

TEXT LISTING

068-000224-05

PROGRAM

EXERCISER FOR ECLIPSE
PART 8

TEXT TAPE

097-000224-05

ABSTRACT

'ECLIPSE31' IS AN EXERCISER PROGRAM USED TO TEST THE RELIABILITY OF THE CENTRAL PROCESSOR INSTRUCTIONS OF THE ECLIPSE COMPUTER. 'ECLIPSE31' EXERCISES THE DOUBLE WORD INSTRUCTIONS OF THE ECLIPSE EXTENSIVELY AND ASSURES OF ITS RELIABLE OPERATION.

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0001 ECL51          MACRO REV.06.30.      08:07:40 05/16/79          10002 ECL31
01
02          *TITL  ECL31
03          *ECLIPSE31
04          *ECLIPSE31 ~ CONTINUATION OF ECLIPSE30
05          *
06          *PART 6 OF EXERCISER FOR ECLIPSE
07          *
08          *:: 0.0  REVISION HISTORY
09          *::
10          *:: REV. 04 WAS CREATED TO
11          *:: IMPLEMENT THE STANDARDS PROVIDED
12          *:: BY DL1B.
13          *:: THIS HAS NOT CHANGED THE PHILOSOPHY
14          *:: OR TEST PROCEDURES IN THIS PROGRAM.
15          *:: ALL UNNECESSARY "IORS" HAVE BEEN
16          *:: DELETED FROM THIS FILE.
17          *::
18          *:: REV. 05 WAS CREATED TO CORRECT THE MMPU1 SIZING
19          *:: PROBLEM WITH MAPS > 256K.
20          *::

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* NAME: ECLIPSE31.TX          PART NUMBER: 097-000224
*
* DESCRIPTION: ECLIPSE EXERCISER, PART 8
*
* REVISION HISTORY:
* REV.          DATE
* 00          12/20/74
* 01          04/11/75
* 02          08/06/76
* 03          12/31/76
* 04          10/06/78
* 05          11/17/78

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26          *
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28          * ALL RIGHTS RESERVED.
29          *

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03 EXERCISER FOR ECLIPSE: PART B
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06 PROGRAM NAME
07 *****
08 ;
09 ECLIPSE31
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11 GENERAL DESCRIPTION
12 *****
13 ;
14 'ECLIPSE31' IS AN EXERCISER PROGRAM USED TO TEST THE
15 RELIABILITY OF THE CENTRAL PROCESSOR INSTRUCTIONS OF
16 THE ECLIPSE COMPUTER. 'ECLIPSE31' EXERCISES THE DOUBLE
17 WORD INSTRUCTIONS OF THE ECLIPSE EXTENSIVELY AND ASSURES
18 OF ITS RELIABLE OPERATION.
19 ;
20 THE INSTRUCTIONS EXERCISED ARE AS FOLLOWS:
21 ;
22 ELEC,ELDA,ESTA,EJMP AND EJSR
23 ;
24 LOCATIONS 200 TO 205 IN PAGE 0 ARE FIXED FOR ECLIPSE31
25 PROGRAM.
26 ;
27 LOCATION 203 KEEPS TRACK OF NUMBER OF PASSES RUN
28 THROUGH ECLIPSE31 PROGRAM.
29 LOCATION 201 KEEPS TRACK OF THE TEST RUNNING AT
30 PRESENT AND IS USEFUL FOR DEBUG WHEN LOOPING
31 OCCURS IN THE PROGRAM.
32 LOCATION 202 CONTAINS THE STARTING ADDRESS OF
33 ECLIPSE31 PROGRAM.
34 LOCATION 200 IS USED BY DTOS.
35 LOCATION 204 KEEPS TRACK OF INTERNAL PASS COUNT
36 WHICH IS FIXED BY LOCATION 205.
37 ;
38 FIRST PASS THROUGH ECLIPSE31 TEST WILL RUN SUPERFAST.
39 NEXT PASSES WILL RUN SLOWER AS EACH TEST IS RUN SEVERAL
40 TIMES TO RUN ALL RANDOM NUMBER COMBINATIONS.
41 ;
42 MACHINE REQUIREMENTS
43 *****
44 ;
45 ECLIPSE PROCESSOR
46 8K READ-WRITE MEMORY
47 CONSOLE EQUIPMENT

