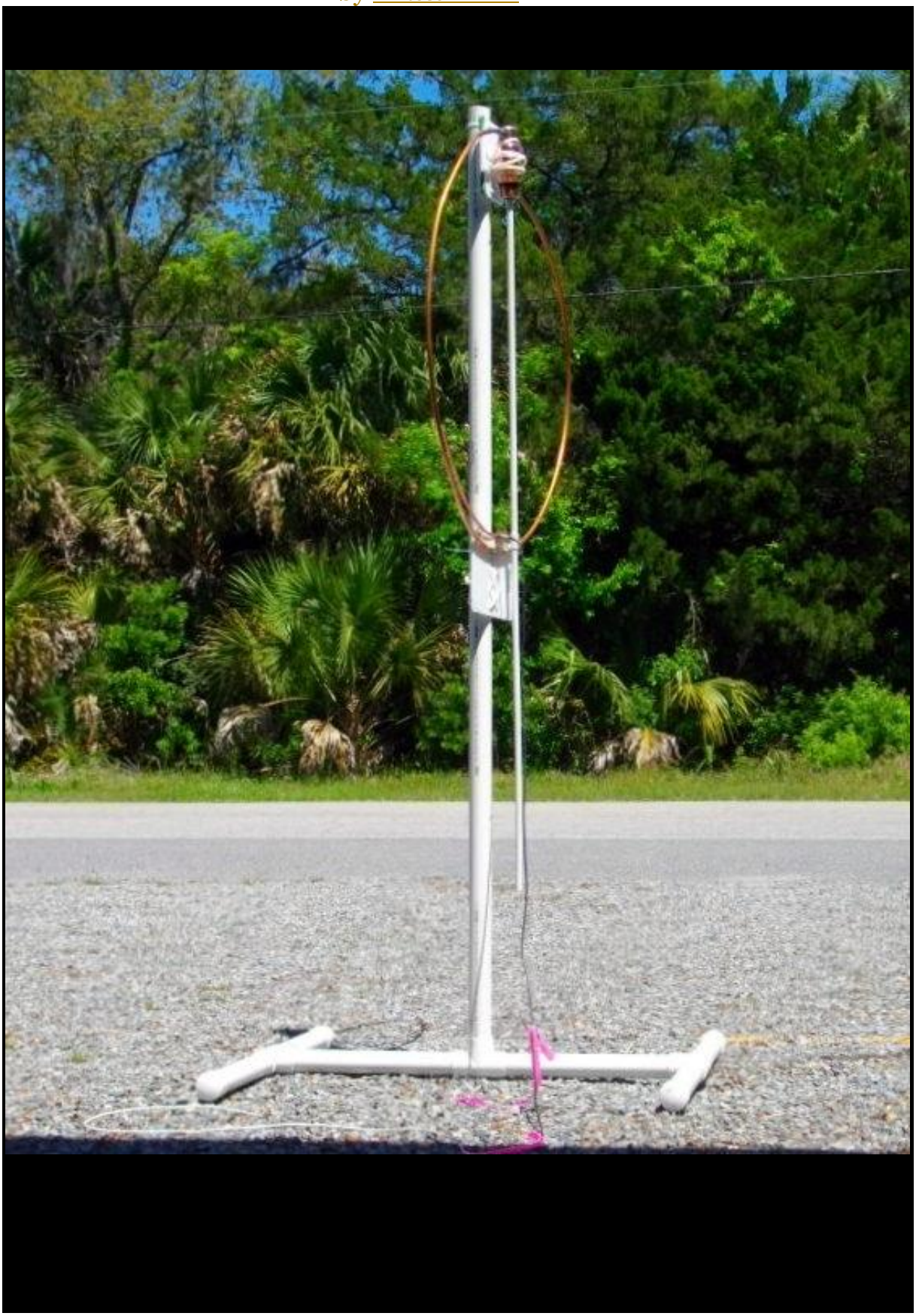
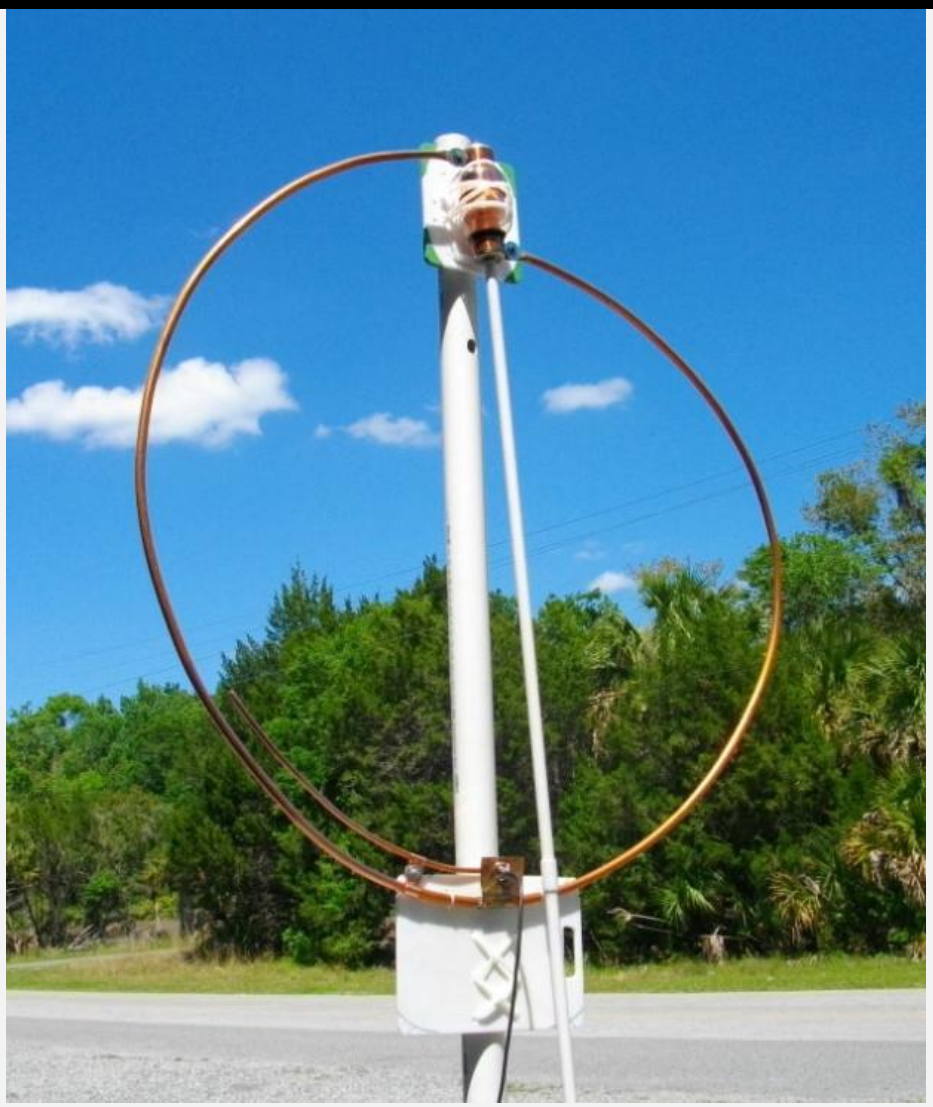
# Multi-Band 4 Foot Magnetic Loop with Gamma Match

