

DataGeneral

**TECHNICAL
STATEMENT**

LISTING

068-001664-00

PROGRAM

CS MICRONOVA ASYNCHRONOUS LINE
DIAGNOSTIC

TAPE

097-001664-00

ABSTRACT

THIS IS A DIAGNOSTIC PROGRAM WRITTEN TO PERFORM A GATE BY GATE TEST OF MOST OF THE LOGIC IN THE MICRONOVA ASYNCHRONOUS COMMUNICATIONS BOARD.

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MACRO REV 06.30 10:25:05 08/29/79
PROGRAM NAME: CSALD.SR
REVISION HISTORY:
REV. DATE
00 XX/XX/79

; NAME: CSALD.TX PART NUMBER: 097-001664
; DESCRIPTION: CS MICRO NOVA ASYNCHRONOUS LINE DIAGNOSTIC
; REVISION HISTORY:
; REV. DATE
; 00 04/18/79

MACHINE REQUIREMENTS:
MICRONOVA PROCESSOR
8K READ/WRITE MEMORY
CONSOLE DEVICE
DISKETTE DRIVE OR PAPER TAPE READER
CONTROLLER BOARD
ASYNCHRONOUS COMMUNICATIONS BOARD
TEST PLUGS
TEST REQUIREMENTS: N/A

SUMMARY:
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. THE CS JUMPER PLUG
ALSO CONNECTS MODEM OUTPUTS TO MODEM INPUTS IN
THE FOLLOWING MANNER:
RTS X TO RING X AND DSR X+1
RTS X+1 TO RING X+1 AND DSR X
UTR X TO CTS X AND CD X+1
UTR X+1 TO CTS X+1 AND CD X
WHERE X = ANY EVEN NUMBERED LINE

RESTRICTIONS:
THIS DIAGNOSTIC DOES NOT TEST THE CONTROLLER
BOARD LOGIC IN THE COMMUNICATIONS SUBSYSTEM,
A SUCCESSFUL COMPLETION OF THE MICRO NOVA
COMMUNICATION SUBSYSTEM DIAGNOSTIC (MNCSD) IS A
PREREQUISITE BEFORE THIS DIAGNOSTIC CAN BE RUN.
THE MODEM SECTION TESTS IN THIS DIAGNOSTIC WILL
BE SKIPPED IF 20 MA CURRENT LOOP INTERFACE ON
THE ASYNC BOARD IS USED. THEREFORE, THE DIAGNOSTIC
SHOULD BE RUN USING THE EIA INTERFACE FIRST AND
THEN SHOULD BE REPEATED FOR 20 MA CURRENT LOOP INTER-
FACE.

ONLY ONE ASYNC BOARD CAN BE TESTED AT A TIME,
FURTHERMORE, NO OTHER COMMUNICATION BOARD (SYNC OR
ASYNC) SHOULD BE INSTALLED IN THE CHASSIS.

