DataGeneral

TECHNICAL STATEMENT

TEXT LISTING

068-000243-05

PROGRAM

EXERCISER FOR ECLIPSE
PART 5

TEXT TAPE

097-000243-05

ABSTRACT

'ECLIPSE22' IS AN EXERCISER PROGRAM USED TO TEST THE RELIABILITY OF THE CENTRAL PROCESSOR INSTRUCTIONS OF THE ECLIPSE COMPUTER. 'ECLIPSE22' EXERCISES THE EXTENDED INSTRUCTIONS OF THE ECLIPSE EXTENSIVELY AND ASSURES OF ITS RELIABLE OPERATION.

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 0001 ECL22    MACRO REV 06.30          07:59:25 05/16/79
01
02
03
04
05
06
07              ;*****************************************************************
08              ;
09              ; NAME: ECLIPSE22.TX                        PART NUMBER: 097-000243
10              ;
11              ;
12              ; DESCRIPTION: ECLIPSE EXERCISER, PART 5
13              ;              TEXT FILE
14              ;
15              ; REVISION HISTORY:
16              ;
17              ;       REV.            DATE
18              ;
19              ;       00              08/02/74
20              ;       01              12/20/74
21              ;       02              08/06/76
22              ;       03              04/22/77
23              ;       04              10/06/78
24              ;       05              11/17/78
25              ;
26              ; COPYRIGHT (C) DATA GENERAL CORPORATION, 1974, 1976, 1977, 1978
27              ; ALL RIGHTS RESERVED.
28              ;*****************************************************************
29
```

```
!0002 ECL22
01
                .TITL ECL22
03              ;ECLIPSE22
04              ;
05              ;ECLIPSE22 - CONTINUATION OF ECLIPSE20
06              ;
07              ;PART 5 OF EXERCISER FOR ECLIPSE
08              ;
09
10              ;; 0.0  REVISION HISTORY
11              ;;
12              ;;      REV. 04 WAS CREATED TO
13              ;;      IMPLEMENT THE STANDARDS PROVIDED
14              ;;      BY DLIB.
15              ;;      THIS HAS NOT CHANGED THE PHILOSOPHY
16              ;;      OR TEST PROCEDURES IN THIS PROGRAM.
17              ;;      ALL UNNECESSARY "IORST" HAVE BEEN
18              ;;      DELETED FROM THIS FILE.
19              ;;
20              ;;      REV. 05 WAS CREATED TO CORRECT THE  MMPU1
21              ;;      WRAP AROUND SIZING PROBLEM.
22              ;;      ALSO, TO CLEAR DTR # 244.
23
```

```
!0003 ECL22
01              :
02
03              :EXERCISER FOR ECLIPSE: PART 5
04
05              :
06              :1.     PROGRAM NAME
07              :       ------------
08              :
09              :       ECLIPSE22
10              :
11              :2.     GENERAL DESCRIPTION
12              :       -------------------
13              :
14              :2.1    'ECLIPSE22' IS AN EXERCISER PROGRAM USED TO TEST THE
15              :       RELIABILITY OF THE CENTRAL PROCESSOR INSTRUCTIONS OF
16              :       THE ECLIPSE COMPUTER. 'ECLIPSE22' EXERCISES THE EXTENDED
17              :       INSTRUCTIONS OF THE ECLIPSE EXTENSIVELY AND ASSURES
18              :       OF ITS RELIABLE OPERATION.
19              :
20              :2.2    THE INSTRUCTIONS EXERCISED ARE AS FOLLOWS:
21              :
22              :       XOP,DIVX AND XCT,STACK OVERFLOW AND UNDERFLOW
23              :
24              :2.3    LOCATIONS 200 TO 205 IN PAGE 0 ARE FIXED FOR ECLIPSE22
25              :       PROGRAM.
26              :       LOCATION 203 KEEPS TRACK OF NUMBER OF PASSES RUN
27              :       THROUGH ECLIPSE22 PROGRAM.
28              :       LOCATION 201 KEEPS TRACK OF THE TEST RUNNING AT
29              :       PRESENT AND IS USEFUL FOR DEBUG WHEN LOOPING
30              :       OCCURS IN THE PROGRAM.
31              :       LOCATION 202 CONTAINS THE STARTING ADDRESS OF
32              :       ECLIPSE22 PROGRAM.
33              :       LOCATION 200 IS USED BY DTOS.
34              :       LOCATION 204 KEEPS TRACK OF INTERNAL PASS COUNT
35              :       WHICH IS FIXED BY LOCATION 205.
36              :
37              :2.4    FIRST PASS THROUGH ECLIPSE22 TEST WILL RUN SUPERFAST.
38              :       NEXT PASSES WILL RUN SLOWER AS EACH TEST IS RUN SEVERAL
39              :       TIMES TO RUN ALL RANDOM NUMBER COMBINATIONS.
40              :
41              :3.     MACHINE REQUIREMENTS
42              :       --------------------
43              :
44              :3.1    ECLIPSE PROCESSOR
45              :3.2    8K READ-WRITE MEMORY
46              :3.3    CONSOLE EQUIPMENT
47              :
```

