

TEXT LISTING

068-000447-01

PROGRAM

MICRONOVA HAND-HELD CONSOLE DIAG.

TEXT TAPE

097-000447-01

ABSTRACT

THIS DIAGNOSTIC IS DESIGNED TO CHECK OUT THE MICRONOVA HAND-HELD CONSOLE INTERFACE AND DISPLAY. ERRORS MAY BE DISPLAYED ON A SYSTEM CONSOLE OR LINE PRINTER, OR IF NOT AVAILABLE, ON THE HAND-HELD CONSOLE ITSELF.

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MACRO REV 06.30
***** 13:53:39 02/14/79 *****
; NAME: MNHHC.TX P.N. 097-000447
; DESCRIPTION: MICRO-NOVA HAND-HELD CONSOLE DIAGNOSTIC
; REVISION HISTORY
; REV. DATE
; 00 11/15/76
; 01 03/16/77
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ABSTRACT

THIS DIAGNOSTIC IS DESIGNED TO CHECK OUT THE MICRO-NOVA
HAND HELD CONSOLE INTERFACE AND DISPLAY. ERRORS MAY BE
DISPLAYED ON A SYSTEM CONSOLE OR LINE PRINTER, OR IF
NOT AVAILABLE, ON THE HAND HELD CONSOLE ITSELF.

MACHINE REQUIREMENTS
2.
2.1 A MICRO-NOVA PROCESSOR
2.2 2K OF READ/WRITE MEMORY
2.3 A MICRO-NOVA HAND HELD CONSOLE
2.4 A LIST DEVICE (EITHER A SYSTEM CONSOLE OR LINE PRINTER)
TEST MAY BE RUN WITH A PARTIALLY OPERATIONAL HAND HELD
CONSOLE USED FOR ERROR REPORTING AS WELL AS THE UUT.

3. OPERATING PROCEDURE
PROGRAM MAY BE LOADED VIA THE BINARY LOADER, OR THE
DTOS DISKETTE, AND WILL START AT LOCATION '200'.
"SWREG" OPTIONS MAY BE CHANGED AT THIS
TIME THROUGH THE CONSOLE DEBUG OPTION OR A
WORKING HAND HELD CONSOLE, OR AT ANY TIME THROUGH
THE TTY SWITCH PACKAGE.

3.1 HARDWARE CONNECTIONS
REMOVE W1 ON HAND HELD CONSOLE BOARD. PLACE CPU IN
LOCK MODE.

4. ERROR DESCRIPTION
THIS PROGRAM IS DESIGNED TO PROVIDE A SNAPSHOT OF ALL
REGISTER CONTENTS IF AN ERROR IS DETECTED. THESE ARE
SAVED IN A MEMORY STACK AND, DEPENDING ON THE "SWREG"
OPTIONS, REPORTED TO THE USER VIA SOME LISTING OUTPUT
DEVICE. A RUNNING COUNT OF ERRORS IS ALSO SAVED BY
THE PROGRAM, AND FACILITIES ARE PROVIDED FOR LOOPING
OR HALTING ON ERROR DETECTION. IF THE PROGRAM HAS
HALTED ON ERROR, THE PC AND CARRY AND THE CONTENTS OF ALL
REGISTERS AT THE TIME OF THE ERROR HAVE BEEN SAVED ON
THE SYSTEM STACK. THE LOCATION POINTED TO BY THE STACK
POINTER CONTAINS THE PC & CARRY. SP-1 IS AC1, SP-2 IS
AC2, SP-3 IS AC1, AND SP-4 IS AC0. ADDITIONAL INFORMATION
IS AVAILABLE IN SEVERAL PAGE 0 LOCATIONS AS FOLLOWS:

LOCATION (OCTAL) VARIABLE INTERPRETATION
00201 HEL?P CURRENT SUBTEST START
00203 PAS?S TEST PASS COUNTER
00207 INTV? SUBTEST LOGOUT INTVL
00210 ERC?T TOTAL ERROR COUNT
00211 ITR?R SUBTEST ERROR SWITCH
00212 ISM?M CURRENT SUBTEST NUMBER
00213 ERN?M LATEST ERROR NUMBER

