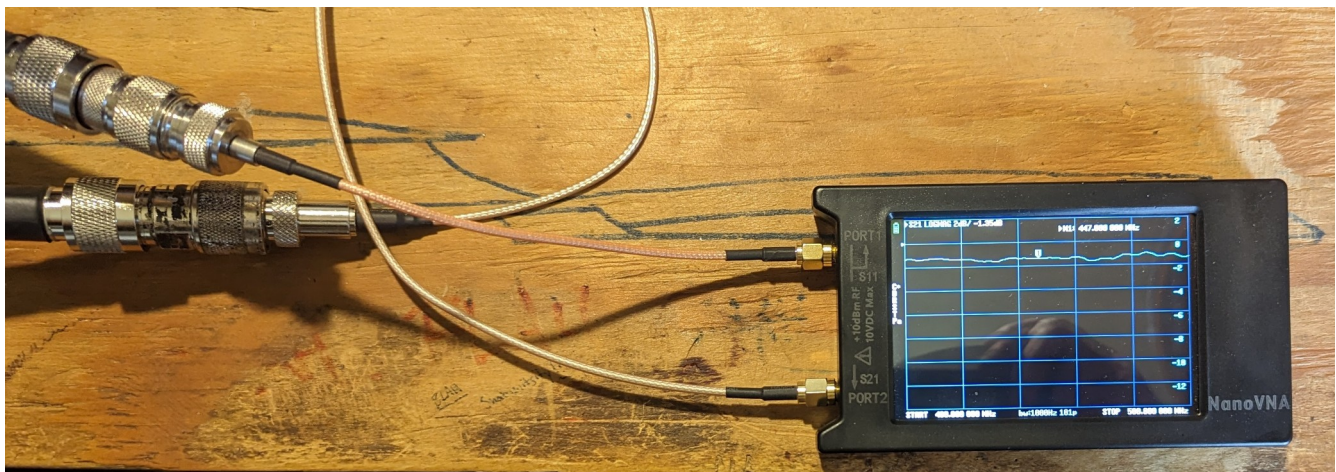


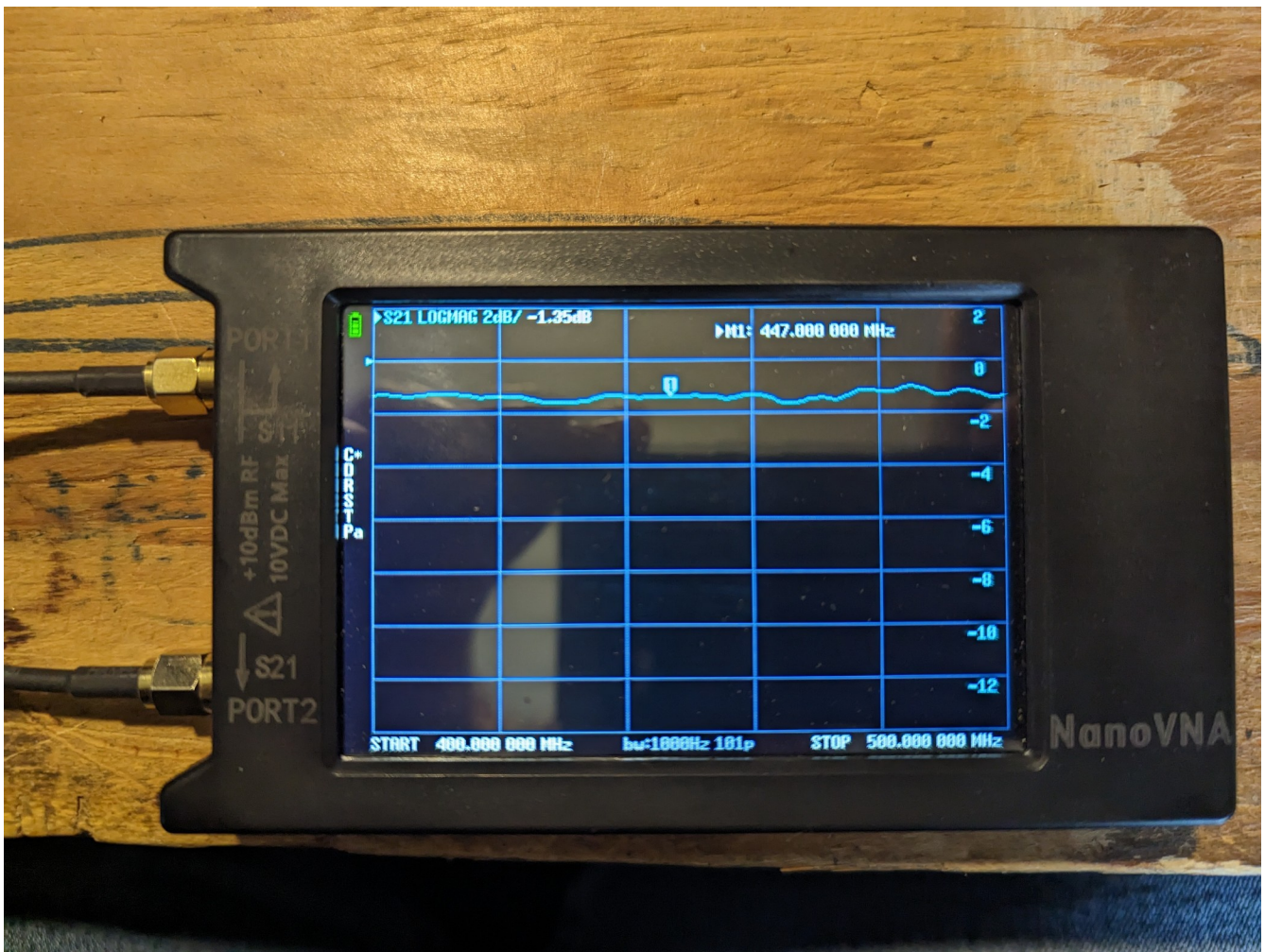
Over the years many discussions have been made about the losses associated with using adapters and connectors in cables from our radios to the antenna. Having heard several values for losses mentioned and not finding a lot of definitive answers on the network or reference books I have, I decided to do a little experimentation on my own. We recently purchased a 50 ft length of LMR 400 type cable for use with the temporary installation of the 70cm repeater antenna upgrade. I wanted to verify the cable was as specified as far as loss went. What better time to expand that and do a little test of adding adapters in the mix.

A little about the testing setup. First I used my Nano VNA. While I realize some may say, and rightly so, this isn't a lab quality instrument. It's what I have available and checking on various occasions with lab quality instruments, I can say that it's pretty close. Certainly good enough for this test.

I first used a SMA to SO-239 adapter cable on both the S11 and S21 connections. I then put a double male connector between the ends and did a calibration of the thru operation. This should have set the reference to 0db of loss. I then had to use a PL-259 to N female connector to get to the cable under test. Setup and results are shown below.



