HP 3000 SERIES II/III
COMPUTER SYSTEMS
MANUAL OF STAND-ALONE DIAGNOSTICS

STAND-ALONE
HP 32234A COBOL II
FIRMWARE DIAGNOSTIC

Diagnostic No. D441A
Diagnostic No. D442A

Part No. 32234-90002
Index No. 3HDWR.070.32234-90002

Printed in U.S.A.
12/79

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I. INTRODUCTION

The HP 32234A COBOL II Diagnostic consists of two separate stand-alone programs; COBOLIIA and COBOLIIB. COBOLIIA is identified by Diagnostic No. D441A and COBOLIIB is identified by Diagnostic No. D442A. COBOLIIA (D441A) tests the EDIT instruction of the COBOL II instruction set and its related 25 sub-instructions. COBOLIIB (D442A) tests the remaining 14 instructions of the instruction set.

II. REQUIREMENTS

A. Hardware

The hardware required to run the COBOL II Firmware Diagnostics is a minimum HP 3000 Series II/III Computer System with HP 32234A COBOL II installed.

B. Software

The Stand-Alone Diagnostic Utility Program (SDUPII) is required to create the Stand-Alone Diagnostic tape. The tape is comprised of the Cold Load program, the Relocating Loader, and one or more diagnostic programs including the Stand-Alone COBOL II Firmware Diagnostics. All the programs are coded in System Programming Language (SPL).

III. MINI-OPERATING INSTRUCTIONS

A. Cold load diagnostic file # (associated with D441A or D442A) from non-CPU cold load tape. (For 800 BPI tape units, use tape part no. 30000-10017. For 1600 BPI tape units, use tape part no. 30000-11017.)

B. After loading is complete, select desired Switch Register options (para IV.B) and assert "CR" on the system console.

Note

If either diagnostic fails (HALT 01, HALT 12, SYSTEM HALT, or system hangs), first attempt to rerun the diagnostic. If the failure persists, replace the EIS PCA.

IV. DETAILED OPERATING INSTRUCTIONS

A. Operating Instructions

Load the non-CPU cold load tape (30000-1 0017/11017) by entering %3006 into the Switch Register and simultaneously depressing the LOAD and ENABLE switches on the CPU front panel. (Use cold load tape part no. 3000 0-10017 for 800 BPI tape units and cold load tape part no. 30000-11017 for 1600 BPI tape units.) If this tape is not available, refer to the Stand-Alone Diagnostic Utility Program II (SDUPII) D417 Manual, part no. 03000-90125 for instructions on creating an stand-alone tape for these diagnostics.

After the cold load tape has been loaded, enter the number corresponding to the diagnostic's position on the cold load tape into the Switch Register and assert "CR" on the system console. For example, COBOL IIA (D441A) is the twenty sixth diagnostic on the tape and, if it is the diagnostic you want to run, enter %26 into the Switch Register. (COBOL IIB is the twenty seventh diagnostic on the tape.) After the Switch Register is set, depress the CPU front panel RUN switch. The program position number entered into the Switch Register will now be loaded and used to select the program segment from the magnetic tape. The selected diagnostic is now executable.

To run the selected diagnostic with its default settings (non-error messages suppressed and HALT %12 on error), press the CPU front panel RUN switch. If program options are desired, set the Switch Register in accordance with paragraph IV.B and then press the RUN switch.

When "CR" is asserted at the system console and the diagnostic is run with its default settings, one of the following introductory messages will appear on the system console.

Note

If either diagnostic fails (HALT 01, HALT 12, SYSTEM HALT, or system hangs), first attempt to rerun the diagnostic. If the failure persists, replace the EIS PCA.

COBOLIIA F/W DIAG. (D441A.00.00)

END OF PASS 0
END OF PASS 1
END OF PASS 2
etc., etc.

or

COBOLIIB FIRMWARE DIAG. (D442A.00.00)

END OF PASS 0
END OF PASS 1
END OF PASS 2
etc., etc.

Note

Both diagnostic programs will loop indefinitely unless Switch Register bit 15 is set.

If not suppressed and no errors are encountered, the following messages will appear on the system console as the program executes.

For D441A only:

TESTING "XXXX" OF EDIT
XXXX PASSED ALL TESTS WITHOUT ERROR

XXXX = Name of subinstruction under test. This message is repeated for each test in the program. (Refer to Table 1.)

END OF PASS NNN

NNN = Number of complete pass through program.

For D442A only:

TESTING XXXX
XXXX PASSED ALL TESTS WITHOUT ERROR

XXXX = Name of instruction under test. This message is repeated for each test in the program. (Refer to Table 2.)

END OF PASS NNN

NNN = Number of complete pass through program.

