DataGeneral

TECHNICAL STATEMENT

TEXT LISTING

068-001060-01

PROGRAM

MICRO NOVA COMMUNICATION SUBSYSTEM
DIAGNOSTIC

TEXT TAPE

097-001060-01

ABSTRACT

THE MICRO NOVA COMMUNICATION SUBSYSTEM DIAGNOSTIC PERFORMS A GATE BY GATE TEST OF MOST OF THE LOGIC ON THE COMMUNICATION CONTROLLER BOARD, THE SYNCHRONOUS COMMUNICATION BOARD, AND THE CRC GENERATOR BOARD. THIS TEST ALSO INCLUDES THE SYNCHRONOUS MODEMS.

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 0001 .MAIN    MACRO REV 06.30          10:00:10 05/05/79
01
02
03
04
05
06
07              ;*********************************************************************
08              ;
09              ; NAME: MNCSD.TX                          PART NUMBER:  097-001060
10              ;
11              ;
12              ; DESCRIPTION: MICRO NOVA COMMUNICATION SUBSYSTEM DIAGNOSTIC
13              ;
14              ;
15              ; REVISION HISTORY:
16              ;
17              ;       REV.            DATE
18              ;
19              ;       00              04/21/78
20              ;       01              03/02/79        FACILITATE SECONDARY
21              ;                                       DEVICE CODE
22              ;
23              ; COPYRIGHT (C) DATA GENERAL CORPORATION, 1978,1979
24              ; ALL RIGHTS RESERVED.
25              ;*********************************************************************
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10002 .MAIN
01              ;1.     PROGRAM NAME
02              ;               MNSCD.SR
03              ;
04              ;2.     REVISION HISTORY
05              ;               REV. 0
06              ;               REV. 1  03/02/79        FACILITATE SECONDARY
07              ;                                       DEVICE CODE
08              ;
09              ;3.     MACHINE REQUIREMENTS (MINIMUM)
10              ;3.1            MICRO NOVA PROCESSOR
11              ;3.2            8K READ/WRITE MEMORY
12              ;3.3            CONSOLE DEVICE
13              ;3.4            DISKETTE DRIVE OR PAPERTAPE READER
14              ;3.5            COMMUNICATION CONTROLLER BOARD
15              ;
16              ;4.     TEST REQUIREMENTS (MAXIMUM CONFIGURATION)
17              ;4.1            COMMUNICATION CONTROLLER BOARD
18              ;4.2            SYNCHRONOUS COMMUNICATION BOARD
19              ;4.3            CRC GENERATOR BOARD
20              ;4.4            MODEM TEST PLUG
21              ;
22              ;5.     SUMMARY
23              ;               THE MICRO NOVA COMMUNICATION SUBSYSTEM
24              ;               DIAGNOSTIC PERFORMS A GATE BY GATE TEST
25              ;               OF MOST OF THE LOGIC ON THE COMMUNICATION
26              ;               CONTROLLER BOARD, THE SYNCHRONOUS COM-
27              ;               MUNICATION BOARD, AND THE CRC GENERATOR
28              ;               BOARD.  THIS TEST ALSO INCLUDES THE
29              ;               SYNCHRONOUS MODEMS.
30              ;
31              ;6.     RESTRICTIONS
32              ;6.1            THIS PROGRAM DOES NOT TEST THE ASYNCHRONOUS
33              ;               COMMUNICATION BOARD AND ASSOCIATED LOGIC,
34              ;               WHICH IS ALSO PART OF THIS SUBSYSTEM. MICRO
35              ;               NOVA ASYNC LINE DIAGNOSTIC(MNALD) IS REQUIRED.
36              ;
37              ;6.2            ONLY ONE SYNC BOARD CAN BE TESTED AT A TIME,
38              ;               FURTHERMORE NO OTHER COMMUNICATIONS BOARD
39              ;               (SYNC OR ASYNC) SHOULD BE PLUGGED INTO THE
40              ;               SAME CHASSIS.
41              ;
42              ;6.3            19200 BAUD MAY NOT BE TESTED ON ANY ADDRESS
43              ;               EXCEPT ZERO.
