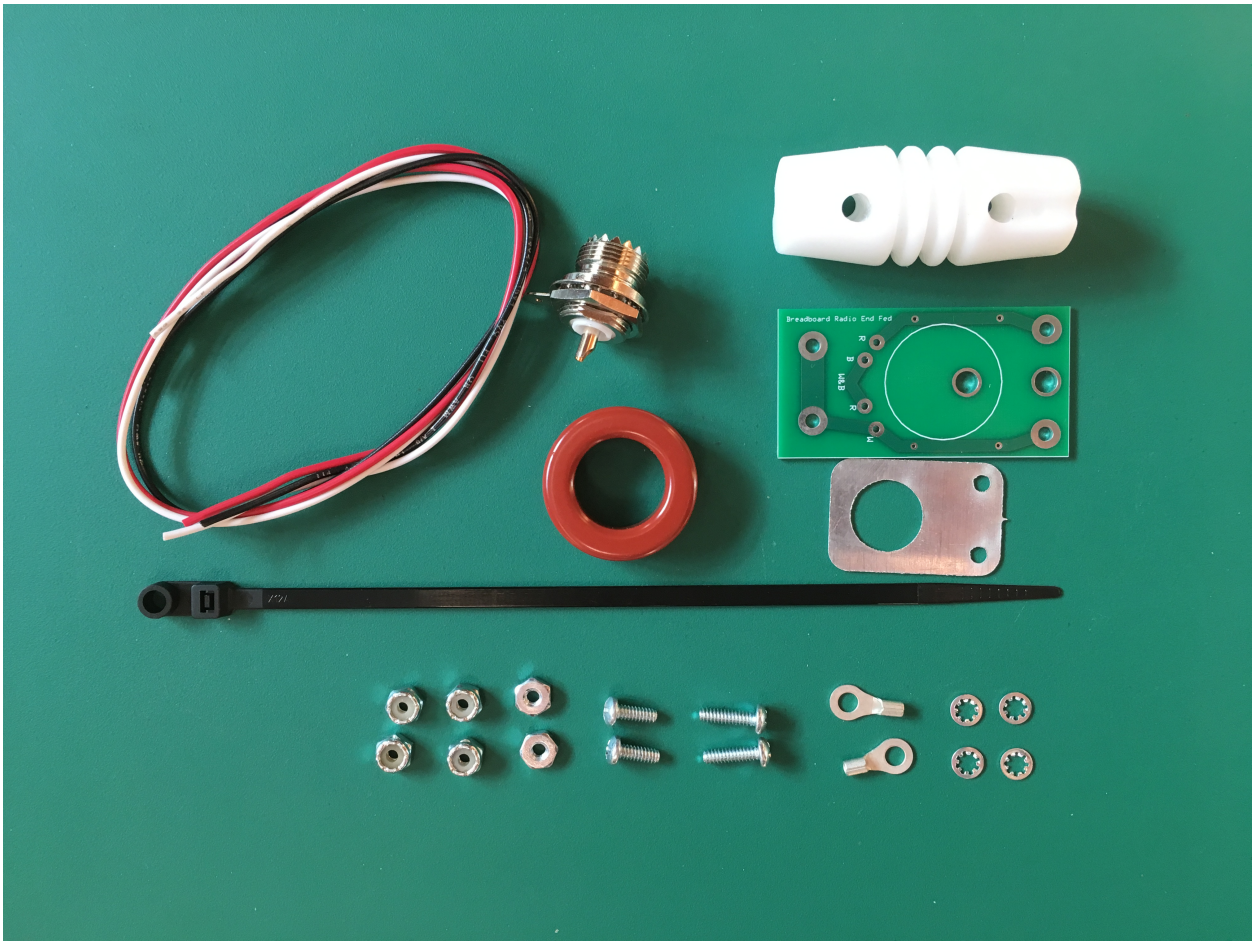
Breadboard Radio End Fed Random Wire Antenna

The Breadboard Radio End Fed Random Wire antenna is an easy to build antenna which can be configured as a vertical, sloper, long-wire, or just about any way you can come up with. Performance will will depend on height, length and an the ability to find a match with your transmitter. A good antenna tuner must be used for good performance. Unlike it's cousin, the half wave end fed, the random length of wire attached to the matching coil will determine which bands will work with your transmitter and tuner.

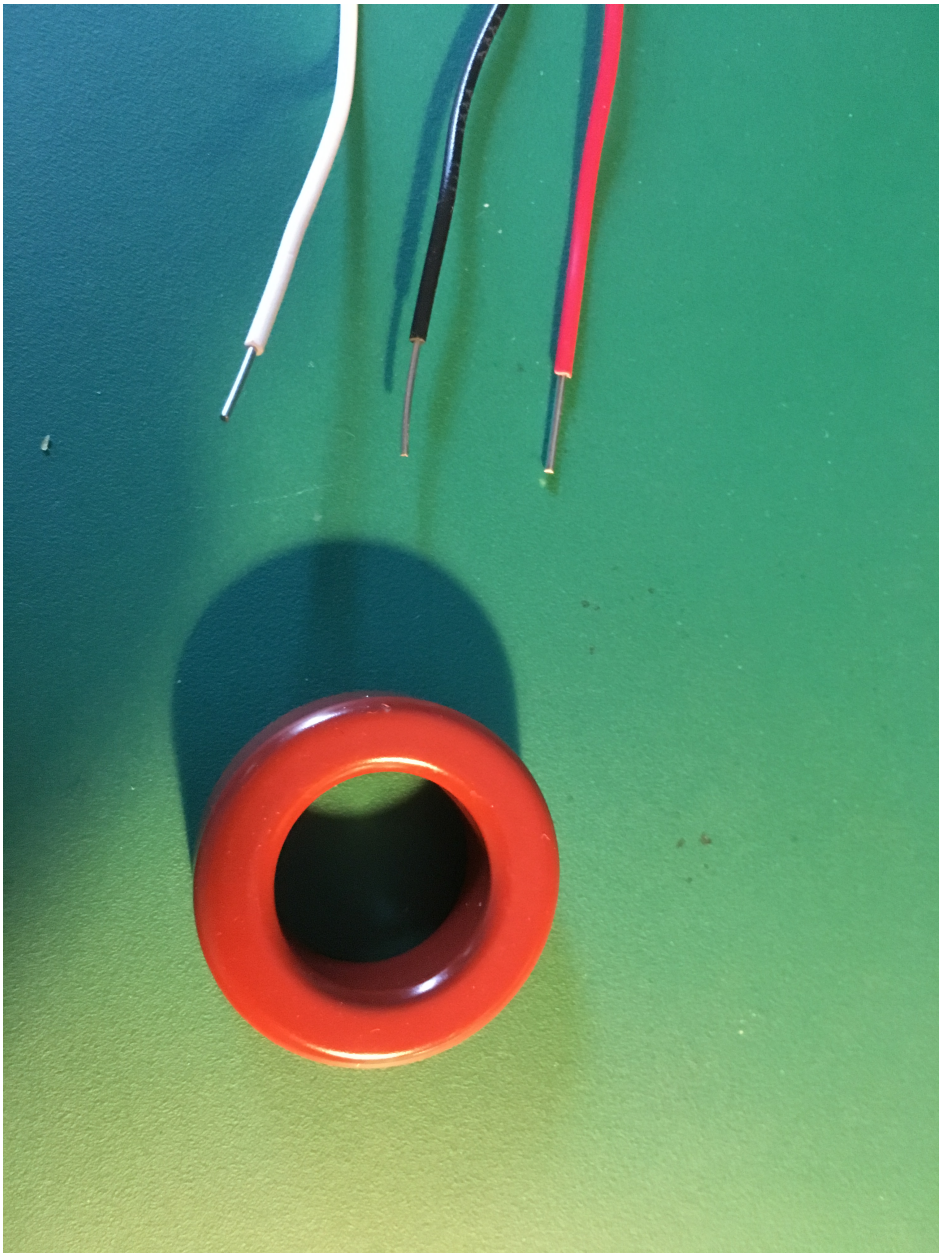
We have our end fed wire at 72 feet long and fed at 58 feet on our tower with the other end sloping down to 5 feet above the ground. It loads up on every band from 160-10 meters. When we used it as a horizontal with 44 feet of wire at 30 feet, it worked very well from 40 -10 meters with no counterpoise.

