

DataGeneral

**TECHNICAL
STATEMENT**

TEXT LISTING

068-000666-01

PROGRAM

MICRO-NOVA DIGITAL
INTERFACE DIAGNOSTIC

TEXT TAPE

097-000666-01

ABSTRACT

THIS PROGRAM IS A HARDWARE DIAGNOSTIC WHICH IS DESIGNED TO EXERCISE THE LOGIC AND DETECT HARDWARE FAILURES DOWN TO THE I.C. LEVEL.

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0001 MNDGI          MACRO REV 06.30      14:38:05 05/17/78      10002 MNDGI
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 ; NAME: MNDGIF.TX PART NUMBER: 097-000666
 ;
 ; DESCRIPTION: MICRO-NOVA DIGITAL INTERFACE DIAGNOSTIC
 ;
 ; REVISION HISTORY:
 ; REV. DATE
 ; 00 12/09/77
 ; 01 04/28/78
 ;
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** .TITL MNDGIF

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PROGRAM NAME=MNDGIF.SR
MICRONOVA DIGITAL INTERFACE DIAGNOSTIC

REVISION HISTORY=

CURRENT REVISION (01) DUE TO SCOPE TRIGGER
INSTRUCTION CODED IMPROPERLY (SUBTEST# 1).

MACHINE REQUIREMENTS=
1. MICRONOVA CPU
2. MINIMUM OF 4K RAM
3. I/O INTERFACE (TTY OR CRT)
4. MICRONOVA DIGITAL INTERFACE

TEST REQUIREMENTS=
THIS DIAGNOSTIC REQUIRES A LOOP BACK PLUG, WITH
THE FOLLOWING CONNECTIONS, TO BE INSERTED ON
THE "A-EDGE" OF THE MNDGIF BOARD.
A1-A50 OVCC-A1(NOT USED)
A2-A49 OREAD-R5(TO GND)
A3-A48 OSTR0BE1-R6(TO GND)
A4-A47 OSTR0BE0'-I1STR0BE'
A4A-A7 0D0-ID0
A42-A9 0D1-ID1
A40-A11 0D2-ID2
A36-A13 0D3-ID3
A34-A17 0D4-ID4
A32-A19 0D5-ID5
A30-A21 0D6-ID6
A28-A23 0D7-ID7
A24-A27 0D8-ID8
A22-A29 0D9-ID9
A20-A31 0D10-ID10
A18-A33 0D11-ID11
A14-A37 0D12-ID12
A12-A39 0D13-ID13
A10-A41 0D14-ID14
A8-A43 0D15-ID15

SUMMARY=
THIS PROGRAM IS A HARDWARE DIAGNOSTIC WHICH IS
DESIGNED TO EXERCISE THE LOGIC AND DETECT
HARDWARE FAILURES DOWN TO THE I.C. LEVEL.

RESTRICTIONS=
THIS PROGRAM DOES NOT EXERCISE THE FOLLOWING LOGIC:
1.0 READ'-OREAD (A50) INVERTER

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INTPIN (R20) INTPUT (R19) LOGIC
ALSO, THE PULSE WIDTH OF THE COM-
PLEMENTARY OUTPUTS OF THE STROBE
GENERATOR ARE NOT CHECKED. THIS
MUST BE DONE MANUALLY BY OPERATOR;
A TIMING LOOP IS PROVIDED.

