

VA200

Virtual Analyzer

Guide

THIS GUIDE:

This Guide is merely a hard-copy supplement to the on-line help that is available in the Help application. Like any Windows Help application, it can be used independently or selected from the menu to run on top of the program.

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REQUIREMENTS

- IBM PC compatible
- A Standard PC Parallel Port
- HP 8552 IF Section with EXT SCAN capability
- Windows 3.1 or later
- Optional -

- Printer and/or Plotter

- Math Coprocessor (speeds up operation)

See the Hardware Section following for information on the Parallel Port.

OVERVIEW

The VA200 hardware and software simply collect amplitude data as the frequency is set to discrete points between the start and stop frequency given. A total of 500 or 1000 (depending on your selection in the Trace Setup) frequency points are used, equally spaced. The amplitude that results is converted to one of 240 possible values between the amplitude limits given in the Freq/Ampl setup dialog. This gives a horizontal resolution of 500 or 1000 (50 or 100 values per division) and a vertical resolution of 240 (30 vaules per division). These resolutions were found to be optimal considering the accuracy of the analyzer frequency and amplitude response.

A default project named DEFAULT.PJT was installed. This is just one possible screen setup you can use, as it is possible to edit the Analyzer Window in the EditMode. You can add, move, delete, resize objects as desired to set up a screen you feel comfortable with. All of the buttons have corresponding menu items, thus no buttons are needed if not desired.

See Help for more information.

INSTALLATION

The files are not compressed for your convenience. You may simply copy the files to a directory of your choice and create the program icon in a group of your choice if desired. Or, the setup program can be used (described below) to automatically do this for you (it also creates a group and program icon that loads the DEFAULT.PJT).

Setup:

1. Insert the installation disk into Drive A (or B, etc)
2. From the Program manager, use the File | Run menu item.
3. Enter: A:setup (B:setup, etc.) and hit enter.
4. The setup dialog appears with a default directory. Use Continue or Options to enter a different directory.

A path in your AUTOEXEC.BAT to the directory containing the program is optional.

HARDWARE CONNECTION

1. Select EXT SCAN MODE on your 8552.
2. Plug in the VA200 power supply.
3. Connect the VA200 Vertical coaxial cable to the 8552 Vertical Output connector.
4. Connect the VA200 Scan coaxial cable to the 8552 Scan In/Out connector.
5. Connect the parallel cable to a PC parallel port and to the VA200 Input/Output port.
6. Turn the VA200 switch to ON

It is assumed that the parallel port is unidirectional (normal printer port not bidirectional). Use the Setup | Parallel Port menu item to select the port. If the parallel cable is lengthened, proper operation may not be obtained, however, it has been possible.

The VA200 front panel switch controls port selection as well as power and Scan output. When the switch is ON, the power is applied, the Scan port is active, and the port A is completely disconnected. When the switch is OFF, the power from the adaptor is disconnected, the Scan port is disconnected, and port A is connected straight through to the Input/Output port. Note that the Vertical port is always connected, and has an input impedance of about 10K ohms.

When the 8552 is switched to internal, single, or manual, the VA200 should be turned off (switch to OFF, port A). There is some protection inside the 8552, and no damage should occur if the VA200 is left on, but turning the VA200 off for 8552 sweep control is highly recommended.

The VA200 hardware has a switch that allows one port to be connected to two devices. A printer can be the other device. However, the port may be set to a condition in which your printer does not expect. Some printers can simply be manually reset, others require the port to be reset before the switch is used. For this reason, a Reset button is included in the port setup dialog. This switch sets the port to a static condition generally accepted. To use a device such as a printer, follow the steps below (if necessary).

1. Pause the sweep
2. Reset the port
3. Switch to port A
4. Use the printer
5. Switch back to VA200

Note that if the VA200 has not swept the analyzer, a reset is not necessary (i.e. the software only uses the port during sweeping). Note also that the VA200 software controls the port directly. Do not use the VA200 and simultaneously try to print through the same port from another application.

The parallel port to be used to communicate with the VA200 can be chosen to be LPT1, LPT2, or LPT3. If your system has nonstandard addresses for these ports, you may have to try the others to find which port you want. A Time Out error typically indicates that the parallel port is not properly connected or chosen. Use the Setup | Parallel Port menu item to bring up the port

selection dialog. The current port is saved along with all other parameters when a project is saved. Thus be sure to save the project when you change the parallel port.

Addresses for the ports are given below (for information only):

LPT1 - 0x3BC

LPT2 - 0x378

LPT3 - 0x278

The Scan coax carries the sweep signal to the 8552. This signal varies from 0 to 8.0 volts. The Vertical coax carries the output back to the VA200. This signal normally varies from 0 to about -1 volt (inverted).

CALIBRATION

Although the VA200 was tested on an actual analyzer, you may want to calibrate the vertical and/or horizontal trace positions. First, insure that your analyzer is warmed up. Your analyzer should also be calibrated, but tests have shown that enough adjustment exists for analyzers that are not malfunctioning.

