VNA 2180

The lastest program and manual are available **(Oct 8,'09)**: VNA_400C.zip
(The program will run in the demo mode if the hardware is not available.)

The Vector Network Analyzer, VNA2180, measures impedance (magnitude and phase) and filter transmission in the range of 5 KHz to 180 MHz.

A PC is used to plot parameters, such as, impedance, SWR, Return Loss and S21.

The test frequency is generated digitally.

An analog to digital converter digitizes the raw data. This avoids non-linearity associated with diode detectors, and results in very good dynamic range and linearity for accurate magnitude and phase measurements.

Main Features:

- Port A is equivalent to an antenna analyzer. (Similar to the AIM4170C).
- Port B has a 50 ohm input impedance with return loss greater than 30dB.
- Port B nominal dynamic range: 100dB up to 50MHz, 80dB up to 160MHz.
- Programmable RF amplitude for Port A (+7 to -19 dBm).
- Resistance and reactance measurements of antennas and discrete components
- Impedance measurements through filters or networks
- Markers for impedance scans and Smith charts
- Parameters that can be plotted include:
  - Resistance and reactance for series or parallel equivalent circuits
  - SWR
  - Return loss
  - Impedance phase angle
  - Two port network transmission (S21, magnitude and phase)
- Cable length, impedance, loss, and velocity factor
- Distance to fault (open or short)
- Smith chart displays (featuring phase rotation and zoom)
- Band scan to check for interfering signals
- Quartz crystal parameter measurements
- Preprogrammed functions, such as tuning a ¼ WL stub, and many more
- I/O expansion port for accessories (digital and analog)
- Calibration loads are included
- No internal adjustments
- Optically isolated USB interface to PC

Impedance measurements can range up to 10K ohms. The sign of the phase angle indicates either inductive or capacitive reactance without ambiguity.

The RF generator can also be used as a signal source for testing receivers. The frequency is very stable and it can be calibrated to WWV.

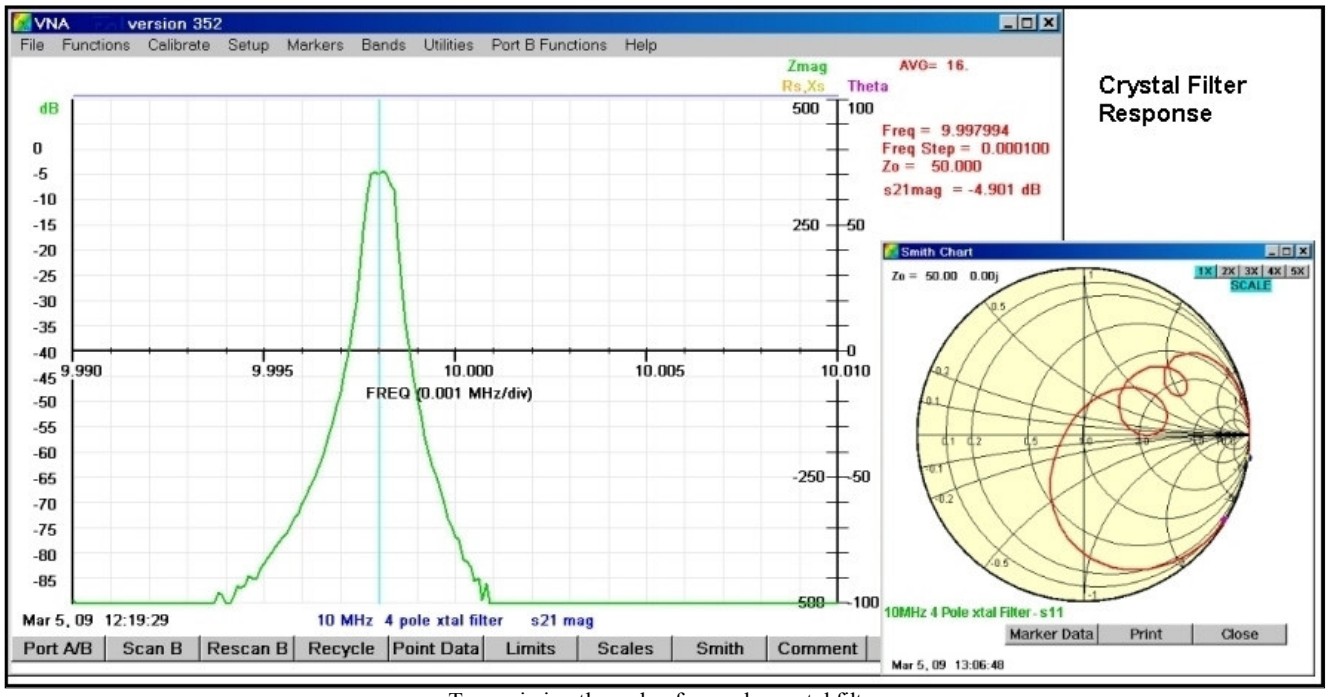
Digitized data is sent to the PC via an optically isolated USB port. Power for the VNA can be obtained from a small DC power supply or a battery. With a laptop computer, the unit is quite small and portable. Measurements can be made at ground level and translated as if they were at the antenna feedpoint by using the refer to antenna function.