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!0003 .MAIN
01              ;7.     PROGRAM DESCRIPTION/THEORY OF OPERATION
02              ;7.1            THE MICRO NOVA COMMUNICATION SUBSYSTEM
03              ;               DIAGNOSTIC IS DESIGNED TO TEST EACH
04              ;               CIRCUIT OF THE THREE BOARDS REQUIRED.
05              ;               ALMOST ALL OF THE TESTS ARE DONE IN
06              ;               OFFLINE (DIAGNOSTIC) MODE.
07              ;7.2            IN DIAGNOSTIC MODE THE BAUD RATE AND
08              ;               INTERNAL STATE CLOCKING IS ACCOMPLISHED
09              ;               BY IOPLS TO DEVICE CODE 34 OR 44(MUX).  THE
10              ;               CRC GENERATOR CLOCKING IS VIA IOPLS TO
11              ;               DEVICE CODE 35 OR 45(CRC).
12              ;7.3            EACH SUBTEST BEGINS WITH AN INITIALIZING
13              ;               SUBROUTINE (ENT?R) AND ENDS WITH AN IT-
14              ;               ERATION SUBROUTINE (CYC?E OR CY?C).
15              ;               WITHIN EACH SUBTEST IS ONE OR MORE CALLS
16              ;               TO THE ERR? SUBROUTINE, THIS IS IN THE
17              ;               FORM OF A UNIQUE TRAP INSTRUCTION.
18              ;
19              ;7.4    THE FLOW OF THE PROGRAM FOLLOWS:
20              ;7.4.1          MAIN CONTROL LOGIC (SYMBOLIC AXXX) - THIS
21              ;               IS CONTAINED ON THE CONTROLLER BOARD AND
22              ;               CONSISTS OF BUS INTERFACES, INSTRUCTION
23              ;               DECODES, ADDRESS LINES, INITIALIZE CLEAR,
24              ;               STATE CLOCK, SETUP OF IOC, BUSY AND DONE.
25              ;7.4.2          TIMING LOGIC (SYMBOLIC TCLKX) - TESTS BAUD
26              ;               RATE GENERATOR LOGIC.
27              ;7.4.3          TRANSMITTER TESTING (T000-T013) - VARIOUS
28              ;               TRANSMITTER TIMING IS EXAMINED
29              ;7.4.4          RECEIVER TESTING (SYMBOLIC RXXX) - RECEIVER
30              ;               TIMING IS EXAMINED WITHOUT DATA TRANSFER.
31              ;7.4.5          TRANSMITTER/RECEIVER TESTING (T014 AND UP) -
32              ;               MISCELLANEOUS SYNC AND CONTROLLER BOARD TESTS
33              ;               INCLUDING CHARACTER TRANSFERS, INSTRUCTION
34              ;               DECODES, SYNC CHARACTERS, LINE CHARACTERISTICS,
35              ;               PARITY GENERATION, CREATE OVERRUN ERRORS,
36              ;               TRANSPARENT MODE, DLE CHARACTERS, CREATE PARITY
37              ;               ERRORS, ONLINE OPERATION.
38              ;7.4.6          MODEM CONTROL (SYMBOLIC MXXX) - MODEM LOGIC IS
39              ;               CONTAINED ON BOTH THE SYNC AND CONT BOARDS.
40              ;7.4.7          CRC GENERATOR TEST (SYMBOLIC CRCXX) - IF CRC
41              ;               OPTION SELECTED (SWITCH "C"), ALL CRC BOARD
42              ;               TESTS
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!0004 .MAIN
01              ;       OPERATING MODES/SWITCH SETTINGS
02
03
04              ;8.     SWITCH SETTINGS
05              ;
06              ;       LOCATION "SWREG" IS USED TO SELECT THE PROGRAM OPTIONS
07              ;       (NOT SYSTEM CONFIGURATION). WHILE RUNNING UNDER DTOS,
08              ;       THIS LOCATION WILL BE LOADED BY THE MONITOR.
