

**DataGeneral**

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**TECHNICAL  
STATEMENT**

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TEXT LISTING

068-001062-01

PROGRAM

MICRO NOVA ASYNCHRONOUS  
LINE DIAGNOSTIC

TEXT TAPE

097-001062-01

ABSTRACT

THIS IS A DIAGNOSTIC PROGRAM WRITTEN TO PERFORM A GATE BY GATE TEST OF MOST OF THE LOGIC ON THE MICRONOVA ASYNCHRONOUS COMMUNICATIONS BOARD. THE TEST IS EXECUTED USING A JUMPER PLUG WHICH CONNECTS EVEN NUMBERED ASYNC TRANSMITTERS TO ODD NUMBERED ASYNC RECEIVERS AND VICE VERSA.

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0001 .MAIN      MACRO REV 06.30      11:39:13 02/23/79
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07 *****
08 ; NAME: MNALD.TX      PART NUMBER: 097-001062
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12 ; DESCRIPTION: MICRO NOVA ASYNCHRONOUS LINE DIAGNOSTIC
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15 ; REVISION HISTORY:
16 ;     REV.          DATE
17 ;
18 ;
19 ;     00          04/21/78
20 ;     01          03/02/79
21 ;
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23 ; FACILITATE SECONDARY
24 ; DEVICE CODE AND CLEAR
25 ; DTR 305
26 ; *****
27 ; COPYRIGHT © DATA GENERAL CORPORATION, 1978,1979
28 ; ALL RIGHTS RESERVED.
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;1. PROGRAM NAME: MNALD.SR
;2. REVISION HISTORY: DATE 04/21/78
;3. REV. 00 03/02/79
;4. FACILITATE SECONDARY DEVICE
;5. CODE AND CLEAR DTR 305
;6.
;7. MACHINE REQUIREMENTS:
;8. MICRONOVA PROCESSOR
;9. 8K READ/WRITE MEMORY
;10. CONSOLE DEVICE
;11. DISKETTE DRIVE OR PAPER TAPE READER
;12. CONTROLLER BOARD
;13. ASYNCHRONOUS COMMUNICATIONS BOARD
;14. TEST PLUGS
;15. TEST REQUIREMENTS: N/A
;16.
;17. SUMMARY:
;18. THIS IS A DIAGNOSTIC PROGRAM WRITTEN TO PERFORM
;19. A GATE BY GATE TEST OF MOST OF THE LOGIC ON THE
;20. MICRONOVA ASYNCHRONOUS COMMUNICATIONS BOARD. THE
;21. TEST IS EXECUTED USING A JUMPER PLUG WHICH CONNECTS
;22. EVEN NUMBERED ASYNC TRANSMITTERS TO ODD NUMBERED
;23. ASYNC RECEIVERS AND VICE VERSA. THE JUMPER PLUG
;24. ALSO CONNECTS MODEM OUTPUTS TO MODEM INPUTS IN
;25. THE FOLLOWING MANNER:
;26.
;27. RTS X TO RING X AND CD X+1
;28. RTS X+1 TO RING X+1 AND CD X
;29. DTR X TO CTS X AND DSR X+1
;30. DTR X+1 TO CTS X+1 AND DSR X
;31.
;32. WHERE X = ANY EVEN NUMBERED LINE
;33.
;34. RESTRICTIONS:
;35. THIS DIAGNOSTIC DOES NOT TEST THE CONTROLLER
;36. BOARD LOGIC IN THE COMMUNICATIONS SUBSYSTEM.
;37. A SUCCESSFUL COMPLETION OF THE MICRO NOVA
;38. COMMUNICATION SUBSYSTEM DIAGNOSTIC (MNCSD) IS A
;39. PREREQUISITE BEFORE THIS DIAGNOSTIC CAN BE RUN.
;40. THE MODEM SECTION TESTS IN THIS DIAGNOSTIC WILL
;41. BE SKIPPED IF 20 MA CURRENT LOOP INTERFACE UN
;42. THE ASYNC BOARD IS USED. THEREFORE, THE DIAGNOSTIC
;43. SHOULD BE RUN USING THE EIA INTERFACE FIRST AND
;44. THEN SHOULD BE REPEATED FOR 20 MA CURRENT LOOP INTER-
;45. FACE.
;46. ONLY ONE ASYNC BOARD CAN BE TESTED AT A TIME.
;47. FURTHERMORE, NO OTHER COMMUNICATION BOARD (SYNC OR
;48. ASYNC) SHOULD BE INSTALLED IN THE CHASSIS.