The impedance at the antenna itself can be read with the VNA located in the shack at the receiving/transmitting end of the coax. The cable can be any length. The cable's impedance and loss characteristics are determined by a simple calibration procedure and the antenna's impedance is then plotted directly during the scan.

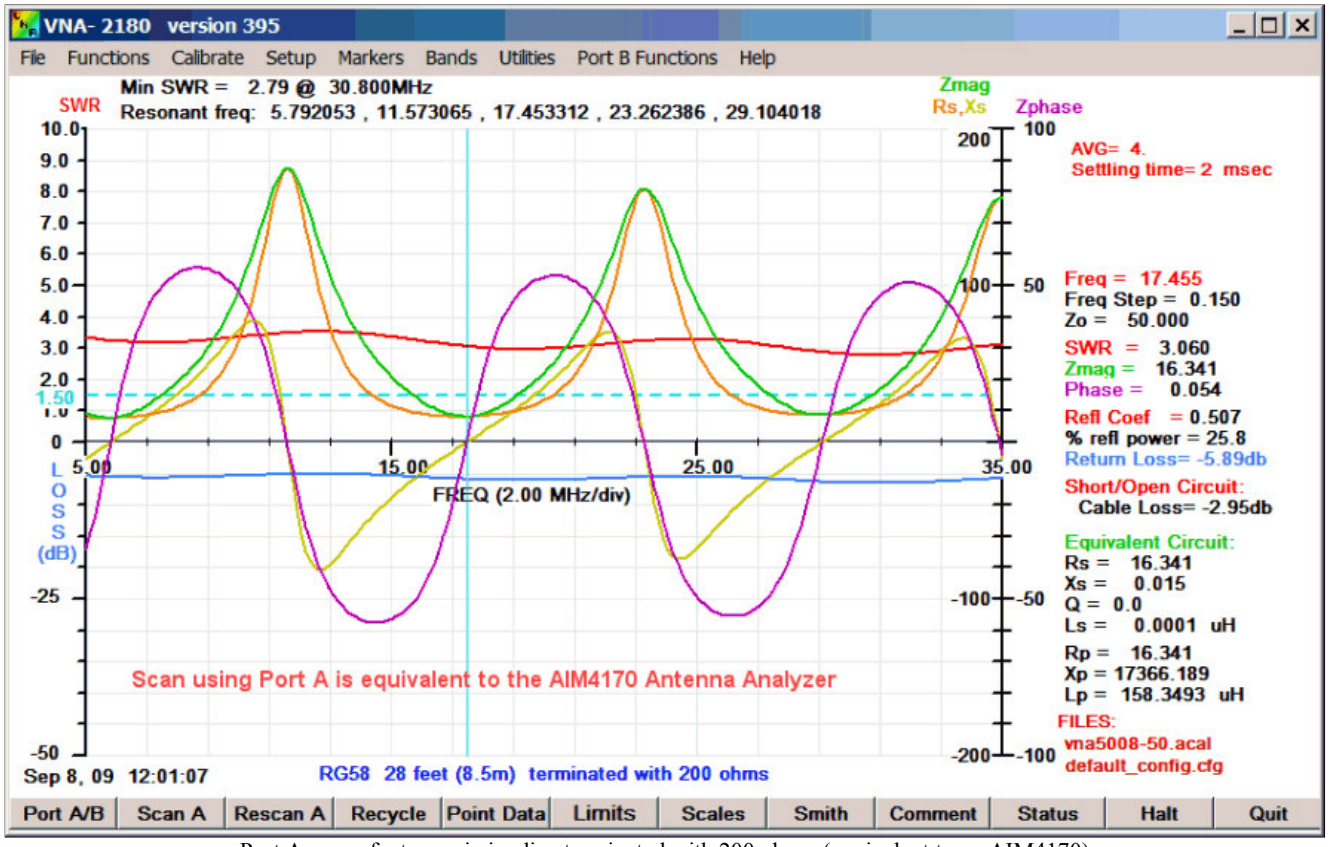
Numeric values can be read from the graph data using the mouse-controlled cursor.