09              ;       HOWEVER UNDER STAND ALONE AND PROGRAM LOAD MODES THIS
10              ;       LOCATION WILL BE SET ACCORDING TO THE ANSWERS SUPPLIED
11              ;       BY THE OPERATOR. IN ANY CASE THE OPTIONS CAN BE CHANGED
12              ;       OR VERIFIED BY USING ONE OF THE COMMANDS GIVEN IN SEC.
13              ;       8.2
14              ;
15              ;
16              ;8.1    SWITCH OPTIONS
17              ;       DIFFERENT BITS AND THEIR INTERPRETATION AT LOCATION
18              ;       "SWREG" IS AS FOLLOWS:
19              ;
20              ;       BIT     OCTAL   BINARY  INERPRETATION
21              ;               VALUE   VALUE
22              ;
23              ;       1               0       LOOP ON ERROR
24              ;               40000   1       SKIP LOOPING ON ERROR
25              ;
26              ;       2               0       PRINT TO CONSOLE
27              ;               20000   1       ARORT PRINT OUT TO CONSOLE
28              ;
29              ;       3               0       DO NOT PRINT % FAILURE
30              ;               10000   1       PRINT % FAILURE
31              ;
32              ;       4               0       ALLOW END OF PASS PRINT OUT
33              ;               04000   1       SUPPRESS END OF PASS PRINT OUT
34              ;
35              ;       5               0       DO NOT PRINT ON THE LINE PRINTER
36              ;               02000   1       PRINT ON THE LINE PRINTER
37              ;
38              ;       6               0       DO NOT HALT ON ERROR
39              ;               01000   1       HALT ON ERROR
40              ;
41              ;       7               0       DO NOT PRINT SUMMARY AND/OR
42              ;                               PASSING OF EACH SUBTEST
43              ;               00400   1       PRINT SUMMARY AND/OR
44              ;                               PASSING OF EACH SUBTEST
45              ;       8               0       PRINT ONLY THE FIRST ERROR
46              ;               00200   1       PRINT EVERY ERROR
47
48              ;8.2    SWITCH COMMANDS
49              ;       ONCE THE PROGRAM STARTS EXECUTING THE STATE OF ANY OF
50              ;       THE BITS CAN BE CHANGED BY HITTING KEYS 1-9, A-F. THE
51              ;       PROGRAM WILL CONTINUE RUNNING AFTER UPDATING THE OPTIONS.
52              ;       EACH KEY WILL COMPLEMENT THE STATE OF THE BIT AFFILIAT-
53              ;       ED WITH IT, THUS BIT 4 CAN BE ALTERED BY HITTING KEY 4.
54              ;       SETTING OF ANY BIT OF LOCATION "SWREG" WILL SET BIT 0.
55              ;       (DEFAULT MODE IS DEFINED AS ALL BITS OF SWREG SET TO 0)
56              ;       THE PROGRAM CAN BE LOCKED INTO SWITCH MODIFICATION MODE
57              ;       BY TYPING A 0, IN WHICH CASE MORE THAN ONE BIT CAN BE
58              ;       CHANGED BEFORE  CONTROL IS ALLOWED TO RETURN TO THE
59              ;       MAIN PROGRAM.
60              ;
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 0005 .MAIN
01              ;8.2.1  OTHER COMMANDS
02              ;
03              ;       "CR"    A "RETURN" CAN BE TYPED TO CONTINUE THE PROGRAM
04              ;               AFTER ITS LOCKED IN A SWITCH MODIFICATION MODE
05              ;
06              ;       ^D      THIS COMMAND GIVEN AT ANY TIME WILL RESET "SWREG"
07              ;               TO DEFAULT MODE AND RESTART THE PROGRAM.
08              ;
09              ;       ^R      THIS COMMAND GIVEN AT ANY TIME WILL RESTART THE
10              ;               PROGRAM. SWITCHES ARE LEFT WITH THE VALUES THEY
11              ;               HAD BEFORE THE COMMAND WAS ISSUED.
