```
0001 .IOT     MACRO REV 06.30          00:32:53 12/22/78
01
02
03
04
05
06
07              ;*********************************************************************
08              ;
09              ; NAME: BASICIOT.TX                          PART NUMBER: 097-001133
10              ;
11              ;
12              ; DESCRIPTION: BASIC INPUT / OUTPUT TEST
13              ;
14              ;
15              ; REVISION HISTORY:
16              ;
17              ;       REV.            DATE
18              ;
19              ;       00              12/29/78
20              ;
21              ;
22              ; COPYRIGHT (C) DATA GENERAL CORPORATION, 1978
23              ; ALL RIGHTS RESERVED.
24              ;*********************************************************************
```

N4 BASIC I/O

```
10002 .IOT
01        000000                .OD     0
02
03              I.  GOAL
04                  ====
05
06                      PROVIDE AN ADEQUATE TEST OF RELIABILITY OF THE INPUT/OUTPUT
07              INSTRUCTIONS AND DATA CHANNEL OPERATION. THE PROGRAM SHOULD BE ABLE
08              TO RUN ON ALL COMPUTER TYPES.
09
10                      THE IOT.SR PROGRAM ALSO INCLUDES A REAL TIME CLOCK
11              EXERCISER.
12
13
14
15              II.  PROGRAM DESCRIPTION
16                   ====================
17
18                      THE 'INPUT/OUTPUT TEST' PROGRAM (IOT.SR) WILL PERFORM TESTS
19              ON ALL THE I/O INSTRUCTIONS BY USING A MULTIMODE I/O TESTER BOARD
20              DEVELOPED BY TEST EQUIPMENT DESIGN.  THE ALGORITHMS DESIGNED FOR
21              THIS PROGRAM ARE BASED ON A SPECIFICATION OF THE I/O TESTER, DRAWING
22              NUMBER 202-000-103, REV. EE. SPECIFIC QUESTIONS ON THE SPECIFICATION
23              CAN BE FORWARDED TO HARRY WHITTEMORE, X5975, MS. B-55, TEST EQUIPMENT
24              DESIGN.
25
26                      PRIOR TO RUNNING BASICIOT, THE MULTIMODE I/O TESTER BOARD
27              MUST BE IN PLACE, ALONG WITH THE NECESSARY INTP AND DCHP JUMPERS.
28
29                      WHEN RUNNING IN MANUAL MODE, THE USER MUST FIRST ENTER A
30              KEY DENOTING WHAT COMPUTER TYPE THE PROGRAM IN RUNNING ON.
31
32                      PROGRAM EXECUTION TIME IS APPROXIMATELY 25-35 SECONDS.
33
34                      ON THE REAL TIME CLOCK EXERCISER, LOOP COUNT VARIATIONS
35              DUE TO THE MEMORY REFRESH CYCLE AND THE INDERTIMINATE NATURE OF
36              THE PREFETCH PROCESSOR MAY CAUSE AN INTERMITTENT "RTC FREQUENCY TEST
37              FAILURE".  THIS SHOULD BE IGNORED UNLESS THE MESSAGE APPEARS
38              FOR THE MAJORITY OF THE PASSES (IN WHICH CASE IT SHOULD BE TREATED
39              AS AN ACTUAL RTC FREQUENCY TEST FAILURE).
40
41                      THE PROGRAM WILL TEST THE FOLLOWING ITEMS IN THE FOLLOWING
42              ORDER:
43
44              1.      DATA OUT, DATA IN INSTRUCTIONS' PULSE VERIFICATION- IS
45              THE CORRECT PULSE ASSERTED ON THE I/O BUS?
46
47              2.      DATA OUT, DATA IN INSTRUCTIONS' DATA PATH- DO THE INSTRUCTIONS
48              PROPERLY LOAD/READ THE CORRECT REGISTER ON THE I/O TESTER BOARD?
49
50              3.      DATA OUT, DATA IN, & NIO INSTRUCTIONS' BUSY & DONE OPERATIONS-
51              VERIFY THAT THE  'S','C', AND 'P' SUFFIXES CORRECTLY ASSERT THE 'STRT',
52              'CLR', AND 'IOPLS' I/O BUS SIGNALS, RESPECTIVELY.
53
54              4.      BUSY & DONE SKIP INSTRUCTIONS- ASSERT OR CLEAR THE SELB AND
55              SELD INSTRUCTIONS TO TEST THE SKP- I/O INSTRUCTIONS.
56
57              5.      IORST- SHOULD CLEAR ALL REGISTERS.
58
```

4. DEVICE SELECT TEST- ISSUE AN IORST TO CLEAR ALL DEVICES' BUSY FLAGS. SET THE BUSY FLAG ON THE I/O TESTER (DEVICE CODE 00). EXECUTE SUCCESSIVE SKIP-ON-BUSY-FLAG INSTRUCTIONS FOR DEVICE CODES 2-76 (1 AND 77 WOULD CAUSE TROUBLE). IF THERE ARE ANY OTHER BUSY FLAGS SET, THEN THERE IS AN ERROR ON THE DEVICE CODE LINES.