```
!0004 ECL22
01              S?WPD 4
02
03
04              :4.     SWITCH SETTINGS
05              :
06              :       LOCATION "SWREG" IS USED TO SELECT THE PROGRAM OPTIONS
07              :       (NOT SYSTEM CONFIGURATION). WHILE RUNNING UNDER DTOS,
08              :       THIS LOCATION WILL BE LOADED BY THE MONITOR.
09              :       HOWEVER UNDER STAND ALONE AND PROGRAM LOAD MODES THIS
10              :       LOCATION WILL BE SET ACCORDING TO THE ANSWERS SUPPLIED
11              :       BY THE OPERATOR. IN ANY CASE THE OPTIONS CAN BE CHANGED
12              :       OR VERIFIED BY USING ONE OF THE COMMANDS GIVEN IN SEC.
13              :       4.2
14              :
15              :
16              :4.1    SWITCH OPTIONS
17              :       DIFFERENT BITS AND THEIR INTERPRETATION AT LOCATION
18              :       "SWREG" IS AS FOLLOWS:
19              :
20              :       BIT     OCTAL   BINARY  INERPRETATION
21              :               VALUE   VALUE
22              :
23              :       1               0       LOOP ON ERROR
24              :               40000   1       SKIP LOOPING ON ERROR
25              :
26              :       2               0       PRINT TO CONSOLE
27              :               20000   1       ABORT PRINT OUT TO CONSOLE
28              :
29              :       3               0       DO NOT PRINT % FAILURE
30              :               10000   1       PRINT % FAILURE
31              :
32              :       4               0       ALLOW END OF PASS PRINT OUT
33              :               04000   1       SUPPRESS END OF PASS PRINT OUT
34              :
35              :       5               0       DO NOT PRINT ON THE LINE PRINTER
36              :               02000   1       PRINT ON THE LINE PRINTER
37              :
38              :       6               0       DO NOT HALT ON ERROR
39              :               01000   1       HALT ON ERROR
40              :
41              :       7               0       DO NOT PRINT SUMMARY AND/OR
42              :                               PASSING OF EACH SUBTEST
43              :               00400   1       PRINT SUMMARY AND/OR
44              :                               PASSING OF EACH SUBTEST
45              :       8               0       PRINT ONLY THE FIRST ERROR
46              :               00200   1       PRINT EVERY ERROR
47
48              :4.2    SWITCH COMMANDS
49              :       ONCE THE PROGRAM STARTS EXECUTING THE STATE OF ANY OF
50              :       THE BITS CAN BE CHANGED BY HITTING KEYS 1-9, A-F. THE
51              :       PROGRAM WILL CONTINUE RUNNING AFTER UPDATING THE OPTIONS.
52              :       EACH KEY WILL COMPLEMENT THE STATE OF THE BIT AFFILIAT-
53              :       ED WITH IT, THUS BIT 4 CAN BE ALTERED BY HITTING KEY 4.
54              :       SETTING OF ANY BIT OF LOCATION "SWREG" WILL SET BIT 0.
55              :       (DEFAULT MODE IS DEFINED AS ALL BITS OF SWREG SET TO 0)
56              :       THE PROGRAM CAN BE LOCKED INTO SWITCH MODIFICATION MODE
57              :       BY TYPING A 0, IN WHICH CASE MORE THAN ONE BIT CAN BE
58              :       CHANGED BEFORE  CONTROL IS ALLOWED TO RETURN TO THE
59              :       MAIN PROGRAM.
60              :
```

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 0005 ECL22
01              ;4.2.1  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 ODT (NOTE: THIS IS AN
15              ;               OPTIONAL COMMAND AND IS AVAILBLE ONLY IF
16              ;               ODTPK IS PRESENT)
17              ;
18              ;       M       THIS COMMAND GIVEN AT ANY TIME WILL PRINT THE
19              ;               CURRENT OPERATING MODES.
20              ;
21
22              ;
23
24
25              ;
26              ;4.3    STAND ALONE STARTING ADDRESS = 200
27              ;       IF 'CAT' OR 'KITTEN' WAS LOADED FROM DTOS AND RSTRT