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DETAILED ERROR MESSAGES PRINT OUT THE REGISTER CONTENTS AT THE TIME OF THE FAILURE, AS WELL AS IDENTIFYING THE SUBTEST AND ERROR NUMBER CAUSING THE PROBLEM. THE MESSAGE FORMAT IS:

ERROR NUMBER XXX ENCOUNTERED SUBTEST XX PC
CRY AC0 AC1 AC2 AC3 XXXXX XXXXX XXXXX XXXXX X

THESE REGISTER CONTENTS SHOULD BE COMPARED TO THOSE DESIRED BY THE FAILING SUBTEST TO ISOLATE THE ERROR. IN ADDITION THIS PROGRAM WILL ALLOW ERRORS TO BE REPORTED TO A PARTIALLY OPERATIONAL HAND-HELD CONSOLE DISPLAY. SETTING BIT 15 OF "SWREG" ENABLES THIS OPTION. THE DECIMAL POINT WILL BE CONSTANTLY LIT WHEN AN ERROR IS DETECTED, AND THE ERROR NUMBER DISPLAYED ON THE LEDs. TO EXAMINE THE CONTENTS OF ANY AC PRESS THE KEY FOR THAT AC. TO CHECK THE PROGRAM COUNT AND CARRY BIT PRESS THE KEY MARKED "STOP". TO RETURN TO THE TEST, PRESS ANY OTHER KEY.

5.

SWITCH SETTINGS

LOCATION "SWREG" IS USED TO SELECT THE PROGRAM OPTIONS (NOT SYSTEM CONFIGURATION). WHILE RUNNING UNDER DTOS THIS LOCATION WILL BE LOADED BY THE MONITOR, HOWEVER UNDER STAND-ALONE AND PROGRAM LOAD MODES THIS LOCATION MAY BE SET BY THE USER USING EITHER THE HAND-HELD CONSOLE OR A TELETYPE WITH THE CONSOLE DEBUG FEATURE, OR THE SWITCH PACKAGE, AS DESCRIBED IN SECTION 5.2

5.1

SWITCH OPTIONS

DIFFERENT BITS AND THEIR INTERPRETATION AT LOCATION "SWREG" ARE AS FOLLOWS:

BIT	OCTAL	BINARY	INTERPRETATION
1	40000	0	LOOP ON ERROR
2	20000	1	SKIP LOOPING ON ERROR
3	10000	0	PRINT TO CONSOLE
4	04000	1	ABORT CONSOLE PRINTOUT
5	02000	0	DO NOT PRINT % FAILURE
6	01000	1	PRINT % FAILURE RATE
7	00400	0	ALLOW END OF PASS PRINT
8	00200	1	SUPPRESS PASS PRINTOUT
9-11		0	DON'T USE LINE PRINTER
12-13		1	USE LINE PRINTER
14	00002	0	DON'T HALT ON ERROR
15	00001	1	HALT ON ERROR
16		0	DON'T PRINT SUBTEST COMPLETION
17		1	PRINT SUBTEST COMPLETION EACH INTVL
18		0	AND ERROR SUMMARY REPORT WHEN FIRST SWITCHED ON.
19		1	PRINT DETAILED ERROR ONLY ONCE
20		0	ALWAYS PRINT DETAILED ERROR MESSAGE
21		1	RESERVED FOR FUTURE DTOS USE
22		0	RESERVED FOR FUTURE USER OPTIONS
23		1	PROVIDE OPERATOR PROMPTS
24		0	SUPPRESS PROMPTS FOR XOR TESTING
25		1	DON'T USE HHC FOR ERROR REPORT
26		0	USE HHC FOR ERROR REPORT