Let's get started:

Locate and inventory all of the parts according to the photo:

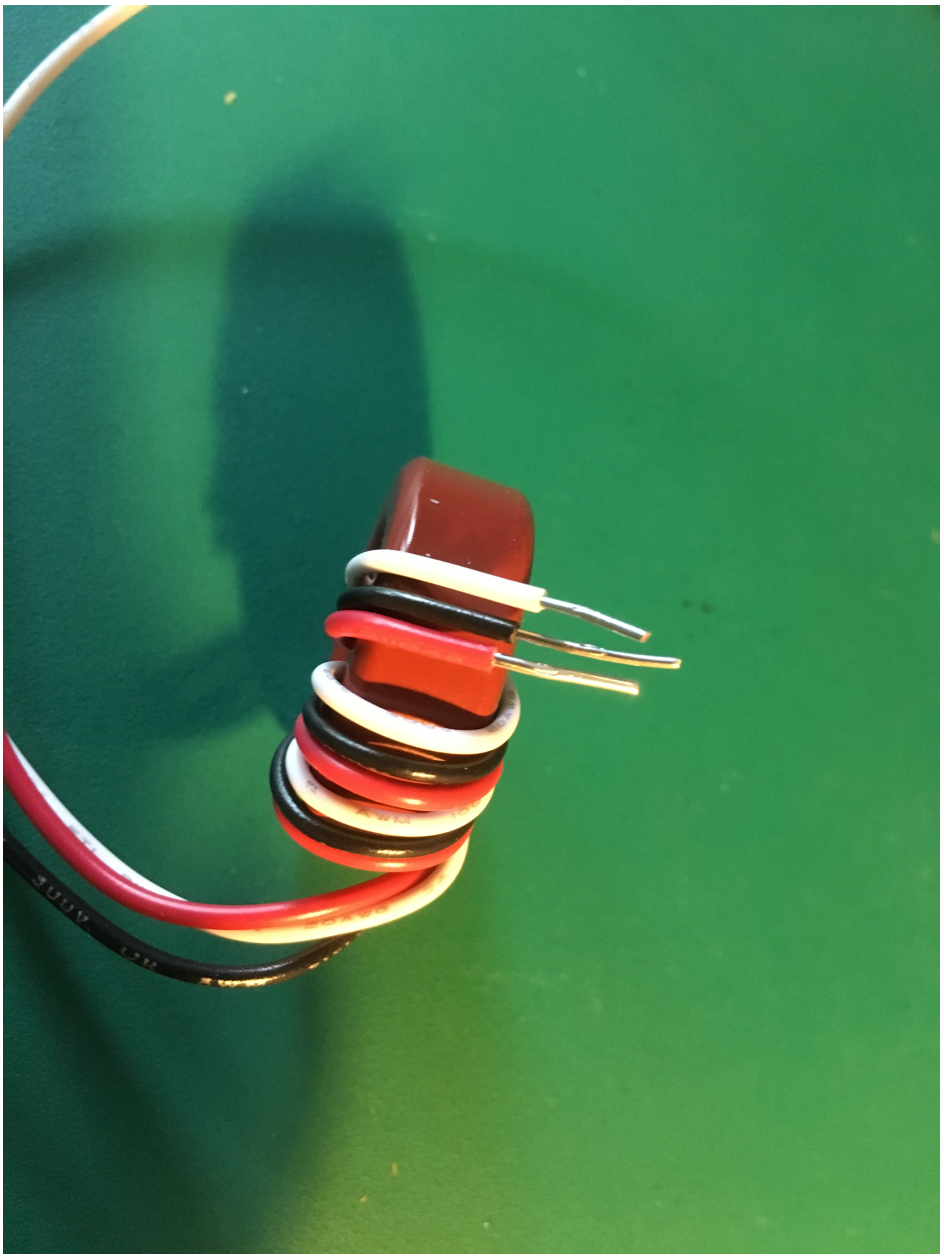


Strip about 1/2 inch of insulation from one end of the white, black, and red wire.



The three wires will be wrapped around the toroid together nine (9) times. Each turn should be tight and not over-lapping, but side to side (white, black, red).

Start your winding clockwise from the 7 o'clock position. Turns go through the center of the toroid and wrap around the outside of the toroid.

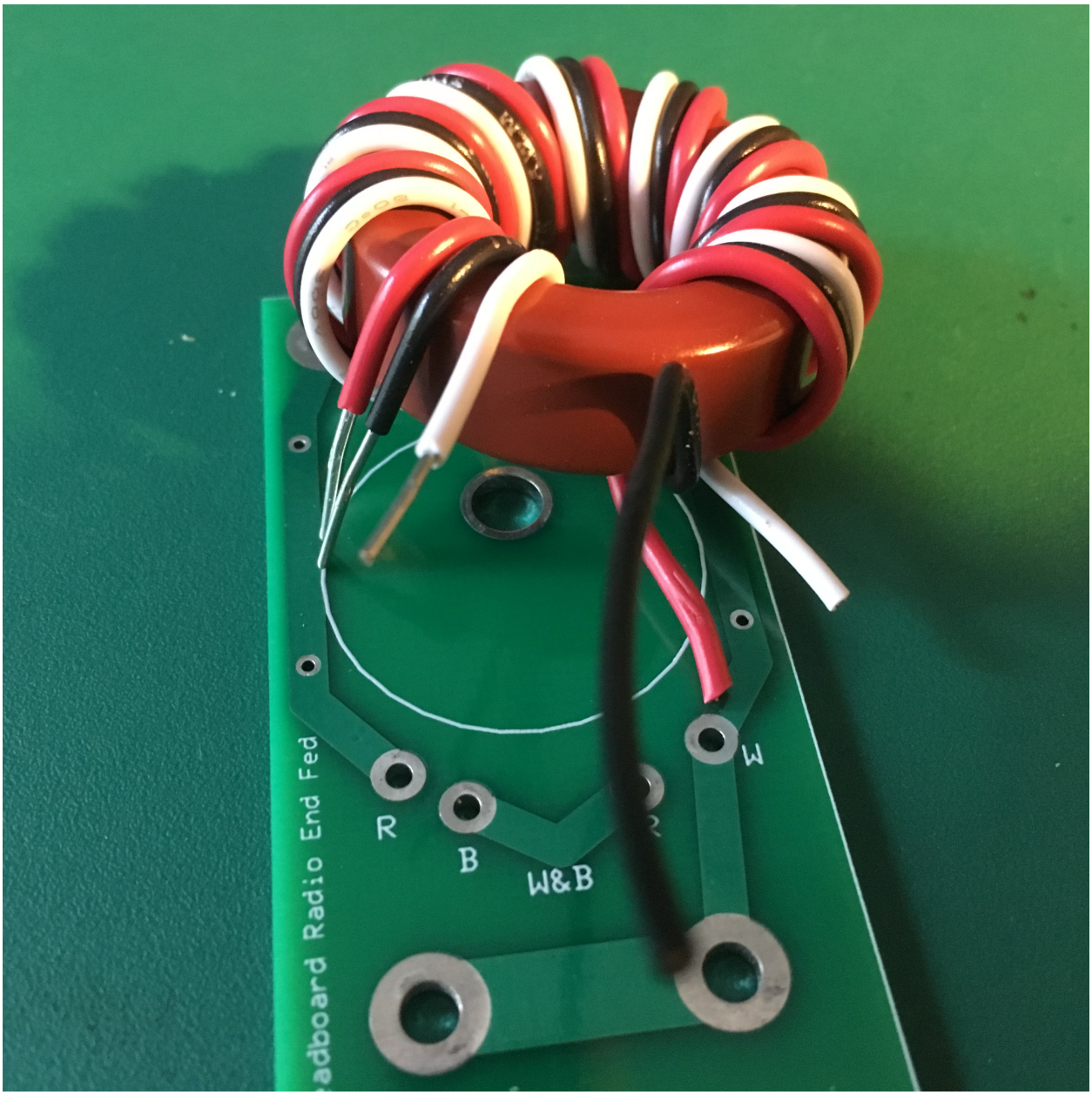


Continue until you have made nine (9) turns. There will be plenty of wire left.