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PROGRAM DESCRIPTION/THEORY OF OPERATION:
THIS DIAGNOSTIC IS A GATE BY GATE TEST OF MOST OF
THE LOGIC ON THE MICRONOVA ASYNCHRONOUS COMMUNICATIONS
BOARD. THE BAUD-RATE-GENERATION AND MODEM SECTION
TESTS ARE DONE IN THE DIAGNOSTIC MODE, WITH CLIPPING
VIA THE IOPLS. TRANSMIT/RECEIVE TESTS FOR THE ASYNC
LINE ARE DONE ON LINE. EACH SUBTEST BEGINS WITH AN
INITIALIZING MACRO (RESETUP)-----AND ENDS WITH AN
ITERATION MACRO (LOOP). MACRO RESETUP STARTS THE
SUBTEST WITH AN I/O RESET INSTRUCTION.
THE ORDER OF FUNCTION TESTING IS AS FOLLOWS:
7.2
7.2.1 BAUD-RATE-GENERATION LOGIC (SYMBOLIC TESTS BXXX)-
USING IOPLS TO STEP THE BAUD-RATE-GENERATOR IN THE
DIAGNOSTIC MODE AND USING BIT 7 OF THE O19 WORD TO
READ THE CLOCK STATUS.
7.2.2 CHECK THE MODEM AND TRANSMIT/RECEIVE TESTS.
CHECK THE ASYNC LINE, MODEM OUTPUTS AND INPUTS AND
ASSOCIATED CONTROL LOGIC.
7.2.3 ASYNC TRANSMITTER/RECEIVER LOGIC (SYMBOLIC TESTS
ASXX)-
CHECK ASYNCHRONOUS LINE TRANSMITTER/RECEIVER OPERATION.
ALL BAUD CLOCKS, ALL LINE CHARACTERISTICS AND TRANSMIT
BREAKS ARE TESTED. MOST OF THE TESTS ARE DONE GOING
ON LINE.
7.3 THE MODEM AND TRANSMIT/RECEIVE TESTS ARE REPEATED
FOR EACH LINE TO COMPLETE A FULL PASS AND THE WORD
"PASS" FOLLOWED BY THE PASS COUNT IS PRINTED ON THE
CONSOLE.
7.4 EACH SUBTEST IS EXECUTED ONLY ONCE TO COMPLETE THE
FIRST PASS. FOR THE SUBSEQUENT PASSES, EACH SUBTEST
IS ITERATED 5 TIMES.
7.5
7.6
7.7
7.8.
7.8.1 OPERATING MODES/SWITCH SETTINGS:
THE PROGRAM ALWAYS USES THE CONTENTS OF LOCATION
"SWREG" FOR SWITCH SETTINGS. THE DIFFERENT SWITCH
SETTINGS USED IN THE PROGRAM ARE EXPLAINED BELOW:
SWITCH 1 (0) = LOOP ON ERROR
SWITCH 2 (0) = SKIP LOOPING ON ERROR
SWITCH 3 (0) = PRINT TO CONSOLE
SWITCH 4 (0) = DO NOT PRINT X FAILURE
SWITCH 5 (0) = PRINT X FAILURE
SWITCH 6 (0) = ALLOW END OF PASS PRINT OUT
SWITCH 7 (0) = DO NOT PRINT ON THE LINE PRINTER
SWITCH 8 (0) = DO NOT HALT ON ERROR
SWITCH 9 (0) = HALT ON ERROR
SWITCH 10 (0) = PRINT ONLY THE FIRST ERROR
SWITCH 11 (0) = PRINT EVERY ERROR
7.8.2
7.8.3 FOR AN EXPLANATION OF HOW TO SET THE "SWREG"
BITS AND OTHER SWITCH COMMANDS, SEE THE "S?WPD"
MACRO EXPANSION AT THE END OF THE PROGRAM.

