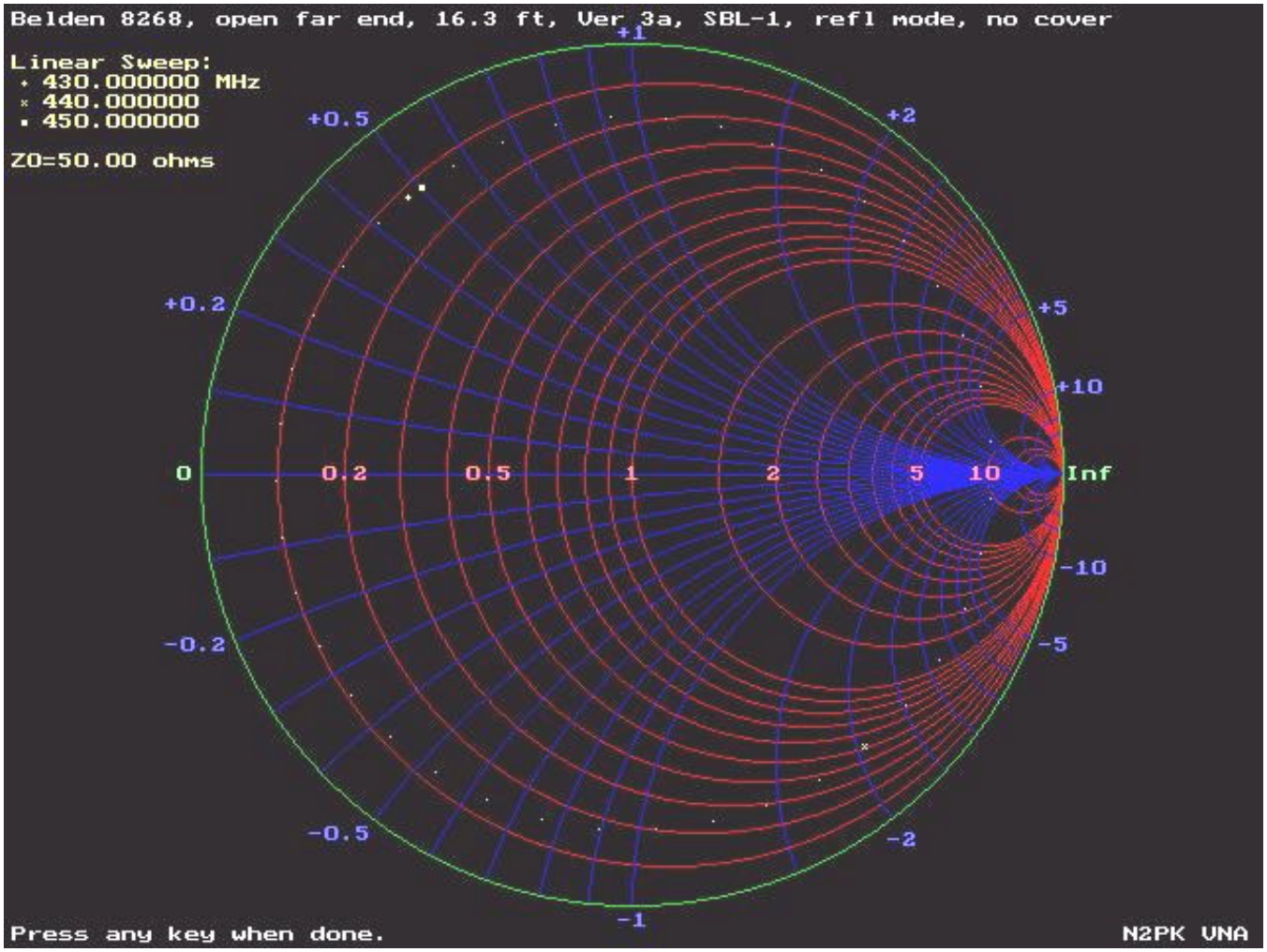
Sample Test Results

This is simply a collection of test results taken with the simple VNA transverter .

