

# Apollo

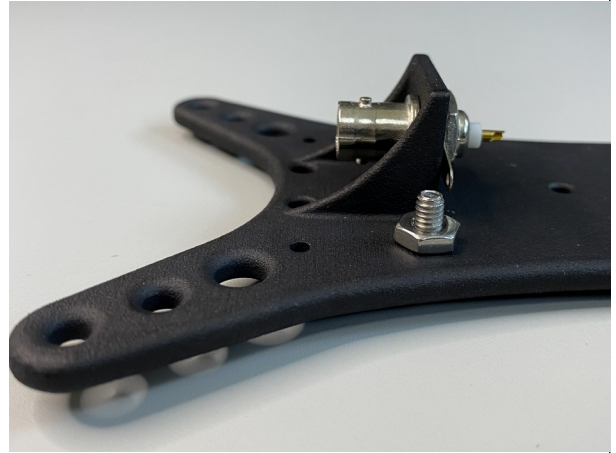
The CaHRtenna Apollo is a 49:1 End Fed Half Wave Dipole (EFHW) Antenna designed for portable use on 10, 15, 20 and 40 meter amateur radio bands. It's designed as a lightweight but rugged kit that any ham will be able to assemble with basic tools that are readily available in most ham shacks. The antenna has been tested at 50w digital and 100w SSB.

|     |                               |
|-----|-------------------------------|
| 90' | Antenna and Counterpoise Wire |
| 40" | Enamel Wire                   |
| 1   | Large Heat Shrink             |
| 1   | CaHR Frame                    |
| 1   | Sticker                       |
| 1   | Velcro Strap                  |
| 1   | Screw                         |
| 1   | Nut                           |
| 2   | Ring Terminals                |
| 1   | Capacitor                     |
| 1   | BNC Connector                 |
| 1   | Toe-Roid                      |
| 4   | Zip Ties                      |



Take a look at that antenna winder. *She's a beaut Clark.* Find the screw and nut included in your kit. Place these together in the lower left of the frame as shown. (Or wherever you want, what do we know?)

Install the BNC connector, with the female BNC being protected by the shroud. You can install a piece of coax or an adaptor onto the female side to give you a place to grip the BNC without deforming it.



Probably the most fun part of the kit is winding that big toroid. When you're done, you should have enough wire left over from the twisted section that a single lead will reach the center pin and the twisted lead should reach the ground lug. Just keep that in the back of your mind as you do this.

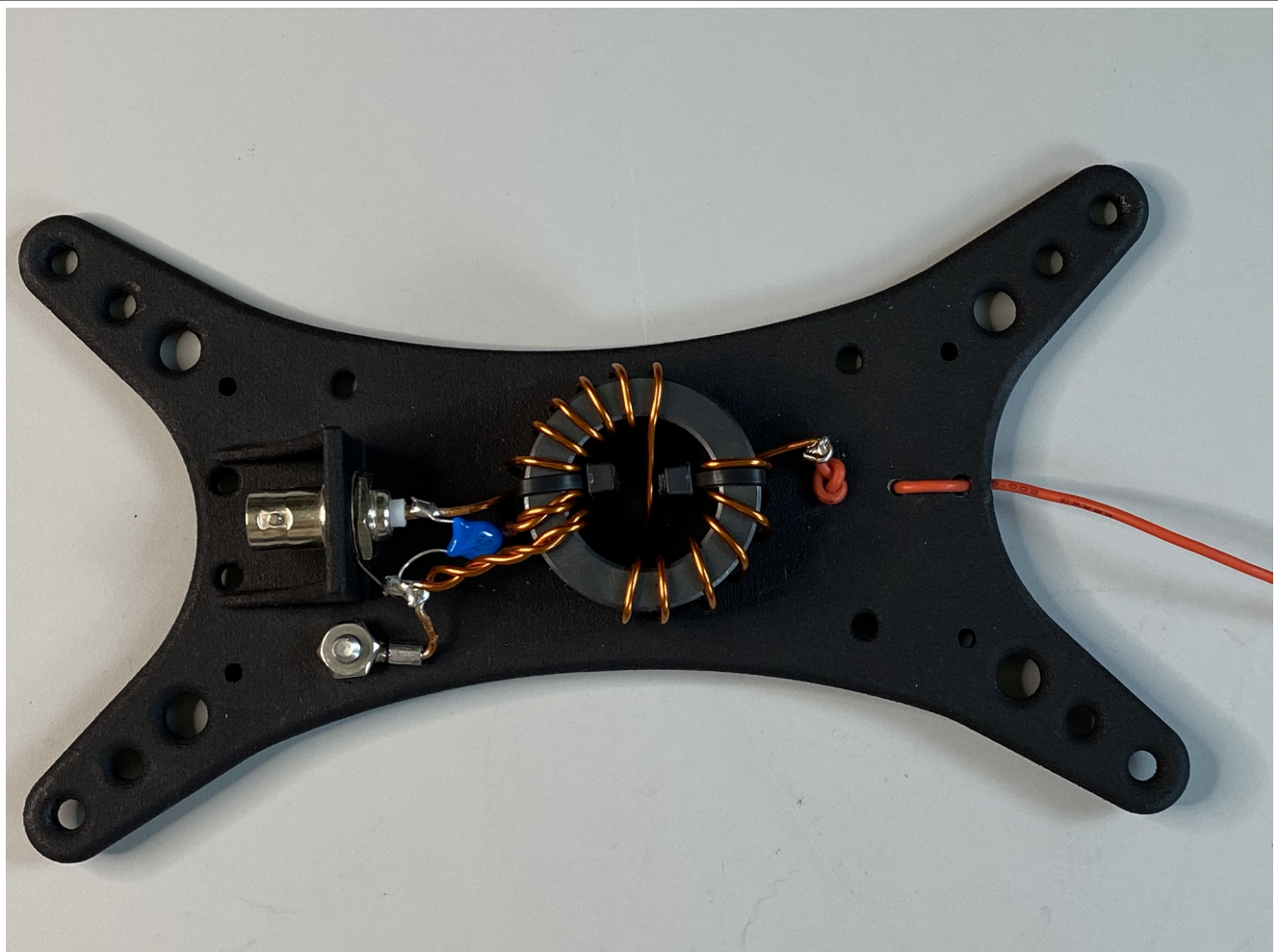
Fold over the first 8 inches of the magnet wire and twist. Don't stress about the twists, just "have some" twists.