12              ;
13              ;       ^O      THIS COMMAND GIVEN AT ANY TIME WILL CAUSE THE
14              ;               PROGRAM CONTROL TO GO TO ODT (NOTE: THIS IS AN
15              ;               OPTIONAL COMMAND AND IS AVAILBLE ONLY IF
16              ;               ODTPK IS PRESENT)
17              ;
18              ;       M       THIS COMMAND GIVEN AT ANY TIME WILL PRINT THE
19              ;               CURRENT OPERATING MODES.
20              ;
21
22              ;
23              ;8.3    ADDITIONAL SWITCH OPTIONS IN THIS PROGRAM ARE:
24              ;
25              ;       BIT     OCTAL   BINARY  INTERPRETATION
26              ;               VALUE   VALUE
27              ;
28              ;       A               0       DO NOT REQUEST PARAMETERS
29              ;                               AFTER RESTART
30              ;               00040   1       REQUEST PARAMETERS AFTER
31              ;                               RESTART IF SWITCH "B"=1
32              ;
33              ;       B               0       DO NOT TEST SYNC BOARD
34              ;               00020   1       TEST SYNC BOARD
35              ;
36              ;       C               0       DO NOT TEST CRC BOARD
37              ;               00010   1       TEST CRC BOARD
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!0005 .MAIN
01              ;9.     OPERATING PROCEDURE/OPERATOR INPUT
02              ;9.1            CONNECT THE MODEM TEST PLUG -
03              ;               IF SYNC BOARD IS TO BE TESTED
04              ;
05              ;                       DTR TO RING
06              ;                       RTS TO DSR
07              ;                       SPA TO CMD AND XMT CLK
08              ;                       SPB TO CTS
09              ;
10              ;9.2            REMOVE CLEAR TO SEND JUMPER(W1) IF INSTALLED.
11              ;
12              ;9.3            LOAD THE TEST PROGRAM VIA THE BINARY LOADER
13              ;               OR DIAGNOSTIC OPERATING SYSTEM.
14              ;                       STARTING ADDRESS = 000200
15              ;
16              ;9.4            THE PROGRAM WILL LIST AND REQUEST OPTIONS
17              ;               DESIRED.  USE SWITCH PACK COMMANDS AND
18              ;               OPTIONS IN PARAGRAPH 8.
19              ;
20              ;9.5            THE PROGRAM WILL REQUEST DEVICE CODE
21              ;               (OCTAL) FOLLOWED BY A CARRIAGE RETURN FOR
22              ;               SUBSYSTEM AND CRC BOARD (IF SWITCH "C"
23              ;               SELECTED).
24              ;
25              ;9.6            THE PROGRAM WILL REQUEST THE BOARD ADDRESS
26              ;               IN DECIMAL (IF THE SYNC BOARD TEST OPTION
27              ;               WAS SELECTED) AND WILL ACCEPT 0,4,8,12.
28              ;
29              ;9.7            THE PROGRAM WILL THEN REQUEST BAUD RATE IN
30              ;               HERTZ.  IT WILL ACCEPT 300,600,1200,2400,
31              ;               4800,9600.  IT WILL ALSO ACCEPT 19200 ONLY
32              ;               IF THE BOARD ADDRESS IS 0.
33              ;
34              ;10.    PROGRAM OUTPUT/ERROR DESCRIPTION
35              ;10.1           IF AN ERROR IS DETECTED THE PRINT-
36              ;               OUT WILL CONSIST OF TRAP NUMBER AND
37              ;               THE CONTENTS OF THE ACCUMULATORS AND
38              ;               PC. IN MOST CASES AC1 CONTAINS THE
39              ;               EXPECTED DATA AND AC0 CONTAINS THE
40              ;               TEST RESULTS.  CHECK THE INSTRUCTION
41              ;               PRECEEDING THAT PARTICULAR TRAP NUM-
42              ;               BER TO DETERMINE THE ACTUAL FAILING
43              ;               CIRCUMSTANCES.
44              ;
45              ;10.2           SWITCH OPTIONS SELECTED IN PARAGRAPH
46              ;               8.1 WILL VARY THE PRINTOUT ACCORDINGLY.
