DIY

Worthwhile projects you can build on your own

6-meter vertical dipole antenna

Due to a couple of regular local nets, and the fact that we've finally reached past the bottom of the sunspot cycle minimum, we're starting to see a resurgence of interest in 6 meters, especially for SSB (single sideband). This project is nearly identical to the roll-up 20-meter antenna I showcased last year (*UVARC Shack*, September 2018), but for 6 meters.

The roll-up dipole is very portable, and when mounted, is less than ten feet long. Also, instead of being centered within the entire 6-meter band, this antenna will favor the lower end of the band, where SSB is likely to be used. I hung my antenna from a tree limb with paracord through one of the ¼˝ stud ring terminals, and secured the ring terminal on the other end by paracord to a ground stake. This resulted in my antenna being center-fed by the coax, which wasn't a problem, since the center was only six feet above the dirt, an easy reach.

Parts list:

10 feet of 18 AWG speaker wire (5 feet of the pair)
5 inches of 2.0 mm heat shrink tubing
1 2.5 mm X 8 mm flathead, beveled machine screw
1 2.5 mm X 0.45 mm nut
1 BNC (female) solder bulkhead connector
1 16 AWG ring terminal for #4 stud
2 16 AWG ring terminal for ¼" stud
1 2.5 mm flat washer
1 2.5 mm lock (split) washer
1 BNC male-to-SO-239 adapter

BNC female solder bulkhead

speaker wire

ring terminals

BNC / SO-239 adapter

First, I started by calculating how long my wires should be. Using the typical frequency-to-feet conversion formula for a quarter-wavelength, I figured that each element (side) should be

234 / 50.200 MHz = 4.67 feet, or 4 feet 8 inches

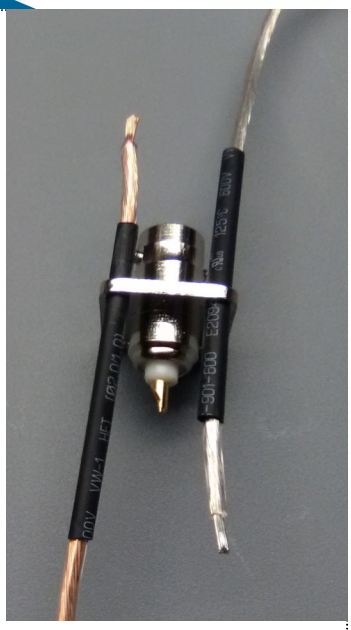
But taking the wire's velocity factor (0.95) into account, the actual length should be closer to

4.67 feet X 0.95 = 4.44 feet, or 4 feet 5 inches

DIY, continued

6-meter vertical dipole antenna

Construction



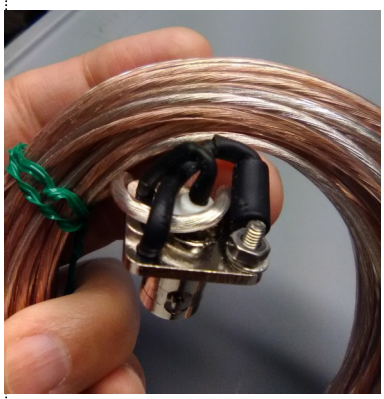
First, I carefully ripped the speaker wire pair down the middle to separate the two halves. Then, I slipped a 1″ piece of the 2-mm heat shrink tubing over each of the separated wire lengths, a couple of inches from the end of the wire, and stripped about ¼″ of insulation off each end. Next, I threaded each wire, along with its tubing, through one of the mounting holes of the bulkhead to relieve the strain on the wire against its connecting joints. In the end, the shrink tubing is applied more for protecting the wire insulation from cutting by the sharp mounting holes.

Next, I soldered one of the wires to the center solder pin of the connector, and shrank the tubing over the soldered connection. For the other wire, I soldered a ring terminal for #4 stud, then mounted it to one of the free holes of the bulkhead using a 2-mm bolt, nut, and split washer, then shrank its tubing as well.

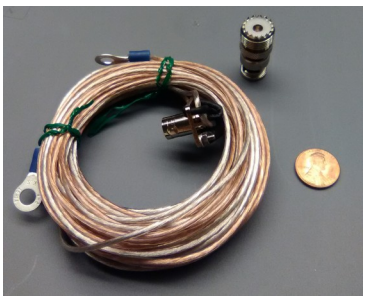
I measured and cut each wire 4 feet 5 inches (4 feet 4 inches after tuning) from the bulkhead, then applied Super Glue to connect the wire to a ring terminal for a ¼″ stud. The ring terminal is only used as a mounting hook, so that I can stretch out the dipole in a vertical configuration. The glue allows for a strong, non-electrical connection between the wire and the terminal.

Testing the finished product

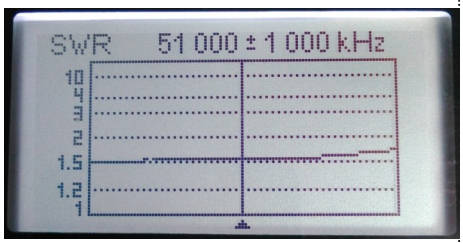
To test the antenna, I connected a BNC-to-SO-239 adapter, then stretched it across some 6-foot-tall garden stakes I had in my garage. Ignoring the proximity to the Earth, I hooked it up through some coax to my antenna analyzer, and was pleased with the results. The center frequency showed an acceptable SWR (about 1.5:1), skewed more toward the lower-end of the 6-meter band. And this is what I wanted, because that's the end where most SSB traffic takes place. Next step: take this little gem up to the mountains to chase some DX when the sunspots decide to return.



Finished detail



Compact roll-up size



Not perfect, but not bad

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