

The 160 Meter Ferrite Loop

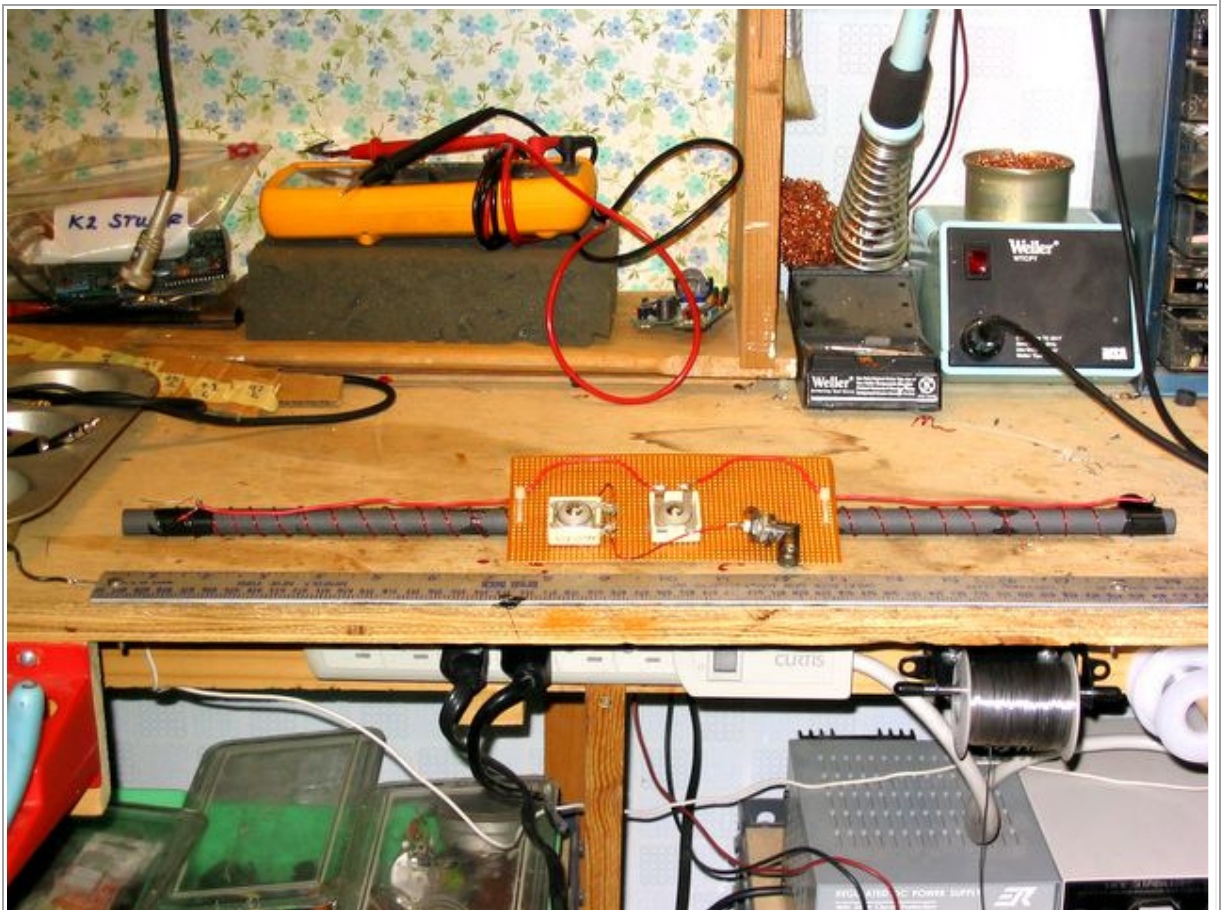
Listening on my inverted L antenna, the 160 meter band is full of various manmade noises including BC mixing products, computer and monitor birdies, etc. I decided to utilize the convenient implementation of the separate receiving antenna on my Elecraft K2 and make a low-noise receiving antenna.

My back yard is very small, and there is almost no room for additional antennas. The only Beverage that will fit comes in a can! So I chose to make a ferrite loop. Like most low-noise antennas it has very low overall gain; it is probably 20 db down from the inverted L. However, the signal-to-noise ratio is much better, and it's easy to boost the level back up with a preamp. I am using the 2-stage preamp built into the MFJ noise canceller. It has plenty of gain for this application. I modified it for low-impedance input by adding an input transformer: a T50-1 iron powder core with a 2-turn primary and 22-turn secondary, resonated with a 400 pf trimmer.

The loop has very sharp nulls off the ends, with a relatively broad pattern elsewhere. It's possible to make birdies and BC noises disappear while still hearing the desired signals. It's impressive to switch back and forth between the loop and the inverted L and hear the signal come up out of the noise!

Here is the 160-meter ferrite loop antenna before it was inserted in a PVC enclosure. The rod was made by epoxy gluing six 3-1/2" ferrite rods together (sold by KE9PQ on Ebay), for a total length of 21" (53.3 cm).