by *Ernest AA1IK*



## 4 Foot Diameter Magnetic Loop In Operation

As my mag loop projects progress, I'm learning a lot about building them and using them. This antenna works on 17, 20, and 30 meters, with the best bandwidth on 20 meters. The bandwidth on 17 and 30 is quite small but usable. There is a 20 KHz bandwidth on 20 meters. I used a vacuum capacitor to build this particular loop for 100 watt operation. The air capacitors are good for QRP but will arc over using much power over QRP levels.



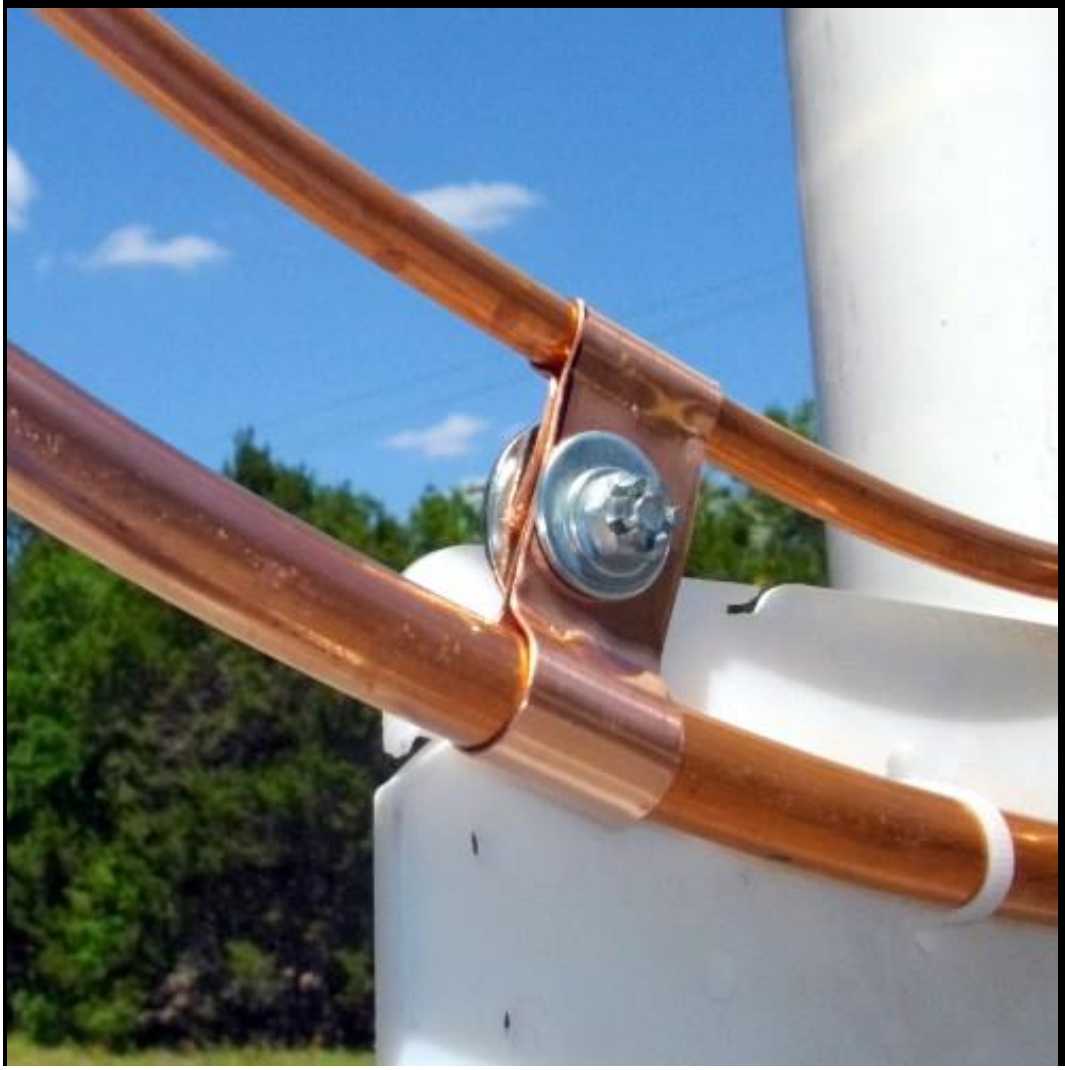
4 Foot Magnetic Loop Antenna with Gamma Match

## This photo was taken before I trimmed the Gamma Match.

I didn't know how long the Gamma Match should be, so I made it long enough to allow for trimming after the match to 50 Ohms was made.