7. MSKO- CHECK THAT THE MSKO PULSE WAS SENT ON THE I/O BUS.

8. INTA- CHECK THAT THE INTA PULSE WAS SENT ON THE I/O BUS. THE I/O TESTER BOARD PROVIDES AN ADDITIONAL TEST OF INTA. SPECIFICALLY, IT READS THE DATA REGISTER IN OLD MODE.

9. VERIFY DATA CHANNEL OUT (DCHO) AND DATA CHANNEL IN (DCMI) I/O PULSES.

10. PROGRAM INTERRUPT COUNTER TEST- AN INTERRUPT CAN BE MADE TO OCCUR AS A FUNCTION OF THE NUMBER OF REQUEST ENABLE PULSES (AS SPECIFIED IN THE NRENM CTR IN THE FUNCTION REGISTER) AND AS A FUNCTION OF THE COMPUTER TYPE. FOR THIS TEST, START THE FUNCTION REGISTER'S PROGRAMMED INTERRUPT COUNTER, AND START A LOOP COUNTER INCREMENTING. WHEN THE PROGRAM INTERRUPT OCCURS, THE LOOP COUNTER SHOULD BE WITHIN A YET TO BE DETERMINED RANGE OF A COMPUTER TYPE-SPECIFIC CONSTANT. THE CONSTANT AND ITS RANGE WILL BE DETERMINED THROUGH EXPERIMENTATION. THIS TEST IS RUN ONLY IN DTOS MANUAL MODE.

11. DATA CHANNEL INPUT TEST- IN NEW MODE, VARY THE MEMORY DATA BUFFER ADDRESS (DBA), NUMBER OF WORDS TRANSFERRED PER DATA CHANNEL OUT CALL (I.E., THE DATA CHANNEL RANGE, DCHR), THE NUMBER OF REQUEST ENABLE PULSES BETWEEN TRANSFERRED WORDS (RQEC, REQUEST ENABLE COUNT), AND THE SEED FOR THE RANDOM NUMBER GENERATOR (SEED). IN ALL CASES, THE NUMBERS INPUTTED FROM THE TESTER BOARD SHOULD EQUAL THE NUMBERS GENERATED BY AN EQUIVALENT SOFTWARE RANDOM NUMBER GENERATOR.

12. DATA CHANNEL OUTPUT TEST- IN NEW MODE, VARY THE SAME VARIABLES, EXCEPT THAT A BUFFER OF NUMBERS FROM MEMORY WILL BE INPUTTED INTO THE TESTER BOARD. THE NEW NUMBER IN THE DATA REGISTER AFTER EACH WORD INPUTTED WILL BE THE PREVIOUS VALUE OF THE DATA REGISTER EXCLUSIVE ORRED WITH THE INPUTTED NUMBER (THE ORIGINAL VALUE OF THE DATA REGISTER BEING 0). AT THE END OF THE TRANSFER, IF THE EXPECTED DATA IS NOT IN THE DATA REGISTER, OR THE ADDRESS REGISTER <> DBA+(DCHN+1)*8, THEN AN ERROR OCCURRED.

13. REAL TIME CLOCK EXERCISER- TEST THE 10, 100, AND 1000 HZ FREQUENCIES AGAINST THE 60 HZ FREQUENCY FOR REASONABLE ACCURACY. USES INTERRUPTS, LOOP COUNTS, AND TIMEOUT ERROR CHECKING. SEE PARAGRAPH ABOVE REGARDING RTC FREQUENCY TEST FAILURES.

```
        .ENDC
        .EJEC
```



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;*****************************************************************
;
; NAME: MASICIOT.SW                          PART NUMBER: 093-001516
;
;
; DESCRIPTION: MASIC INPUT / OUTPUT TEST
;
;
; REVISION HISTORY:
;
;       REV.            DATE
;
;       00              12/29/78
;
;
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;*****************************************************************
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