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10007 .MAIN
01                ;       DEBUG HELP
02                ;
03                ;11.    OCTAL DEBUG TOOL (ODT)
04                ;
05                ;       THE DIAGNOSTIC IS EQUIPED WITH A BUILT IN ODT WHICH CAN
06                ;       BE ACCESSED BY HITTING CONTROL O (^O) AT ANY TIME DURING
07                ;       THE EXECUTION OF THE PROGRAM (AFTER SETTING THE PARA-
08                ;       METERS).
09                ;       ON ENTERING ODT THE ADDRESS OF THE LOCATION HAVING THE
10                ;       NEXT INSTRUCTION TO BE EXECUTED WILL BE TYPED-OUT.
11                ;
12                ;11.1   CONVENTIONS AND SYMBOLS
13                ;       THE FOLLOWING CONVENTIONS ARE USED BY THE ODT:
14                ;       ?       PRESSING ANY ILLEGAL KEY CAUSES THE ODT TO RES-
15                ;               POND WITH A "?".
16                ;       @       ODT IS READY AND AT YOUR SERVICE.
17                ;
18                ;11.2   COMMAND STRUCTURE
19                ;       AN ODT COMMAND HAS THE FOLLOWING FORMAT:
20                ;               [ARGUMENT][COMMAND]
21                ;       AN ARGUMENT MAY BE ONE OF THE FOLLOWING:
22                ;       "EXP"   AN OCTAL EXPRESSION CONSISTING OF OCTAL NUMBERS
23                ;               SEPARATED BY PLUS (+) OR MINUS (-) SIGNS. LEAD-
24                ;               ING ZEROS NEED NOT BE TYPED.
25                ;       "ADR"   AN ADDRESS IS THE SAME AS AN EXPRESSION EXCEPT
26                ;               THAT BIT 0 IS NEGLECTED.
27                ;       A COMMAND IS A SINGLE TELETYPE CHARACTER
28                ;
29                ;11.3   ODT COMMANDS
30                ;       THE LOCATIONS THAT CAN BE EXAMINED AND MODIFIED BY THE
31                ;       USER ARE CALLED CELLS. THESE CELLS ARE OF TWO TYPES:
32                ;       INTERNAL CPU CELLS AND MEMORY LOCATIONS.
33                ;
34                ;11.3.1 OPENING INTERNAL CELLS
35                ;       THE COMMAND TO OPEN ONE OF THE INTERNAL REGISTERS IS OF
36                ;       THE FORM "NA" WHERE N IS ANY OCTAL EXPRESSION BETWEEN
37                ;       0 AND 7
38                ;       0-3     FOR ACCUMULATORS 0-3
39                ;       4       FOR PC OF THE NEXT INSTRUCTION TO BE EXECUTED IN
40                ;               THE EVENT OF A "P" COMMAND.
41                ;       5       CPU AND TTO STATUS
42                ;               BIT     INTERPRETATION
43                ;               15      STATUS OF TTO DONE FLAG
44                ;               14      STATUS OF INTERRUPTS (ION FLAG)
45                ;               13      STATUS OF CARRY BIT
46                ;       6       ADDRESS OF THE LOCATION HAVING THE BREAK POINT (IF
47                ;               ANY)
48                ;       7       INSTRUCTION AT THE BREAK POINT LOCATION
49                ;
50                ;       OTHER COMMANDS TO OPEN CELLS ARE:
51                ;
52                ;       "ADR"/  OPEN THE CELL AND PRINT ITS CONTENTS
53                ;       ./      OPEN THE CELL CURRENTLY POINTED TO BY THE POINTER
54                ;               AND PRINT ITS CONTENTS.
55                ;       .+"ADR"/        ADD "ADR" TO THE POINTER, OPEN THE CELL
56                ;               AND PRINT ITS CONTENTS.
57                ;       .-"ADR"/        SUBTRACT "ADR" FROM THE POINTER, OPEN
58                ;               THE CELL AND PRINT ITS CONTENTS.
59                ;       "CR"    THE RETURN KEY IS USED TO CLOSE THE OPEN CELL
60                ;               WITH OR WITHOUT MODIFICATION.
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0008 .MAIN
01                ;       "LF"    LINE FEED IS USED TO CLOSE THE OPEN CELL WITH OR
02                ;               WITHOUT MODIFICATION AND TO OPEN THE SUCCEEDING
03                ;               CELL.
