

DataGeneral

**TECHNICAL
STATEMENT**

TEXT LISTING

068-000251-07

PROGRAM

ECLIPSE EXTENDED MEMORY
EXERCISER

TEXT TAPE

097-000251-07

ABSTRACT

THE ECLIPSE EXTENDED MEMORY EXERCISER IS INTENDED TO AUGMENT THE EXISTENCE OF THE OTHER MEMORY CHECKERBOARD TESTS. THIS CHECKERBOARD, HOWEVER, TAKES INTO CONSIDERATION THE EXISTENCE OF SUCH ITEMS AS THE MMPU AND INTERLEAVED MEMORIES. IT ALSO INCLUDES SPECIAL PATTERNS THAT ALLOW FOR WORST CASE PATTERNS IN THE 5 ERROR CORRECTION BITS IN THE ERCC MEMORIES.

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10003 .MAIN
01
02 SWITCH SETTINGS
03 STARTING ADDRESSES
04 200 RUN ALL AVAILABLE OPTIONS
05 202 ALLOW FOR DELETION OF OPTIONS
06 204 IGNORE MMPU/MMPU1 AND ONLY RUN UP
07 TO THE FIRST 32K OF MEMORY
08
09 SWITCH/KEY PACKAGE
10
11 KEY 0 PLACES PGM IN KEY ENTRY MODE.
12 ALLOWS SETTING OF OPTIONS FROM KEYBOARD.
13 TYPING ANY KEY FROM 1-7,A-F COMPLEMENTS
14 THE PREVIOUS STATE OF THE BIT IN SWREG.
15
16 TYPE A CR TO EXIT KEYENTRY MODE.
17
18 NOTE: THE ABOVE MANNER OF USING KEYENTRY ALLOWS
19 FOR THE ADDRESS MATCH FEATURE TO BE
20 UTILIZED IN DEBUGGING AS A SCOPE SYNC.
21
22 KEY 2 =1 DELETE T10 TYPE OUTS
23 =0 ENABLE T10 TYPE OUTS
24
25 KEY 5 =1 ENABLE OUTPUT TO LPT
26 =0 DISABLE OUTPUT TO LPT
27
28 KEY 7 =1 TYPING A 7 WILL PRINT THE
29 RUN TIME AND ACCUMULATED ERRORS
30
31 KEY A =1 PRINT TIMING LOOP INFORMATION
32 =0 DO NOT PRINT TIMING LOOP INFORMATION
33
34 KEY F =1 RING BELL ON ERROR
35 =0 DO NOT RING BELL ON ERROR
36
37
38 KEY M LIST THE CURRENT SWITCH REGISTER BITS
39
40 (C)0 SETS SWREG TO DEFAULT MODE
41 AND RESTARTS THE PROGRAM
42
43 (C)R RESTARTS PROGRAM WITHOUT DISTURBING SWREG
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45 (C) = CONTROL KEY
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10004 .MAIN
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?4. OPERATING PROCEDURE
? START AT ADRS. 200 TO RUN ALL OPTIONS.
? START AT ADRS. 202 IF YOU WANT TO DELETE A TEST.
? START AT ADRS. 204 IF YOU WANT TO RUN
? WITHOUT THE MMPU.
?4.1 INITIAL PROGRAM OPERATIONS
? THE TEST WILL THEN SIZE MEMORY AND THEN
? RUN A SERIES OF TIMING TESTS TO DETERMINE
? THE INTERLEAVING FACTORS OF THE AVAILABLE
? MEMORY.
? THE ENSUING TYPEOUT WILL INDICATE THE FOLLOWING:
? TOTAL AMOUNT OF MEMORY FOUND
? WHETHER OR NOT AN MMPU OR MMPU1 EXISTS
? AFTER INDICATING THE EXISTANCE AND TYPE OF MMPU
? THE TEST WILL PROCEED TO TYPE AN INDICATION OF THE
? TYPES OF MEMORIES AVAILABLE AND THEIR INTERLEAVE
? FACTORS. THE TEST INDICATES THE EXISTENCE OF MEMORY
? OF A SPECIFIC TYPE AND INTERLEAVING AND FOLLOWS ON
? THE SAME LINE WITH EIGHT 16 BIT CONSTANTS.
? THE EACH CONSTANT INDICATES EXISTENCE OF THAT TYPE
? OF MEMORY WITHIN THE INDICATED 128K WORD BLOCK.
? THE PROGRAM DESCRIBES THE MEMORY IN 128K BLOCKS UPTO
? 1024K WORDS.
? I.E. IF A SYSTEM HAD THE FIRST 64K 4 WAY INTERLEAVED 16K CORE
? THE NEXT 64K 2 WAY INTERLEAVED 32K SC AND THE UPPER
? 128K 8 WAY INTERLEAVED 32K SC'S THE TYPEOUT WOULD APPEAR
? AS BELOW:
?TYPE INTLF 128K 256K 384K 512K 640K-----1024K
?SCORE 4 WAY 177400 000000 000000 000000 -----000000
?SC 2 WAY 000377 000000 000000 000000 -----000000
?SC 8 WAY 000000 177777 000000 000000 -----000000
?NOTE: DUE TO THE LIMITED WIDTH OF THIS PAPER I HAVE NOT SHOWN
? ALL THE DETAIL
?NOTE: THE TEST DOES NOT ATTEMPT TO IDENTIFY THE INTERLEAVING
? OF THE 8K CACHED SC MEMORIES. IT DOES HOWEVER IDENTIFY
? THEIR EXISTENCE. IF THE UPPER 64K OF A 128K SYSTEM
? WAS 8K CACHED SC'S THE FOLLOWING TYPEOUT WOULD BE INCLUDED
? NO MATTER HOW THE MEMORIES WERE INTERLEAVED:
?8K SC CACHED 000377 000000 000000 000000-----000000
?
? IF IT IS DESIRED TO SEE RESULTS OF THE TIMING LOOPS, ONE
? SHOULD SET KEY A (BIT 10) OF THE SWREG. THIS CAN BE DONE
? IN DTOS BEFORE THE PROGRAM IS CALLED OR ONE COULD HIT KEY
? "A" AND (C) "R". THE PROGRAM WOULD THEN RESTART. NOTE
? THIS INFORMATION IS OF LITTLE USE TO A PERSON WHO IS UNFA-
? MLAR WITH THEORY BEHIND THE TESTS. BASICLY THE NUMBERS
? REPRESENT THE NUMBER OF TIMES A PARTICULAR TYPE OF MEMORY
? BOARD TYPES AND INTERLEAVING FACTORS RESULT IN DIFFERENT
? COUNTS. ONE POSSIBLE USE OF THE LOOPS WOULD BE TO CHECK IF
? TWO MEMORY BOARDS HAVE BEEN GIVEN THE SAME ADDRESS UR ARE
? TIME INCOMPATABLE.

