUF
4040 NONE
0000
PIT2S. JMF PIT2B /CONTINUE TEST.
CLA /CLEAR LOAD AND PUNCH
PLS /WAIT FOR FLAG
PUS
JMF :-1
PCF /CLEAR FLAG
PCF /SKIP IF FLAG=1
JMF :-2 /CLEARED
JMF :-3 /NOT CLEAR.
JMF :-4 /SAVE?
PIT2B. ISZ CTR4 /NO REPEAT
JMF PIT2A /YES CHAIN
JMF I CHAIN
/ROUTINE TO CHECK FOR SKIP WITH INTERRUPT DISABLED
PIT3.
PIT4
TAD (4000
DCA COUNT
TAD (7773
DCA CTR
FOR
CLA
DCA MILLI
ISZ MILLI
JMF :-1
JMF CTR
JMF :-3
JMF (0001
/16 MS CONSTANT

```

```

4000
4100
4200
4300
4400
4500
4600
4700
5000
5100
5200
5300
5400
5500
5600
5700
6000
6100
6200
6300
6400
6500
6600
6700
7000
7100
7200
7300
7400
7500
7600

```

E04

```

3133 3134 DCA DELTIM
3134 6007 CAF
3135 6024 PPC /PUNCH
3136 4361 JMS TIM1
3137 6021 PIT3A. /SKIP IF PUNCH FLAG SET
3140 5347 JMF PIE3
3141 6010 RPE
3142 6003 SRG /SHOULD SKIP HERE FOR INT REQ
3143 534 /REPORT ERROR
3144
3145 JMF PIE3
3146 ISZ COUNT
3147 JMF PIT3+4
3148 JMF I CHAIN
3149 JMS I UERROR
3150 NOSUF
3151 NONE
3152 JMF PIT3+4
3153 6002
3154 6021
3155 5354 /-1
3156 5356 /-1
3157 5356 /-2
3160 TIM1. /44 MILLISECOND TIME OUT
3161 0000
3162 2134 ISZ DELTIM
3163 5362 JMF :-1
3164 1374 TAD (0500
3165 3134 DCA DELTIM
3166 2134 ISZ DELTIM
3167 5366 JMF :-1
3170 5367 ISZ DELTIM
3171 5370 JMF :-1
3172 5761 JMF I TIM1
/RETURN
3174 0500
3175 0001
3176 7773
3177 4000
3200 PAGE
3200 0004 /ROUTINE TO CHECK THAT INTERRUPT ENABLE CAN BE CLEARED FOR PUNCH.
3201 3234 PIT4.
3202 6002 IOF
3203 1322 TAD P7770
3204 3201 DCA PCNT2
3205 6001 PLOOP. /INIT. COUNTER
3206 5010 RPE /ENABLE INTERRUPT
3207 6020 PCE
3210 6001 TON
3211 6024 PPC
3212 6000 SKON
3213 6024 JMF PIE4 /PUNCH
3214 6003 SRG /ERROR -- NO ION
3215 7410 SKP /SKIP IF INT REQ GENERATED
3216 6024 JMF PIE4 /NO INT REQ
3217 6000 ISZ COUNT /ERROR -- INT REQ GENERATED
/RELIABILITY SETUP

```