I held them in position for gluing by simply placing them in a piece of angle aluminum lined with



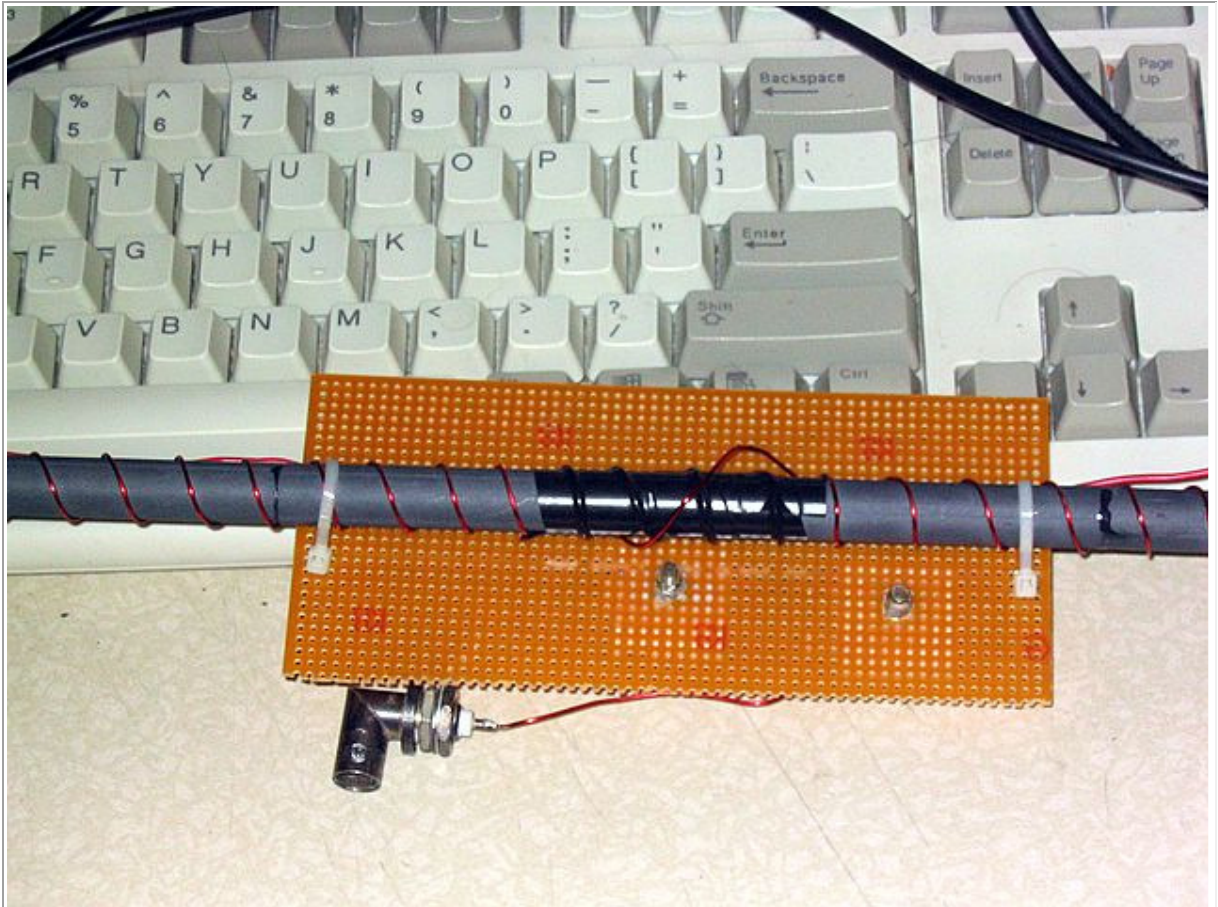
waxed paper.

The main coil has 37 turns, and is resonated at 1825 KHz by a 400 pf trimmer in parallel. The other trimmer is 1500 pf and is in series with the link (see below).

The other side of the board, showing the 1-turn link. There should be no connection between the link and the main coil.

The easiest way to tune it is to connect an antenna analyzer such as the MFJ 259B to the link and adjust both trimmers for minimum SWR.

It was possible to adjust the capacitors for an indicated SWR of 1:1



on the MFJ analyzer. Tuning is VERY sharp, with gain starting to drop off noticeably 10 KHz away from the center.

The gain is quite low, of course, and I use a two-stage external preamp as well as turning on the preamp in the K2 in order to make the overall signal strength about the same as that on the inverted L.

Here is the antenna installed in a PVC tube. The holes are for tuning the capacitors and will be covered by tape in the final installation. The rod is supported inside the tube with some foam material.

The end caps are NOT glued on! I put some silicon grease on the ends and tapped them into place.



Now the whole thing is ready for mounting. The black gunk is 'liquid electrical tape', used to prevent water from getting in around the connector mounting. The large tube just sits on a cut-down 'T' fitting, held in place by large cable ties.



The antenna and rotor mounted on the clothesline pole in my back yard. I chose this location because it is away from power lines, houses, and the inverted L. However, the pole in the background carries some telephone wires, and I suspect that the null depth is compromised somewhat by re-radiation from these conductors.



[Back to K2VCO home page](#)