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01 ;
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05 SWITCH SETTINGS
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LOCATION "SWREG" IS USED TO SELECT THE PROGRAM OPTIONS (NOT SYSTEM CONFIGURATION). WHILE RUNNING UNDER DTOS, THIS LOCATION WILL BE LOADED BY THE MONITOR. HOWEVER UNDER STAND ALONE AND PROGRAM LOAD MODES THIS LOCATION WILL BE SET ACCORDING TO THE ANSWERS SUPPLIED BY THE OPERATOR. IN ANY CASE THE OPTIONS CAN BE CHANGED OR VERIFIED BY USING ONE OF THE COMMANDS GIVEN IN SEC. 4.2.

SWITCH OPTIONS
DIFFERENT BITS AND THEIR INTERPRETATION AT LOCATION "SWREG" IS AS FOLLOWS:

BIT	OCTAL VALUE	BINARY VALUE	INTERPRETATION
1	40000	1	LOOP ON ERROR SKIP LOOPING ON ERROR
2	20000	0	PRINT TO CONSOLE ABORT PRINT OUT TO CONSOLE
3	10000	0	DO NOT PRINT % FAILURE PRINT % FAILURE
4	04000	1	ALLOW END OF PASS PRINT OUT SUPPRESS END OF PASS PRINT OUT
5	02000	1	DO NOT PRINT ON THE LINE PRINTER PRINT ON THE LINE PRINTER
6	01000	1	DO NOT HALT ON ERROR HALT ON ERROR
7	00400	1	DO NOT PRINT SUMMARY AND/OR PASSING OF EACH SUBTEST PRINT SUMMARY AND/OR PASSING OF EACH SUBTEST
8	00200	1	PRINT ONLY THE FIRST ERROR PRINT EVERY ERROR

SWITCH COMMANDS
ONCE THE PROGRAM STARTS EXECUTING THE STATE OF ANY OF THE BITS CAN BE CHANGED BY HITTING KEYS 1-9, A-F. THE PROGRAM WILL CONTINUE RUNNING AFTER UPDATING THE OPTIONS. EACH KEY WILL COMPLEMENT THE STATE OF THE BIT AFFILIATED WITH IT, THUS BIT 4 CAN BE ALTERED BY HITTING KEY 4. SETTING OF ANY BIT OF LOCATION "SWREG" WILL SET BIT 0. (DEFAULT MODE IS DEFINED AS ALL BITS OF SWREG SET TO 0) THE PROGRAM CAN BE LOCKED INTO SWITCH MODIFICATION MODE BY TYPING A 0, IN WHICH CASE MORE THAN ONE BIT CAN BE CHANGED BEFORE CONTROL IS ALLOWED TO RETURN TO THE MAIN PROGRAM.

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01 14.2.1 OTHER COMMANDS
02 ?
03 ? "CR" A RETURN CAN BE TYPED TO CONTINUE THE PROGRAM
04 ? AFTER ITS LOCKED IN A SWITCH MODIFICATION MODE
05 ?
06 ? *D THIS COMMAND GIVEN AT ANY TIME WILL RESET "SWREG"
07 ? TO DEFAULT MODE AND RESTART THE PROGRAM.
08 ?
09 ? *R THIS COMMAND GIVEN AT ANY TIME WILL RESTART THE
10 ? PROGRAM. SWITCHES ARE LEFT WITH THE VALUES THEY
11 ? HAD BEFORE THE COMMAND WAS ISSUED.
12 ?
13 ? *O THIS COMMAND GIVEN AT ANY TIME WILL CAUSE THE
14 ? PROGRAM CONTROL TO GO TO ODI (NOTE: THIS IS AN
15 ? OPTIONAL COMMAND AND IS AVAILBLE ONLY IF
16 ? OUTPK IS PRESENT)
17 ?
18 ? M THIS COMMAND GIVEN AT ANY TIME WILL PRINT THE
19 ? CURRENT OPERATING MODES.
20 ?
21 ?
22 ?
23 ?
24 ? 14.3 STAND ALONE STARTING ADDRESS = 200
25 ? IF 'CAT' OR 'KITTEN' WAS LOADED FROM DTOS AND RESTRT
26 ? WAS NEEDED, THEN USE AS FOLLOWS:
27 ? STARTING ADDR = 170 (FOR START WITH NO 'CAT')
28 ? STARTING ADDR = 171 (FOR START WITH 'CAT')
29 ?
30 ? 14.4 MONITOR LOCATION 203 TO CHECK THE CURRENT PASS COUNT
31 ?
32 ?
33 ? 14.5 MONITOR LOCATION X6000 TO MAKE SURE THAT 'CAT' OR
34 ? 'KITTEN' IS RUNNING. IN CASES WHERE PROGRAM IS
35 ? STARTED WITH 'CAT' OR 'KITTEN' LOCATION X6000 WILL SHOW
36 ? A PATTERN CHANGING FROM ZEROS; TO ALL ONES
37 ? TO AN INC/SWAP PATTERN.
38 ?
39 ? (*= THE NUMBER OF THE HIGHEST MEMORY MODULE IN THE
40 ? SYSTEM AND MAY BE A VALUE 0 - 7)