04                ;       ^       CLOSE THE OPEN CELL WITH OR WITHOUT MODIFICATION
05                ;               AND OPEN THE PRECEDING CELL
06                ;       /       CLOSE THE OPEN CELL WITHOUT MODIFICATION, AND
07                ;               OPEN THE CELL POINTED TO BY ITS CONTENTS.
08                ;       +"ADR"/ CLOSE THE OPEN CELL WITHOUT MODIFICATION, AND
09                ;               OPEN THE CELL POINTED TO BY ITS CONTENTS + "ADDR".
10                ;       -"ADR"/ CLOSE THE OPEN CELL WITHOUT MODIFICATION, AND
11                ;               OPEN THE CELL POINTED TO BY ITS CONTENTS - "ADR".
12                ;
13                ;11.3.2 MODIFICATION OF A CELL
14                ;       ONCE A CELL HAS BEEN OPENED ITS CONTENTS CAN BE MODIFIED
15                ;       BY TYPING THE NEW VALUE THE CELL IS TO CONTAIN IN THE
16                ;       FORM OF AN OCTAL EXPRESSION FOLLOWED BY "CR" OR "LF".
17                ;       IF A + OR - IS TYPED AS THE FIRST CHARACTER OF THE EX-
18                ;       PRESSION THEN THE VALUE OF THE EXPRESSION IS ADDED TO OR
19                ;       SUBTRACTED FROM THE OLD CONTENTS OF THE CELL. THE
20                ;       ADDRESS ITSELF OR AN EXPRESION RELATIVE TO THE ADDRESS
21                ;       CAN BE DEPOSITED BY TYPING A "." OR ".+/-OCTAL EXPRESS-
22                ;       ION". A RUBOUT COMMAND GIVEN RIGHT AFTER OPENING A CELL
23                ;       ALLOWS THE MODIFICATION OF ITS CONTENTS AS IF THEY WERE
24                ;       TYPED IN JUST BEFORE THE COMMAND WAS ISSUED.
25                ;
26                ;11.3.3 OTHER ODT COMMANDS
27                ;       RUBOUT  THIS KEY IS USED TO DELETE ERRONEOUSLY TYPED
28                ;               DIGITS. EACH TIME THE KEY IS PRESSED THE RIGHT MOST
29                ;               DIGIT IS DELETED AND ECHOED ON THE TERMINAL. IF
30                ;               THE RUBOUT KEY IS PRESSED RIGHT AFTER OPENING A
31                ;               CELL THEN IT DELETES THE RIGHT MOST DIGIT OF THE CELLS
32                ;               CONTENTS. THIS ALLOWS THE MODIFICATION OF THE CELL
33                ;               AS IF ITS CONTENTS WERE TYPED IN JUST BEFORE THE
34                ;               KEY WAS PRESSED.
35                ;       "ADR"B  INSERT A BREAK POINT AT LOCATION "ADR".
36                ;               ONLY ONE BREAK POINT CAN BE INSERTED AND ANY
37                ;               ENTRY TO ODT AFTER EXECUTING A BREAK POINT WILL
38                ;               CAUSE IT TO BE DELETED.
39                ;       B       DELETE THE BREAK POINT IF ANY.
40                ;       P       RESTART THE EXECUTION OF THE PROGRAM AT LOCATION
41                ;               POINTED BY 4A.
42                ;       "ADR"R  START EXECUTING THE PROGRAM AT "ADR" AFTER AN
43                ;               IO-RESET.
44                ;       K       KILL THE STRING TYPED SO FAR. THE ODT RESPONDS
45                ;               WITH A "?" AND THE OPEN CELL IS CLOSED WITHOUT
46                ;               MODIFICATION.
47                ;       =       PRINT THE OCTAL VALUE OF THE INPUT ONLY.