5.2

SWITCH COMMANDS

ONCE THE PROGRAM STARTS EXECUTING THE STATE OF ANY OF THE BITS CAN BE CHANGED BY HITTING KEYS 1 THROUGH 6. THE PROGRAM WILL CONTINUE RUNNING AFTER UPDATING THE OPTIONS. EACH KEY WILL COMPLEMENT THE STATE OF THE BIT AFFILIATED WITH IT, THUS BIT 4 CAN BE ALTERED BY HITTING KEY 4. SETTING ANY BIT OF LOCATION "SWREG" WILL SET BIT 0. (DEFAULT MODE IS DEFINED AS ALL BITS OF SWREG SET TO 0) THE PROGRAM CAN BE LOCKED INTO SWITCH MODIFICATION MODE BY TYPING A 0, IN WHICH CASE MORE THAN ONE BITS CAN BE CHANGED BEFORE THE CONTROL IS ALLOWED TO RETURN TO THE MAIN PROGRAM.

5.2.1

OTHER COMMANDS

- "CR" A "RETURN" CAN BE TYPED TO CONTINUE THE PROGRAM AFTER ITS LOCKED IN A SWITCH MODIFICATION MODE
- "D" THIS COMMAND GIVEN AT ANY TIME WILL RESET "SWREG" TO DEFAULT MODE AND RESTART THE PROGRAM.
- "R" THIS COMMAND GIVEN AT ANY TIME WILL RESTART THE PROGRAM. SWITCHES ARE LEFT WITH THE VALUES THEY HAD BEFORE THE COMMAND WAS ISSUED.
- "O" THIS COMMAND GIVEN AT ANY TIME WILL CAUSE THE PROGRAM CONTROL TO GO TO ODT (SEE SEC. 6)
- 7 PRINT THE SUMMARY OF ERRORS ACCUMULATED SO FAR.
- M THIS COMMAND GIVEN AT ANY TIME WILL PRINT THE CURRENT OPERATING MODES.

6.

OCTAL DEBUG TOOL (ODT)

THE DIAGNOSTIC IS EQUIPPED WITH A BUILT IN ODT WHICH CAN BE ACCESSED BY HITTING CONTROL O ("O") AT ANY TIME DURING THE EXECUTION OF THE PROGRAM (AFTER SETTING THE PARAMETERS).

ON ENTERING ODT THE ADDRESS OF THE LOCATION HAVING THE NEXT INSTRUCTION TO BE EXECUTED WILL BE TYPED-OUT.

6.1

CONVENTIONS AND SYMBOLS

- ? THE FOLLOWING CONVENTIONS ARE USED BY THE ODT:
 - o PRESSING ANY ILLEGAL KEY CAUSES THE ODT TO RESPOND WITH A "?".
 - @ ODT IS READY AND AT YOUR SERVICE.

6.2

COMMAND STRUCTURE

AN ODT COMMAND THE FOLLOWING FORMAT:
 (ARGUMENT) (COMMAND)

AN ARGUMENT MAY BE ONE OF THE FOLLOWING:
 EXP AN OCTAL EXPRESSION CONSISTING OF OCTAL NUMBERS SEPARATED BY PLUS (+) OR MINUS (-) SIGNS. LEADING ZEROS NEED NOT BE TYPED.
 ADR AN ADDRESS IS THE SAME AS AN EXPRESSION EXCEPT THAT BIT 0 IS NEGLECTED.
 A COMMAND IS A SINGLE TELETYPE CHARACTER

6.3

ODT COMMANDS

THE LOCATIONS THAT CAN BE EXAMINED AND MODIFIED BY THE USER ARE CALLED CELLS. THESE CELLS ARE OF TWO TYPE: INTERNAL CPU CELLS AND MEMORY LOCATIONS.

