

IDENTIFICATION

PRODUCT CODE:           MAINDEC-11-D1AA  
PRODUCT NAME:           BASIC ADDRESS TEST (UP)  
DATE CREATED:           MARCH 30, 1970  
MAINTAINER:             DIAGNOSTIC GROUP  
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1. ABSTRACT

THE PDP-11 BASIC ADDRESS TEST IS DESIGNED TO PROVIDE ELEMENTARY FIRST LEVEL TEST CAPABLE OF VERIFYING THE OPERATIONAL STATUS OF A PDP-11 MM-11-E MEMORY; THE TEST WRITES THE ADDRESS OF EACH LOCATION (WITHIN THE TEST LIMITS) INTO ITSELF AND READ VERIFIES THAT THE PROPER ADDRESS HAS BEEN STORED,

2. REQUIREMENTS

2.1 EQUIPMENT

PDP-11/20

2.2 STORAGE

2.2.1 PROGRAM STORAGE

THE COMPLETE TEST PROGRAM OCCUPIES 20(8) LOCATIONS

2.3 PRELIMINARY PROGRAMS

NONE REQUIRED

3. LOADING PROCEDURE

3.1 METHOD

THIS PROGRAM IS LOADED MANUALLY FROM THE CONSOLE KEYBOARD. THE MACHINE INSTRUCTIONS LISTED IN SECTION 9 MAY BE LOADED INTO ANY SECTION OF MEMORY. PRIOR TO LOADING THE PROGRAM, SET ADDRESS 100(8) INTO THE SWITCH REGISTER AND PRESS LOAD ADDRESS, CLEAR THE SWITCH REGISTER AND PRESS DEPOSIT, EXAMINE LOCATION 100(8) TO MAKE SURE IT CONTAINS ZERO, SELECT AND LOAD THE STARTING ADDRESS INTO CONSOLE SWITCH REGISTER AND PRESS LOAD ADDRESS, LOAD THE FIRST INSTRUCTION INTO SWITCH REGISTER AND PRESS DEPOSIT, LOAD NEXT INSTRUCTION INTO THE SWITCH REGISTER AND PRESS DEPOSIT, CONTINUE LOADING INSTRUCTIONS AS LISTED IN SECTION 9 WITH THE FOLLOWING EXCEPTIONS: THE SIXTH ENTRY (LOCATION 212 IN THE SAMPLE LISTING) AND THE SEVENTEENTH ENTRY (LOCATION 236 IN THE SAMPLE LISTING) ARE THE HIGH MEMORY TEST BOUNDARY ADDRESS AND THE LOW MEMORY TEST BOUNDARY ADDRESS, RESPECTIVELY, THE LOW LIMIT BOUNDARY SHOULD ALWAYS BE SET ABOVE THE END OF THE PROGRAM, THE HIGH LIMIT BOUNDARY SHOULD BE SET WITHIN THE MAXIMUM BOUNDS OF THE MEMORY UNDER TEST, AND ABOVE THE END OF THE TEST PROGRAM, THE PROGRAM AS LOADED INITIALLY, IS

(3.1 CONT'D)

PRIMED FOR A LOW LIMIT OF 240, AND A HIGH LIMIT OF 17500. THE PROGRAM WILL RUN WITHIN THOSE LIMITS IF NEW LIMITS ARE NOT ENTERED INTO THE RESPECTIVE LIMIT LOCATIONS, I.E., 212 AND 236.

4. STARTING PROCEDURE

THIS PROGRAM IS NOT SELF STARTING. THE PROGRAM IS STARTED AT THE STARTING ADDRESS SELECTED DURING THE LOADING OPERATION. LOAD THIS ADDRESS INTO THE CONSOLE SWITCH REGISTER AND PRESS START.

4.1 CONTROL SWITCH SETTING

NO SPECIAL SWITCH SETTING IS REQUIRED FOR THIS TEST.

4.2 STARTING ADDRESS OR ADDRESSES

OPTIONAL, SELECTED BY OPERATOR.

4.3 PROGRAM AND/OR OPERATOR ACTION.

LOAD PROGRAM MANUALLY AS DESCRIBED IN SECTION 3.  
SET SWITCH REGISTER TO STARTING ADDRESS.  
LOAD ADDRESS,  
PRESS START (ENABLE/HALT MUST BE IN ENABLE POSITION)

5. OPERATIONAL PROCEDURE

5.1 OPERATIONAL SWITCH SETTING

NO SPECIAL SWITCH SETTINGS REQUIRED.

5.2 SUB-ROUTINE ABSTRACTS

NOT APPLICABLE.