```

P174. JMP PLOOP
      ISZ PONT2
      JMP PLOOP
      JMP I CHAIN
P1E4. JMS I UERROR
      NOSUP
      NONE
      JMP I CHAIN
P174S. RPP
      DELAY
      PCE
      JMP .-3
P175. P176
      /USED TO CHECK ABILITY OF 107022 TO CLEAR BUFFER. VISUAL CHECK
      SETA -500 TO CTRA
      -764
P175A. CLA CMA /7777 TO AC
      PLS /CLEAR, LOAD, AND PUNCH
      CLA /CLEAR BUFFER CONTENTS PRIOR
      PLS /TO PUNCHING
      PSF
      JMP .-1
      ISZ CTRA /DONE?
      JMP P175A /NO, REPEAT
      JMP I CHAIN /YES, CHAIN
P176. P177
      /CHECKS ABILITY OF 107024 TO SET BUFFER TO 125 AND PUNCH IT
      SETA -500 TO CTRA
      -764
P176A. CLA /125
      TAD /125
      PLS /CLEAR, LOAD AND PUNCH
      PSF /WAIT FOR FLAG 1
      JMP
      ISZ CTRA /DONE?
      JMP P176A /NO, REPEAT
      JMP I CHAIN /YES, CHAIN
P177. P178
      /CHECKS ABILITY OF 107024 TO SET BUFFER TO 252 AND PUNCH IT
      SETA -500 TO CTRA
      -764
P177A. CLA /252
      TAD /252
      PLS /CLEAR LOAD AND PUNCH.
      PSF /WAIT FOR FLAG 1
      JMP
      ISZ CTRA /DONE?
      JMP P177A /NO, REPEAT
      JMP I CHAIN /YES, CHAIN
PONT2. 7770
    
```

```

7770 P7770, 7770
3400 PAGE
0010 P1710, 10
7777 7777
/CHECKS ABILITY OF PUNCH FLAG TO CAUSE AN INTERRUPT
      SETLOC /SET INTERRUPT RETURN
      /TO P1E10A.
P1710A. KCC /CLEAR ITTY READER
      ICF /CLEAR READER
      RRD /CLEAR READER
      XCF /CLEAR PUNCH FLAG
      ION /ENABLE INTERRUPT
      NOP
      ICF /TURN OFF INTERRUPT
      JMP P1710B
P1E10A. JMS I UERROR
      NONE
      JMP P1710A
      JMP P1710A
P1710B. SETA -4095 TO CTRA
      SETLOC /SET INTERRUPT RETURN
      /TO P1710C
      P1710C
      CLA
      RPP /SET INTERRUPT ENABLE
      PLS /CLEAR, LOAD AND PUNCH
      PSF /WAIT FOR FLAG 1.
      JMP .-1
P1710C. XON
      NOP
      ICF
      ICF
P1E10B. JMS I UERROR
      NONE
      JMP P1710C
P1710S. SETLOC /SET INTERRUPT
      /RETURN TO P1710C
      P1710D
      CLA
      PLS /CLEAR, LOAD AND PUNCH
      PSF /WAIT FOR FLAG 1.
      JMP .-1
      ION /ENABLE INTERRUPT
      NOP
      JMP .-2
      ISZ CTRA /DONE?
      JMP P1710C /NO, REPEAT
      JMP I CHAIN /YES, CHAIN
    