28              ;       WAS NEEDED, THEN USE AS FOLLOWS:
29              ;       STARTING ADDR = 170 (FOR START WITH NO 'CAT')
30              ;       STARTING ADDR = 171 (FOR START WITH 'CAT')
31              ;
32              ;4.4    MONITOR LOCATION 203 TO CHECK THE CURRENT PASS COUNT
33              ;
34              ;4.5    MONITOR LOCATION X6000 TO MAKE SURE THAT 'CAT' OR
35              ;       'KITTEN' IS RUNNING. IN CASES WHERE PROGRAM IS
36              ;       STARTED WITH 'CAT' OR 'KITTEN' LOCATION X6000 WILL SHOW
37              ;       A PATTERN CHANGING FROM ZEROS; TO ALL ONES
38              ;       TO AN INC/SWAP PATTERN.
39              ;
40              ;       (X= THE NUMBER OF THE HIGHEST MEMORY MODULE IN THE
41              ;       SYSTEM AND MAY BE A VALUE 0 - 7)
42              ;
```

```
10006 ECL22
01              ;
02              ;5.     OPERATING PROCEDURE/OPERATOR INPUT
03              ;       ----------------------------------
04              ;
05              ;5.1    LOAD THE PROGRAM VIA THE BINARY LOADER OR INSERT A
06              ;       PRELOADED MEMORY MODULE.
07              ;5.2    SET SWITCHES TO 200.
08              ;5.3    PRESS START.
09              ;5.4    THE PROGRAM WILL RUN UNTIL MANUALLY STOPPED. IN CASE
10              ;       OF MALFUNCTIONING, THE PROGRAM WILL PRINT ERROR
11              ;       MESSAGE AND TAKE APPROPRIATE ACTION AS PER THE
12              ;       SWREG SETTINGS.
13              ;
14              ;6.     PROGRAM OUTPUT/ERROR DESCRIPTION
15              ;       --------------------------------
16              ;
17              ;6.1    FOR ANY ERRORS DETECTED, THE PROGRAM WILL PRINT ERROR
18              ;       REPORT OR % FAILURES DEPENDING UPON THE SWREG SETTINGS.
19              ;6.2    ERROR REPORT CONSISTS OF ALL ACCUMULATORS,CARRY,
20              ;       RELOCATED PROGRAM COUNTER OF THE TEST THAT IS FAILING
21              ;       AND PC IN THE LISTING AT THE TIME OF FAILURE.
22              ;6.3    THE PROGRAM WILL LOOP IN THE TEST THAT IS FAILING IF
23              ;       SW"1" IS 0.
24              ;6.4    THE PRINTING OF ERROR REPORT CAN BE ABORTED BY SETTING
25              ;       SW"2" TO 1.
26              ;6.5    IF LOOPING OCCURS IN THE PROGRAM, STOP THE COMPUTER
27              ;       AND CHECK LOCATION 201 TO FIND OUT THE TEST THAT WAS
28              ;       RUNNING BEFORE THE LOOPING OCCURRED.
29              ;
```

```
!0007 ECL22
01
02                ;
03                ;7.     PROGRAM DESCRIPTION/THEORY OF OPERATION
04                ;       ---------------------------------------
05                ;
06                ;7.1    EACH TEST IS COMPLETE IN ITSELF, SO THE PROGRAM CAN
07                ;       BE STARTED FROM ANY TEST WITHOUT CAUSING ANY
08                ;       INITIALIZATION ERRORS.
09                ;7.2    WHEN 'ECLIPSE22' IS STARTED AT LOCATION 200 OR BY
10                ;       DTOS, IT WILL SIZE UP THE MEMORY AND WILL PRINT
11                ;       THE TOP OF THE MEMORY.
12                ;       THE EXERCISER WILL RUN THE FIRST PASS VERY FAST. IN
13                ;       THE FIRST PASS EACH TEST IS RUN ONLY ONCE. ALL OTHER
14                ;       PASSES WILL TAKE MORE TIME AS EACH TEST IS RUN
15                ;       ACCORDING TO THE TEST COUNT SPECIFIED IN EACH TEST.
16                ;       REFER TO THE LISTING TO FIND OUT THE INFORMATION
17                ;       ABOUT EACH TEST.
18                ;
19                ;8.     RESTRICTIONS/MISC
20                ;       -----------------
21                ;
22                ;8.1    CERTAIN INSTRUCTIONS LIKE BLM, XCT, BAM, ETC.,
23                ;       DO ALLOW INTERRUPTS TO OCCUR DURING THEIR
24                ;       EXECUTION. THIS FEATURE OF THOSE INSTRUCTIONS IS
25                ;       NOT CHECKED IN THIS TEST.
26                ;
