



DIY

Worthwhile projects you can build on your own



Off-center-fed dipole antenna

In past issues of the *UVARC Shack*, we've brought you designs for a simple 80-meter dipole, a multi-band fan dipole, and a window-line dipole (G5RV), but never a simple wire "dipole" that can serve multiple bands. Probably one of the easiest ways to construct a multi-band wire antenna is by using an OCF (off-center-fed) design. The one featured here supports **80-meters, 40-meters, 20-meters, plus 10-meters**, and is based on [the design by Balun Designs](#). The most difficult part of an OCF antenna to build, however, is the 4:1 current balun, used as the center insulator. Its primary purpose is to transform the OCF characteristic 200-ohm impedance into the 50-ohm impedance that matches your coax.

The difficulty in building the required balun is due to obtaining the proper ferrite core, and then properly winding it. Therefore, in this project, you have a choice: you can order an already-constructed balun, or you can order a balun kit. For an over-the-counter balun, you can purchase the [MFJ MFJ-913](#) 4:1 current balun, which is what I'll use in this article. Or you can purchase the [Amidon AB240-250](#) 4:1 balun kit, if you'd really like to tackle the winding job, but you'll also need to purchase an [appropriate enclosure box](#) for it. Either way, the focus is on the antenna, rather than the balun, so that allows me to cheat a little here.

Parts list

- 133 feet of 14 AWG stranded wire
- MFJ MFJ-913 4:1 current balun
- Appropriate heat shrink tubing, some paracord, zip ties
- 2 dogbone insulators (you can fabricate these from ½" PVC, about 3" long each)



dogbone insulator

Cut the 14 AWG stranded wire into two pieces, one 48 feet and the other 85 feet long. Thread one end of each insulated wire through the side eyebolt of the balun, then wrap the wire around itself two or three turns. Strip the end of the wire, slip an inch of heat shrink tubing over the insulated wire, and connect (crimp a lug or solder) the wire to the balun, allowing three or four inches of the balun wire to hang down as a drip loop before entering the balun.



DIY, continued

Off-center-fed dipole antenna



Zip tie the wire where you wrapped it around itself, as a strain-relief. Repeat this with the other wire on the other side of the balun.

Thread the loose end of the 48-foot wire through a dogbone insulator, measuring 46 feet 9½" from the balun eyebolt to the dogbone. Wrap the wire around itself two or three times, but do not cut the excess wire off. Repeat this with the 85-foot wire on the other side, but measuring 83 feet 2½" from the balun eyebolt to the dogbone. These two wires are now your antenna *elements*.

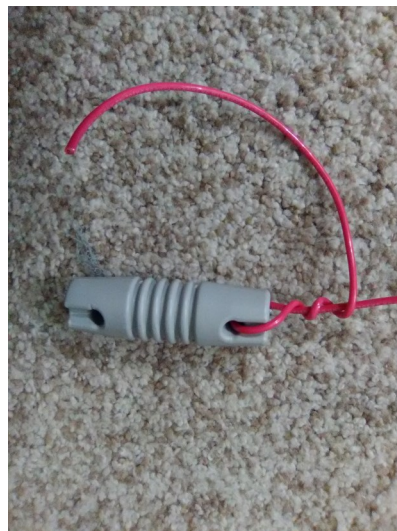
Create an RF choke at one end of your coax (coaxial cable) by forming an eight-inch loop out of five or six loops of the coax, then use four or five zip ties to keep the loop together. Attach the PL-259 connector at the end of your RF choke loop to the SO-239 connector of your balun. Tie (optional) a four-foot piece of paracord to one of the balun eyebolts, then route the paracord through the RF choke coil, wrapping the paracord three or four turns around the RF choke coil for a strain-relief. Tie the other end of the paracord to the other balun eyebolt.



RF choke zip tie-secured



paracord strain-relief



dogbone tied on one end

The performance and SWR with this antenna will measure differently between installing it close to the ground, up in the air, and near metallic objects. If possible, raise the entire length of the antenna up at least 25 feet before you start measuring, and try and keep all parts of the antenna away from gutters and aluminum siding. Using your analyzer on 80 meters, tune the antenna by shortening both elements a little at a time, until you've reached an acceptable SWR and *SWR bandwidth* across the 80-meter band. But shorten them proportionally 2:1, so that if you take 2 inches off the long element, take 1 inch off the short element, for example.

Measure also for the 40-meter band, 20-meter band, and then the 10-meter band. When the measurements look like the antenna's going to work for you, hoist the antenna into its (more) permanent position and enjoy!

Noji Ratzlaff, KNØJI (kn0ji@arrl.net)