

IDENTIFICATION

PRODUCT CODE I	MAINDEC-8E-DBCC-0
PRODUCT NAME I	8E ADDER TESTS
DATE CREATED I	SEPT. 1, 1971
MAINTAINER I	DIAGNOSTIC GROUP
AUTHOR I	M. DAVIS & J. VROBEL

COPYRIGHT © 1971
DIGITAL EQUIPMENT CORPORATION



1. ABSTRACT

THIS PROGRAM TESTS THE ADDER CIRCUITS OF THE PDP-8E. THE PROGRAM IS COMPOSED OF FIVE PARTS.

A SIMULATOR FOR THE TAD INSTRUCTION WHICH TESTS ALL COMBINATIONS OF TWO ARGUMENT ADDITIONS.

A SIMULATOR FOR ROTATE INSTRUCTIONS THAT TESTS ROTATION OF ALL POSSIBLE ARGUMENTS WITH RAL, RAR, RTL, RTR AND BSW.

A CARRY GENERATION TEST

A SERIES OF RANDOM NUMBER TESTS

A FIELD RELOCATION ADDER TEST

2. REQUIREMENTS

2.1 EQUIPMENT

PDP-8E EQUIPPED WITH AT LEAST 4K OF MEMORY AND A TELETYPE

2.2 STORAGE

THE PROGRAM IS STORED IN LOCATIONS 0000-6000 AND UTILIZES LOCATIONS 7775-7777 AS A TEST AREA.

2.3 PRELIMINARY PROGRAMS

MAINDEC=8E-00AA, 00BA

RUN ALL EXTENDED MEMORY TESTS PRIOR TO RUNNING RELOCATION ADDER TEST.

3. LOADING PROCEDURE

THE STANDARD PROCEDURE FOR LOADING BINARY TAPES IS TO BE USED.

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

SR00=1 SUPPRESS HALT ON ERROR
SR01=1 SUPPRESS ERROR TYPEOUT
SR02=1 LOOP ON ERROR
SR03=1 FAST TEST
SR04=0 LOOP IN CURRENT MEMORY BANK
SR04=1 RELOCATE TO NEXT EXISTING BANK
SR06=0B AMOUNT OF EXTENDED BANKS OF MEMORY
SR09=1 HALT AT END OF TEST
SR10=1 SUPPRESS END OF TEST TYPEOUT
SR11=1 LOOP ON PRESENT TEST

4.2 STARTING ADDRESSES

NORMAL STARTING ADDRESS=0200
RESTORE LOADERS=7600

4.3 OPERATOR ACTION

4.3.1 SET SR=0200

4.3.2 PRESS ADDR LOAD SWITCH

4.3.3 SET SR=0000

4.3.4 SET SWITCH REGISTER TO DESIRED FUNCTIONS SEE 4.1

4.3.5 PRESS CLEAR AND CONT SWITCHES

5. OPERATING PROCEDURE

5.1 FASI TEST

THE ADDITION SIMULATOR NORMALLY STARTS WITH ARG1 AND ARG2 0000, TO SPEED UP THE TEST, THE VALUE OF ARG2 MAY BE SET AT SOME OTHER VALUE INITIALLY. TO DO THIS, DEPOSIT THE DESIRED VALUE IN LOCATION 170, AND PROCEED AS IN 4., BUT WITH SR=0400 INSTEAD OF 0000 IN 4.3.3

5.2 TO RESTORE AND START BINARY LOADER, STOP PROGRAM, LOAD ADDRESS 7600 AND START COMPUTER.

5.3 RELOCATION ADDER TEST

IF SR04=1 THE ADDER TEST WILL RELOCATE TO THE NEXT SEQUENTIAL EXISTING MEMORY BANK AT THE COMPLETION OF EVERY PASS, THE EXACT AMOUNT OF EXISTING EXTENDED MEMORY BANKS MUST BE IN SR06=00 TO RUN THIS PORTION OF THE ADDER TEST, PRIOR TO EACH RELOCATION THE PROGRAM WILL COMPARE THE BANKS FOUND UNDER TEST TO THE BANK AMOUNT IN SR05=00 AND START RELOCATION, THE FOLLOWING MESSAGE WILL BE TYPED ON TELETYPE.