Try to space the groups of white, black, red turns with equal spacing.

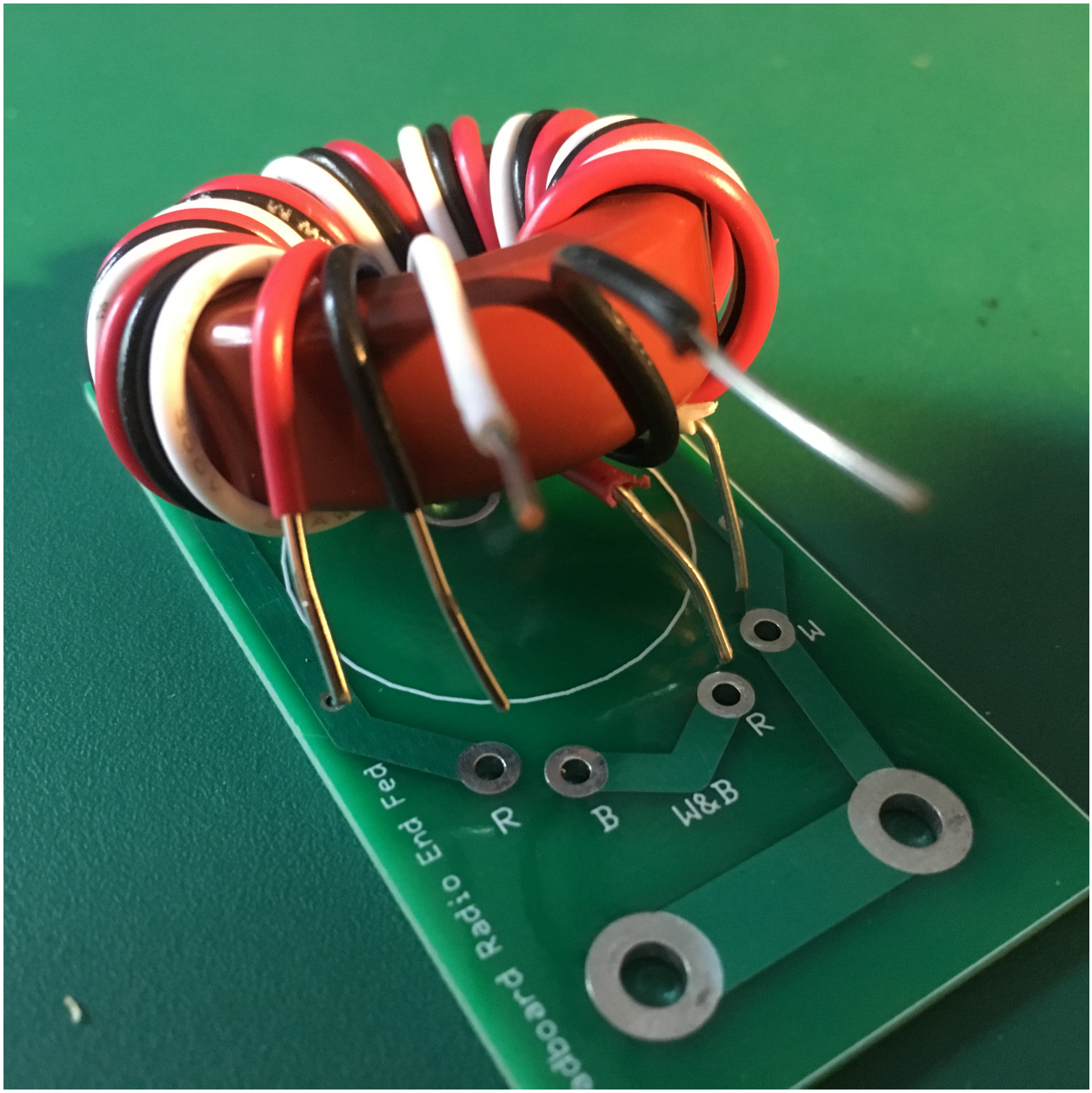
If your toroid looks like this, you have completed the hardest part of construction!

Cut the red and white wire to a length of about 1/2 inch from where they come around from the bottom to the front of the last turn.



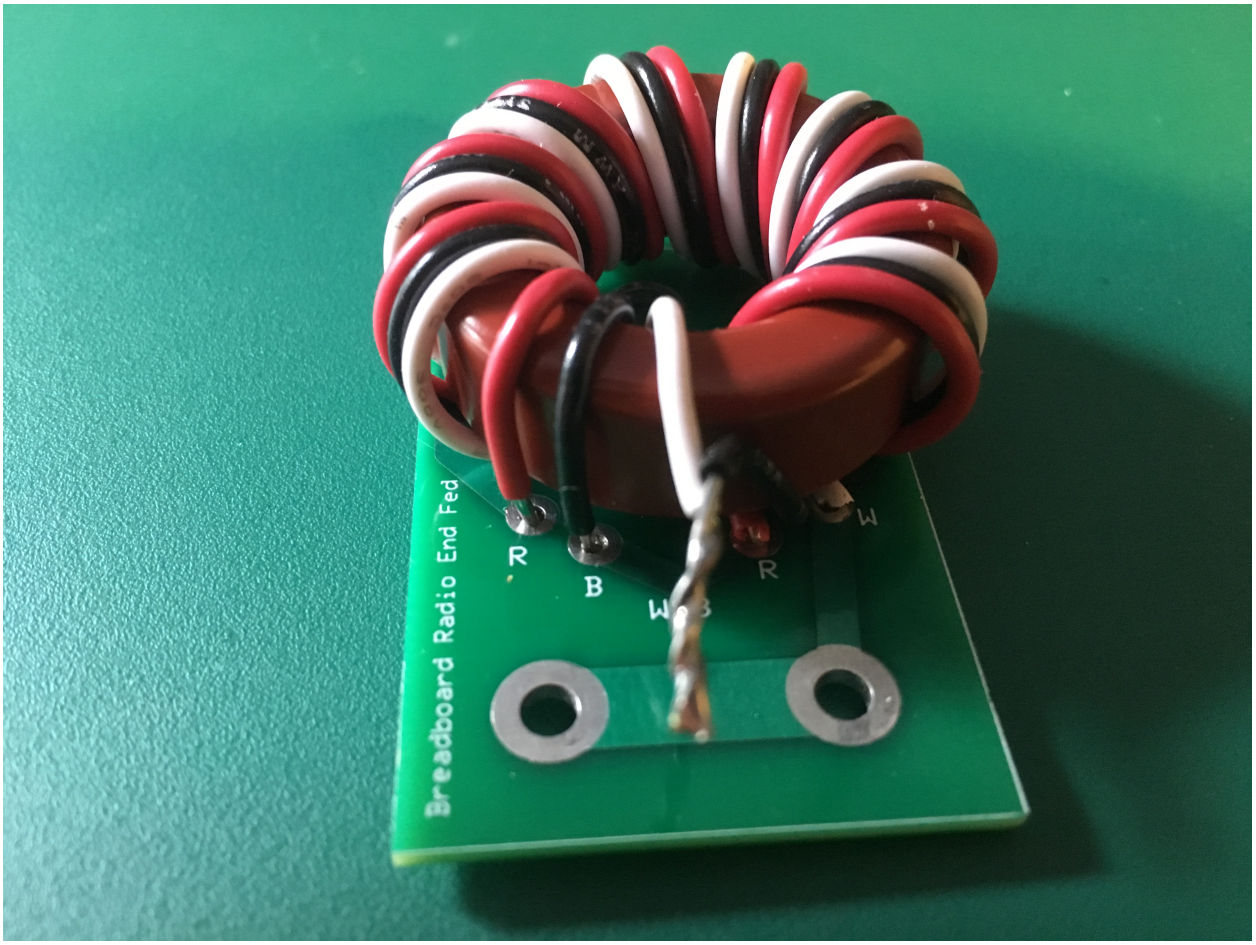
Bring the black wire straight up and bend forward at the top of the toroid as shown above. Do Not Cut Yet!

