

S E R V I C E N O T E

SUPERSEDES: 8981B-01

HP 8981B Vector Modulation Analyzer

Serial Numbers: 0000A00000 / 3130A00154

Firmware History and Upgrade Procedures

Throughout the lifecycle of Hewlett-Packard products, we are constantly striving to improve their performance through design changes. Changes in firmware is one area of design which is easy to retrofit into the existing installed base of instruments. Firmware can be purchased and installed to improve overall performance, alleviate operational problems, or to retain compatibility with either hardware upgrades in the instrument or application software.

This service note is intended to document the various versions of firmware for the HP 8981B Vector Modulation Analyzer. With each new release of firmware, the changes will be incorporated into this service note, and a revised note issued.

This note also documents the procedure for checking the firmware version installed in the HP 8981B via either the front panel or by using HP-IB commands. Also procedures for replacing the firmware. All ordering information for the firmware version will be listed under the section titled Firmware Version, Kits, and History.

Checking the Firmware Version Number.

There are two methods by which the firmware revision may be checked: Either via the front panel or over HP-IB.

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DATE: 29 October 1992

ADMINISTRATIVE INFORMATION

SERVICE NOTE CLASSIFICATION:

INFORMATION ONLY

AUTHOR:	ENTITY:	ADDITIONAL INFORMATION:
DGS	0400	

Front Panel Method

1. Press the INST STA key located on the lower right hand side of the HP 8981B Modulation Analyzer. This key activates the instrument state menu on the display.
2. Press the OTHER softkey. This will activate the second level OTHER (miscellaneous) menu on the display.
3. Press the SOFTWARE VERSION softkey to display the firmware version number and date it was released.

HP-IB Method

1. Connect an HP-IB compatible computer to the rear panel of the HP 8981B Modulation Analyzer.
2. With the HP BASIC language loaded in the computer, load and run the following basic program with the computer connected to the Vector Modulation Analyzer.

```

10 DIM A$(120)
20 OUTPUT 709;"*IDN?"
30 ENTER 709;A$
40 PRINT "INSTRUMENT IS";A$
50 END

```

The Vector Modulation Analyzer will return a 40 character string in the following format:

HEWLETT-PACKARD,HP8981B,NNNNANNNNN, X.XX

Where X.XX is the firmware version number such as 4.2 or 5.4

Replacing the Firmware EPROMs.**NOTE:**

The following procedures require a knowledge of, and tools for, working with electrostatic sensitive devices. A properly grounded workstation, with operator wrist strap is recommended while performing the following procedure.

NOTE:

When replacing the firmware, the EPROMs are replaced as a set and are NOT orderable as individual parts.

1. Unplug the LINE (mains) power cable from the HP8981B. Ensure that the Modulation Analyzer is grounded, as an ESD precaution, and you should wear a grounded ESD wrist strap.
2. Remove the two top rear panel standoffs and then remove the top cover.
3. Remove the board hold down bracket.
4. Locate and remove the A17 RAM and A18 Microprocessor board assemblies. Place them on a certified ESD work bench.

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5. Replace ROMs U1, U2, U3, U7, U8 and U9 on the RAM board assembly with the latest version. Replace U4 and U19 on the A18 Microprocessor assembly with the latest version of ROM.
6. Re-install the A17 and A18 board assemblies in the Modulation analyzer.

Firmware Versions, Kits, and History

The following documentation contains information on the latest firmware parts/kits available, ordering information, firmware version numbers, problems corrected and history of past versions.

Version 4.3. This version is the original version of firmware shipped in the 8981B Vector Modulation Analyzer. Version 4.3 EPROMs are no longer available and have been replaced by Version 5.4.

Version 5.4. This is the latest version of Firmware available for the HP 8981B Vector Modulation Analyzer. Version 5.4 EPROMs are orderable under HP part number 08981-60034.