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01 ?
02 ? OPERATING PROCEDURE/OPERATOR INPUT
03 ? -----
04 ?
05 ? 15.1 LOAD THE PROGRAM VIA THE BINARY LOADER OR INSERT A
06 ? PRELOADED MEMORY MODULE.
07 ?
08 ? 15.2 PROGRAM WILL HALT AFTER PRINTING THE MESSAGE
09 ? 'SET DATA SWITCHES AND PRESS CONTINUE',
10 ? AND PRESS START.
11 ?
12 ? 15.3 THE PROGRAM WILL RUN UNTIL MANUALLY STOPPED. IN CASE
13 ? OF MALFUNCTIONING, THE PROGRAM WILL PRINT ERROR
14 ? MESSAGE AND TAKE APPROPRIATE ACTION AS PER THE SW
15 ? SETTINGS.
16 ?
17 ? PROGRAM OUTPUT/ERROR DESCRIPTION
18 ? -----
19 ?
20 ? 16.1 FOR ANY ERRORS DETECTED, THE PROGRAM WILL PRINT ERROR
21 ? REPORT OR % FAILURES DEPENDING UPON THE SW SETTINGS.
22 ? ERROR REPORT CONSISTS OF ALL ACCUMULATORS,CARRY,
23 ? RELOCATED PROGRAM COUNTER OF THE TEST THAT IS FAILING
24 ? AND PC IN THE LISTING AT THE TIME OF FAILURE.
25 ? 16.2 THE PROGRAM WILL LOOP IN THE TEST THAT IS FAILING IF
26 ? SW"1" IS 0.
27 ? 16.3 THE PRINTING OF ERROR REPORT CAN BE ABORTED BY SETTING
28 ? SW"2" TO 1.
29 ?
30 ? 16.4 IF LOOPING OCCURS IN THE PROGRAM, STOP THE COMPUTER
31 ? AND CHECK LOCATION 201 TO FIND OUT THE TEST THAT WAS
32 ? RUNNING BEFORE THE LOOPING OCCURRED.

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01 PROGRAM DESCRIPTION/THEORY OF OPERATION
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EACH TEST IS COMPLETE IN ITSELF, SO THE PROGRAM CAN BE STARTED FROM ANY TEST WITHOUT CAUSING ANY INITIALIZATION ERRORS.
 WHEN 'ECLIPSE31' IS STARTED AT LOCATION 200 OR BY DTOS, IT WILL SIZE UP THE MEMORY AND WILL PRINT THE TOP OF THE MEMORY.
 AFTER SETTING UP THE SWITCHES AND PRESSING CONTINUE, THE EXERCISER WILL RUN THE FIRST PASS VERY FAST. IN THE FIRST PASS EACH TEST IS RUN ONLY ONCE. ALL OTHER PASSES WILL TAKE MORE TIME AS EACH TEST IS RUN ACCORDING TO THE TEST COUNT SPECIFIED IN EACH TEST.
 AFTER THE 1ST PASS, ECLIPSE31 IS RELOCATED IN THE AVAILABLE MEMORY FOR ALL NEXT PASSES AND THE AREA BELOW AND ABOVE THE RELOCATED PROGRAM IS USED FOR SCRATCH BUFFER AREA. REFER TO THE LISTING TO FIND OUT THE INFORMATION ABOUT EACH TEST.
 RESTRICTIONS/MISC