5.3 PROGRAM AND/OR OPERATOR ACTION

THE PROGRAM WILL RUN THROUGH THE SELECTED ADDRESS FIELD AND LOOP UPON COMPLETION, IF LOCATION 232 IS CHANGED TO 000000 THE PROGRAM WILL HALT UPON COMPLETION, WITH THE PC POINTING TO THE ADDRESS CORRESPONDING TO LOCATION 234 OF THE PROGRAM.

6. ERRORS

6.1 ERROR HALTS AND DESCRIPTION

IF AN ERROR IS DETECTED THE PROGRAM WILL HALT WITH THE PC POINTING AT LOCATION 224 OF THE PROGRAM WITH THE ADDRESS OF THE ERROR LOCATION STORED IN LOCATION 177700(R0), AN ADDRESSING ERROR (CAUSED BY EITHER A HARDWARE FAILURE OR AN IMPROPER HIGH LIMIT SETTING) WILL RESULT IN A HALT WITH THE PC POINTING TO ADDRESS 102.

6.2 ERROR RECOVERY

DEPRESS CONTINUE OR IF ADDRESS ERROR VERIFY HIGH LIMIT IS SET AS SPECIFIED IN SECTION 3 AND RESTART.

7. RESTRICTION

NORMAL HARDWARE CONSTRAINTS

7.1 STARTING RESTRICTION

NONE.

7.2 OPERATION RESTRICTION

NONE.

8. MISCELLANEOUS

THIS PROGRAM IS ALSO SUPPLIED IN A PAPER TAPE VERSION.

8.1 EXECUTION TIME

N/A

9. PROGRAM DESCRIPTION

THE PROGRAM WRITES THE (WORD) ADDRESS OF EACH (WORD) LOCATION IN THE TEST RANGE INTO ITSELF. THE PROGRAM STARTS THE WRITE LOOP WITH THE LOW LIMIT LOCATION AND CONTINUES WRITING AND INCREMENTING THROUGH MEMORY UNTIL THE ADDRESS CORRESPONDING TO THE HIGH LIMIT IS REACHED. AFTER THIS LOCATION HAS BEEN WRITTEN THE READ CYCLE IS ENTERED. THIS CYCLE STARTS WITH THE HIGH LIMIT LOCATION AND READS AND COMPARES EACH (WORD) LOCATION, DECREMENTING DOWN TO THE LOW LIMIT LOCATION. THE PROGRAM HALTS ON A FAILURE TO COMPARE, WITH THE ERROR ADDRESS DISPLAYED IN THE CONSOLE.

10. LISTING

THE PROGRAM LISTING BELOW ALSO CONTAINS A SAMPLE LISTING  
SHOWING THE ADDRESS DISTRIBUTION OF THE INSTRUCTIONS.  
THE STARTING ADDRESS OF THE SAMPLE WAS 200, HOWEVER  
ANY STARTING ADDRESS FROM 200 UP MAY BE USED (ADDRESSES  
BELOW 200 ARE RESERVED FOR SEPECIFIC HARDWARE FUNCTIONS)  
WITHOUT PLACING ANY RESTRICTION ON THE PROGRAM AS LISTED.

ADDRESS CONTENTS

200	016700
202	000032
204	010010
206	005720
210	020027
212	017500 (THIS IS HIGH LIMIT - MAY BE CHANGED)
214	101773
216	024000
220	001401
222	000000
224	026700
226	000006
230	103772
232	000240
234	000761
236	000236 (THIS IS LOW LIMIT - MAY BE CHANGED)

BASIC ADDRESS TEST (UP)  
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NOP=240

000200	016700	000032
000204	010010	
000206	005720	
000210	020027	017500
000214	101773	
000216	024000	
000220	001401	
000222	000000	
000224	026700	000006
000230	103772	
000232	000240	
000234	000761	
000236	000236	
	000001	

```

      . = 200
STARTI  MOV      LOLMT,%0      ;INITIALIZE LOW LIMIT
WRITEI  MOV      %0,%0        ;WRITE VALUE INTO ADDRESS
        TST      (0)+         ;JUST INCREMENT
        CMP      %0,#17500    ;TEST FOR DONE ALL MEMORY
        BLOS    WRITE        ;NOT DONE
READI   CMP      -(0),%0      ;READ VALUE BACK FROM ADDRESS
        BEQ     CKON         ;WAS VALUE OK?
CKONI   CMP      LOLMT,%0     ;NO, HAVE ERROR=PRESS CONTINUE OR RESTART AT 200
        BLO    READ         ;TEST FOR DONE ALL MEMORY
        NOP     READ         ;NOT DONE
        BR     START        ;STORE "HALT" HERE TO STOP AFTER A PASS COMPLETION
LOLMTI  .        ;REPEAT TEST
        .      ;END

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CKON	000224
LCLMT	000236
NOP	000240
READ	000216
START	000200
WRITE	000204

ERRORS DETECTED: 0

RUN-TIME: 0 SECONDS

4K CORE USED