This is the first mag loop that I made with a Gamma match. I like this match better than the usual Faraday feed loop that is featured in my previous mag loop antennas. Matching is easy and building the Gamma match is not difficult. I'm planning to build other smaller loops that will also feature the Gamma match. The smaller loops will target 10, 12, and 15 meters. Loop size determines which band its best suited too. Although it is possible to get more bands on one loop, the bandwidth is small and the tuning 'dip' is very sharp. I found it better to limit the number of bands in favor of wider bandwidth and antenna efficiency.

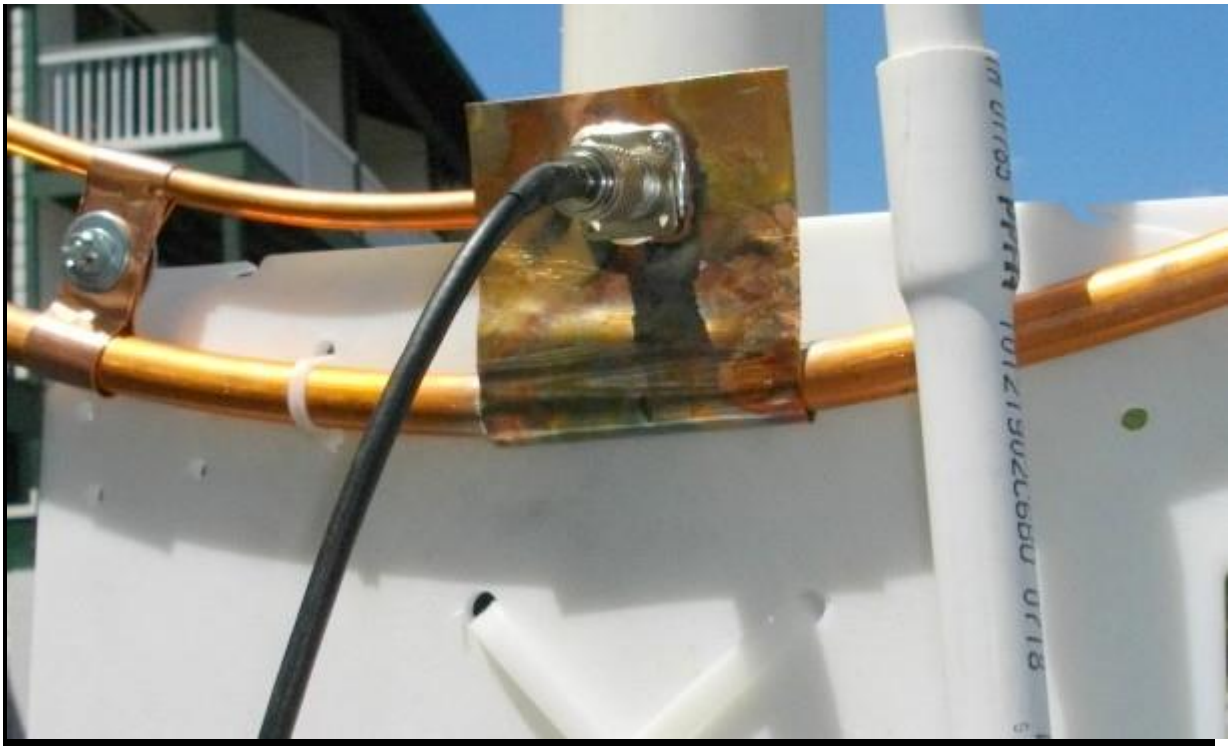
Please look up my previous posts for more details on parts and plans.