Bring the white wire from the first turn up so it points forward as it comes over the toroid.



Strip the black wire so that it will have about the same length of insulation left as the white wire.

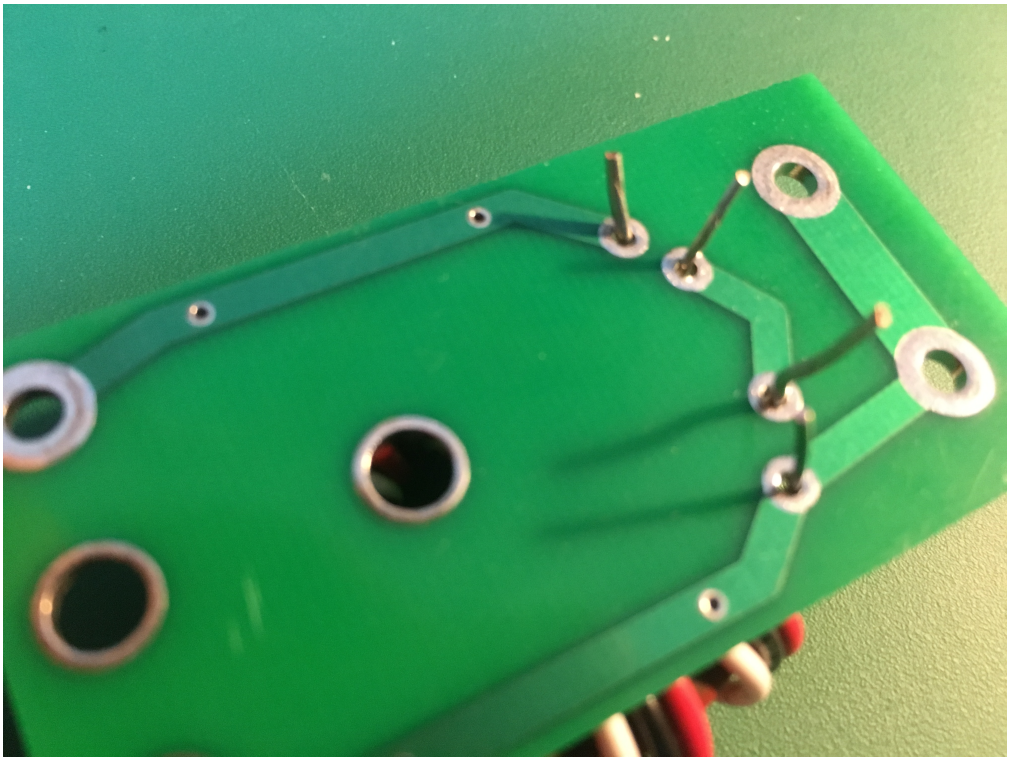
Twist the stripped ends of the black and white wires together.

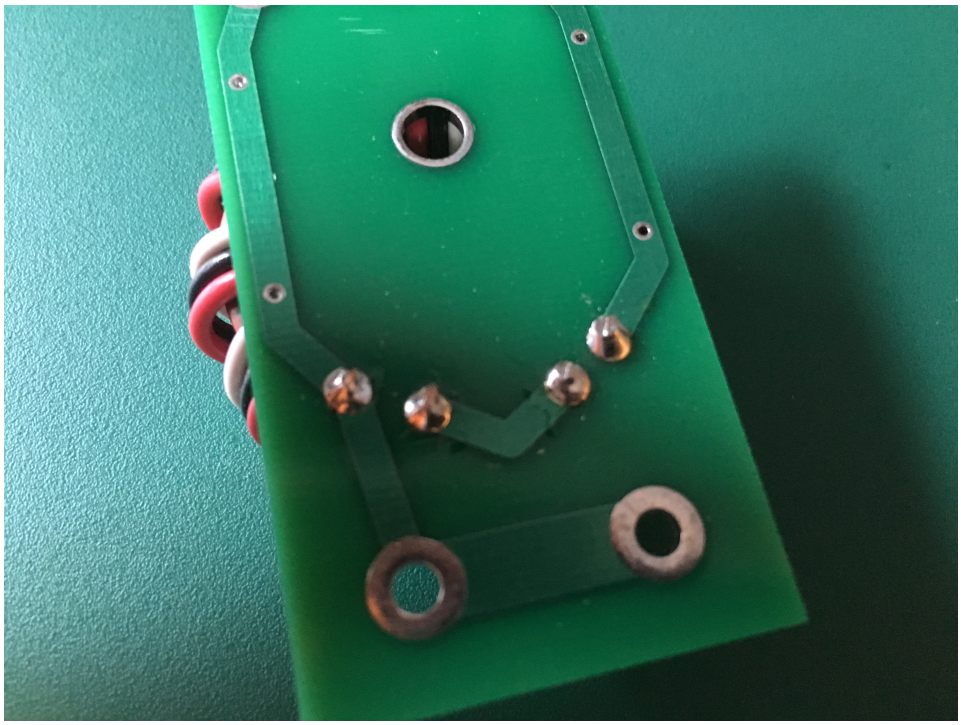


Place the remaining four (4) stripped wires into the color coded holes (red “R”, black “B”, red “R” and white “W”.

Solder the twisted black and white wires just enough to hold them together.

