

Getting Started on the HP 3577 Network Analyzer

The HP 3577 network analyzer can make Bode plot and other frequency-domain measurements. The source output produces a sinusoid of controllable amplitude and frequency, used to sinusoidally excite a circuit. The receiver input channels R, A, and possibly B, are used to measure the resulting sinusoids within the circuit. The analyzer can plot the magnitude and phase of the components of R and A (and possibly B) at the frequency of the sinusoidal excitation.

Caution: *the input amplifiers of the HP 3577 are similar to oscilloscope inputs, and are rated 25V peak.*

Do not connect the high voltage output of your converter directly to the network analyzer inputs, or you will destroy this expensive instrument! Use the x10 probes provided with the network analyzer inputs; these will divide the measured voltages by a factor of 10, so that the voltage applied to the analyzer input channel is one-tenth of the actual voltage; this allows signals having peak voltages up to 250 V to be measured.

Also note that the injection source and the input channels of the analyzer are connected to the chassis of the analyzer, which is connected through the power plug to earth ground. Therefore, the analyzer cannot make floating measurements, nor can it make floating injections. To avoid disrupting the quiescent operating point, it may be necessary to employ a suitable dc blocking capacitor between the injection source and the circuit.

Example: To make a Bode plot over the frequency range 100 Hz to 100 kHz

1. Turn the power on (LINE = 1)
2. Connect:

Source output	to	Circuit input (signal injection)
Receiver input R	to	Circuit input signal
Receiver input A	to	Circuit output signal
3. Receiver ATTEN

IMPED	R	1 M Ω
IMPED	A	1 M Ω
4. Receiver RES BW
AUTO OFF
10 Hz

Source

5. SWEEP TYPE LOG FREQ SWEEP
6. SWEEP TIME 20 SEC
7. FREQ

START FREQ	100 Hz (Enter from numeric keypad)
STOP FREQ	100 kHz (Enter from numeric keypad)

Display Format

8. DISPLAY FCTN

TRACE 1	LOG MAG
TRACE 2	PHASE
9. INPUT

TRACE 1	A/R
TRACE 2	A/R

It may be necessary to scale the plots. This can be done using

10. SCALE

TRACE 1 autoscale, or change values as appropriate
TRACE 2 autoscale, or enter values as appropriate

If the error message “OVERLOAD on INPUT A” or “OVERLOAD ON INPUT R” appears, then the source output amplitude (SOURCE - AMPTD) needs to be decreased.

If the plot is noisy, the increase the source output amplitude, and/or increase the resolution bandwidth (RES BW), and/or decrease the receiver attenuation (ATTEN). Averaging can also be used to reduce noise.

As the resolution bandwidth (RES BW) is decreased, the sweep time must be lengthened to maintain accuracy of the plot. A 1 Hz bandwidth requires a sweep time of at least 50 sec.

Plotting the waveform

A plotter is connected via GPIB/HPIB. The plotter must be set to address 31, HPGL, GPIB. To plot:

PLOT PLOT ALL

If the pens skip, it is necessary to reduce the pen speed:

PLOT CONFIG PLOT PN SPEED SLOW

You may wish to save the instrument settings in a REGister, so that it can be RECALLED later.