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17.0 PROGRAM DESCRIPTION/THEORY OF OPERATION:
17.1 THIS DIAGNOSTIC IS A GATE BY GATE TEST OF MOST OF
02 THE LOGIC ON THE MICRONOVA ASYNCHRONOUS COMMUNICATIONS
03 BOARD. THE BAUD-RATE-GENERATION AND MODEM SECTION
04 TESTS ARE DONE IN THE DIAGNOSTIC MODE, WITH CLOCKING
05 VIA THE IOPLS. TRANSMIT/RECEIVE TESTS FOR THE ASYNC
06 LINE ARE DONE ON LINE. EACH SUBTEST BEGINS WITH AN
07 INITIALIZING MACRO (RESETUP)-----AND ENDS WITH AN
08 ITERATING MACRO (LOOP). MACRO RESETUP STARTS THE
09 SUBTEST WITH AN I/O RESET INSTRUCTION.
10 THE ORDER OF FUNCTION TESTING IS AS FOLLOWS:
11 BAUD-RATE-GENERATION LOGIC (SYMBOLIC TESTS R4XX)-
12 CHECK THE CORRECT TIMING OF EACH ASYNC CLOCK BY
13 USING IOPLS TO STEP THE BAUD-RATE-GENERATOR IN THE
14 DIAGNOSTIC MODE AND USING BIT 7 OF THE DIB WORD TO
15 READ THE CLOCK STATUS.
16 ASYNC MODEM CONTROL LOGIC (SYMBOLIC TESTS AMXX)-
17 CHECK THE ASYNC LINE MODEM OUTPUTS AND INPUTS AND
18 ASSOCIATED CONTROL LOGIC.
19 ASYNC TRANSMITTER/RECEIVER LOGIC (SYMBOLIC TESTS
20 ASXX)-
21 CHECK ASYNCHRONOUS LINE TRANSMITTER/RECEIVER OPERATION.
22 ALL BAUD CLOCKS, ALL LINE CHARACTERISTICS AND TRANSMIT
23 BREAKS ARE TESTED. MOST OF THE TESTS ARE DONE GOING
24 ON LINE.
25 THE MODEM AND TRANSMIT/RECEIVE TESTS ARE REPEATED
26 FOR EACH LINE TO COMPLETE A FULL PASS AND THE WORD
27 "PASS" FOLLOWED BY THE PASS COUNT IS PRINTED ON THE
28 CONSOLE.
29 EACH SUBTEST IS EXECUTED ONLY ONCE TO COMPLETE THE
30 FIRST PASS. FOR THE SUBSEQUENT PASSES, EACH SUBTEST
31 IS ITERATED 5 TIMES.
32
33 OPERATING MODES/SWITCH SETTINGS:
34 THE PROGRAM ALWAYS USES THE CONTENTS OF LOCATION
35 "SWREG" FOR SWITCH SETTINGS. THE DIFFERENT SWITCH
36 SETTINGS USED IN THE PROGRAM ARE EXPLAINED BELOW:
37 SWITCH 1 (0) = LOOP ON ERROR
38 (1) = SKIP LOOPING ON ERROR
39 SWITCH 2 (0) = PRINT TO CONSOLE
40 (1) = ABORT PRINT OUT TO CONSOLE
41 SWITCH 3 (0) = DO NOT PRINT % FAILURE
42 (1) = PRINT % FAILURE
43 SWITCH 4 (0) = ALLOW END OF PASS PRINT OUT
44 (1) = SUPPRESS END OF PASS PRINT OUT
45 SWITCH 5 (0) = DO NOT PRINT ON THE LINE PRINTER
46 (1) = PRINT ON THE LINE PRINTER
47 SWITCH 6 (0) = DO NOT HALT ON ERROR
48 (1) = HALT ON ERROR
49 SWITCH 8 (0) = PRINT ONLY THE FIRST ERROR
50 (1) = PRINT EVERY ERROR
51
52 FOR AN EXPLANATION OF HOW TO SET THE "SWREG"
53 BITS AND OTHER SWITCH COMMANDS, SEE THE "SWREG"
54 MACRO EXPANSION AT THE END OF THE PROGRAM.
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19.0 OPERATING PROCEDURE/OPERATOR INPUT:
19.1 CONNECT THE CS TEST PLUG ON THE ASYNC BOARD. REMOVE
02 ANY "CTS" JUMPERS (W3 THRU W6) THAT MAY HAVE BEEN
03 INSTALLED.
04 LOAD THE TEST PROGRAM VIA BINARY LOADER OR DIAGNOSTIC
05 OPERATING SYSTEM.
06 REMOVE THE "BUSINESS BASIC" JUMPER (W7) IF INSTALLED.
07 THE PROGRAM WILL START AT LOCATION 200 AND OUTPUT THE
08 FOLLOWING MESSAGE ON THE SYSTEM CONSOLE: "SELECT
09 INITIAL SWITCH SETTINGS". AT THIS POINT THE OPERATOR
