A Coax Problem …

I mounted a 2M J-antenna at our lake cottage at Lake Wabamun and ran into some feedline problems.
The SWR at the antenna looked pretty good (Figure 1) with a resonant frequency of 146.25 and SWR of 1.06:1.
(SWR is yellow on all charts)

I then planned to use an RG8 feedline into the shack. It was much longer than necessary and had been sitting on the ground for the past 20+ years. Even so it sort of worked (Figure 2)

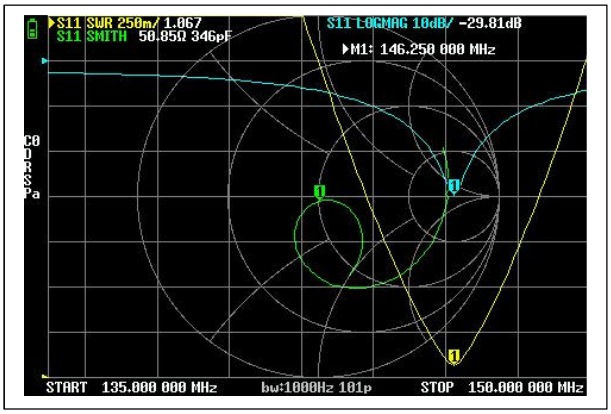

Figure 1

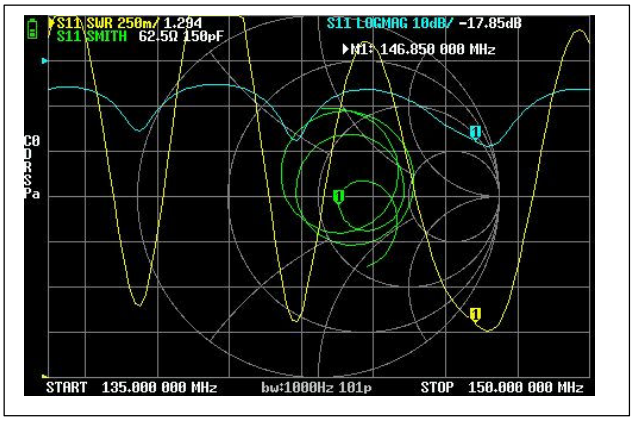

Figure 2

I assumed that trace was poor due to severe weathering of the coax end so removed the excess cable and installed a new connector. The result was less than encouraging with an SWR now 2.26 at 146 MHz (Figure 3) .

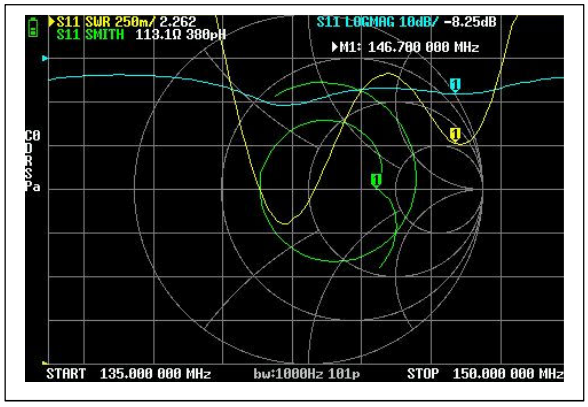

Figure 3

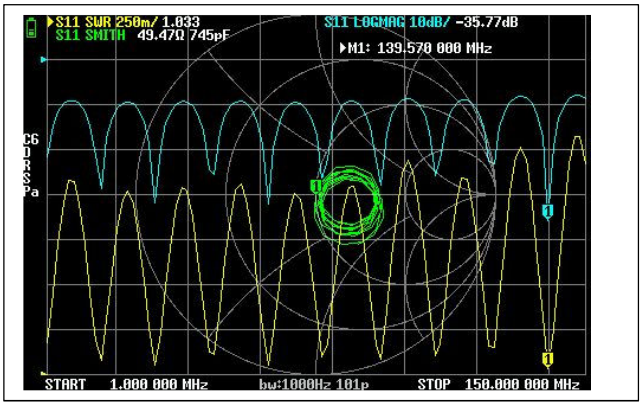

Figure 4

The problem was solved by running a 20 foot length of RG58 coax (thank you Neil VE6TCK) from the rig to the antenna with an SWR curve the same as Figure 1. All worked very well with an ability to work the VE6QCR repeater with 5 watts.