Here is a Smith Chart for a 16.3-foot length of Belden 8268 coax, open at the far end and swept from 430 to 450 MHz. Look closely to see the nearly complete circle of data dots near the perimeter:



Here is the tabular data for the 8268 coax with a comparison to TLDetails (8267 nearest equiv.):

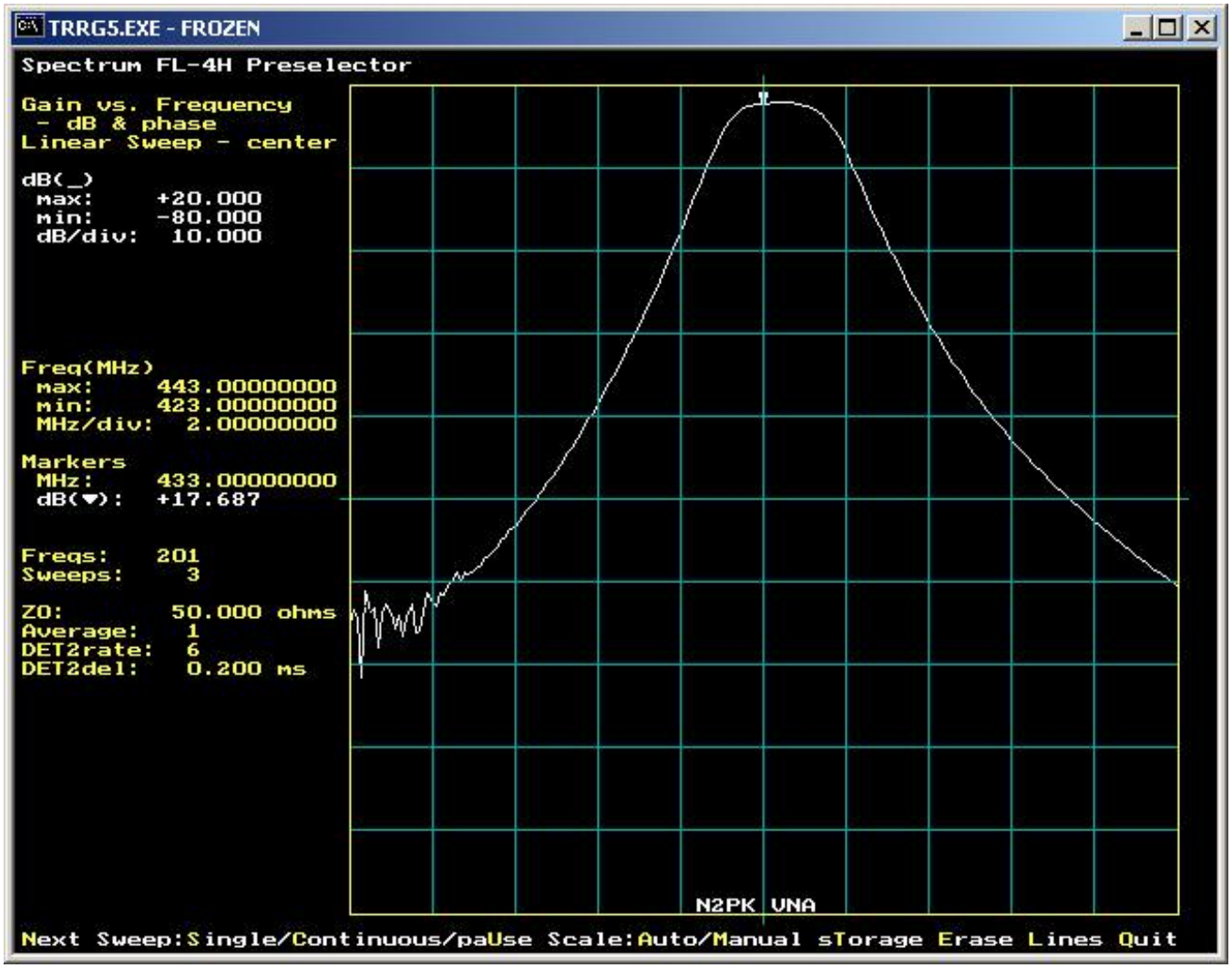
	----- |rho| ------		
MHz	Meas.	Pred.	Delta
430	0.837	0.833	+0.004
435	0.839	0.831	+0.008
440	0.837	0.831	+0.006
445	0.830	0.829	+0.001
450	0.827	0.827	0.000

At these frequencies, angle(rho) depends very critically on actual physical length and velocity of propagation, but measured vs predicted is as follows:

MHz	-- angle(rho), deg -- Meas.	Pred.	Delta
430	+122.3	+98.4	+23.9
435	+35.0	+7.4	+27.6
440	-54.5	-83.5	+29.0
445	-147.9	-174.4	+26.5
450	+120.4	+94.6	+25.8

The values for delta degrees suggests an approximate delay offset of 160 ps, equivalent to either a 1.3 inch length error or an actual velocity factor of 66.4% vs 66% spec'd – either way a small error.