27                ;
```

```
!0008 ECL22
01
02
03                02?DTD 9
04
05                ;9.     OCTAL DEBUG TOOL (ODT)
06                ;
07                ;       THE DIAGNOSTIC IS EQUIPED WITH A BUILT IN ODT WHICH CAN
08                ;       BE ACCESSED BY HITTING CONTROL O (^O) AT ANY TIME DURING
09                ;       THE EXECUTION OF THE PROGRAM (AFTER SETTING THE PARA-
10                ;       METERS).
11                ;       ON ENTERING ODT THE ADDRESS OF THE LOCATION HAVING THE
12                ;       NEXT INSTRUCTION TO BE EXECUTED WILL BE TYPED-OUT.
13                ;
14                ;9.1    CONVENTIONS AND SYMBOLS
15                ;       THE FOLLOWING CONVENTIONS ARE USED BY THE ODT:
16                ;       ?       PRESSING ANY ILLEGAL KEY CAUSES THE ODT TO RES-
17                ;               POND WITH A "?".
18                ;       @       ODT IS READY AND AT YOUR SERVICE.
19                ;
20                ;9.2    COMMAND STRUCTURE
21                ;       AN ODT COMMAND HAS THE FOLLOWING FORMAT:
22                ;               [ARGUMENT][COMMAND]
23                ;       AN ARGUMENT MAY BE ONE OF THE FOLLOWING:
24                ;       "EXP"   AN OCTAL EXPRESSION CONSISTING OF OCTAL NUMBERS
25                ;               SEPARATED BY PLUS (+) OR MINUS (-) SIGNS. LEAD-
26                ;               ING ZEROS NEED NOT BE TYPED.
27                ;       "ADR"   AN ADDRESS IS THE SAME AS AN EXPRESSION EXCEPT
28                ;               THAT BIT 0 IS NEGLECTED.
29                ;       A COMMAND IS A SINGLE TELETYPE CHARACTER
30                ;
31                ;9.3    ODT COMMANDS
32                ;       THE LOCATIONS THAT CAN BE EXAMINED AND MODIFIED BY THE
33                ;       USER ARE CALLED CELLS. THESE CELLS ARE OF TWO TYPES:
34                ;       INTERNAL CPU CELLS AND MEMORY LOCATIONS.
35                ;
36                ;9.3.1  OPENING INTERNAL CELLS
37                ;       THE COMMAND TO OPEN ONE OF THE INTERNAL REGISTERS IS OF
38                ;       THE FORM "NA" WHERE N IS ANY OCTAL EXPRESSION BETWEEN
39                ;       0 AND 7
40                ;       0-3     FOR ACCUMULATORS 0-3
41                ;       4       FOR PC OF THE NEXT INSTRUCTION TO BE EXECUTED IN
42                ;               THE EVENT OF A "P" COMMAND.
43                ;       5       CPU AND TTO STATUS
44                ;               BIT     INTERPRETATION
45                ;               15      STATUS OF TTO DONE FLAG
46                ;               14      STATUS OF INTERRUPTS (ION FLAG)
47                ;               13      STATUS OF CARRY BIT
48                ;       6       ADDRESS OF THE LOCATION HAVING THE BREAK POINT (IF
49                ;               ANY)
50                ;       7       INSTRUCTION AT THE BREAK POINT LOCATION
51
52                ;       OTHER COMMANDS TO OPEN CELLS ARE:
53                ;
54                ;       "ADR"/  OPEN THE CELL AND PRINT ITS CONTENTS
55                ;       ./      OPEN THE CELL CURRENTLY POINTED TO BY THE POINTER
56                ;               AND PRINT ITS CONTENTS.
57                ;       .+"ADR"/        ADD "ADR" TO THE POINTER, OPEN THE CELL
58                ;               AND PRINT ITS CONTENTS.
59                ;       .-"ADR"/        SUBTRACT "ADR" FROM THE POINTER, OPEN
60                ;               THE CELL AND PRINT ITS CONTENTS.
```

```
0009 ECL22
01                ;       "CR"    THE RETURN KEY IS USED TO CLOSE THE OPEN CELL
02                ;               WITH OR WITHOUT MODIFICATION.
03                ;       "LF"    LINE FEED IS USED TO CLOSE THE OPEN CELL WITH OR
04                ;               WITHOUT MODIFICATION AND TO OPEN THE SUCCEEDING
05                ;               CELL.
06                ;       ^       CLOSE THE OPEN CELL WITH OR WITHOUT MODIFICATION