PROGRAM DESCRIPTION=
THIS PROGRAM IS ESSENTIALLY DIVIDED INTO 4 PHASES.
THE FIRST PHASE, WHICH IS SUBTEST 1, SERVES TO
DETERMINE TO GO-NO GO STATUS OF THE MICRONOVA
I/O CONTROLLER LOGIC, WHICH IS COMPRISED
OF THE FOLLOWING I.C.'S:
17.1.1 IOC (MN603)
17.1.2 CLOCK DRIVER (MN637)
17.1.3 I/O TRANSCIEVER (MN636)
17.1.4. I/O FUNCTION DECODER (DG 0794)
ALSO, THE BUSY-DONE LOGIC IS CHECKED.
THE SECOND PHASE (SUBTESTS 2-5) CHECKS THE
CIRCUITRY WHICH IS SPECIFIC TO THE FUNCTIONS
OF THIS BOARD AND INTERFACE TO THE MICRONOVA
I/O CONTROLLER.
THE THIRD PHASE (SUBTEST 6) IS A MINI-
RELIABILITY EXERCISE OF THE BOARD.
THE FOURTH PHASE (SUBTESTS 7-11) IS A
FURTHER, MORE DETAILED CHECK OFF THE I/O
CONTROLLER SPECIFICALLY.

** STMPD 8
F0J00000 000000 **

19.0 OPERATING PROCEDURE=
19.1 LOAD USING THE BINARY LOADER (OR DTOS).
19.2 STARTING ADDRESS IS 200 (DTOS DEFAULT START).
19.3 THIS PROGRAM CAN BE RUN ONLY IN MANUAL MODE (DTOS).
19.4 OPERATOR INPUTS=
19.4.1 THE PROGRAM WILL ASK THE OPERATOR WHAT THE
DEVICE CODE OF THE MNDGIF BOARD IS. THE
DEVICE CODE IS JUMPER-SELECTABLE.
THE OPERATOR SHOULD RESPOND WITH THE DEVICE
CODE (IN OCTAL) HE HAS CHOSEN FOR THE TEST
BOARD. THIS DEVICE CODE CANNOT BE ANY OF
THE FOLLOWING:
1.0 00 DEFAULT NO-OP
2.0 01 MUL/DIV ,STACK
3.0 35 XOR?
4.0 77 CPU
5.0 XX WHERE XX IS THAT OF ANY OTHER

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0005 MNDGI

I/O BOARD IN THE SYSTEM

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THE PROGRAM WILL ALSO ASK WHICH PHASE OF THE PROGRAM IS TO BE RUN. ONE PHASE ("DIAGNOSTIC") IS THE MAIN BODY OF THE DIAGNOSTIC, AND THE OTHER ("ONE-SHOT TIMING LOOP") SIMPLY PUTS THE PROGRAM IN A LOOP THAT REPEATEDLY TRIGGERS THE ONE-SHOTS SO THE OPERATOR MAY MONITOR THE RANGE OF THE STROBE GENERATOR WITH AN OSCILLOSCOPE. THAT RANGE IS FROM LESS THAN 1.3 MICROSEC TO GREATER THAN 6.0 MICROSEC. THE RANGE IS ADJUSTED BY ADJUSTING THE APPROPRIATE POTENTIOMETERS.

NOTE: OREAD AND OSTROBE1 ARE PULLED LOW WHEN THE DIAGNOSTIC TERMINATOR IS IN PLACE.

10.0 ERROR DESCRIPTION-

WHEN AN ERROR OCCURS, THE PROGRAM WILL PRINT OUT ALL FOUR ACCUMULATORS AND THE PROGRAM COUNTER, WHICH CONTAINS THE MEMORY ADDRESS OF THE PROGRAM WHERE THE ERROR OCCURRED. THE OPERATOR SHOULD TURN TO THE PAGE OF THE LISTING WHICH CONTAINS THAT LOCATION FOR A MORE DETAILED ERROR ANALYSIS. ALSO, THE OPERATOR SHOULD READ THE SUMMARY AT THE BEGINNING OF THAT PARTICULAR SUBTEST. ADDITIONALLY, IF AN ERROR OCCURS IN THE MINI-RELIABILITY SUBTEST (#6), THE PROGRAM WILL PRINT OUT THE FOLLOWING:

1.0 INPUT WORD
2.0 OUTPUT WORD
3.0 CONDITION WORD
4.0 COMPARISON WORD
5.0 MASK WORD
6.0 IF DONE IS TO BE SET

02D1 11

CONTROL SPECIFICATIONS

DOA= LOADS MASK REGISTER
DOB= LOADS OUTPUT REGISTER
DOC= LOADS CONDITION REGISTER
DIA= READS INPUT REGISTER
DIB= READS OUTPUT REGISTER
DIC= READS COMPARISON LATCH.
S PULSE=SETS BUSY, CLEARS DONE, CLEARS COMPARISON HATCH.
C PULSE=CLEARS BUSY, CLEARS DONE, CLEARS COMPARISON HATCH.
P PULSE=INDIRECTLY LOADS INPUT REGISTER, AND SETS READ FLOP BY ACTIVATING STROBES.

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CLEARSTROBE GENERATOR, READ REGISTER, MASK REGISTER, READ FLOP, BUSY, DONE, CONDITION REGISTER, COMPARISON LATCH, AND INPUT REGISTER. INTO THE IOC THE FOLLOWING INFORMATION:

(O10-15) DEVICE CODE
(O8) EXTERNAL REGISTER ENABLE BIT
(O9) DATA POLARITY BIT
(O7) EXTERNAL BUSY/DONE ENABLE BIT

MSKU= STROBES INTO THE IOC CHIP THE HARDWIRED PRIORITY MASK BIT (O5) AND AFFECTS THE STATE OF THE IOC INTERNAL INTERRUPT DISABLE FLIP-FLOP.

NOTE: A BLOCK DIAGRAM OF THE LOGIC OF THIS BOARD IS PROVIDED ON PAGE 9-1 OF THE DIAGNOSTIC APPENDIX.

DLIB MACROS

M7RAN MICRONOVA RANDOM NUMBER GENERATOR
D7VCD DEVICE CODE CHANGE ROUTINE
D7L80 CALLS THE FOLLOWING:
T?T10
S?MPK
O?DTP
M?NDG

NOTE: A USER MACRO IS INSERTED IN THE ERR? SERVICE ROUTINE. THIS MACRO IS A JUMP TO "XYZ0" SUBROUTINE WHICH IMPLEMENTS THE ALTERNATE ERROR PRINTOUT FOR SUBTEST 6.

SPECIAL NOTES-

THIS PROGRAM CANNOT BE RUN IN AUTOMODE.
THIS PROGRAM CANNOT BE RUN WITH CAT/KITTEN.
THE DEVICE CODE OF THIS BOARD MUST CONFORM TO SECTION 9.4.1
THE ACTUAL I/O INSTRUCTIONS TO THIS BOARD DO NOT CORRESPOND TO THOSE IN THE LISTING. THE TWO RIGHT OCTAL DIGITS OF ALL APPLICABLE I/O INSTRUCTIONS WILL EQUAL THOSE OF THE DEVICE CODE GIVEN BY THE OPERATOR IN RESPONSE TO THE OPENING QUESTION.
FOR EXAMPLE:

DOAS 0-DEV	LISTING	ACTUAL	DEVICE CODE
DIAC 1-DEV	61105	61123	23
	64605	64656	56

A DIAGNOSTIC APPENDIX IS PROVIDED. APPENDIX A CONTAINS A HARDWARE/SOFTWARE DESCRIPTION OF THE BOARD, AND APPENDIX B CONTAINS TIMING

0007 MNDGI

01 ; DIAGRAMS RELEVANT TO THE DIAGNOSTIC.
02 THERE SHOULD NOT BE ANY I/O BOARDS
03 ;
04 ; IN THE SYSTEM WITH A DEVICE CODE EQUAL TO 0.
05
06
07 ; RUN TIME*
08 ;
09 ; THE RUN TIME FOR FIRST 2 PASSES IS APPROX. 4 MINUTES
10 ;
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0008 MNDGI

**00005 TOTAL ERRORS, 00000 PASS 1 ERRORS

0009 MNDGI

0701D 0000000
STWPD 0000000

5/44
4/38