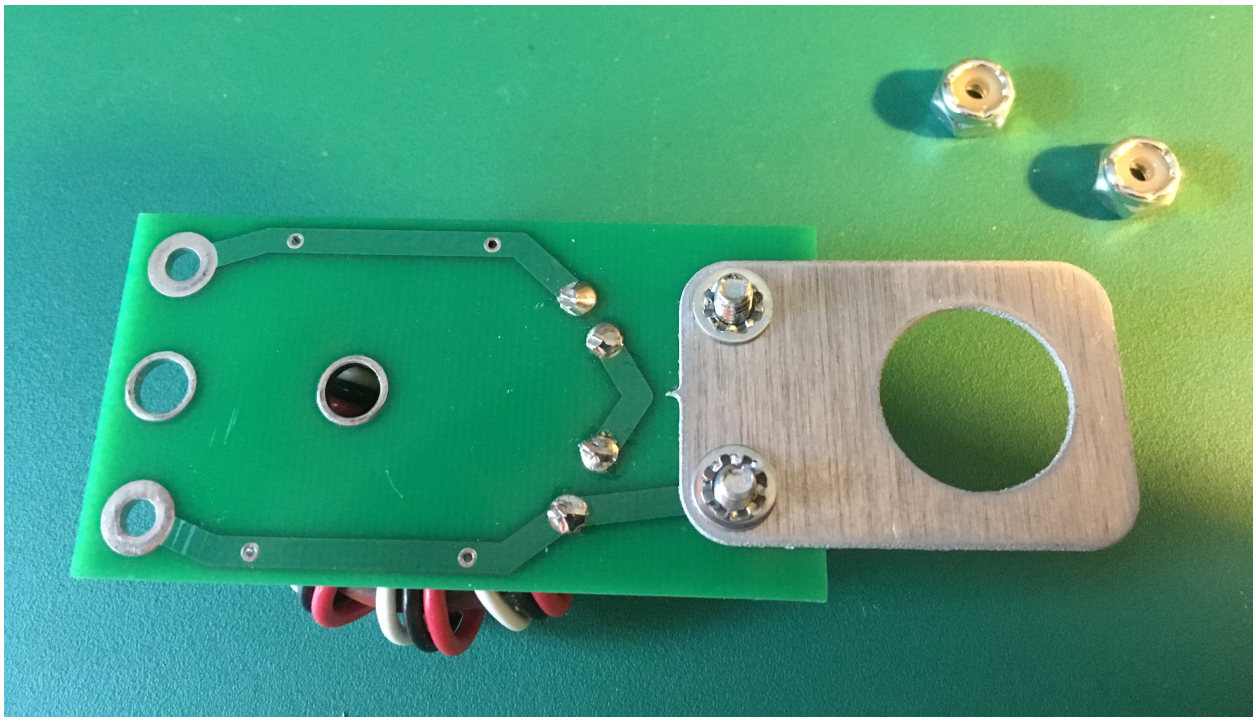
Turn the board over and pull the protruding wires tight and then solder in place.

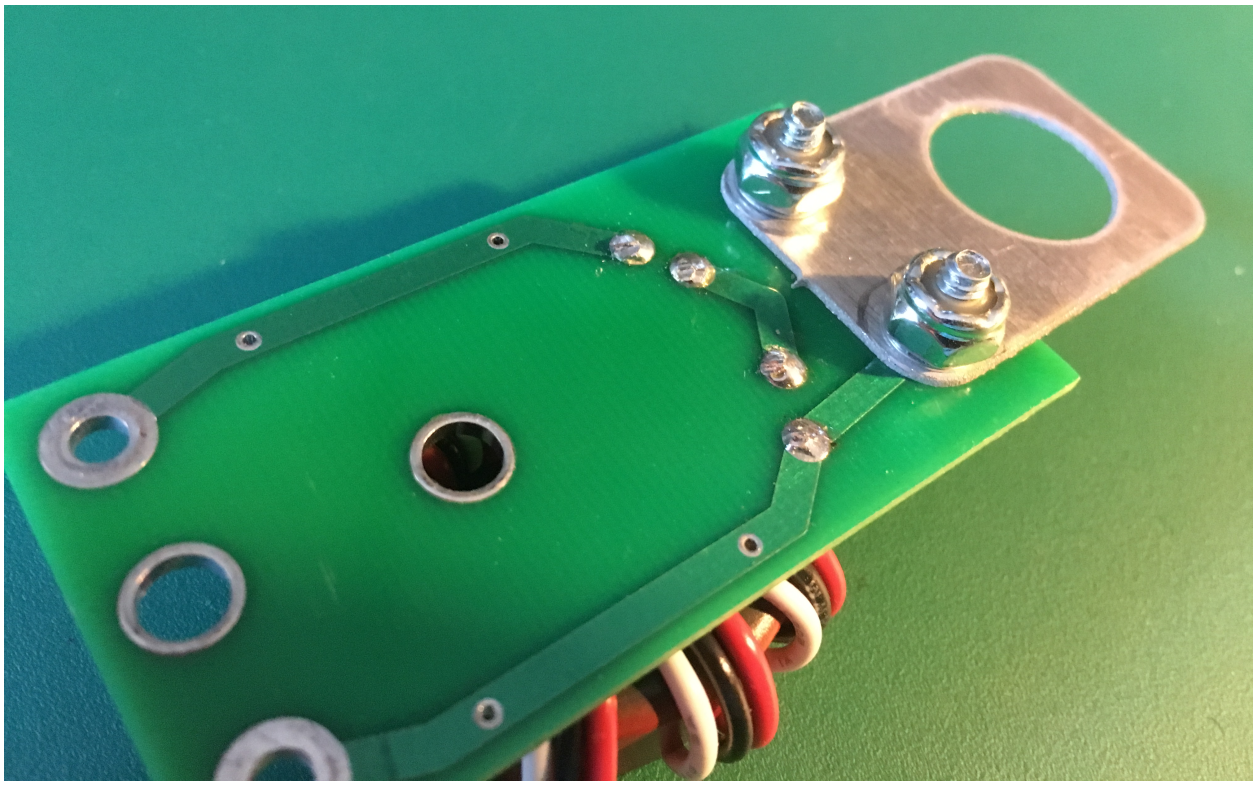




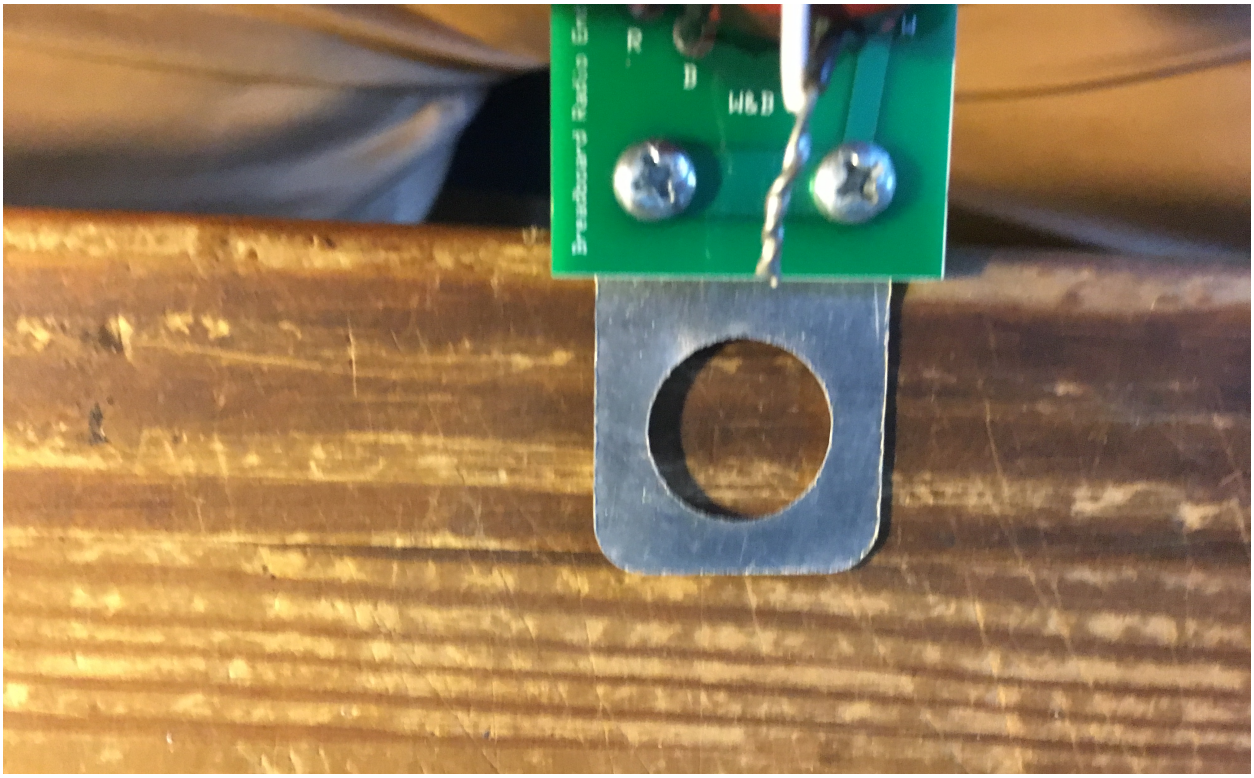
Cut soldered wires close to the board.

