

I wanted to improve the filtering on my 220 repeater at a high density mountain top site due to some intermod issues. So rather than purchasing a new "band pass" set of cavities (coaxial resonators) versus the "pass / reject" Wacom duplexer I was currently using I considered converting them to band pass only, to assure my system has the best filtering with the circulator. I am on a community receive antenna so there are two cavities on the Receiver and Transmit side fed by split antennas.

Here is the stock duplexer for the before picture, with the complete duplex cabling back in place for reference. You can see the notch rods and clips in the middle.



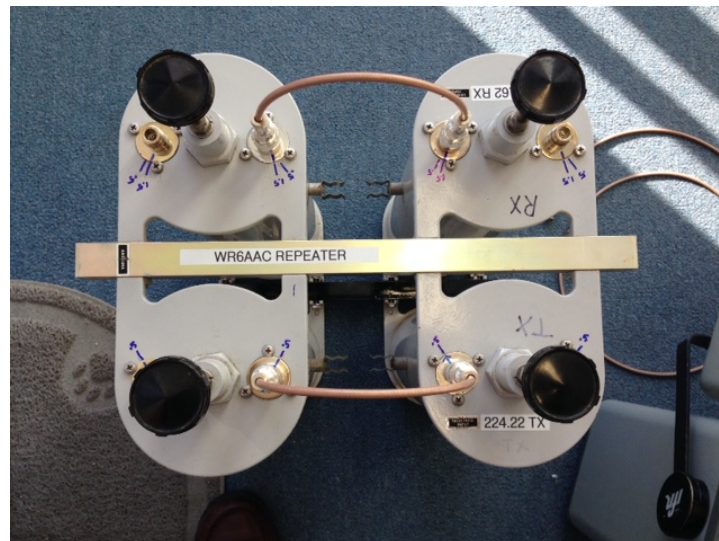
Since Wacom was bought by TX/RX and parts are no longer available, I got lucky and found a great source, JAG Electromagnetics in Canada; they refurbish filters, antennas, circulators, etc. as well as making their own products. I contacted them and they assured me that they could construct new band pass loops to fit the Wacom cavities and I could have them with "N" connectors vs. the "UHF" connectors. So three weeks later I had them in hand for \$29 a loop. A side note, have them ship by "Canada Post" their post office. UPS shipping gets an extra \$25 brokerage fee for customs.

The JAG loop on left and the Wacom loop on right with connector to notch rod.

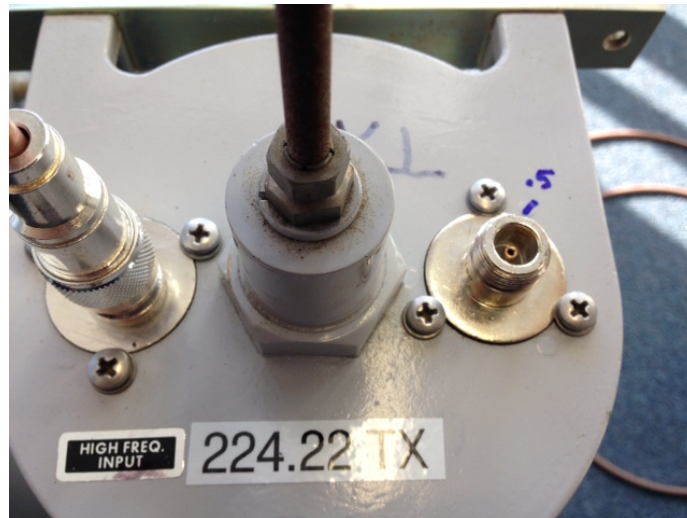
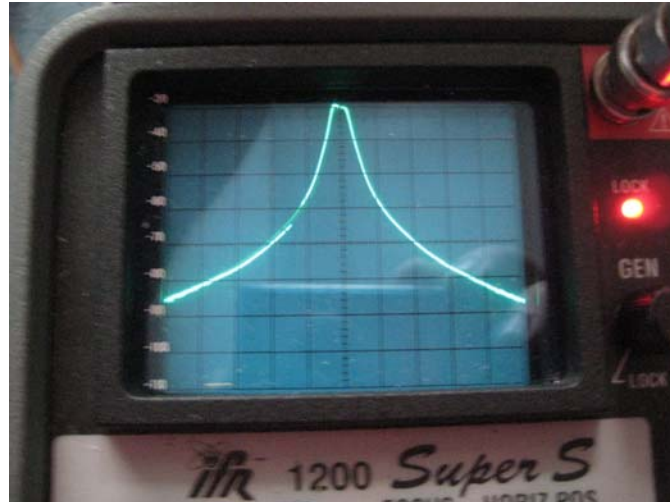




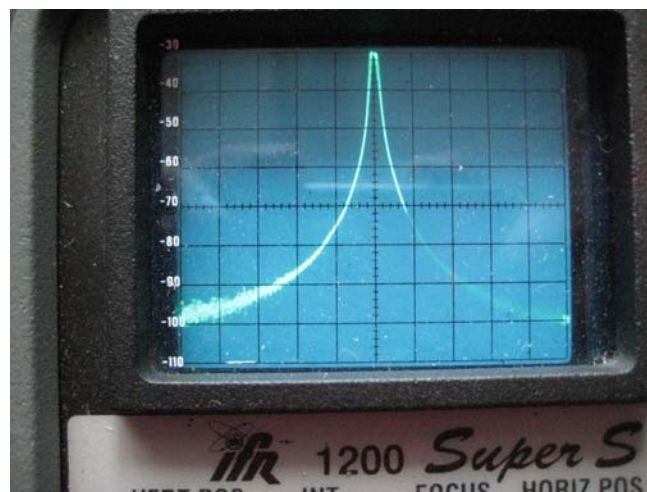
Completed installation of loops, JAG Engineering recommended that the cable length be 12.726" for RG-142 or 12" for RG-213 including the connectors. I went with the RG-142 and it appears to be a  $\frac{1}{4}$  wave including the loops and they were spot on as the tuning did not change when the two cavities were interconnected.



I went with .5 db insertion loss for each transmit cavity, using the service monitor tracking generator to adjust the loops for minimum insertion loss and tune to frequency. This is about -58 dBm at 5 Mhz. I put an index mark on the loop ground side for reference. The hole in the side of the cavity for the notch rod was covered with aluminum foil tape to keep out debris and moisture. I left the clips for the rods in place as it appeared that there are nuts on the inside of the cavity and I didn't want to go fishing.



The receive side was adjusted to 1.5 db insertion loss per cavity so I could get steeper skirts on the band pass about -70 dBm at 5 Mhz. The higher loss was not an issue since I was also installing an Angle Linear preamp to make up for the insertion loss after the filters and still have some gain.







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