***** X EXTENDED BANKS OF MEMORY TO BANK X *****

5.4 OPTIONS

SEE 4.1

6. ERRORS

6.1 ERROR MESSAGES

6.1.1 SIMULATED ADDITION TEST

IF A FAILURE OCCURS DURING THE SIMULATED ADDITION TEST, THE PROGRAM WILL TYPE THE FOLLOWING MESSAGE AND THEN HALT:

ARG1 SIMULATED ADD TEST FAILED
ARG2 SIMULATED ARG1+ARG2 ARG2+ARG1
XXXXXXXXXXXXX XXXXXXXXXXXXXXXX X XXXXXXXXXXXXXXXX X XXXXXXXXXXXXXXXX

ARG1 AND ARG2 ARE THE TWO NUMBERS THAT WERE ADDED, SIMULATED IS THE ANSWER PRODUCED BY THE ADDITION SIMULATOR (K AND AC)

1+ARG2 IS THE RESULT OF ADDING ARG2 TO ARG1

(ARG1 IS IN AC INITIALLY)
ARG2+ARG1 IS THE RESULT OF ADDING ARG1 TO ARG2
(ARG2 IS IN AC INITIALLY),

NOTE! EITHER THE SIMULATION OR THE ACTUAL ADDITIONS MAY
HAVE FAILED,

6.1.1.2 SIMULATED ROTATE TEST

IF A FAILURE OCCURS DURING THE SIMULATED ROTATE TEST, THE
PROGRAM WILL TYPE THE FOLLOWING MESSAGE AND THEN HALT!

SIMULATED AAA TEST FAILED
ORIGINAL SIMULATED ACTUAL
XXXXXXXXXXXXX X XXXXXXXXXXXXXXXX X XXXXXXXXXXXXXXXX

ORIGINAL IS THE LINK AND ACCUMULATOR TO BE ROTATED
SIMULATED IS THE SIMULATED RESULT OF ROTATION
ACTUAL IS THE REAL RESULT OF ROTATION
AAA IS THE INSTRUCTION BEING TESTED, I.E. RAL,RAR,RTL,RTR,BSW

6.1.1.3 FALSE CARRY TEST

IF A FAILURE OCCURS DURING THE FALSE CARRY TEST, THE PROGRAM
WILL TYPE THE FOLLOWING MESSAGE AND THEN HALT!

DATA ERROR
AAAA X XXXXXXXXXXXXXXXX

AAAA IS THE STARTING ADDRESS OF THE TEST THAT FAILED
X XXXXXXXXXXXXXXXX ARE THE CONTENTS OF THE LINK AND AC

NOTE! EACH FALSE CARRY TEST EXPECTS LINK#1 AND AC#0
AS A RESULT.

6.1.1.4 RANDOM ADD TEST 1

IF A FAILURE OCCURS DURING RANDOM ADD TEST 1, THE PROGRAM WILL
TYPE THE FOLLOWING MESSAGE AND THEN HALT!

RANDOM ADD TEST 1 FAILED
RANDA RANDC RESULT
XXXXXXXXXXXXX XXXXXXXXXXXXXXXX X XXXXXXXXXXXXXXXX

RANDA IS A RANDOM NUMBER
RANDC IS THE COMPLEMENT OF RANDA
RESULT IS THE RESULT OF CONSECUTIVE ADDITIONS OF
RANDA AND RANDC

NOTE! THE EXPECTED RESULT IS LINK#1, AC#0

6.1.1.5 RANDOM ADD TEST 2

IF A FAILURE OCCURS DURING RANDOM ADD TEST 2, THE PROGRAM
WILL TYPE THE FOLLOWING MESSAGE AND HALT!

RANDOM ADD TEST 2 FAILED
ARG1 ARG2 EXPECTED ARG1+ARG2
XXXXXXXXXXXXX XXXXXXXXXXXXXXXX X XXXXXXXXXXXXXXXX X XXXXXXXXXXXXXXXX