Insert the twisted end into the core all the way to the end of the twists. Make 2 wraps to the right/counter-clockwise. Turns can be a tad loose but tighter is better. There should be enough left over to reach the ground lug with a little bit to spare. Next up, make 5 more wraps around the core. This brings you to the crossover shown in the photo above – so make the crossover and finish wrapping for 14 turns total.

Don't stress about the turns. You can adjust spacing after you are done.



Attach your toe-roid to the Apollo winder with 2 zip ties. Orient it so that the leads lie properly to connect the BNC connector and your antenna wire. The heads of the Zip Ties should be below the surface of the toe-roid so that they don't snag the heat shrink.





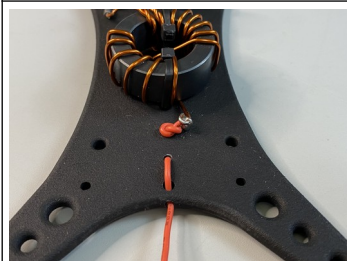
We've got some soldering to do on the coax side of the antenna. Scrape off the enamel from the wire where you'll be soldering and get after it. Here's what you'll want:

1. Solder Single Transformer Lead to the Center Pin of the BNC Connector
2. Solder Double Transformer Lead to the Ground Lug of the BNC Connector
3. Solder the capacitor legs, one each, on the center and ground conductors\*

\*Lay this in such a way that it is out of the direct line-of-fire of any odd branches, weird looks, or mother-in-laws.



Time to get your hands dirty(er). Grab your antenna wire and cut off the first 70' for your Element. The remaining wire will make up your counterpoise.



Top Side



Bottom Side

Take the remaining antenna wire and fish one end through the end of the Apollo winder, up on the first hole and down on the second hole and then up on the third hole. (There is a hole in the edge). Strip back the end of the wire and tie a knot so it won't ever come loose. Solder it to the enamel wire as shown left. (don't forget to scrape off the enamel too)

### Ring Terminals:

First things first – those red plastic booties have got to go. We are hams, we ain't got no time for "booties" !!

Strip back a bit of wire and add a ring terminal on the end. Crimp, solder, crimp and solder, crimp then solder, etc... whatever you believe in.

1. Attach a ring terminal to the counterpoise lead end of the toe-roid wire. I would terminate the twisted pair at the BNC ground lug and continue a single wire to the ring terminal. (See photo above)
2. Attach a ring terminal to the counterpoise wire.

Marry the ring terminals for the poise and the transformer at the bottom screw, secure with the nut.

Now it's time for tuning. Stretch your antenna wire out, at least 3ft off the ground, up over a tree branch, attached to a pole or whatever makes you happy – Try to set this up in such a way that you can reach the far end of the antenna and its similar to your intended operating style.

*“Always be ‘Poisen”* - Connect your Counterpoise wire to the counterpoise stud. Lay this out in the opposite direction of your main antenna element.

Using your antennalyzer trim this element to length. You’ll probably be in the neighborhood of 62’ when completed. This is a 40m antenna kit, so set your antennalyzer to the 40m band, tuned to the frequency you’re mostly likely going to work and connect your antenna. If your antenna is resonant BELOW the frequency of interest it is too long. For example: If you’re shooting for 7.185MHz and your antenna is 1:1 at 6.5MHz you’ll need to trim some wire until it comes into resonance where you want it.

If on the other hand (likely not possible with the amount of wire we’ve sent) your antenna is too short, you’ll need to add more wire. For example: if you’re shooting for 7.185MHz and your antenna is happiest at 8.5MHz, you’ll need to add wire.

In order to cheat at tuning, you can fold the wire over and twist it on itself – that way if you make it too short, you can adjust. There is a video on this.



Once you’ve got it tuned up, leave a small loop in the end of the wire and double zip-tie it for strenf.

Put the same loop in the end of your counterpoise wire.

Now that your antenna is all tuned up, take the larger heat shrink and slide it over the CaHR winder. Give it some heat and watch it shrink. Move your heat source around slowly – don’t linger in one spot for too long. Be patient so as not to burn it... and with enough time, it will magically reach the right shape – this is big stuff and will take time to shrink properly. A really long time. Slow and steady wins the race.

You should be all out of parts – Now go enjoy your radio!

Stuck? We’ve got some videos right here that will help out:

Point your phone’s camera at the QR code and you’ll be taken to YouTube videos of folks making their CaHR Apollo, Giving Tips and showing off their activations.

If you’re the video makin type, put the hashtag: ‘#CaHR-Apollo’ in your description and we’ll add it to the list.