07                ;               AND OPEN THE PRECEDING CELL
08                ;       /       CLOSE THE OPEN CELL WITHOUT MODIFICATION, AND
09                ;               OPEN THE CELL POINTED TO BY ITS CONTENTS.
10                ;       +"ADR"/ CLOSE THE OPEN CELL WITHOUT MODIFICATION, AND
11                ;               OPEN THE CELL POINTED TO BY ITS CONTENTS + "ADDR".
12                ;       -"ADR"/ CLOSE THE OPEN CELL WITHOUT MODIFICATION, AND
13                ;               OPEN THE CELL POINTED TO BY ITS CONTENTS - "ADR".
14                ;
15                ;9.3.2  MODIFICATION OF A CELL
16                ;       ONCE A CELL HAS BEEN OPENED ITS CONTENTS CAN BE MODIFIED
17                ;       BY TYPING THE NEW VALUE THE CELL IS TO CONTAIN IN THE
18                ;       FORM OF AN OCTAL EXPRESSION FOLLOWED BY "CR" OR "LF".
19                ;       IF A + OR - IS TYPED AS THE FIRST CHARACTER OF THE EX-
20                ;       PRESSION THEN THE VALUE OF THE EXPRESSION IS ADDED TO OR
21                ;       SUBTRACTED FROM THE OLD CONTENTS OF THE CELL. THE
22                ;       ADDRESS ITSELF OR AN EXPRESION RELATIVE TO THE ADDRESS
23                ;       CAN BE DEPOSITED BY TYPING A "." OR ".+/-OCTAL EXPRESS-
24                ;       ION". A RUBOUT COMMAND GIVEN RIGHT AFTER OPENING A CELL
25                ;       ALLOWS THE MODIFICATION OF ITS CONTENTS AS IF THEY WERE
26                ;       TYPED IN JUST BEFORE THE COMMAND WAS ISSUED.
27                ;
28                ;9.3.3  OTHER ODT COMMANDS
29                ;       RUBOUT  THIS KEY IS USED TO DELETE ERRONEOUSLY TYPED
30                ;               DIGITS. EACH TIME THE KEY IS PRESSED THE RIGHT MOST
31                ;               DIGIT IS DELETED AND ECHOED ON THE TERMINAL. IF
32                ;               THE RUBOUT KEY IS PRESSED RIGHT AFTER OPENING A
33                ;               CELL THEN IT DELETES THE RIGHT MOST DIGIT OF THE CELLS
34                ;               CONTENTS. THIS ALLOWS THE MODIFICATION OF THE CELL
35                ;               AS IF ITS CONTENTS WERE TYPED IN JUST BEFORE THE
36                ;               KEY WAS PRESSED.
37                ;       "ADR"B  INSERT A BREAK POINT AT LOCATION "ADR".
38                ;               ONLY ONE BREAK POINT CAN BE INSERTED AND ANY
39                ;               ENTRY TO ODT AFTER EXECUTING A BREAK POINT WILL
40                ;               CAUSE IT TO BE DELETED.
41                ;       D       DELETE THE BREAK POINT IF ANY.
42                ;       P       RESTART THE EXECUTION OF THE PROGRAM AT LOCATION
43                ;               POINTED BY 4A.
44                ;       "ADR"R  START EXECUTING THE PROGRAM AT "ADR" AFTER AN
45                ;               IO-RESET.
46                ;       K       KILL THE STRING TYPED SO FAR. THE ODT RESPONDS
47                ;               WITH A "?" AND THE OPEN CELL IS CLOSED WITHOUT
48                ;               MODIFICATION.
49                ;       =       PRINT THE OCTAL VALUE OF THE INPUT ONLY.
50                ;               THIS WILL CLOSE ANY OPEN CELLS WITHOUT
51                ;               MODIFICATION AND WILL NOT OPEN A CELL
52                ;
53                ;
54                ;       NOTE:   IN PROGRAMS WHICH RELOCATE THEMSELVES THE
55                ;               THE USER SHOULD PLACE BREAK POINTS ONLY IN THE
56                ;               THE ORIGINAL PROGRAM AREA. IF A BREAK POINT IS
57                ;               PLACED OUTSIDE THIS AREA THE RESULTS WILL
58                ;               BE UNPREDICTABLE.
59                ;
60                ;
```

```
0010 ECL22
01                .EOT
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0011 ECL22

**00000 TOTAL ERRORS, 00000 PASS 1 ERRORS

0012 ECL22

O?DTD 000524 MC 8/03
S?WPD 000050 MC 4/01