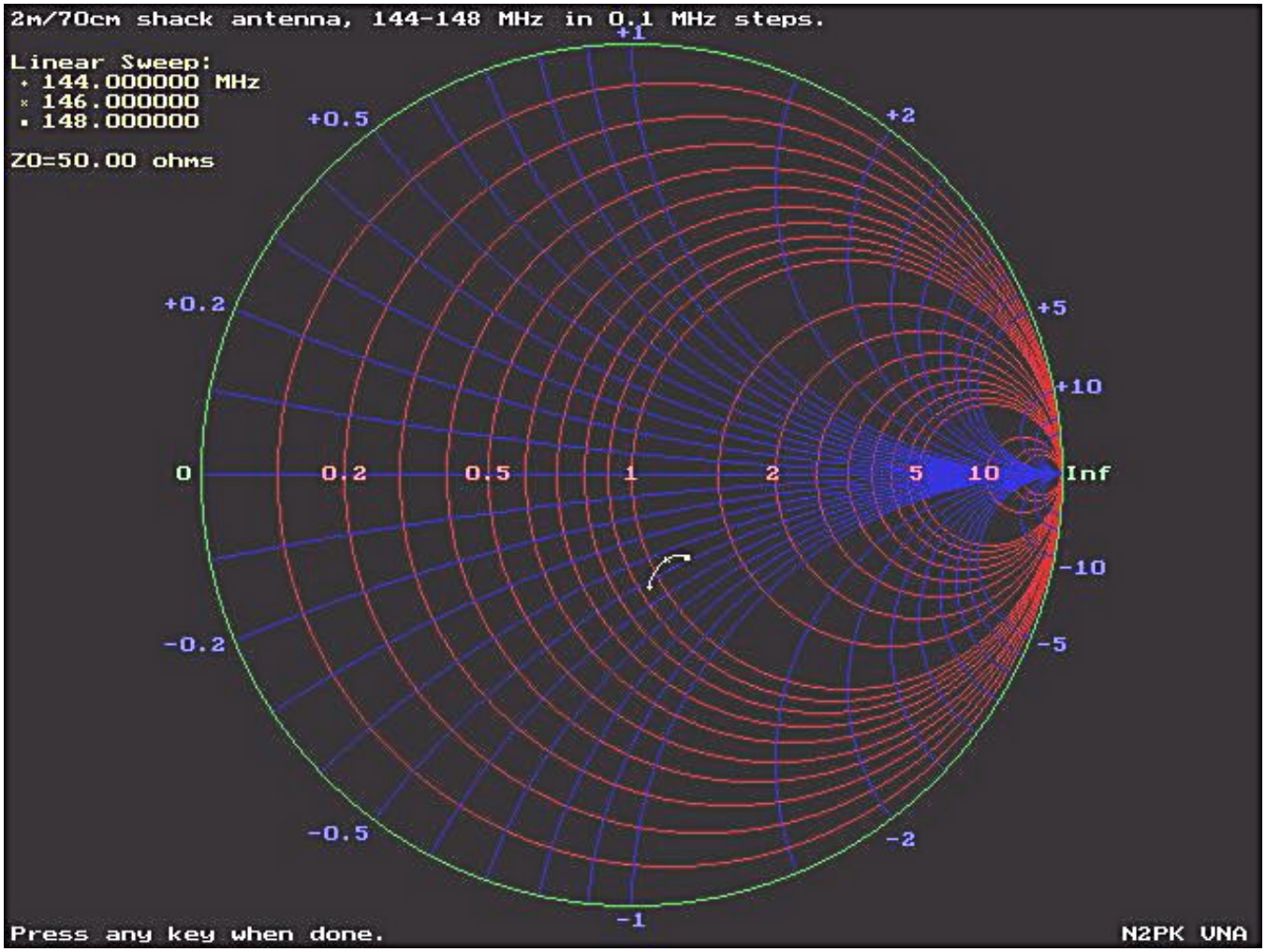
Here is a transmission plot from 423 to 433 MHz of a cavity filter and pre-amp after its adjustment to the desired frequency using the VNA transverter. The VNA noise floor is seen on the low side and likely to be primarily the result of the 430-450 MHz transverter BPF, but also illustrates that the transverted VNA dynamic range is over 60 dB on the high side where the transverter BPF is in passband. An input attenuator, present during cal, was removed here to better show the dynamic range.