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10005 .MAIN
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15. TEST EXECUTION
?ALL MEMORY UNDER TEST IS FILLED WITH AN INHIBIT PATTERN
? (DONE VIA A BLM )
?THE WORST CASE CHECKERBOARD IS CREATED BY FILLING IN
?THOSE AREAS THAT SHOULD NOT CONTAIN THE INHIBIT PAT.
?WITH THE NON INHIBIT PATTERN
?
?MEMORY IS THEN EXERCISED IN THE FOLLOWING MANNER(FOR 2 PASSES)
?EACH GROUP OF 16 WORDS CHECKED TO SEE IF IT CONTAINS THE KEY
?PATTERN.(IF NOT EACH WORD IS READ AND COMPLIMENTED TO IT)
?EACH GROUP OF 16 WORDS IS THEN SHUFFLED 16 TIMES
?(WORD 1 IS MOVED TO WORD 2 IS MOVED TO WORD 3 ETC.
?UNTIL WORD 15 IS MOVED TO 16 AND 16 BACK TO 0)
?NOTE: THE SHUFFLE LOOP "DISLP" IS MODIFIED TO
? ACCOMMODATE THE DIFFERENT INTERLEAVES
? SO THAT DISTURB NOISE WILL BE CONGEN-
? TRATED WITHIN EACH PHYSICAL 8K MODUAL.
? ALSO, NONE OF THESE SHUFFLE LOOPS
? ARE EXECUTED FOR THE INITIAL PASS 0 OF
? EXEMX FOR MEMORIES THAT ARE
? OF A DIFFERENT INTERLEAVING THAN
? THE LOOP.
?
?THE THIRD PASS THROUGH MEMORY FOR EACH PATTERN,
?THE SHUFFLE IS EXTENDED IF THE LOOP IS
?CORRECTLY MODIFIED FOR INTERLEAVING.
?BIT 15 OF THE FIRST WORD OF THE 16 IS COMPLIMENTED
?THE 16 WORDS ARE THEN "SHUFFLED"
?AND THE WORD IS CHECKED TO SEE IF IT STILL EQUALS THE
?INHIBIT PATTERN.
?THE ABOVE PROCESS IS THEN REPEATED WITH BIT 14 OF THE 2ND
?WORD, 13 OF THE THIRD WORD, 12 OF THE 4TH WORD, ETC.
?UNTIL BIT 0 OF THE 16TH WORD HAS BEEN COMPLIMENTED
?SHUFFLED RECOMPLIMENTED AND CHECKED.
?THE ENTIRE 16 WORDS ARE THEN RECOMPLIMENTED TO THE NONINHIBIT
?PATTERN IF THEY WERE ORIGINALLY IN THAT STATE.
?THE SAME PROCEDURE IS REPEATED FOR THE NEXT 16 WORDS
?UNTIL THE END OF MEMORY.
?
?THE ENTIRE MEMORY IS THEN CHECKED TO SEE IF IT CONTAINS
?THE ORIGINAL WORST CASE PATTERN.
?
?MEMORY IS THEN FILLED WITH THE COMPLIMENT WORST
?CASE CHECKERBOARD AND THE WHOLE COMP."-SHUFFLE"-
?RECOMP. SEQUENCE IS AGAIN EXERCISED FOR 3
?PASSES THROUGH MEMORY.

