IDENTIFICATION

Product Code: MAINDEC-08-DO4B-D

Product Name: Random JMP Test

Date Created: March 25, 1968

Maintainer: Diagnostic Group

1.   ABSTRACT

This program tests the JMP instruction of the PDP-8. Most of memory is used as a JUMP field with a random number generator selecting each JUMP FROM and JUMP TO location.

2.   REQUIREMENTS

2.1   Equipment

PDP-8 equipped with Teletype.

2.2   Storage

0000, 0364. The Binary Loader must be stored in the last memory page.

2.3   Preliminary Programs

It is assumed that MAINDEC 08-D01(n), 08-D02(n), and 08-D03(n) have run successfully.

3.   LOADING PROCEDURE

3.1   Method

Use standard Binary Loader.

4.   STARTING PROCEDURE

4.1   Control Switch Settings

SR0   Halt on Error.

SR2   Hold JUMP FROM addresses constant. (1)
        Select random JUMP FROM addresses. (0)

SR3   Hold JUMP TO addresses constant. (1)
        Select random JUMP TO addresses. (0)

4.2   Starting Address

0200

Restart Address

0214

4.3   Operator Action

a. Set SR to 0200 and press LOAD ADDRESS.

b. Set SR to desired mode. If a particular memory location is desired for either a "constant FROM" or "constant TO", this memory address is entered into one of the locations shown below:

```
FROM 1      ADDRESS  =  0116
FROM        ADDRESS  =  0115
TO          ADDRESS  =  0114
```

NOTE: Always make (FROM 1) = (FROM) - 1

If SR2 or SR3 is set after the program has been started, the last address taken from the random number generator is used repeatedly.

c. Press START.

5.   OPERATING PROCEDURE

Same as section 4.

6.   ERRORS

6.1   Error Halts

All unused memory locations are loaded with HLT orders. If the program executes one of these background HLTS, it is probable that the interrupt failed to occur following the JMP instruction.

6.2   Error Printouts

F wwww TO xxxx

Z = yyyy

(FROM) F wwww: wwww = the address of the JMP instruction.

(TO) T xxxx: xxxx = the address that the JMP instruction is jumping to.

(LOC 0000) Z = yyyy: yyyy = the address stored in location 0000 during the interrupt.
Note that yyyy should equal xxxx.

Example: the following is a typical error printout:

F 4252 TO 7020

Z = 7000

Line 1 of the printout is a statement of the problem. A JMP
instruction is placed at location 4252. This JMP instruction is
trying to jump to location 7020. Line 2 of the printout indicates

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the error. The TO address (7020) was to have been stored in location 0000 but instead a 7000 was stored. Thus bit 7 was dropped.

6.3 Error Recovery

The program continues testing following an error printout. When enough information has been gathered from the error printouts, a FROM and TO address is selected for use in the scope mode loop. Enter the chosen addresses into proper locations (see section 4.3.b). Restart the program with SR2 and SR3 set. After allowing it to run for a moment push STOP, enter (5516) into location 1, and restart the program at location 0025 with SR2 and SR3 set. The scope mode loop is

Location	Coding
0000	
0001	JMP I FROM 1
xxxx	A, ION
xxxx	JMP I TO
0116	FROM 1, A

When it is desired to discontinue the scope mode loop, restore the original contents (1114) of location 1, and restart the program.

7. RESTRICTIONS

(None)

8. MISCELLANEOUS

8.1 Execution Time

7200 random tests/second

9. PROGRAM DESCRIPTION

The JMP instruction is checked through the use of the interrupt function. A random number generator selects a FROM and a TO address. An ION instruction is then placed at FROM -1 and the JMP instruction at FROM. The JMP instruction jumps to the address specified by TO. After executing these two orders, an interrupt occurs starting the program counter at location 1. A checking routine located here verifies that the operation was successful before starting the next test.

Random addresses are restricted as follows: 0400 < random address < 7600. The area between 0400 and 7600 is filled with HLT instructions in case the interrupt fails. A "04" is printed after each group of 72,000 tests.

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