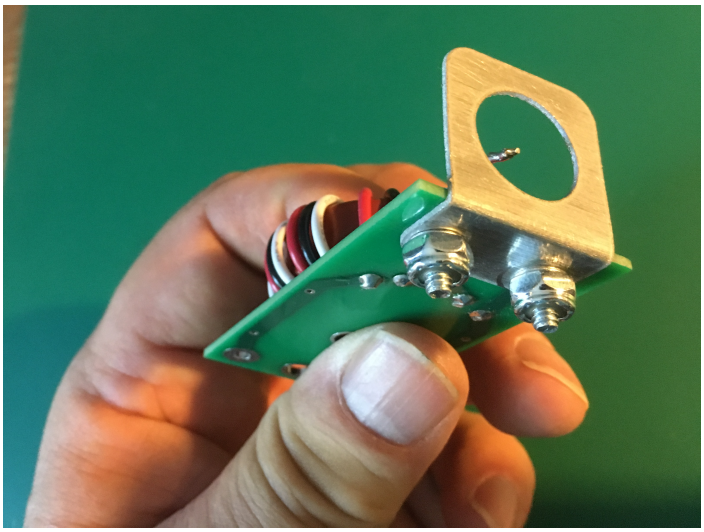
Use the 2 short sheet metal screws, 2 lock washers and 2 nylon locking nuts to mount the coax connector mount to the circuit board. NOTE: The bolts will self tap through the circuit board holes.

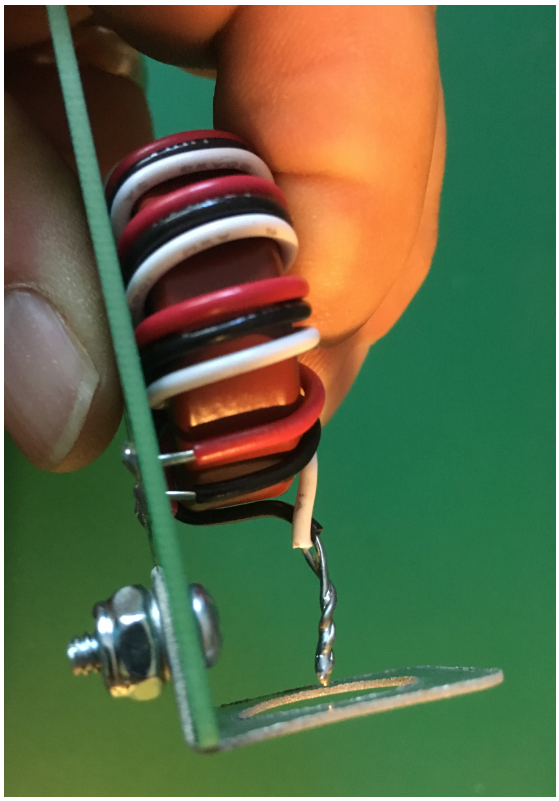




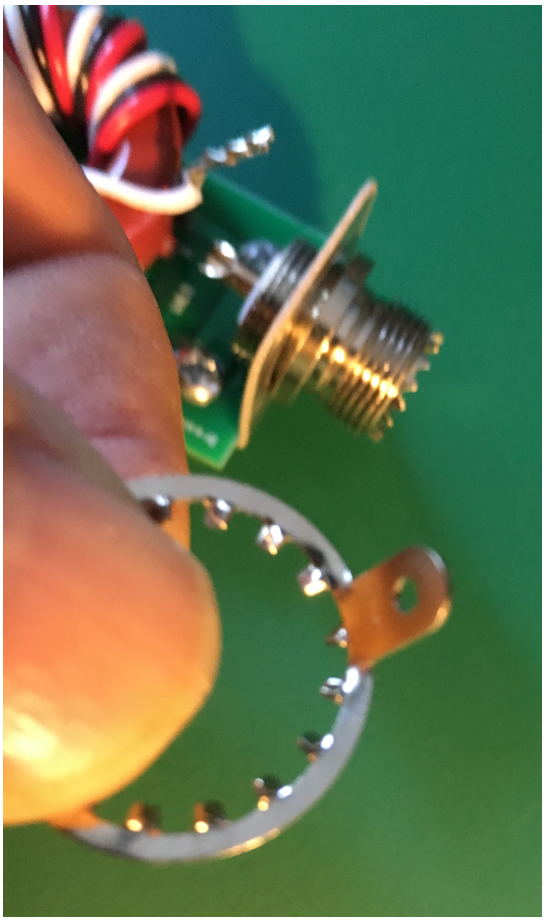
Bend the coax mounting bracket 90 degrees up as shown. Use a firm surface for a nice clean bend.