B. Options

Both D441A and D442A use the external Switch Register and two internal memory locations (SWREG1 and SWREG2) to control their operation. After the initial cold load of either diagnostic, the diagnostic configuration will be either the default settings from the pre-initialized SWREG1 or the settings entered into the Switch Register (with bit 0 set to 1) which are then stored in SWREG1. The data stored in SWREG1 and SWREG2 control execution of the diagnostic.

If it is desired to alter the diagnostic configuration while it is running, set the new configuration into the Switch Register in accordance with the options listed below and then set Switch Register bit 0 to 1. The new configuration will automatically be loaded into SWREG1 at the end of the current pass. If Switch Register bit 1 is also set to 1 at this time, program execution will stop with HALT %5 displayed in the Current Instruction Register and the following message displayed on the system console.

PLACE INSTR. NO. INTO SWITCH REG.

At this point, a specific test number can be entered into the Switch Register to run a particular instruction test. (Refer to Table 1 for D441A instruction test number assignments and to Table 2 for D442A instruction test number assignments.) To select a specific instruction test, clear the Switch Register, enter the appropriate test number from Table 1 or 2 into the Switch Register, and press the RUN switch. The program will now loop on the selected instruction test. The Switch Register option bits and their respective functions are as follows:

Bit #	Function
0	When set, causes SWREG1 to be loaded with the configuration set into the Switch Register. If set during program execution, the current diagnostic pass (or test if looping on a particular instruction) will complete before the change occurs.
1	When set during cold-load or set in conjunction with bit 0 during program execution, causes program execution to stop for reconfiguration to a particular instruction test. HALT %5 will be displayed in the Current Instruction Register and the following message will be dispalyed on the system console. PLACE INSTR. NO. INTO SWITCH REG.
2-6	Unused
7	When set, directs messages to a line printer if it was configured in the diagnostic by SDUPII. If no line printer was configured, this bit is ignored and messages are directed to the system console.
8	Unused
9	When set, suppresses non-error messages.
10	When set, suppresses error messages.
11	Unused
12	When set, program execution will stop with HALT %12 in the Current Instruction Register if a recoverable error is detected. If bit 10 is not set, the error message will be issued first.
13-14	Unused
15	When set, causes program execution to stop with HALT %15 in the Current Instruction Register after one complete pass through the diagnostic.

Table 1. D441A Instruction Test Number Assignments

OCTAL TEST NO.	INSTRUCTION (Sub-Instructions Of EDIT Instruction)
01	MFL and TE
02	MC
03	IC and SUFT
04	MA
05	ICS, SST0, and SST1
06	ICI and BRIS
07	MN
10	SFC and ICSI
11	MNS
12	DBNZ and SETC
13	MDWO and SUFS
14	ICP
15	ICPS
16	IS
17	ENDF, SFLC, and DFLC

Example test pass with non-error messages not suppressed:

```
**************************************************

TESTING IC AND SUFT OF EDIT
PB'DB' MODE=           0
PB'DB' MODE=           1
 IC OF EDIT PASSED ALL TESTS WITHOUT ERROR
 SUFT OF EDIT PASSED ALL TESTS WITHOUT ERROR
**************************************************
```

Table 2. D442A Instruction Test Number Assignments

OCTAL TEST NO.	INSTRUCTION
01	ABSD
02	ABSN
03	XBR
04	NEGD
05	PARC and ENDP
06	TR
07	CVND
10	CMPS
11	CMPT
12	TCCS
13	LDW and LDDW
14	ALGN

Example test pass with non-error messages not suppressed:

```
**********************************************

TESTING TR
TESTING DB TABLE ACCESS
TESTING PB TABLE ACCESS
TR PASSED ALL TESTS WITHOUT ERROR
**********************************************
```

C. Halt Assignments

All possible halts that this diagnostic can generate are listed below.

Bits 12-15 Halt Code	Assignment
01	Irrecoverable error. Recold-load program to continue.
05	Select instruction test.
12	Recoverable error. Press RUN to continue.
15	End of pass thrcugh complete program.

D. Typical Operating Sequence

The normal operating sequence is to cold-load the selected diagnostic and then run the diagnostic with its default settings. This permits the printing of error messages and the program stopping with HALT %12 in the Current Instruction Register upon detection of a recoverable error. If only one pass through the diagnostic is desired, set Switch Register bit 15 to "1". (Switch Register bits 9 and 12 must also be set in order retain the remaining normal defaults.)

If a HALT %12 occurs, set Switch Register bits 0, 1, 9, and 10 to "1" and press RUN. This permits looping on a particular instruction test without halts or messages. When HALT %5 occurs, first clear the Switch Register and then enter the instruction test number (refer to Table 1 or 2) of the failing instruction into the Switch Register. Press RUN. The program will now loop on the selected instruction test.