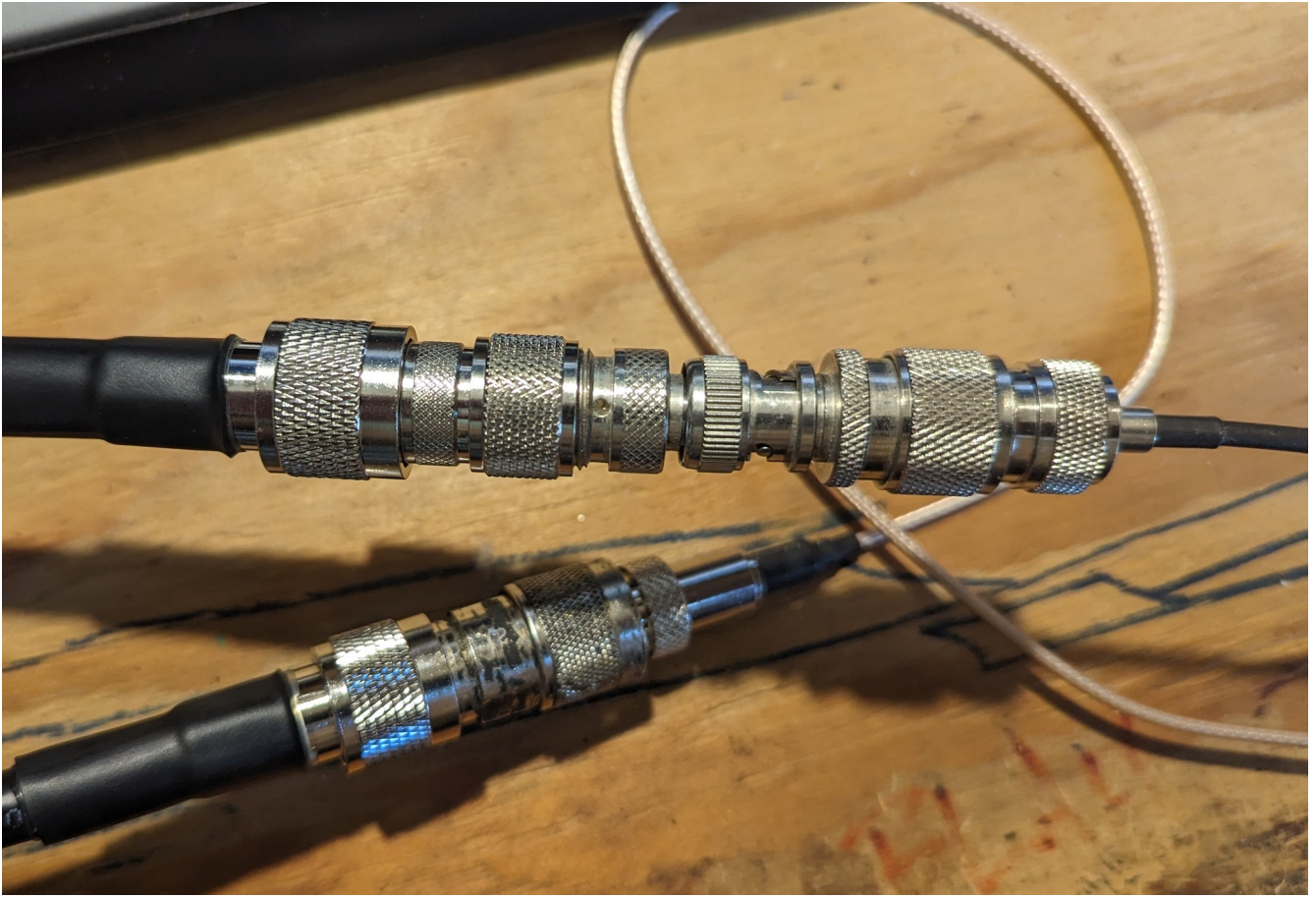
Initial cable and VNA



Closeup of the VNA screen

As you can see, the loss of 1.35db is right where the expected values for 50ft of this cable at UHF frequencies is expected to be.

Next I added a BNC to SO-239 male and female adapter in line.



