

IDENTIFICATION

PRODUCT CODE: MAINDEC-8E-D018-0
PRODUCT NAME: BASIC JMP-JMS TEST
DATE CREATED: JUNE 11, 1971
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1. ABSTRACT

THIS IS A DIAGNOSTIC PROGRAM FOR TESTING THE JMP AND JMS INSTRUCTIONS OF THE PDP-8E.

2. REQUIREMENTS

2.1 EQUIPMENT

A PDP-8E EQUIPPED WITH TELETYPE.

2.2 STORAGE

THIS PROGRAM USES MOST OF MEMORY. THE BINARY LOADER MUST BE STORED IN THE LAST MEMORY PAGE.

2.3 PRELIMINARY PROGRAMS

MAINDEC-8E-D0A(N) AND MAINDEC-8E-D0B(N)

3. LOADING PROCEDURE

3.1 METHOD

THE STANDARD BINARY LOADER IS USED.

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS (NONE)

4.2 STARTING ADDRESS

200

4.3 RESTART ADDRESSES

600
704

4.4 OPERATOR ACTION

A. SET SR TO 200 AND PRESS LOAD ADDRESS.

B. PUSH CLEAR AND THEN CONTINUE. THE PROGRAM WILL STORE PARTS OF THE RIM AND BINARY LOADERS THAT WILL BE DESTROYED, AND THEN JMP TO 4200 TO BEGIN TESTING.

5. OPERATING PROCEDURES

5.1 PROGRAM RESTARTS

SINCE THE LOADERS ARE ALREADY STORED, A PROGRAM RESTART SHOULD BEGIN AT 600 NOT 200.

5.2 PROGRAM END

TO RESTORE THE LOADERS AT THE CONCLUSION OF THE TEST, START AT 704. WHEN THE PROGRAM HALTS, RESTORATION IS COMPLETED (PC=736).

6. ERRORS

6.1 ERROR HALTS AND DESCRIPTION

SEE SECTION 9.

6.2 ERROR RECOVERY

IN MOST CASES IT IS POSSIBLE TO INSERT A JMP INSTRUCTION IN THE ERROR HALT POSITION TO RETURN THE PROGRAM TO THE FAILING TEST. THIS FORMS A PROGRAM LOOP ON THE FAILING TEST AND ALLOWS THE PROBLEM TO BE INVESTIGATED WITH AN OSCILLOSCOPE. IN CASES WHERE A SCOPE MODE LOOP CANNOT BE MAINTAINED DUE TO THE INSTABILITY OF THE JMP OR JMS INSTRUCTION AND ITS FAILING CONDITION, IT WILL PROBABLY BE ADVANTAGEOUS TO SIMULATE THIS SAME PROBLEM USING THE RANDOM JMP TEST, MAINDEC-8E-D0HC, OR RANDOM JMP-JMS TEST, MAINDEC-8E-D0JC.

7. RESTRICTIONS (NONE)

8. MISCELLANEOUS

8.1 EXECUTION TIME

THREE HUNDRED AND FORTY-FIVE PROGRAM LOOPS PER SECOND. A BELL IS SOUNDED EVERY 10 SECONDS, WHICH EQUALS 3456 PROGRAM LOOPS.

PROGRAM DESCRIPTION

THE PROGRAM IS MADE UP OF 82 INDIVIDUAL TESTS FOR JMP AND JMS. AN OCTAL COUNTER LOCATED AT MEMORY LOCATION 0136 ALWAYS HOLDS THE NUMBER OF THE PRESENT TEST. FOR TEST 1 LOCATION, 0136 CONTAINS 0000 AND FOR TEST 82, 0136 CONTAINS 0121. EACH TEST PERFORMS THE FOLLOWING FUNCTIONS:

- A. CHECK LOCATION 0136 FOR PROPER TEST NUMBER.
- B. PERFORMS ADDITIONAL CHECKING SUCH AS VERIFICATION OF THE STORED PC (PROGRAM COUNTER) ON A JMS.
- C. ADVANCES TEST COUNTER.
- D. SETS UP FOR NEXT TEST.
- E. JMP'S OR JMS'S TO THE NEXT TEST. THESE JMP AND JMS INSTRUCTIONS ARE THE ONES BEING TESTED.

IF THE PC DOES NOT ARRIVE AT THE PROPER PLACE AFTER PERFORMING STEPS ABOVE, IT EITHER FALLS INTO THE BACKGROUND FIELD OF HLTS OR INTO ANOTHER AREA OF THE PROGRAM. IF THE FIELD OF HLTS IS ENCOUNTERED, THE PROGRAM HALTS IMMEDIATELY. IF A PROGRAM FIELD IS ENTERED, IT IS MOST LIKELY THAT THE PROGRAM WILL HALT WHEN THE TEST COUNTER CHECK IS MADE (LOCATION 136 EQUALS THE TEST COUNT). IN A FEW REMOTE CASES IT IS POSSIBLE FOR THE TEST COUNTER TO BE ADVANCED BY ONE, FOLLOWING THE ERRONEOUS JMP OR JMS AND BEFORE THE HALT. IT IS ALSO POSSIBLE FOR THE PROGRAM, ON A ERROR CONDITION, TO ENTER THE LOADERS STORED IN THE LAST MEMORY PAGE. ALL OF THESE POSSIBILITIES SHOULD BE KEPT IN MIND WHEN ANALYZING AN ERROR.

TEST 0 THROUGH 19 ARE TESTS FOR SAME PAGE JUMPING USING DIRECT ADDRESSING. TESTS 20 THROUGH 45 TEST THE JMP INSTRUCTION WITH INDIRECT ADDRESSING. IN THESE CASES, THE ADDRESS THAT THE PROGRAM JUMPS TO IS ALWAYS THE COMPLEMENT OF ITS PRESENT ADDRESS. JMS TESTS 1 THROUGH 12 ARE TESTS FOR THE SAME PAGE USING DIRECT ADDRESSING. JMS TESTS 13 THROUGH 35 TEST JMS IN THE SAME MANNER AS JMP IS TESTED IN TEST 20 THROUGH 45.

THE TELETYPE BELL IS SOUNDED EVERY 10 SECONDS (3456 PROGRAM CYCLES).