When Version 5.4 is installed, the following enhancements or features are added to the HP8981B Vector Modulation Analyzer.

a) Constellation analysis allows more empty states. With revision 5.4, you only need $\sqrt{\text{mod size}} + 1$ POPULATED states. This means you can analyze all sorts of strange modulation formats by just choosing a mod format greater than or equal to the number of states in the strange format.

b) Features Added:

1. 1024 QAM constellation analysis on the new 1024 QAM grid.
2. Magnitude and phase markers on the magnitude and phase display.
3. Save/recall, power cycle preserve magnitude and phase mode.
4. SIGNAL INTENSITY now affects magnitude and phase display mode.
5. INSTRUMENT INFORMATION under INST STATE key displays model number, serial number and options installed (if any).

32 QAM Constellation Analysis:

You can do 32 QAM with the 64 QAM grid because the constellation analysis only requires 9 populated states with the 64 QAM grid.

128 QAM Constellation Analysis:

You can do 128 QAM with the 256 QAM grid because the constellation analysis only requires 17 populated states with the 256 QAM grid.

512 QAM Constellation Analysis:

You can do 512 QAM with the new 1024 QAM grid because the constellation analysis only requires 33 populated states with the 1024 QAM grid.

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The following frequency option capabilities (which may be found under DEMOD window) were added:

Option	Lower Limit	Upper Limit	EEPROM Cal Increment	Preset
NONE	10 MHz	220 MHz	1 MHz	70 MHz
H20	200 MHz	350 MHz	1 MHz	250 MHz
H32	321.4 MHz	321.4 MHz	N/A	321.4 MHz
H35	350 MHz	500 MHz	1 MHz	400 MHz
H36 or H04	360 MHz	550 MHz	1 MHz	400 MHz
H50	500 MHz	900 MHz	2 MHz	600 MHz
H75	750 MHz	1250 MHz	2 MHz	800 MHz
H85	850 MHz	1400 MHz	2 MHz	900 MHz

HP-IB Commands added:

*OPT? - Option Query, this returns either 0, H20, H32, H35, H36 (note H36 returned for either H04 or H36), H50, H75 or H85. 0 indicates no options installed.

SERV:Z_FREQ:RANGOPT <option> - sets frequency range option and stores it into EEPROM. Choices are NONE, H20, H32, H35, H36, H04, H50, H75 or H85.
Note: After changing the range option, it will be necessary to cycle the power on the HP 8981B Vector Modulation Analyzer.

SERV:Z_FREQ:RANGOPT? - returns frequency range option currently stored in EEPROM.
Returns either NONE, H20, H32, H35, H36, H50, H75 or H85.

SERV:Z_OPT <number> - set option value and stores in EEPROM. The option values are 0 (=NONE), 1 (=H20), 2 (=H32), 3 (=H35), 4 (=H36 or H04), 5 (=H50), 6 (=H75), and 7 (=H85).

SERV:Z_OPT? - returns option value currently stored in EEPROM.

ADDED Front Panel Function:

Service Function 83 - This service function will print the 'Option Data' into EEPROM. This function will output the option information into the service buffer which may be displayed.

How to use Service Function 83:

- a) Press the INST STA key on the front panel.
- b) Press the SERVICE softkey.
- c) Press the SERVICE FUNCTION softkey.
- d) Enter 83 via the front panel keys and then press the ENTER softkey.
- e) Press the SERVICE DEBUG softkey.
- f) Press the DISPLAY SERVICE BUFFER softkey.

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The option information will be printed on the front panel display. To leave the front panel service function press the EXIT softkey.

Compatibility Issues

Version 4.3. Original Version shipped. Location of ROMs by assembly are:

A17U1 (08981-80033), A17U2 (08981-80034), A17U3 (08981-80035), A17U7 (08981-80036), A17U8 (08981-80037), A17U9 (08981-80038), A18U4 (08981-80031) and A18U19 (08981-80032).

Version 5.4. Version 5.4 ROMs are the preferred replacement. Shipped with instruments with serial prefix 3227A. The ROMs are fully backwards compatible with earlier produced HP8981B Vector Modulation Analyzers. Location of ROMs by assembly are:

A17U1 (08981-80049), A17U2 (08981-80050), A17U3 (08981-80051), A17U7 (08981-80052), A17U8 (08981-80053), A17U9 (08981-80054), A18U4 (08981-80047) and A18U19 (08981-80048).

Special Notes:

When installing the new firmware, all of the user's save/recall registers, serial number, etc. will be lost. This means all information in RAM and battery backed RAM will be lost.