 CERTAIN INSTRUCTIONS LIKE BLM, ACT, BAM, ETC., DO ALLOW INTERRUPTS TO OCCUR DURING THEIR EXECUTION. THIS FEATURE OF THOSE INSTRUCTIONS IS NOT CHECKED IN THIS TEST.
 O?OTD 9
 OCTAL DEBUG TOOL (ODT)
 THE DIAGNOSTIC IS EQUIPPED WITH A BUILT IN ODT WHICH CAN BE ACCESSED BY HITTING CONTROL 0 (-O) AT ANY TIME DURING THE EXECUTION OF THE PROGRAM (AFTER SETTING THE PARAMETERS).
 ON ENTERING ODT THE ADDRESS OF THE LOCATION HAVING THE NEXT INSTRUCTION TO BE EXECUTED WILL BE TYPED-OUT.
 CONVENTIONS AND SYMBOLS
 THE FOLLOWING CONVENTIONS ARE USED BY THE ODT:
 ? POUND WITH A "?".
 @ ODT IS READY AND AT YOUR SERVICE.
 COMMAND STRUCTURE
 AN ODT COMMAND HAS THE FOLLOWING FORMAT:
 (ARGUMENT)(COMMAND)
 AN ARGUMENT MAY BE ONE OF THE FOLLOWING:
 "Exp" AN OCTAL EXPRESSION CONSISTING OF OCTAL NUMBERS SEPARATED BY PLUS (+) OR MINUS (-) SIGNS. LEADING ZEROS NEED NOT BE TYPED.
 "ADR" AN ADDRESS IS THE SAME AS AN EXPRESSION EXCEPT THAT BIT 0 IS NEGLECTED.
 A COMMAND IS A SINGLE TELETYPE CHARACTER

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ODT COMMANDS THAT CAN BE EXAMINED AND MODIFIED BY THE USER ARE CALLED CELLS. THESE CELLS ARE OF TWO TYPES: INTERNAL CPU CELLS AND MEMORY LOCATIONS.
 OPENING INTERNAL CELLS
 THE COMMAND TO OPEN ONE OF THE INTERNAL REGISTERS IS OF THE FORM "NA" WHERE N IS ANY OCTAL EXPRESSION BETWEEN 0 AND 7
 0-3 FOR ACCUMULATORS 0-3
 4 FOR PC OF THE NEXT INSTRUCTION TO BE EXECUTED IN THE EVENT OF A "sp" COMMAND.
 5 CPU AND TIO STATUS
 BIT INTERPRETATION
 15 STATUS OF TIO DONE FLAG
 14 STATUS OF INTERRUPTS (ION FLAG)
 13 STATUS OF CARRY BIT
 6 ADDRESS OF THE LOCATION HAVING THE BREAK POINT (IF ANY)
 7 INSTRUCTION AT THE BREAK POINT LOCATION
 OTHER COMMANDS TO OPEN CELLS ARE:
 "ADR"/ OPEN THE CELL AND PRINT ITS CONTENTS
 ./ OPEN THE CELL CURRENTLY POINTED TO BY THE POINTER
 + "ADR"/ AND PRINT ITS CONTENTS.
 * "ADR"/ ADD "ADR" TO THE POINTER, OPEN THE CELL AND PRINT ITS CONTENTS.
 - "ADR"/ SUBTRACT "ADR" FROM THE POINTER, OPEN THE CELL AND PRINT ITS CONTENTS.
 "CR" THE RETURN KEY IS USED TO CLOSE THE OPEN CELL WITH OR WITHOUT MODIFICATION.
 "LF" LINE FEED IS USED TO CLOSE THE OPEN CELL WITH OR WITHOUT MODIFICATION AND TO OPEN THE SUCCEEDING CELL.
 * CLOSE THE OPEN CELL WITH OR WITHOUT MODIFICATION AND OPEN THE PRECEDING CELL
 / CLOSE THE OPEN CELL WITHOUT MODIFICATION, AND OPEN THE CELL POINTED TO BY ITS CONTENTS.
 + "ADR"/ CLOSE THE OPEN CELL WITHOUT MODIFICATION, AND OPEN THE CELL POINTED TO BY ITS CONTENTS + "ADR".
 - "ADR"/ CLOSE THE OPEN CELL WITHOUT MODIFICATION, AND OPEN THE CELL POINTED TO BY ITS CONTENTS - "ADR".
 MODIFICATION OF A CELL
 ONCE A CELL HAS BEEN OPENED ITS CONTENTS CAN BE MODIFIED BY TYPING THE NEW VALUE THE CELL IS TO CONTAIN IN THE FORM OF AN OCTAL EXPRESSION FOLLOWED BY "CR" OR "LF".
 IF A + OR - IS TYPED AS THE FIRST CHARACTER OF THE EXPRESSION THEN THE VALUE OF THE EXPRESSION IS ADDED TO OR SUBTRACTED FROM THE OLD CONTENTS OF THE CELL. THE ADDRESS ITSELF OR AN EXPRESSION RELATIVE TO THE ADDRESS CAN BE DEPOSITED BY TYPING A " " OR " +/-OCTAL EXPRESS-ION". A RUBOUT COMMAND GIVEN RIGHT AFTER OPENING A CELL ALLOWS THE MODIFICATION OF ITS CONTENTS AS IF THEY WERE TYPED IN JUST BEFORE THE COMMAND WAS ISSUED.
 OTHER ODT COMMANDS
 RUBOUT THIS KEY IS USED TO DELETE ERRONEOUSLY TYPED DIGITS. EACH TIME THE KEY IS PRESSED THE RIGHT MOST