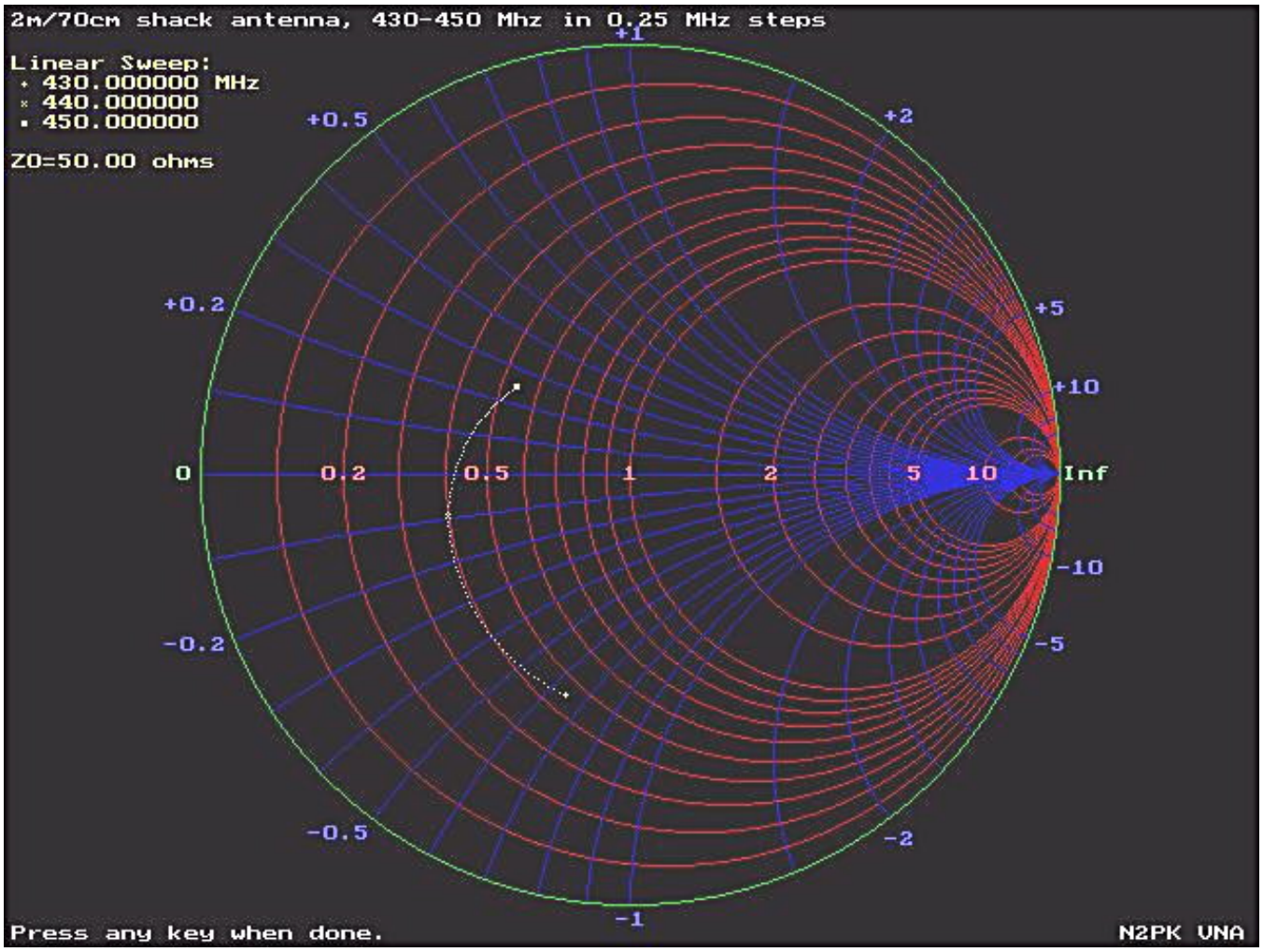


I also did a reflection measurement of my load #7 at 500 MHz with another transverter BPF centered on 500 MHz. My load #7 is described in Part 1 and is a series RC load on an Amphenol SMA jack - same as my calibration standards construction. The RC consists of an 0805 SMD 24.9 Ω 1% resistor and two 0805 100 pf 5% NPO capacitors in parallel.

As noted in Part 1, Chip, NW0O, also tested load #7 at 500 MHz using an HP 8753C VNA With Chip's reference plane, Chip measured |rho|=0.333 & angle(rho)=+158.3°. I got |rho|=0.331 and angle(rho)=+159.5° using my cal stds #1, #2, and #3 for an |rho| difference of 0.002 or 0.05 dB return loss difference. The angle(rho) difference is 1.2° - probably most of the 1.2° degree angle error is due to my approximations for the strays of my 50-ohm load (#3).

Here are two Smith Charts of a homebrew sleeved coax vertical dipole in a corner of my hame shack that I mainly use for local repeater access. The antenna is a dual bander for 2m and 70cm.





This antenna VSWRs aren’t very low, particularly on 70 cm, but the plots are quite smooth over the frequency range.