The scan data can be saved to disk or printed to compare before and after results. It can also be imported into spreadsheet programs for further analysis.

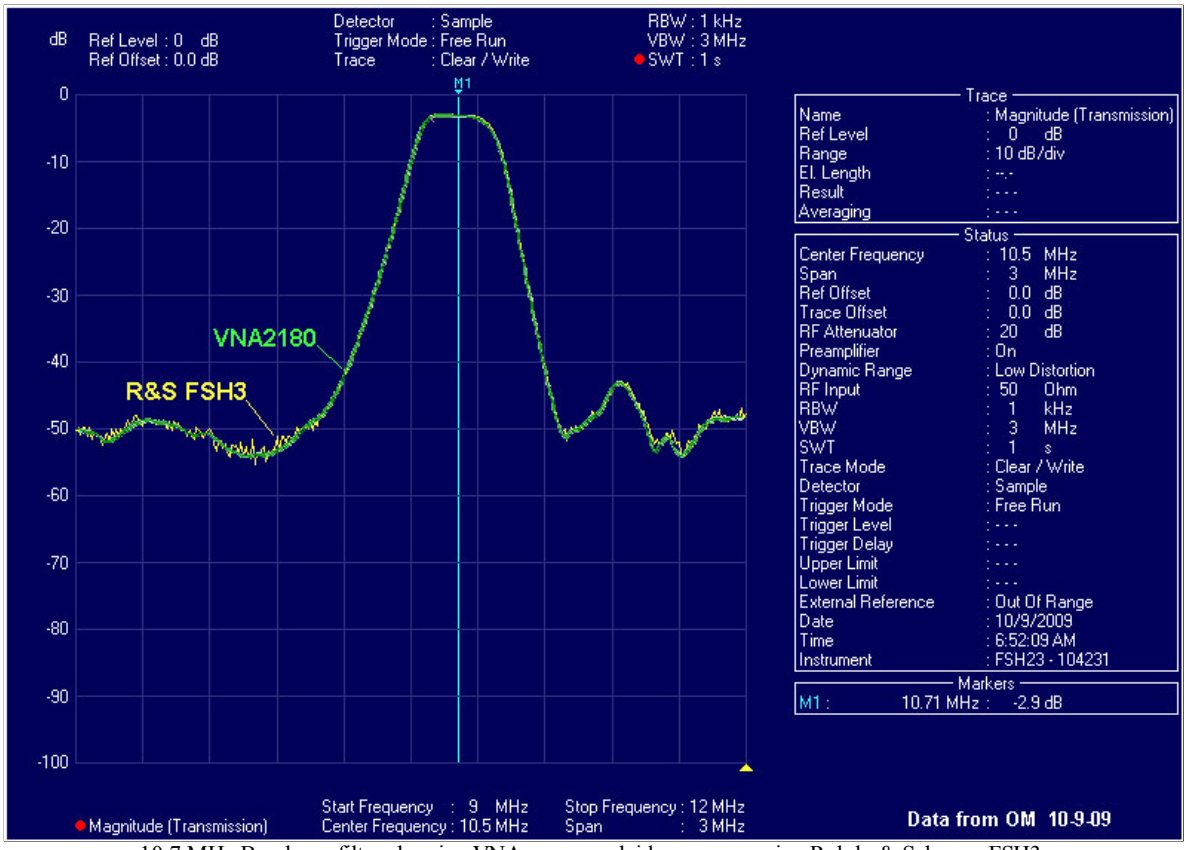
SAMPLE SCANS



Transmission through a four pole crystal filter



Port A scan of a transmission line terminated with 200 ohms. (equivalent to an AIM4170)



10.7 MHz Bandpass filter showing VNA scan overlaid on a scan using Rohde & Schwarz FSH3.

COMPARISON WITH THE AIM4170

The VNA2180 is not a replacement for the AIM4170. The AIM4170 will continue in production.

Parameter	VNA2180	AIM4170
Output signal into 50 ohms	0.5Vrms (+7dBm)	0.028Vrms (-18dBm)
Max interference input while measuring	1.4Vrms (+16dBm)	0.1Vrms (-7dBm)
Programmable output level	Yes	No
Two ports for filter testing	Yes	No
Program port for accessories	Yes	No
Antenna & component testing	Yes	Yes

The VNA2180 is now in stock and ready to ship.

Orders can be placed at our on-line store

Updated: Oct 8, 2009
Note - preliminary specification, subject to change
Analyzer has patents pending