But what was going on with my "bad coax"? Back in Edmonton I decided to check out the 21 foot length of RG8. The first test was to terminate one end of the coax with a 50 ohm dummy load and then sweep the other end with the NanoVNA. The 50 ohm load when fed directly from the VNA showed a straight line from 1 MHz to 150 MHz at just a bit over 1:1 SWR. The SWR when fed via the 21 feet of RG8 was a different story. (Figure 4).
I didn't expect this! Note that the scans are now from 1 MHz to 150 MHz.

The next test was to measure the losses though the RG8 coax using the VNA in the Thru Mode. These losses were quite low ranging from < 0.64 to 1.33 db (Figures 5 and 6) with peaks and valleys mirroring the SWR chart (Figure 4) .

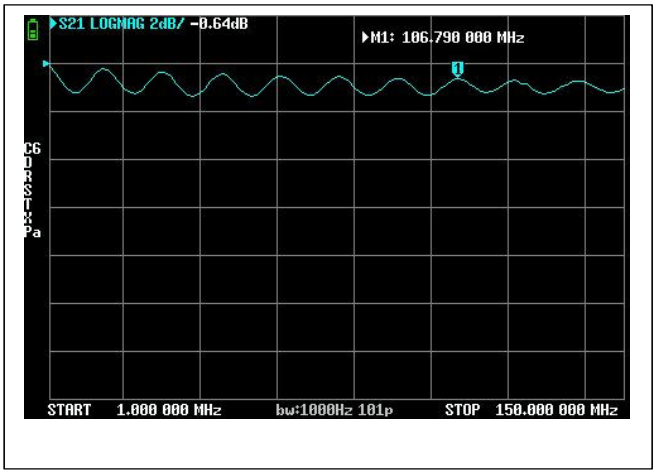

Figure 5

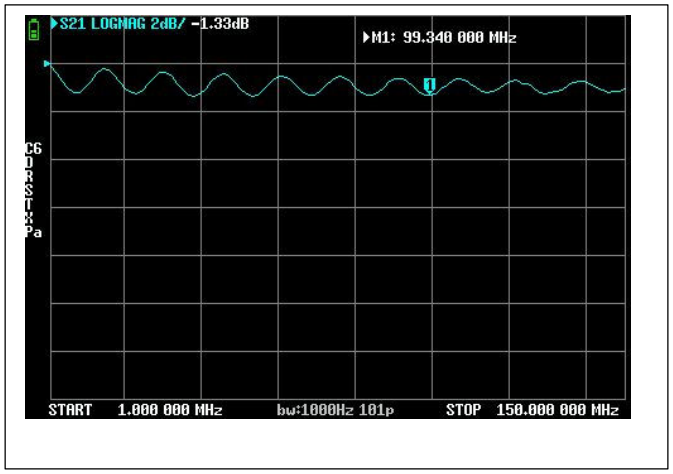

Figure 6

Lots of information but no answers.
Maybe it isn't RG8.
Checking the cable again there were no markings to be seen … even under UV light!

Question: How do you measure the characteristic impedance of an unknown piece of coax? The answer was on YouTube.

"How to Measure the impedance of "unknown" coax using a NanoVNA"
https://www.youtube.com/watch?v=hqKLFbNYRZc

The procedure was very straightforward and quick using the VNA's Smith Chart function.

The result for my 21.2 feet of coax using the above link was **73 ohms**!!! My 50 ohm RG8 was likely 75 ohm RG11 which is the same diameter as RG8.
This finally explains what has been going on, at least in part.

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