

The NA4IT "CHEAP" Dual Band Ground Plane Antenna

Scott Duckworth, NA4IT
na4it@arrl.net

Here is a neat little antenna that is very easy and cheap to build. It is ideal for Technician class hams needing a "first" antenna, and also a very good "emergency" antenna for use during Skywarn events when you don't want to be on the sky hooks tall in the sky! This little antenna is very functional on 2 meters and 70 centimetres.

Materials needed:

- (1) SO-239 4-hole chassis mount connector
- (3) 3/32 (2 mm) bare welding rods (copper or brass)
- Rosin Core Electrical Solder
- Clear Silicone Sealant

Tools Needed:

- Heavy duty soldering gun
 - Wire cutters
 - Vice or "Third Hand" or another human.
- The finished product will look like this:

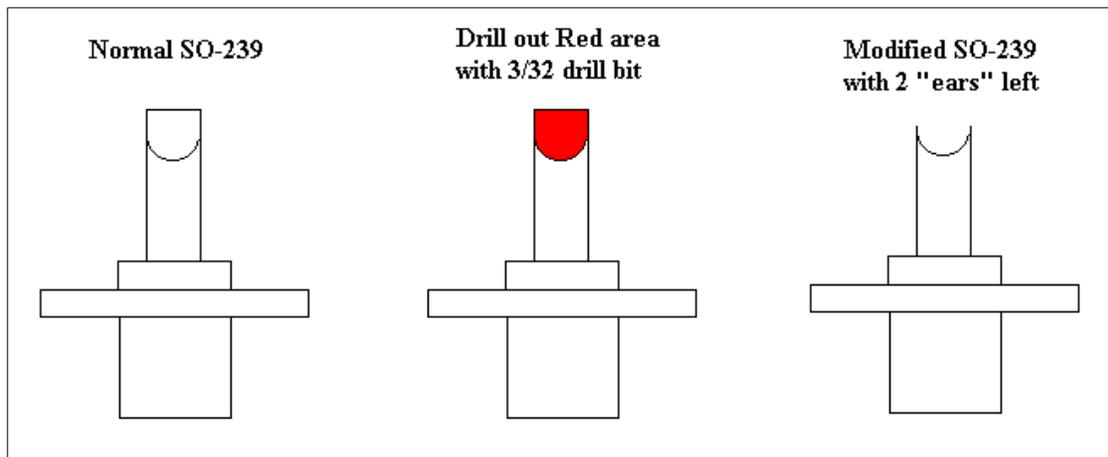


Let's get started! From the welding rods you need the following:

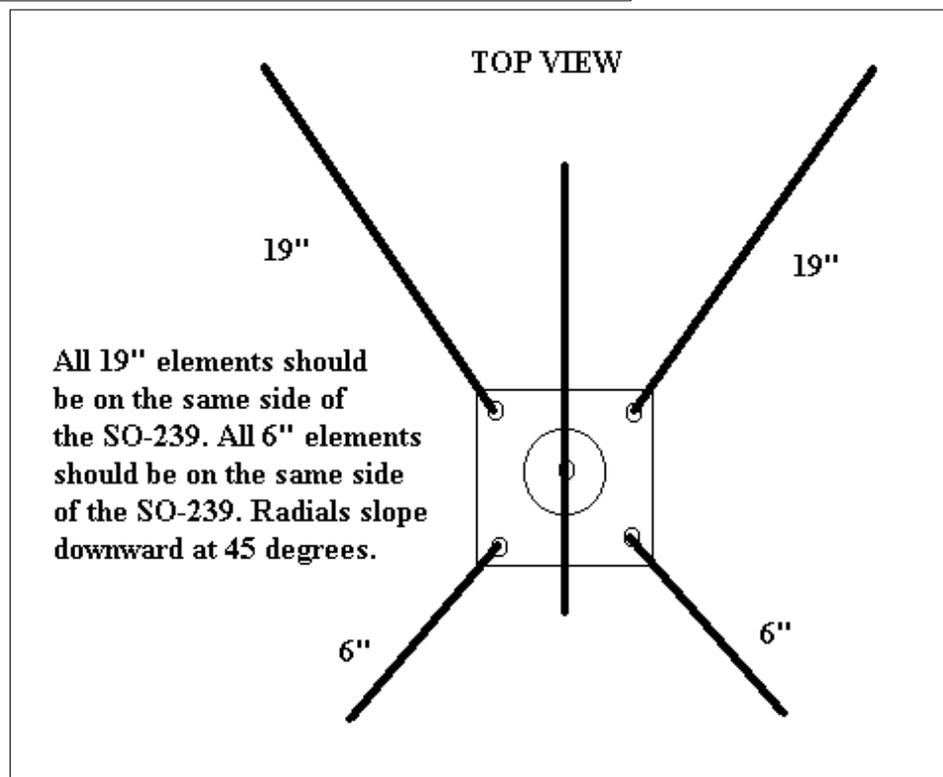
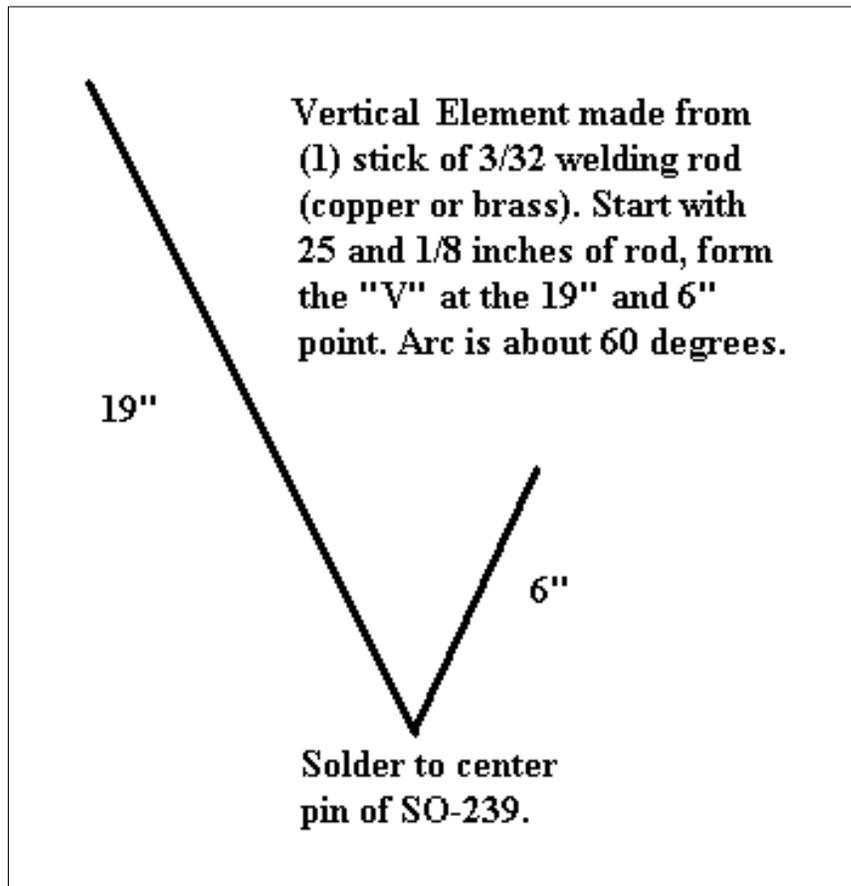
- 1 x piece 25 & 1/8 inches (638 mm) long
- 2 x pieces 6 & 1/2 inches (165 mm) long
- 2 x pieces 19 & 1/2 inches (495 mm) long