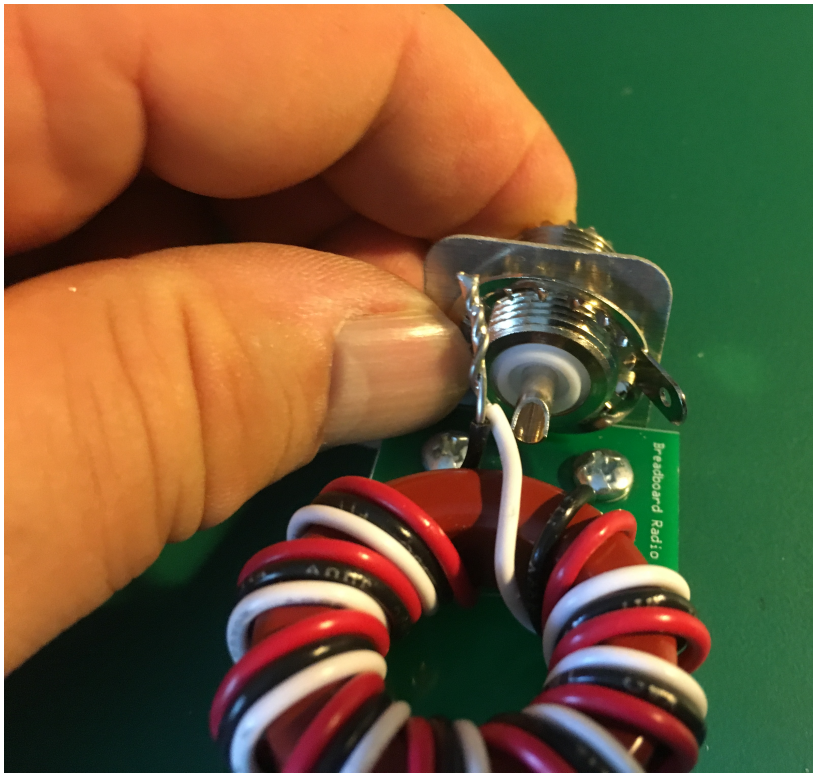




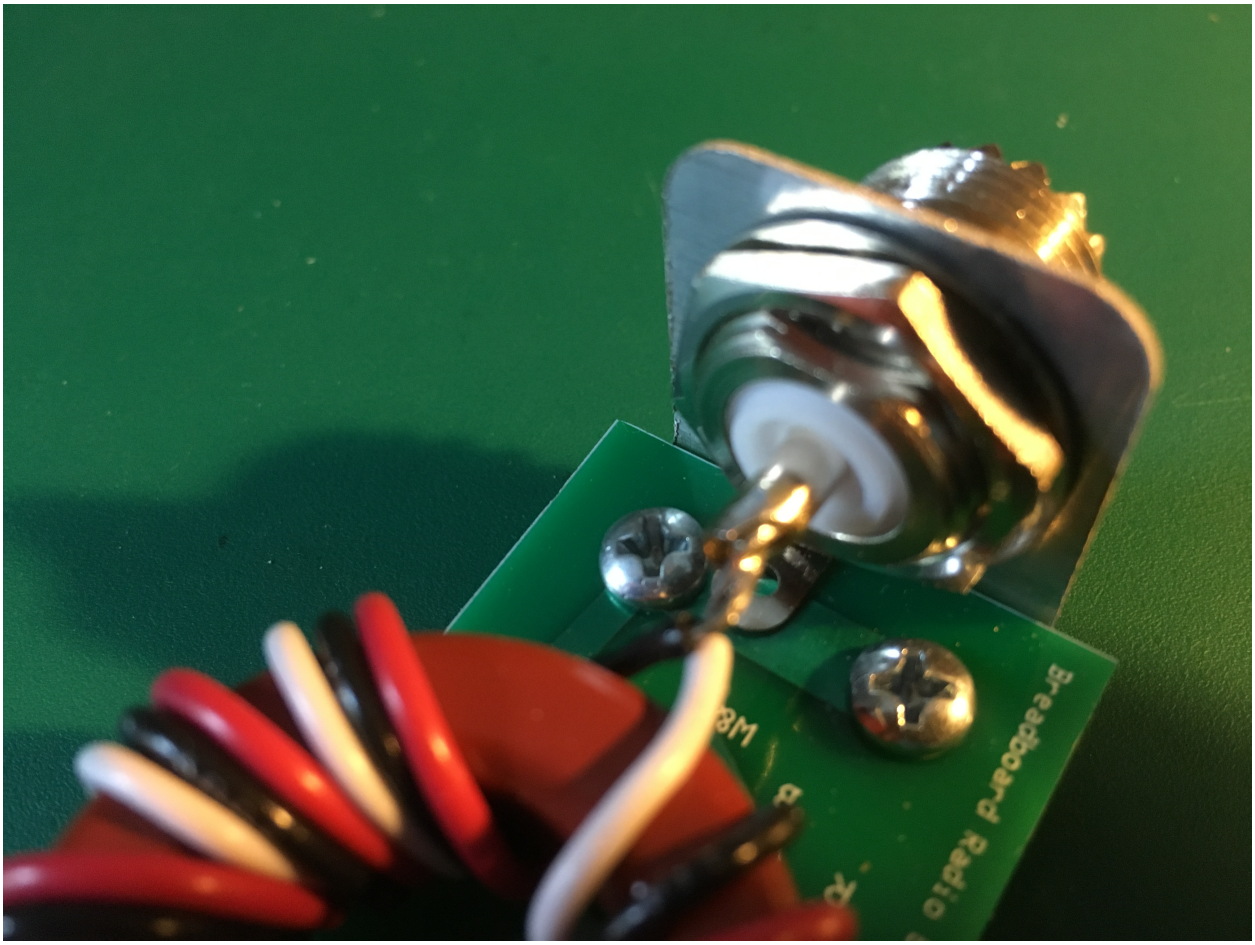


Mount the coax connector to the bracket. First, using pliers, bend the solder tab on the lock washer about 90 degrees. Then place the lock washer on the coax connector as shown.



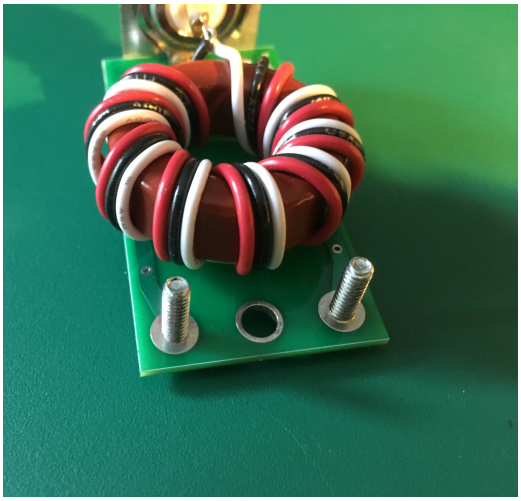


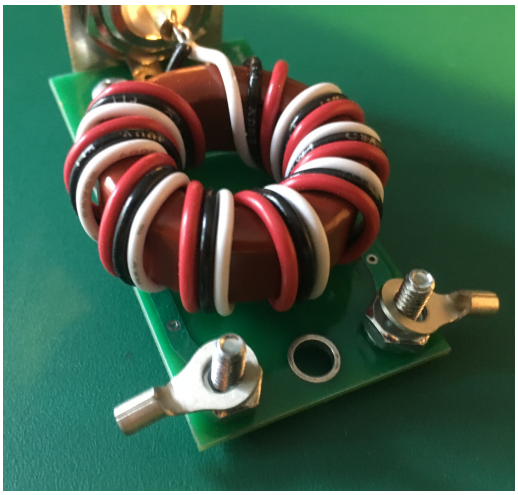
Turn the lock washer so that the solder tab is against the board. Tighten the coax connector nut tight using wide pliers or a wrench.

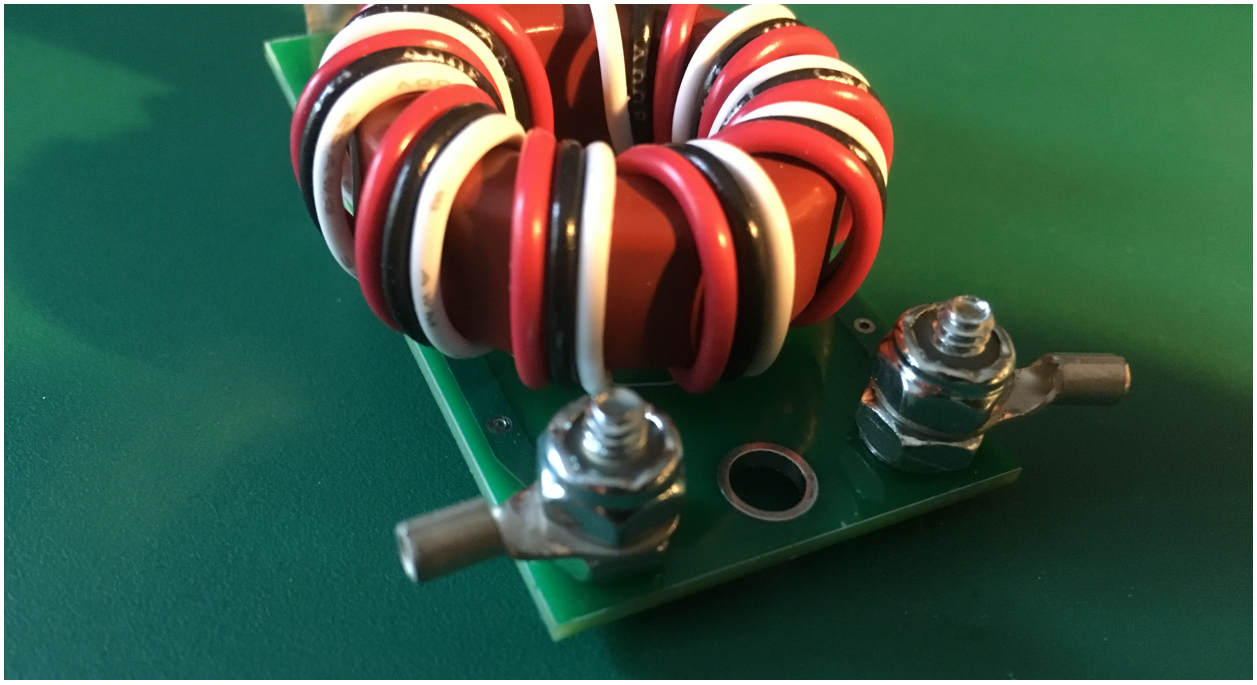


Place the twisted white and black wire into the center pin of the coax connector (trim if too long) and solder in place.

