

## IDENTIFICATION

PRODUCT NAME: HIGH-SPEED READER/PUNCH TESTS  
PRODUCT CODE: MAINDEC-GB-DHPCA-A-D  
PRODUCT DATE: MARCH 1977  
MAINTAINER: DIAGNOSTIC ENGINEERING  
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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/6E 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/6E WITH ASR33/35 TELETYPE, PRB-E READER, OR PRP-E PUNCH, OR PDB-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 CODE 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 PRGD AND PRG1 TO PERMIT SETTING OF DESIRED OPTIONS. PRESS CONTINUE TO PROCEED.
- LOC 0305 PROGRAM END HALT. OCCURS AT END OF PRGD 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 PRGD AND PRG1 IF SR0 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 SR0 IS OFF, AND THAT SR1 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 SR0 IS OFF.
- LOC 4332 PRG15 SR SET HALT. OCCURS TO PERMIT SETTING OF DESIRED CHARACTER AND STALL COUNT. SET SR0-4 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 RFS COMMAND (I/O CL 4) RFS DID NOT SKIP. FLAG IS NOT SET, OR RFS COMMAND FAILED TO SKIP.