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OPERATING PROCEDURE/OPERATOR INPUT:
CONNECT THE TEST PLUG ON THE ASYNC BOARD. REMOVE
ANY "CTS" JUMPEKS (W3 THRU W6) THAT MAY HAVE BEEN
INSTALLED.
LOAD THE TEST PROGRAM VIA PRIMARY LOADER OR DIAGNOSTIC
OPERATING SYSTEM.
REMOVE THE "BUSINESS BASIC" JUMPER (W7) IF INSTALLED.
THE PROGRAM WILL START AT LOCATION 200 AND OUTPUT THE
FOLLOWING MESSAGE ON THE SYSTEM CONSOLE: "SELECT
INITIAL SWITCH SETTINGS". AT THIS POINT THE OPERATOR
MAY SET ANY SWITCHES IN THE SWREG BY TYPING 1 THROUGH
F FOLLOWED BY A CARRIAGE RETURN. TYPE ONLY A CR IF NO
SWITCHES ARE TO BE SET.
THE PROGRAM WILL REQUEST DEVICE CODE (IN OCTAL)
FOLLOWED BY A CR.
THE PROGRAM WILL ASK THE ASYNC BOARD ADDRESS. TYPE
ADDRESS OF THE FIRST LINE ON BOARD (IN DECIMAL) FOLLOWED
BY A CR.
THE PROGRAM WILL ASK WHETHER THE EIA OR THE 20MA CURRENT
LOOP INTERFACE IS BEING USED.
WHEN ANSWERING ANY OF THE ABOVE INPUT REQUESTS, IF THE
OPERATOR INPUT IS NOT AS EXPECTED, THE PROGRAM WILL DE-
TECT AN ERROR AND REPEAT THE INPUT REQUEST.
PROGRAM OUTPUT/ERROR DESCRIPTION:
WHEN A SUBTEST DETECTS A FAILURE, THE PROGRAM WILL
EXECUTE A TRAP INSTRUCTION WHICH IN TURN WILL CALL THE
ERROR ROUTINE. THIS WILL PRINT OUT THE CONTENTS OF ALL
ACCUMULATORS AND PROGRAM COUNTER AND THE ERROR NUMBER
ENCOUNTERED. THE PROGRAM COUNTER WILL HAVE THE ADDRESS
OF THE NEXT INSTRUCTION AFTER TRAP INSTRUCTION. IN
ADDITION, PROGRAM WILL PRINT THE LINE NUMBER UNDER TEST
AT THE TIME (PRIME LINE), AND IF TRANSMITTING AND RE-
CEIVING USING 2 DIFFERENT LINES, "PRIME LINE" WILL BE
THE TRANSMITTING LINE AND "SECONDARY LINE" WILL BE THE
RECEIVING LINE ADDRESS. IF SWITCH 1 IS RESET AT THIS
TIME, THE PROGRAM WILL PRINT "LOOPING ON ERROR" AND
ENTER A LOOP SUITABLE FOR SCOPING.
SETTING SWITCH 3 (1) CAUSES X FAILURE RATE TO BE PRINTED
WHEN THE PROGRAM IS LOOPING ON ERROR OR WHENEVER AN
ERROR MESSAGE IS PRINTED OUT.
AT THE END OF EVERY PASS, THE MESSAGE "END OF PASS"
FOLLOWED BY THE PASS COUNT IS PRINTED.
DEBUG HELP:
AFTER ENCOUNTERING AN ERROR, EXAMINE THE CONTENTS
OF ACCUMULATORS PRINTED OUT ON THE CONSOLE FOR
PERTINENT DATA AND SEE THE COMMENTS UNDER THE
CALL TO ERROR ROUTINE IN THE FAILING SUBTEST FOR
THE PROBABLE CAUSES OF FAILURE.
WHEN LOOPING ON ERROR, THE PROGRAM WILL START
LOOPING AT THE SECOND INSTRUCTION FOLLOWING "JSR
@ IENT?R", WHICH IS NORMALLY AN "MNRST" INSTRU-
TION. IN SOME CASES, THIS MAY BE USED TO SYNC A
SCOPE. IN OTHER CASES, IT MAY BE BEST TO SYNC ON
THE CONTROLLER I/O INSTRUCTION OR THE "DONE"
FLUP.

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10006 .MAIN
**000000 TOTAL ERRORS, 00000 PASS 1 ERRORS

?11.3 DESCRIPTION OF MOST COMMON MACROS AND SUBROUTINES:
?11.3.1 "RESETUP" MACRO IS USED TO START A SUBTEST.
? IT EXPANDS TO A CALL TO THE ENTIR ROUTINE FOLLOWED BY
? AN I/O RESET. "LOOP" MACRO IS USED TO END A SUBTEST
? AND IT CALLS THE CYC?X ROUTINE. "ERROR" MACRO CREATES
? A TRAP INSTRUCTION WITH THE ERROR NO., AND THIS IN TURNS
? CALLS THE ERR? ROUTINE WHEN A SUBTEST FAILS. FOR
? FURTHER INFORMATION, READ THE EXPLANATION GIVEN AT THE
? END OF THE PROGRAM WHERE THESE ROUTINES ARE LOCATED.
?11.3.2 THE "SCLK" MACRO USES ONE ARGUMENT AND SENDS OUT
? CLOCK PULSES IN THE DIAGNOSTIC MODE EQUAL TO
? THE ARGUMENT.
? "CLKHL" IS A SUBROUTINE TO INITIALIZE THE RECEIVER
? CLOCK BY GIVING PULSES IN THE DIAGNOSTIC MODE TILL
? THE FIRST HIGH TO LOW TRANSITION OF RCLK.
?11.3.3 "TRCV" IS A SUBROUTINE USED TO TRANSMIT AND
? RECEIVE DATA ON PRIME LINE.
?
? SPECIAL NOTES:
?12. THE TEST ROUTINES SHOULD NOT BE RUN OUT OF SEQUENCE,
?12.1 AS A TEST MAY REQUIRE SETUP SEQUENCING FROM
? A PREVIOUS TEST. RESTART THE PROGRAM FROM THE
? BEGINNING AFTER A POWER DOWN.
?12.2 CAT/KITTENS IS NOT INCLUDED IN THIS PROGRAM.
?
? RUN TIME:
?13. THE APPROXIMATE RUN TIME FOR THE FIRST TWO
?13.1 PASSES WITH MODEMS (EIA INTERFACE) SELECTED IS
? EIGHT MINUTES.

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