Screw the long bolts through the circuit board holes from the bottom to the top (coil) side.

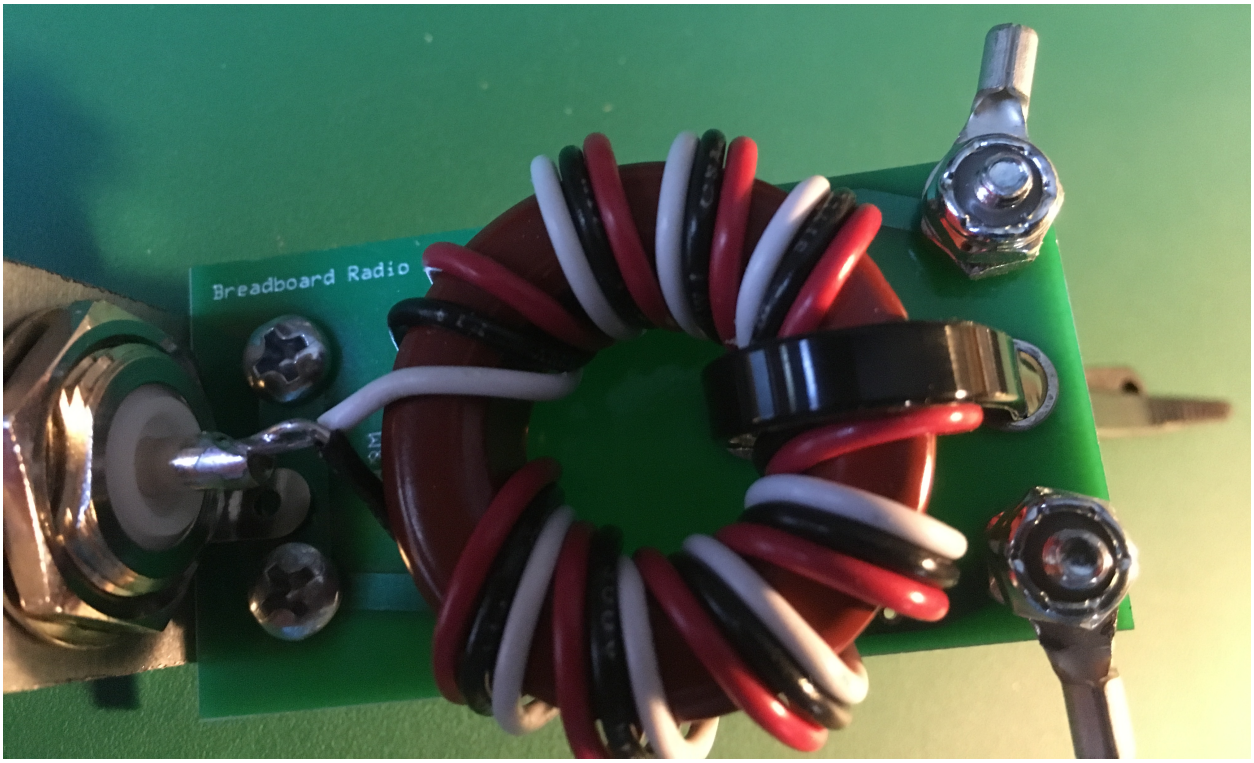




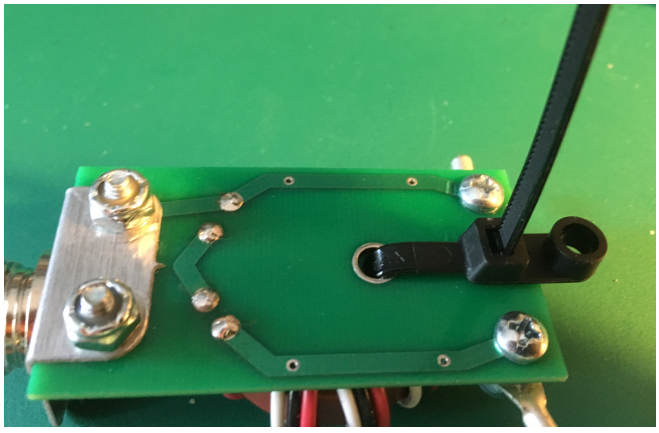


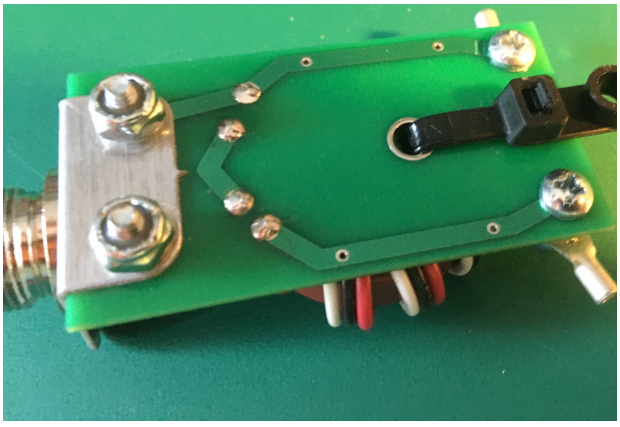
On each side, place a lock washer, plain nut, ring terminal and nylon locking nut in that order.

Pass the wire tie through the large hole from the bottom side and through the coil.

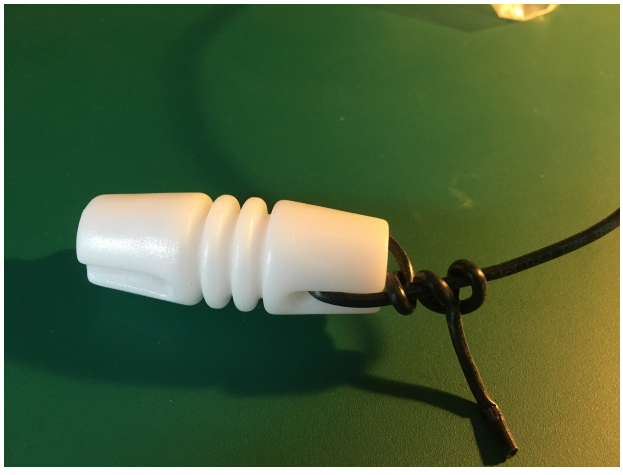


Make sure that the flat side lies flat against the circuit board. The round mounting hole should clear the board as shown.





The finished front should look like this:



Crimp and solder antenna wire and tie the other end to the end insulator.

The End Fed Wire Antenna is complete and ready to put up in the air as a temporary antenna for outings or field day, etc. Use 16 ga. wire (other sizes will work) and at least 30 feet of RG-58 or RG-8X coax (we have found that 100 feet of coax works better for multi-band operation). Extra coax should be coiled up neatly at the operating position end and will act as a current balun. A counterpoise wire will usually not be needed, but may improve performance. We have found 44 feet and 72 feet to be good lengths of antenna wire to work well in our installations, but you may wish to experiment with your station rig and tuner.

For a permanent installation, one more step should be done. Weatherproof, UV and bug proof the the matching device and all connections with Liquid Tape (available at Lowes and Home Depot). Other products work as well. Let dry well before your final installation.

Once up and attached to your tuner, apply low power and attain a SWR match. Anything 2:1 or less is fine. Once matched you may apply up to 100 watts.

R.F. and antenna installations are never quite the same. If you are not satisfied with the performance, try changing your mounting configuration or wire length or add a counterpoise of 20 to 30 feet.

DO NOT MOUNT THIS ANTENNA NEAR ANY POWER LINES!!!!!!!!!