10 MAY SET ANY SWITCHES IN THE SWREG BY TYPING 1 THROUGH
11 F FOLLOWED BY A CARRIAGE RETURN. TYPE ONLY A CR IF NO
12 SWITCHES ARE TO BE SET.
13 THE PROGRAM WILL REQUEST DEVICE CODE (IN OCTAL)
14 FOLLOWED BY A CR.
15 THE PROGRAM WILL ASK THE ASYNC BOARD ADDRESS. TYPE
16 BY A CR.
17 ADDRESS OF THE FIRST LINE ON BOARD (IN DECIMAL) FOLLOWED
18 BY A CR.
19 THE PROGRAM WILL ASK WHETHER THE EIA OR THE 20MA CURRENT
20 LOOP INTERFACE IS BEING USED.
21 WHEN ANSWERING ANY OF THE ABOVE INPUT REQUESTS, IF THE
22 OPERATOR INPUT IS NOT AS EXPECTED, THE PROGRAM WILL DE-
23 TECT AN ERROR AND REPEAT THE INPUT REQUEST.
24
25 PROGRAM OUTPUT/ERROR DESCRIPTION:
26 WHEN A SUBTEST DETECTS A FAILURE, THE PROGRAM WILL
27 EXECUTE A TRAP INSTRUCTION WHICH IN TURN WILL CALL THE
28 ERROR ROUTINE. THIS WILL PRINT OUT THE CONTENTS OF ALL
29 ACCUMULATORS AND PROGRAM COUNTER AND THE ERROR NUMBER
30 ENCOUNTERED. THE PROGRAM COUNTER WILL HAVE THE ADDRESS
31 OF THE NEXT INSTRUCTION AFTER TRAP INSTRUCTION. IN
32 ADDITION, PROGRAM WILL PRINT THE LINE NUMBER UNDER TEST
33 AT THE TIME (PRIME LINE), AND IF TRANSMITTING AND RE-
34 CEIVING USING 2 DIFFERENT LINES, "PRIME LINE" WILL BE
35 THE TRANSMITTING LINE AND "SECONDARY LINE" WILL BE THE
36 RECEIVING LINE ADDRESS. IF SWITCH 1 IS RESET AT THIS
37 TIME, THE PROGRAM WILL PRINT "LOOPING ON ERROR" AND
38 ENTER A LOOP SUITABLE FOR SCOPING.
39 SETTING SWITCH 3 (1) CAUSES % FAILURE RATE TO BE PRINTED
40 WHEN THE PROGRAM IS LOOPING ON ERROR OR WHENEVER AN
41 ERROR MESSAGE IS PRINTED OUT.
42 AT THE END OF EVERY PASS, THE MESSAGE "END OF PASS"
43 FOLLOWED BY THE PASS COUNT IS PRINTED.
44
45 DEBUG HELP:
46 AFTER ENCOUNTERING AN ERROR, EXAMINE THE CONTENTS
47 OF ACCUMULATORS PRINTED OUT ON THE CONSOLE FOR
48 PERTINENT DATA AND SEE THE COMMENTS UNDER THE
49 CALL TO ERROR ROUTINE IN THE FAILING SUBTEST FOR
50 THE PROBABLE CAUSES OF FAILURE.
51 WHEN LOOPING ON ERROR, THE PROGRAM WILL START
52 LOOPING AT THE SECOND INSTRUCTION FOLLOWING "JSR
53 @ IENT?" WHICH IS NORMALLY AN "MNRST" INSTRU-
54 TION. IN SOME CASES, THIS MAY BE USED TO SYNC A
55 SCOPE. IN OTHER CASES, IT MAY BE BEST TO SYNC ON
56 THE CONTROLLER I/O INSTRUCTION OR THE "DOONE"
57 FLOP.

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**000000 TOTAL ERRORS, 00000 PASS 1 ERRORS

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: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 ENTZR 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.
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:12. SPECIAL NOTES:  
:12.1 THE TEST ROUTINES SHOULD NOT BE RUN OUT OF SEQUENCE,  
: 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.
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:13. RUN TIME:  
:13.1 THE APPROXIMATE RUN TIME FOR THE FIRST TWO  
: PASSES WITH MODEMS (EIA INTERFACE) SELECTED IS  
: EIGHT MINUTES.
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