```

PCB-E
ERRORS
LINKS
PLY-TC
9-108

ED READER AND PUNCH TESTS.

PAL10 V142A 4-FEB-77

7710	SPA CLA	/GREATER THAN 100?
5233	JMS .+3	/NO OK
7402	HLT	/YES, ERROR. HALT
5231	JMP	/PUNCH BIN CHARACTER
4246	JMS CPCH	
1127	TAD RBSY	/READER BUSY?
7640	SZA CLA	/YES, EXIT
5503	OUT	/GET PUNCH COUNT
1132	TAD PCHCNT	/SUBTRACT SLACK COUNT
1146	TAD (-12	/POSITIVE?
7710	SPA CLA	/NO
5503	OUT	/YES, START READER
6014	RFC	/SET READER BUSY
2127	ISZ RBSY	/EXIT.
5503	OUT	
0000	CPCH, JMS I GETPTR	/GET BIN CHAR.
4470	PLUS	/ENABLE PUNCH
6026	CLD	/CLEAR AC
7200	JMS I CPCH	/EXIT
5546	OUT	
0000	CREAD, JMS I CREAD	/READ CHARACTER
7200	OUT	/STORE IT
6012	TAD TCHKW	/GET PUNCH COUNT
3131	TAD PCHCNT	/MINUS 1
1132	TAD (-1	/STORE IT
1146	TAD PCHCNT	
3132	TAD PCHCNT	
1132	TAD CLK	/0?
7640	SZA .+3	/NO
5267	JMS RBSY	/YES, CLEAR READER BUSY
3127	DCA I CREAD	/EXIT
5553	RFC	/FETCH NEXT CHARACTER
6014	JMS I CREAD	/EXIT
70	JMS CREAD	/READ CHARACTER
4253	TAD TCHKW	/IS IT 0?
1131	SMG CLA	/YES
7650	OUT	/SET INTERRUPT SERVICE
5503	SETLOC	/TO RBIN.
4475	RVCTR	/TO RBIN.
0711	RBIN	/-5 TO CTRA
3703	SETLOC	
4477	RVCTR	
7773	SKP	/READ CHARACTER
7410	JMS CREAD	/GET BINARY CHARACTER
4253	JMS I GETPT	
4467	DCA I UT5B	/GET CHARACTER READ
3462	TAD TCHKW	/GO CHECK IT
1131	JMS I UTCHK	/ERROR
4451	SKP	/NO
7410	OUT	/5 ERRORS?
5503	ISZ CTRA	/NO TO MAILLINE
2122	OUT	/YES, SET READER SERVICE
5503	SETLOC	/TO RESYNC TAPE.
4475	RVCTR	
4711	RVCTR	

HIGH SPEED READER AND PUNCH TESTS.

PAL10 V142A 4-FEB-77

K04

10:03 PAGE 2-13

SEC 0049

3716	3720	.+2		
3717	5503	OUT		/READ CHARACTER
3720	4253	JMS CREAD		
3721	1131	TAD TCHKW		/STORE
3722	3140	DCA CHR1		/SET READER SERVICE
3723	4475	SETLOC		
3724	0711	RVCTR		
3725	4475	OUT		/READ CHAR.
3726	4475	JMS CREAD		
3727	4475	TAD TCHKW		
3730	4475	DCA CHR2		/SET RDR
3731	4475	SETLOC		/SERVICE
3732	4475	RVCTR		
3733	4475	OUT		/READ CHAR.
3734	4475	JMS CREAD		
3735	4475	TAD TCHKW		/STORE AT CHR3
3736	4475	DCA CHR3		/GO SYNC
3737	4475	JMS I SYNCA		/SYNC ERROR, TRY AGAIN
3740	4475	JMP RBINA		/YES, -5 TO CTRA.
3741	4475	SETA		
3742	4475	-5		/RESTORE READER SERVICE
3743	4475	SETLOC		/TO RBIN
3744	4475	RVCTR		
3745	4475	RVCTR		
3746	4475	RVCTR		/TO MAINLINE.
3747	4475	OUT		
3750	5503	OUT		
4000	4475	PAGE		
4000	4475	PROGRAM 10, READ AMPLIFIER ADJUSTMENT LOOP		/SET INTERRUPT SERVICE
4001	4475	PRG10, SETLOC		/TO INTSVC.
4002	4475	2		
4003	4475	INTSVC		/SET PUNCH SERVICE ADDRESS
4004	4475	SETLOC		/TO PCHCLR.
4005	4475	PVCTR		
4006	4475	PCHCLR		/SET READER SERVICE ADDRESS
4007	4475	SETLOC		/TO AMPRDR
4010	4475	RVCTR		
4011	4475	AMPRDR		