**Here is a good close up of the clamp.**

(Before Trimming)

**Gamma Match After Trimming. This enables a 50 Ohm Match for all three bands.**



**Gamma Match on the left, PL 259 in the center and, Tuning Aid Stick (PVC) pipe , on the right.**

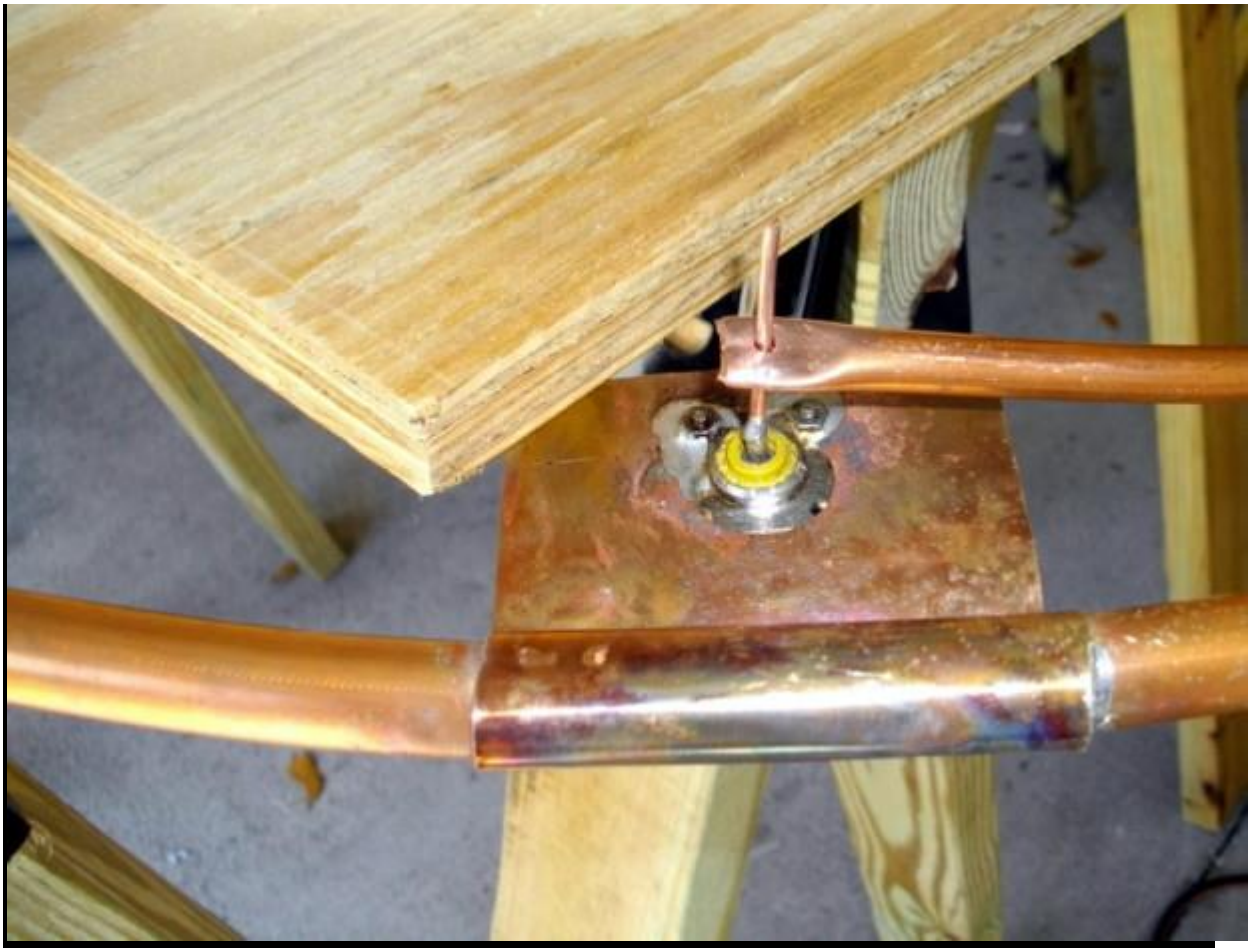
The vacuum capacitor is ‘tuned’ by twisting the PVC pipe that is attacked to it with a cotter pin.

Tuning the cap to the ‘loudest noise’ on the air will put you in the ball park for operating.