6.3.1

OPENING INTERNAL CELLS

THE COMMAND TO OPEN ONE OF THE INTERNAL REGISTERS IS OF THE FORM "NA" WHERE N IS ANY OCTAL EXPRESSION BETWEEN 0 AND 7

FOR ACCUMULATORS 0-3
 FOR PC OF THE NEXT INSTRUCTION TO BE EXECUTED IN THE EVENT OF A "P" COMMAND.
 CPU AND TIO STATUS
 BIT INTERPRETATION
 15 STATUS OF TIO DONE FLAG
 14 STATUS OF INTERRUPTS
 13 STATUS OF CARRY BIT
 6 ADDRESS OF THE LOCATION HAVING BREAK POINT (IF ANY)
 7 INSTRUCTION AT THE BREAK POINT LOCATION

OTHER COMMANDS TO OPEN CELLS ARE:

- ADR/ OPEN THE CELL AND PRINT ITS CONTENTS
- ./ AND PRINT THE CELL CURRENTLY POINTED BY THE POINTER
- *+ADR/ ADD ADR TO THE POINTER, OPEN THE CELL AND PRINT ITS CONTENTS.
- *-ADR/ SUBTRACT ADR FROM THE POINTER, OPEN THE CELL AND PRINT ITS CONTENTS.
- "CR" THE RETURN KEY IS USED TO CLOSE THE OPEN CELL WITH OR WITHOUT MODIFICATION.
- "LF" LINE FEED IS USED TO CLOSE THE OPEN CELL WITH OR WITHOUT MODIFICATION AND TO OPEN THE SUCCEEDING CELL.
- / CLOSE THE OPEN CELL WITHOUT MODIFICATION, AND OPEN THE CELL POINTED BY ITS CONTENTS.
- *ADR/ CLOSE THE OPEN CELL WITHOUT MODIFICATION, AND OPEN THE CELL POINTED BY ITS CONTENTS.
- *ADR/ CLOSE THE OPEN CELL WITHOUT MODIFICATION, AND OPEN THE CELL POINTED BY ITS CONTENTS.

6.3.2

MODIFICATION OF A CELL

ONCE A CELL HAS BEEN OPENED ITS CONTENTS CAN BE MODIFIED BY TYPING THE NEW VALUE THE CELL IS TO CONTAIN IN THE FORM OF AN OCTAL EXPRESSION FOLLOWED BY "CR" OR "LF".

IF A + OR - IS TYPED AS THE FIRST CHARACTER OF THE EXPRESSION THEN THE VALUE OF THE EXPRESSION IS ADDED TO OR SUBTRACTED FROM THE OLD CONTENTS OF THE CELL.

ADDRESS ITSELF OR AN EXPRESSION RELATIVE TO THE ADDRESS CAN BE DEPOSITED BY TYPING A " " OR "*/-OCTAL EXPRESSION" A RUBOUT COMMAND GIVEN RIGHT AFTER OPENING A CELL ALLOWS THE MODIFICATION OF ITS CONTENTS AS IF THEY WERE TYPED IN JUST BEFORE THE COMMAND WAS ISSUED.

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6.3.3 OTHER ODT COMMANDS

RUBOUT

THIS KEY IS USED TO DELETE ERRONEOUSLY TYPED DIGITS. EACH TIME THE KEY IS PRESSED RIGHT MUST BE DELETED AND ECHOED ON THE TERMINAL. IF THE RUBOUT KEY IS PRESSED RIGHT AFTER OPENING A CELL THEN IT ALLOWS THE MODIFICATION OF THE CELL AS IF ITS CONTENTS WERE TYPED IN JUST BEFORE THE KEY WAS PRESSED.

ADRB

INSERT A BREAK POINT AT LOCATION "ADR".

ONLY ONE BREAK POINT CAN BE INSERTED AND ANY ENTRY TO ODT AFTER EXECUTING A BREAK POINT WILL CAUSE IT TO BE DELETED.

D

DELETE THE BREAK POINT IF ANY.

P

RESTART THE EXECUTION OF THE PROGRAM AT LOCATION POINTED BY "A".

ADRR

START EXECUTING THE PROGRAM AT "ADR" AFTER AN IO-RESET.

K

KILL THE STRING TYPED SO FAR. THE ODT RESPONDS WITH A "2" AND THE OPEN CELL IS CLOSED WITHOUT MODIFICATION.

.EOT

**00000 TOTAL ERRORS, 00000 PASS 1 ERRORS