4012	4475	SETLOC		
4013	4475	ERRORA		
4014	4475	7000		
4015	4475	TAD INOP		
4016	4475	DCA I (STALL+3		/NO TO SRMSK
4017	4475	DCA SRMSK		/GO READ CHARACTER
4018	4475	JMS AMPRD		/ZERO?
4019	4475	SZA		/NO.
4020	4475	SKP		/GO READ CHARACTER.
4021	4475	JMS AMPRD		
4022	4475	CIA		
4023	4475	TAD (PTMSK		/ALL 1'S?
4024	4475	SZA CLA		/NO, ERROR
4025	4475	JMP AMPRD		/YES, GO READ
4026	4475	JMS AMPRD		/ZERO?
4027	4475	SZA CLA		


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799 4114 0153 AND (PTMSK
800 4115 4456 JMS I UTPCH /PUNCH ALL 1'S
801 4116 4563 JMS I (STALL
802 4117 7200 CLA
803 4120 4456 JMS I UTPCH /PUNCH ALL 0'S
804 4121 4563 JMS I (STALL
805 4122 5313 JMP PRG12A /REPEAT.
806
807 4200 PAGE
808 4201 7200 PRG13, CLA
809 4202 3123 DCA CTRB /CLEAR CTRB
810 4202 7604 LAS /READ SR
811 4203 7104 CLL RAL
812 4204 7710 SPA CLA /LONG OR SHORT?
813 4205 1143 TAD (-416 /LONG
814 4205 1143 TAD (-36 /SHORT
815 4207 3232 DCA TKN /STORE AT TKN
816 4210 5220 JMS TSTRL
817 4211 6014 TSTRD, RFC /START READER
818 4212 6011 RSE /WAIT FOR
819 4213 6212 JMS -1 /FLAG
820 4214 3123 JMS CTRA /INCREMENT CTRA.
821 4215 3123 JMS TSTRC /NO
822 4215 3123 JMS CTRB /YES, INCREMENT CTRB
823 4217 7000 JMS
824 4220 1232 TSTRL, TAD TKN /LOAD CTRA
825 4221 3123 DCA CTRA
826 4223 7604 TSTRC, LAS /READ SR
827 4223 7700 SPA CLA /PRINT SPEED?
828 4224 5211 JMS TSTRD /NO CONTINUE READING
829 4225 4447 JMS I XTYPST /YES.
830 4225 1532 RSPD
831 4227 4257 JMS TSTRPC
832 4230 7402 JMS
833 4231 5200 JMP PRG13
834 4232 0000 TKN, OPEN
835
836 4233 7200 PRG14, CLA
837 4234 3123 DCA CTRB /CLEAR CTRB
838 4235 3123 JMS TSTRL
839 4235 6026 TSTPP, PLS
840 4237 6021 PLS
841 4240 3123 JMS -1 /60?
842 4241 3123 JMS CTRA /NO
843 4242 3123 JMS TSTRC /YES, INCREMENT CTRB
844 4243 3123 JMS CTRB
845 4244 7000 JMS
846 4245 1151 TSTPL TAD (-74 /LOAD -60 IN CTRA
847 4246 1123 DCA CTRA
848 4247 7604 TSTPC, SPA CLA /READ SR
849 4248 7700 JMS CTRA /PRINT SPEED? (AFTER 60 SECONDS)
850 4249 5235 JMS TSTPP /NO CONTINUE
851 4250 4447 JMS I XTYPST /YES.
852 4251 1543 RSPD
853 4252 4257 JMS TSTRPC

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1854 4255 7402 HLT
1855 4256 5233 JMP PRG14
1856
1857 4257 0000 TSTRPC, 0
1858 4260 4265 JMS BDCNV /TYPE C(CTRB) IN DECIMAL
1859 4261 0123 CTRB
1860 4262 4147 JMS I XTYPST /TYPE "CPS"
1861 4263 1531 CPS
1862 4264 3333 JMS I TSTRPC /EXIT.
1863 4265 0000 BDCNV, 0 /BINARY TO DECIMAL CONVERT
1864 4266 1178 SETLOC /AND PRINT SUBROUTINE
1865 4267 5331 CNVCTR
1866 4270 -4
1867 4271 1332 TAD ADDRZA /INITIALIZE ARROW.