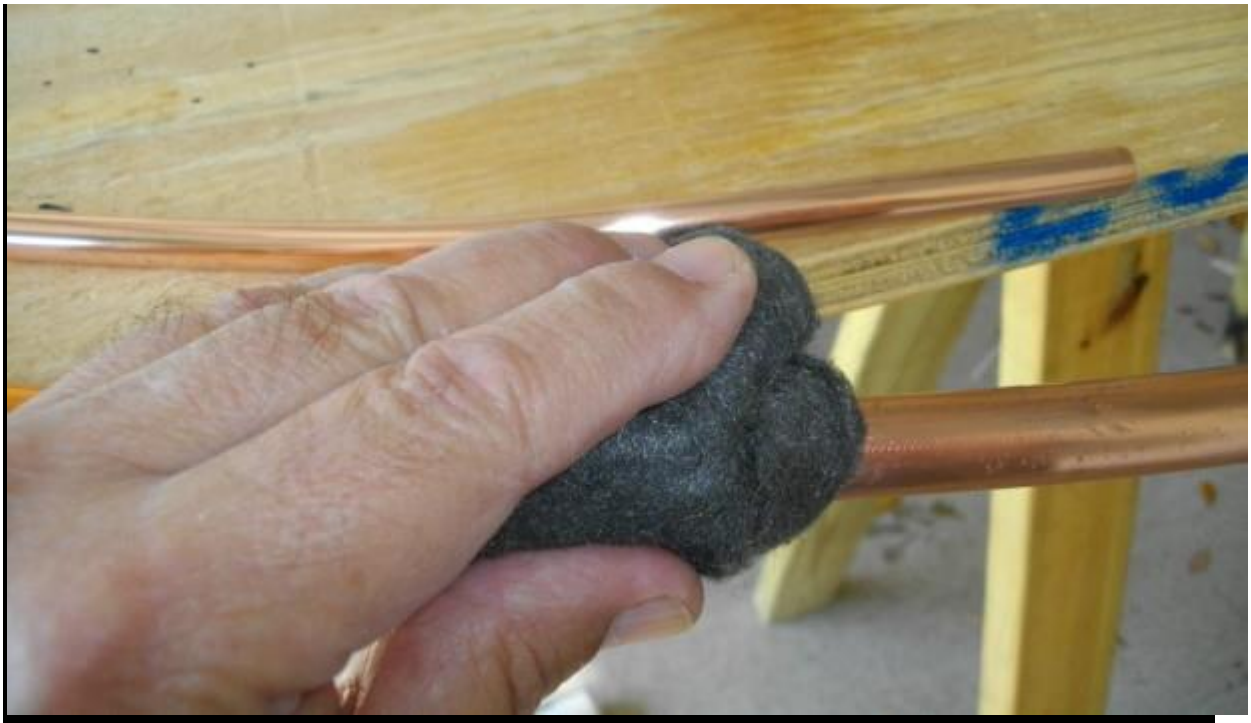
You can also use an antenna analyzer if you want to know the exact SWR, and RR of the antenna.

Tuning with a radio attached is fast and easy.