48                ;               THIS WILL CLOSE ANY OPEN CELLS WITHOUT
49                ;               MODIFICATION AND WILL NOT OPEN A CELL
50                ;
51                ;
52                ;       NOTE:   IN PROGRAMS WHICH RELOCATE THEMSELVES THE
53                ;               THE USER SHOULD PLACE BREAK POINTS ONLY IN THE
54                ;               THE ORIGINAL PROGRAM AREA. IF A BREAK POINT IS
55                ;               PLACED OUTSIDE THIS AREA THE RESULTS WILL
56                ;               BE UNPREDICTABLE.
57                ;
58                ;
59                ;
60                ;
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 0009 .MAIN
01              ;11.4           THE SEQUENCE OF TESTING THE HARDWARE
02              ;               WITH ALL OPTIONS SELECTED IS:
03              ;               CONTROLLER BOARD, SYNC BOARD, MODEMS,
04              ;               AND CRC BOARD.  FOR A MORE DETAILED
05              ;               DESCRIPTION SEE PARAGRAPH 7.4.
06              ;
07              ;11.5           EACH SUBTEST BEGINS WITH A RESETUP MACRO,
08              ;               THIS EXECUTES A MNRST (IORST) INSTRUCTION.
09              ;               WHEN LOOPING ON ERROR, IT MAY BE DESIRABLE
10              ;               TO SYNC A SCOPE ON THIS DECODE.
11              ;
12              ;11.6           DO NOT RUN SUBTESTS OUT OF SEQUENCE
13              ;               AS A TEST MAY REQUIRE DATA OR SETUP FROM A
14              ;               PREVIOUS TEST OR AN UNWANTED INTERRUPT MAY
15              ;               BE PENDING.
16              ;
17              ;11.7           TO ASCERTAIN ABSOLUTE ADDRESSES OF LITERALS
18              ;               (=), ADD 245 (OCTAL) TO THE RELOCATABLE AD-
19              ;               DRESS IN THE LISTING.  LITERALS ARE IDENTIFIED
20              ;               BY A MINUS (-) SIGN NEXT TO THE DATA FIELD OF
21              ;               THE INSTRUCTION.
22              ;
23              ;11.8           A DESCRIPTION OF THE SUBROUTINES FOLLOWS:
24              ;11.8.1         STEP: PROVIDES TRANSITIONS FOR T/R CLOCK
25              ;                     WITH VALUE PASSED FROM XCLK MACRO.
26              ;11.8.2         LINCH: SPECIFY LINE CHARACTERISTICS WITH
27              ;                     WORD PASSED FROM LCS MACRO.
28              ;11.8.3         .XOR: "EXCLUSIVE OR" AC0 WITH AC1, RETURN
29              ;                     RESULT IN AC1
30              ;11.8.4         DCLK: CALCULATES THE MINIMUM NUMBER OF CLOCK
31              ;                     PULSES REQUIRED TO SET DONE.
32              ;11.8.5         CONT: EXECUTES THE NUMBER OF IOPLS PASSED
33              ;                     FROM THE SCLK MACRO.
34              ;11.8.6         CTER: CLEARS THE TRANSMITTER AND RE-
35              ;                     CEIVER, USES THE 008 CHARACTER
36              ;                     AND NUMBER OF TRANSITIONS PASSED
37              ;                     FROM THE CHARA MACRO TO TRANSFER
38              ;                     A CHARACTER FROM THE TRANSMITTER
39              ;                     TO THE RECEIVER.
40              ;11.8.7         CLEAR: CLEARS THE INITIAL MODEM INTERRUPT
41              ;                     AND THE TRANSMITTER AND RECEIVER
42              ;                     BUFFERS OF THE USRT.
43              ;11.8.8         CHRO: LOADS TRANSMITTER AND RECEIVER SYNC
44              ;                     REGISTERS WITH CHARACTER PASSED
45              ;                     FROM SYNC MACRO.
46              ;
47              ;11.9           A DESCRIPTION OF THE MOST COMMONLY USED
48              ;               MACROS FOLLOWS:
49              ;11.9.1         RESETUP % JUMP TO SUBROUTINE ENT?R WITH
50              ;                       AN ITERATION COUNT OF +5, EX-
51              ;                       ECUTES A MNRST AND WAITS FOR INIT
52              ;                       CLEAR TO FINISH
53              ;11.9.2         TRANSMIT % ADDRESSES THE SELECTED TRANS-
54              ;                         MITTER, JSR TO LCS WHICH SPECIFIES
55              ;                         LINE CHARACTERISTICS PASSED FROM
56              ;                         ^1^2^3, AND TURNS ON THE TRANSMITTER.