1868 4272 1332 DCA ARROW
1869 4273 1332 TAD I BDCNV /GET AND STORE BINARY
1870 4274 1332 ISZ BDCNV /NUMBER. STORE IT AT VALUE.
1871 4275 1332 DCA DIGIT
1872 4276 1332 TAD I DIGIT
1873 4277 3337 DCA VALUE
1874 4300 3339 DCA DIGIT /0 TO DIGIT.
1875 4301 7100 CLL
1876 4302 1000 TAD VALUE
1877 4303 1000 ARROW, TAD TENPWR
1878 4304 7402 SNL
1879 4305 5311 JMP +4
1880 4306 3333 ISZ DIGIT
1881 4307 3333 DCA VALUE
1882 4310 5303 JMP ARROW-2
1883 4311 7200 CLA
1884 4312 1333 TAD DIGIT
1885 4313 1143 TAD (-260
1886 4314 4473 JMS I UPUNCH
1887 4315 7303 CLA CLL
1888 4316 2303 ISZ ARROW
1889 4317 2303 ISZ CNVCTR
1890 4320 3303 JMP ARROW-3
1891 4321 5265 ADDRZA, TAD BDCNV
1892 4322 1333 TAD TENPWR
1893 4323 5303 TENPWR, -1750
1894 4324 7604 -144
1895 4325 7765 -12
1896 4326 7777 -1
1897 4327 0000 VALUE, 0
1898 4330 0000 DIGIT, 0
1899 4331 0000 CNVCTR, 0
1900
1901 /PROGRAM 15. READ X CHARACTERS. STALL Y MS. LOOP UNTIL ADJUST TIMINGS.
1902 4332 7500 PRG15, HLT CLA /HALT TO SET SR
1903 4333 7500 LAS /READ SR
1904 4334 0177 AND (177 /MASK OFF EXCESS BITS
1905 4335 7511 CIA
1906 4336 3321 DCA DELAYM /STORE STALL COUNT
1907 4337 7500 LAS /READ SR
1908 4340 0177 AND (7600 /MASK OFF EXCESS BITS

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0000 11111111 11111111 11111111 11111111 11111111 11111111 11111111
1000 11111111 11111111 11100000 00000000 00000000 00000000 00000000
2000 11111111 11111111 11111111 11111111 11111111 11111111 11111111
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7200
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EOS

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2 0140 ERRORA 1075
AC 0023 FADDR 0000
ACTIND 0000 FLAG 0000
ADDRZA 4333 FORMD 0000
AMPRD 4057 GETPT 0000
AMPROA 4057 GETPR 0000
ARROW 4057 GETPTT 0000
ASCCN 0000 GETRDY 0000
ASCT 4100 GTPTR 0000
BDDCNV 0000 INCRTN 0000
BELL3 0000 INIT 0000
BELL4 0000 INITPT 0000
CHAIN 0000 INPATT 0000
CHAINN 0000 INTSVC 0000
CHECK 0000 IOUT 0000
CHR1 0000 KSTART 0000
CHR2 0000 LINK 0000
CHR3 0000 LARGN 0000
CHR4 0000 LARGN 0000
CHR5 0000 MARK 0000
CHRCNT 0000 MARKAD 0000
CNY 0000 MARKEP 0000
CNYCTR 0000 MCTR 0000
COUNT 0000 MILL 0000
CPCH 0000 MILCTR 0000
CPIC 0000 MILLI 0000
CPCNT 0000 MOVE 0000
CPCNT 0000 MSCTR 0000
CPCNT 0000 NONE 0000
CPCNT 0000 NOSUF 0000
CPCNT 0000 NXTST 0000
CPCNT 0000 OPEN 0000
CPCNT 0000 OUT 0000
CPCNT 0000 POED 0000
CPCNT 0000 POEL 0000
CPCNT 0000 POELOR 0000
CPCNT 0000 POE1 0000
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CPCNT 0000 POE3 0000
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