**Making the clamp for the Gamma Match**

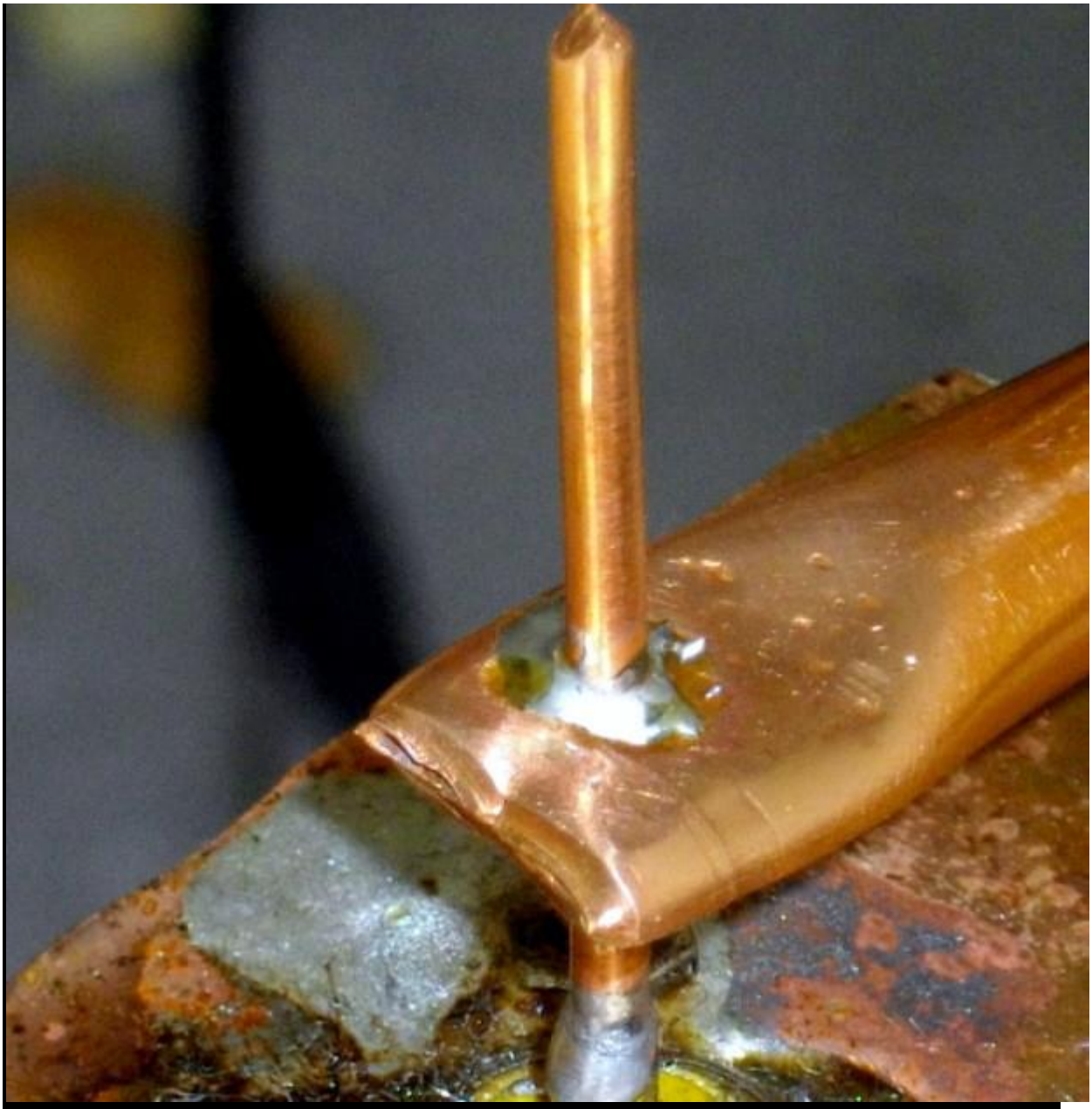


**Soldering The Back Plate and PL 259**



**Removing The Oxidation Before Soldering**

The main loop is 5/8 inch, soft copper tubing.



**Close Up of PL 259 to Gamma Match Joint**

The center of the PL 259 had a #10 solid copper wire inserted and soldered in place.

The Gamma match is 3/8 inch soft copper tubing.

**This part of the job was done with a soldering iron, the rest was done with a plumbers torch.**

**Handy ‘third hand’. A clamp to hold the Gamma match in place while I soldered it.**

My town was going to hire a ‘Mad Scientist’ but it couldn’t afford one, so they settled for a ham radio operator instead. Me!

73 de AA1IK

Ernest Gregoire

*Ernest Gregoire, AA1IK, is a regular contributor to AmateurRadio.com and writes from Florida, USA. Contact him at ernestaa1ik@gmail.com.*