0009 ECL31

0010 ECL31

**00000 TOTAL ERRORS, 00000 PASS 1 ERRORS

01 ? DIGIT IS DELETED AND ECHOED ON THE TERMINAL. IF
 02 ? THE RUBOUT KEY IS PRESSED RIGHT AFTER OPENING A
 03 ? CELL THEN IT DELETES THE RIGHT MOST DIGIT OF THE CELL
 04 ? CONTENTS. THIS ALLOWS THE MODIFICATION OF THE CELL
 05 ? AS IF ITS CONTENTS WERE TYPED IN JUST BEFORE THE
 06 ? KEY WAS PRESSED.

07 ? "ADR"B INSERT A BREAK POINT AT LOCATION "ADR".
 08 ? ONLY ONE BREAK POINT CAN BE INSERTED AND ANY
 09 ? ENTRY TO ODT AFTER EXECUTING A BREAK POINT WILL
 10 ? CAUSE IT TO BE DELETED.

11 ? D DELETE THE BREAK POINT IF ANY
 12 ? P RESTART THE EXECUTION OF THE PROGRAM AT LOCATION
 13 ? POINTED BY 4#.

14 ? "ADR"R START EXECUTING THE PROGRAM AT "ADR" AFTER AN
 15 ? IO-RESET.

16 ? K KILL THE STRING TYPED SO FAR. THE ODT RESPONDS
 17 ? WITH A "?" AND THE OPEN CELL IS CLOSED WITHOUT
 18 ? MODIFICATION.

19 ? = PRINT THE OCTAL VALUE OF THE INPUT ONLY.
 20 ? THIS WILL CLOSE ANY OPEN CELLS WITHOUT
 21 ? MODIFICATION AND WILL NOT OPEN A CELL

22 ?
 23 ? NOTE: IN PROGRAMS WHICH RELOCATE THEMSELVES THE
 24 ? THE USER SHOULD PLACE BREAK POINTS ONLY IN THE
 25 ? ORIGINAL PROGRAM AREA. IF A BREAK POINT IS
 26 ? PLACED OUTSIDE THIS AREA THE RESULTS WILL
 27 ? BE UNPREDICTABLE.
 28 ?
 29 ?
 30 ?
 31 ?
 32 ?

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0011 ECLJ1

02DTD 000524 MC 7/33
S2WPD 000050 MC 4/01