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10006 .MAIN

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15. TEST EXECUTION(CONTINUED)
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?THE ABOVE SEQUENCE OF PATTERN EXERCISING IS
?THEN REPEATED FOR THE NEXT INTERLEAVING LEAF.
?NEXT PATTERN PAIR IF UNINTERLEAVED
?2 TIMES IF 2 WAY, 4 IF 4 WAY AND
?8 TIMES IF 8WAY
?
?THE TEST THEN PROCEEDS TO THE NEXT INHIBIT/NON INHIBIT
?PAIR IF IT IS A 21 BIT MEMORY
?IF A REGULAR 16 BIT MEM. OR BOTH ERCC PATTERNS HAVE BEEN RUN
?THE TEST THEN PROCEEDS TO THE NEXT
?INTERLEAVE SEQUENCE
?AFTER ALL PATTERNS, THEIR COMPLIMENT PATRNS
?HAVE BEEN EXERCISED FOR ALL COMBINATIONS OF
?INTERLEAVING THE PROGRAM WILL TYPE PASS
15.1 SUMMARY
?
?TO SUMMARIZE THE SEQUENCE:
?CB.TK= 0 FILL WITH KEY PATTERN
? 1 CREATE WORST CASE PAT
? 2 FAST SHUFFLE
? 3 FAST SHUFFLE
? 4 SLOW SHUFFLE
? 5 COMPARE MEMORY
? 6 FILL WITH KEY PATTERN
? 7 COMPLIMENT PAT
? 10 CONTINUE FILL COMPL. WORST CASE
? 11 FAST SHUFFLE
? 12 FAST SHUFFLE
? 13 SLOW SHUFFLE
? 14 COMPARE MEMORY
?
?THE ABOVE 15 OPERATIONS WILL BE REPEATED
?FOR EACH PATTERN
?INTLS= 1 ONCE(UNINTERLEAVED CORE TEST)
? 2 FOR INTLF=0 AND 1 (2WAY CORE)
? 4 FOR INTLF=0,1,2 AND 3 (4 WAY CORE)
? 10 FOR INTLF=0 TO 7 (8 WAY CORE)
? NOTE: FOR CB.TK= 4 OR 14 A FAST SHUFFLE OCCURS
? IF INTLS DOES NOT AGREE WITH THE
? INTERLEAVING OF THE 8K BEING EXERCISED
?AFTER INTLS=INTLF STEP TO NEXT PATTERN
?AND RESET INTLF=0
?AFTER ALL PATTERNS STEP TO NEXT INTLS
?MODIFY THE SHUFFLE LOOP AND RESTART PATTERNS.
?
?I.E. IF INTLS IS 10 AND INTLF IS =5,
?THEN, THE 8 WAY INTERLEAVE SHUFFLE IS
?OCCURRING ON ALL ADDRESSES THAT END
?IN THE DIGIT 5.
15.2 PROGRAM EXECUTION TIME
? PASS 0 1 MINUTE PER 32K (PLUS PASS 0 TIME)
? PASS 1 4 MINUTES PER 32K (PLUS PASS 0 TIME)

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10011 .MAIN

**00000 TOTAL ERRORS, 00000 PASS 1 ERRORS