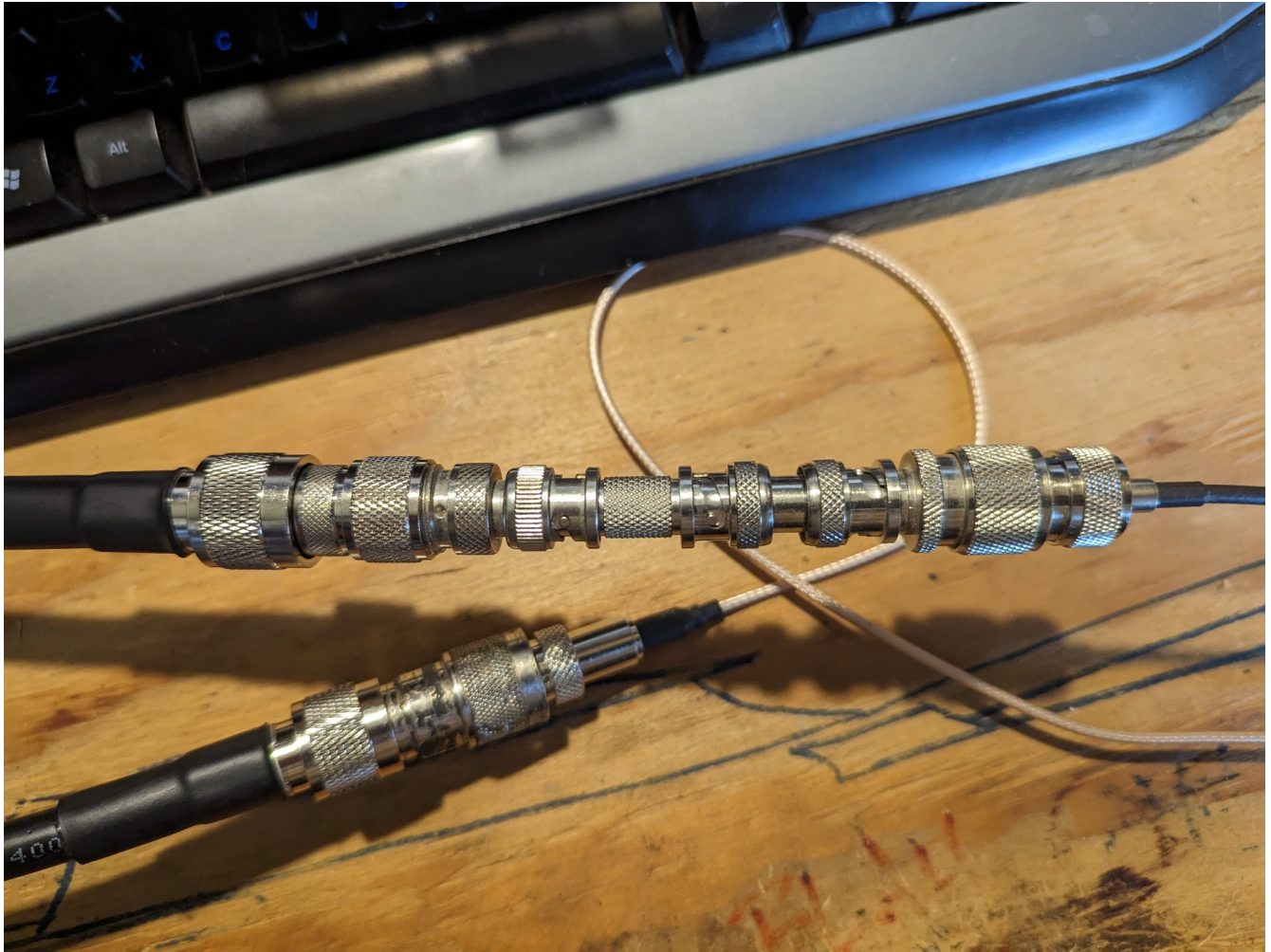
Inserted BNC adapters



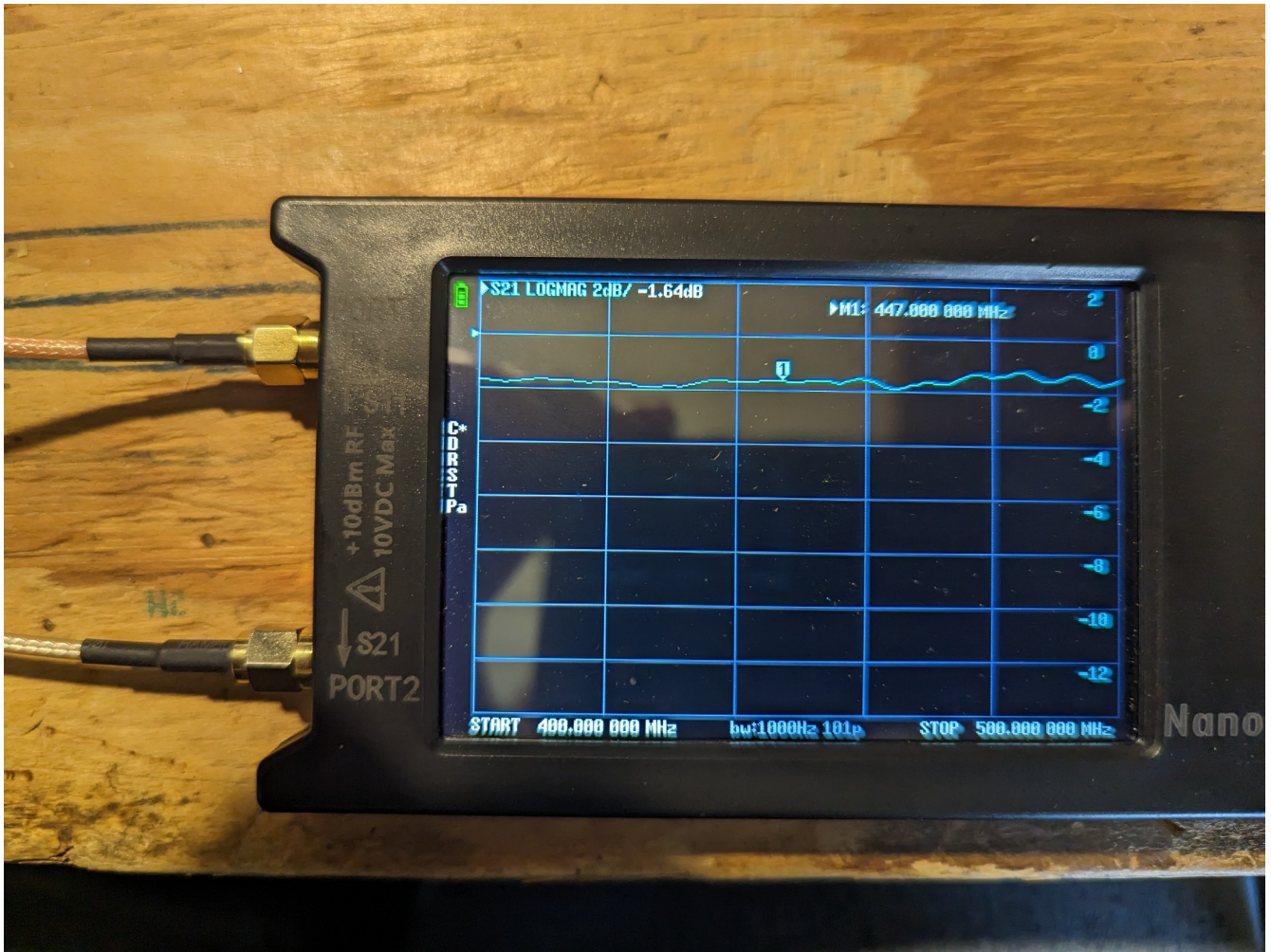
1 Adapter closeup

As expected a loss was observed. In this case a loss of .8db. Not a lot really but measurable.

Next I added another connector set into the mix.