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!0010 .MAIN
01              ;11.9.3         WAIT % SETS UP A DELAY WHICH LASTS APPROXIMATELY
02              ;                       1 SCAN CYCLE
03              ;11.9.4         CHARA % PUSHES ONTO THE STACK THE NUMBER OF
04              ;                       TRANSITIONS (4*^2+^3) AND THE DATA
05              ;                       CHARACTER (^1) AND PASSES IT TO THE
06              ;                       CTER SUBROUTINE
07              ;11.9.5         ONOFF % ADDRESSES ^1 (RFC=RECADR OR TR=TRADR)
08              ;                       AND TURNS THE SECTION OFF (^2=S) OR
09              ;                       ON (^2=L).
10              ;11.9.6         BLANK % EXECUTES THE I/O INSTRUCTION IN ^1
11              ;                       AND MASKS THE RECEIVED DATA WITH ^2
12              ;
13              ;12.    SPECIAL NOTES/SPECIAL FEATURES
14              ;12.1           AFTER PROGRAM IS IN PROGRESS
15              ;               CHANGING SWITCH OPTIONS "A",
16              ;               "B", "C" WILL NOT TAKE AFFECT
17              ;               UNTIL AFTER RESTART (CTRL "R").
18              ;
19              ;12.2           IF IT IS DESIRED NOT TO EXPAND
20              ;               ALL MACROS IN THE LISTING.  CHANGE
21              ;               THE VALUE OF .DUSR D=FROM 0 TO 1
22              ;               BEFORE ASSEMBLING.
23              ;
24              ;12.3           CAT/KITTEN IS NOT INCLUDED IN THIS
25              ;               PROGRAM.
26              ;
27              ;12.4           TO COMPLETELY TEST THE CONTROLLER BOARD,
28              ;               SYNC AND CRC BOARD TEST OPTIONS SHOULD
29              ;               BE SELECTED.  CONTROLLER BOARDS SHOULD
30              ;               ALSO BE RUN WITH THE ASYNC LINE DIAGNOSTIC
31              ;               (MNALD).
32              ;
33              ;12.5           IF NO FAILURES OCCUR WITH THIS TEST
34              ;               MICRO NOVA COMMUNICATION SUBSYSTEM RE-
35              ;               LIABILITY (MNCOMM) SHOULD BE RUN TO
36              ;               INSURE SUCCESSFUL SYSTEM OPERATION.
37              ;
38              ;13.    RUN TIME
39              ;13.1           WITHOUT SYNC BOARD TESTING THERE ARE ONLY
40              ;               A FEW SECONDS BETWEEN PASSES.
41              ;
42              ;13.2           WHEN SYNC BOARD IS BEING TESTED RUN TIME
43              ;               VARIES LARGELY WITH BAUD RATE SELECTED
44              ;
45              ;13.3           DURING PASS 1 EACH SUBTEST IS EXECUTED
46              ;               ONLY ONCE.  DURING ALL SUBSEQUENT PASSES
47              ;               EACH SUBTEST IS EXECUTED THE ITERATION COUNT
48              ;               WHICH FOLLOWS THE JSR @IENT?R COMMAND IN THE
49              ;               RESETUP MACRO.
50              ;
51              ;13.4           THE APPROXIMATE RUN TIME FOR THE FIRST TWO
52              ;               PASSES ARE:     BAUD    MIN     SEC
53              ;                               300     37      30
54              ;                               600     18      50
55              ;                               1200    9       30
56              ;                               2400    4       50
57              ;                               4800    2       30
58              ;                               9600    1       20
59              ;                               19200           45

**00000 TOTAL ERRORS, 00000 PASS 1 ERRORS
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  0011 _MAIN

O?DTD 000524  MC     7/02
S?WPD 000050  MC     4/02
```