Before performing calibration, connect the VA200 as described in the Hardware section. Use a Continuous Sweep. Set the sweep speed to a slow setting using the sweep speed scroll bar (to the right is slower) to insure a slow sweep.

Before using the procedure below, attach a source such as the Cal Output and see if any adjustment is necessary!!

Also note that calibration is easier if you have an RF/microwave source that allows the display of a signal extending from at one division above bottom to one division from the top. In that case simply adjust the offset and gain pots to obtain the same display on the computer screen. The following procedure assumes that such a source does not exist.

Access holes to the calibration potentiometers is on the bottom of the case. A non-metallic screwdriver is suggested. If a metallic screwdriver is used, remove the screwdriver often to see the real effect. The potentiometers are very sensitive in order to cover a wider range, do not turn far before observing the effect.

1. Use DEFAULT.PJT or set up your Freq/Ampl for an amplitude ref level of -5dBm and 10 dB/div. Activate Marker 1.

2. With no RF input, adjust your 8552 and RF section to display a trace 1 division from the bottom of the 141T display (a low video bandwidth such as 100 Hz is suggested).
3. Gently inserting a small non-metallic screwdriver, turn the Vertical Offset pot clockwise on the VA200 to raise the trace for a marker readout above -75 dBm. Then adjust slowly until the marker readout is at -75 dBm. Do not adjust below the bottom line.
4. Connect the Cal Output to the RF input (or another reliable source). Adjust your 8552 and RF section to position the top of the signal 1 division from the top amplitude line of the 141T display section.
5. Use Peak Search to position the marker at the peak of the trace.
6. Gently inserting a small non-metallic screwdriver, turn the Vertical Range pot clockwise on the VA200 to lower the trace for a marker reading below -15 dBm. Then adjust slowly upward for a peak reading of -15 dBm. Do not adjust above the top line.
7. Steps 2 through 6 can be repeated to refine vertical calibration.
8. The Horizontal Gain control of the VA200 can be adjusted by looking at a signal centered on the 141T display and adjusting for center on the Analyzer Window graph (or more easily looking at the marker frequency readout). Alternatively, the scan of the 141T display can be observed while adjusting the VA200 horizontal gain pot (the scan should stop at the right edge of the 141T display). However, the linearity of the VA200 and 8552 will have some discrepancy. Experience dictates that the D/A used in the VA200 is as linear or more linear. Thus, a centered signal should yield better results (although the difference is barely perceptible on a good analyzer).

Typically, a calibration need only be performed once.

Note that once the VA200 is calibrated, the 141T Display intensity can be turned down.

GETTING STARTED

NOTE: use the VA200 much as you would a spectrum analyzer (i.e. sweep speed adjusted to be compatible with bandwidths). The only parameters controlled by the VA200 are sweep speed and scan position. Other parameters in the program and hardware do not effect the 141T/8552 operation.

If the default project is not visible, load DEFAULT.PJT via the Project | Open menu item. Select a parallel port and connect the VA200 as described in the Hardware section. Click on the Contin button (continuous sweep). Adjust the sweep speed via the scroll bar, the data seen on the 141T should now be displayed on the graph. If the 141T display is not nearly identical to the data on the computer screen, a calibration may be necessary.

The List can be toggled into view or hidden via the Options Toggle List View menu item. When the List is hidden, the sweeps proceed faster.

The Sweep Speed scroll bar can be used to vary the sweep speed to optimize the spectral shape in the same way as the scan time control on the 8552. The sweep is slower as the scroll bar scrolls to the right.

To exit the program, first pause the sweep, use the Pause button, OR Sweep | Pause menu item.

It is not necessary to set up the frequency and amplitude for proper operation. However, the graph and/or list data will not be numerically accurate until the Freq/Ampl setup dialog is used. At any time the project can be saved via the Project | SaveAs (or Save to overwrite) menu item.

The Trace button (or menu) can be used to switch active traces or to view up to 5 traces. If the Status Bar is visible at the bottom of the screen, the active trace will be shown on the status bar. Also note that you can change the resolution to 1000 sample points per sweep via the Trace Setup.

To activate Markers, use the Mkr 1 (or 2) button or the Marker menu. The mouse can be used to position the active marker on the graph (or the scroll bar can be used).

More help is available on-line via the Help menu.

Set up your own Screen layout !

Enter the Editmode via the Setup | EditMode menu item. Alter the screen layout as desired (see on-line Help for more information).

HELP

The on-line Help application provides information on operation and options. Searches and jumps on keywords allow you to locate any subject. If you are not familiar with Windows help applications, there is a Help on Help application provided by Windows (if you have a typical Windows installation).

Please feel free to call 513-459-7070 for help if you get stuck or are not sure about something. The software version number is in the About box available from the Help menu, and the serial number is on the installation disk. Record these numbers here and refer to them when calling.

Version _____
Serial # _____

Suggestions are welcome! Phone or mail any suggestions to

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Since the source code is in C++ (Object Oriented), alterations or additions are much easier than would normally be the case with old style programming.