2nd set of adapters



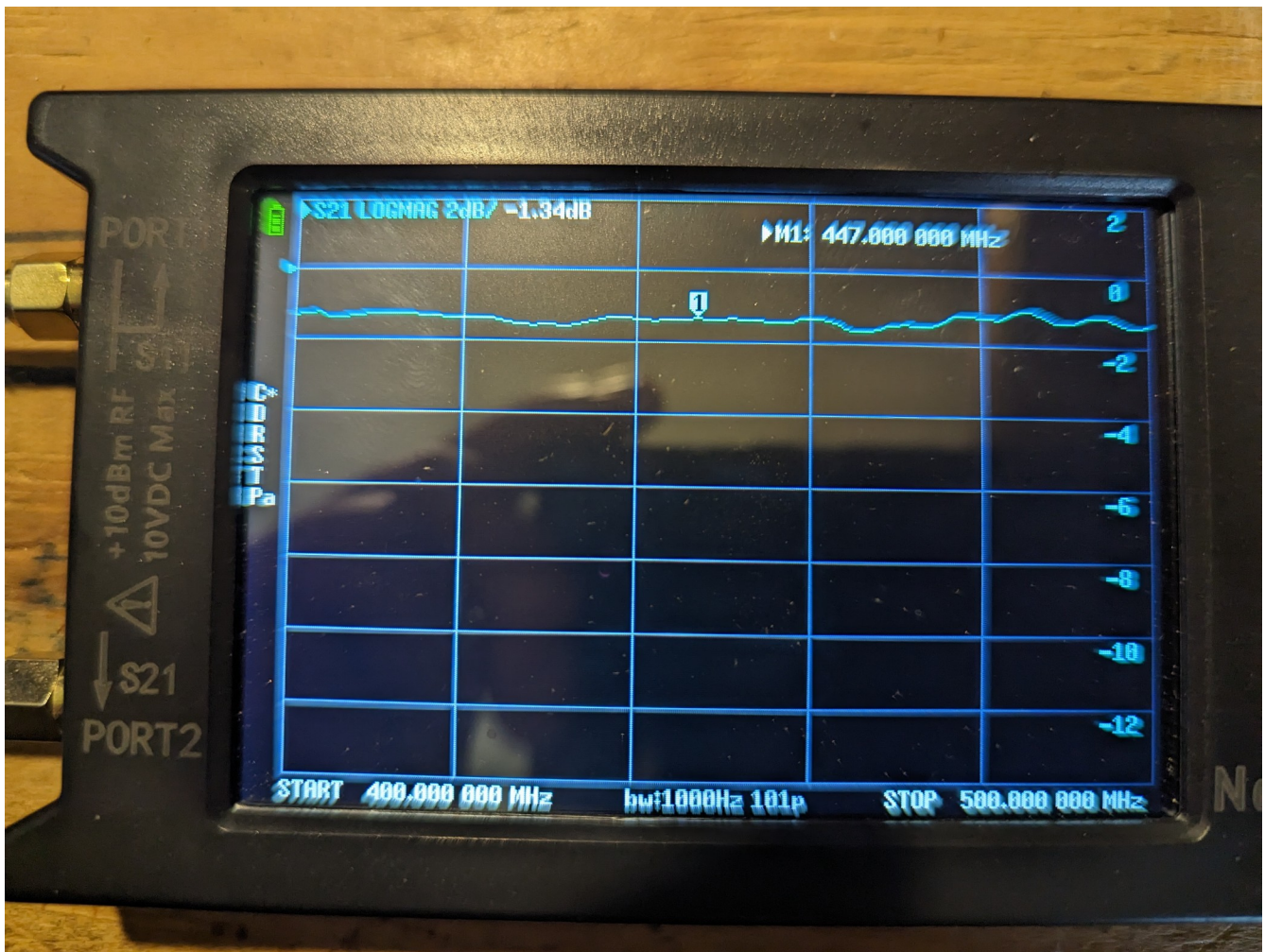
Closeup of 1 adapter pair screen

As expected, some more loss is seen. 1.64db at this point. Or a loss of .29db. Not too bad.

Here's the connector / adapter chain used. Note that this image does not include the adapters used in the initial connection, just the added ones.



Connectors used in finial test



Repeated initial setup

I then took all the adapter back out and returned to my initial setup of minimum adapters to connect to the cable. As you can see the loss is pretty close, .01db off from the original measurement.

So what can we conclude from this. First, any additional connectors or adapters added will induce loss. Second here we have a test, admittedly maybe not the perfect lab test, that puts some numbers in real life examples. I think we can safely conclude that having to use an adapter from one connector type to another is not a real big issue in most cases. I did not repeat this test at VHF or HF frequencies but I feel it's probably safe to say the losses will be close if not less at lower frequencies. Hope this is a little informative and feel free to repeat the test. If you do repeat the test, please publish the results.