Here is how to prep the SO-239 connector:

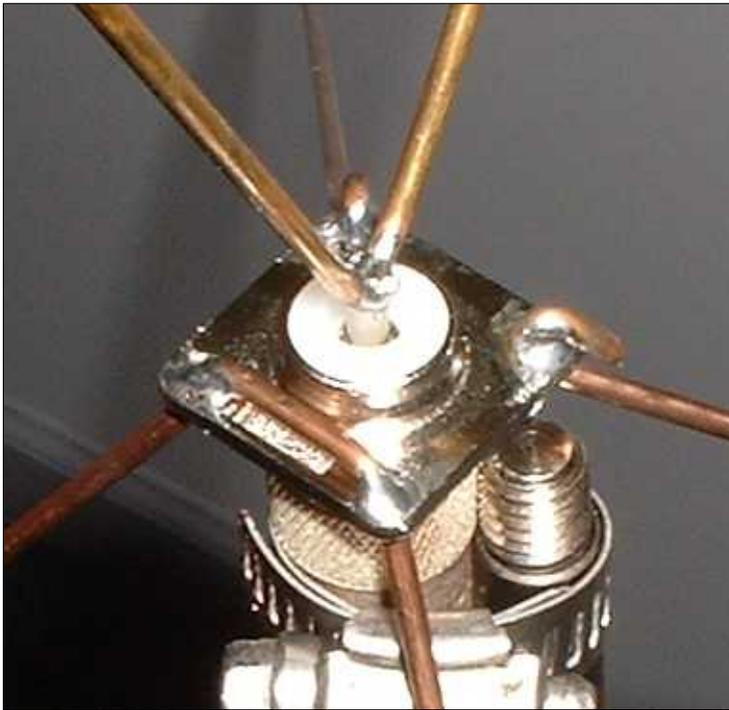
*2-mm Drill Bit



Now to make the vertical element:



Now take the 19 & ½” and the 6 & ½” pieces and make a “ring” on one end, placing each on into one of the mounting holes of the SO-239 and crimp it tightly, then solder, filling the hole. The arrangement should look like this:



Here is a close up photo of the first one I did: (My 6” radials were made from a welding rod 12 & ¾” long, bent into a “C” shape and run down through 2 of the mounting holes, then bent back out to the proper angles and soldered.

Finish by covering the entire centre pin and insulator area on the “top” of the SO-239 with Clear Silicone Caulk.

To mount the antenna, use a 1-foot piece of ¾ EMT conduit. Slide the coax and PL-259 connector up through the piece of

conduit, connect the antenna to the coax and let it sit down into the conduit. Use stainless steel hose clamps to attach it to a mast. I’m sure you can come up with other ways to mount the little antenna also. This antenna makes a great Severe Weather antenna, so that you can maintain communications, by mounting it in the attic or even below the eaves of your house.

The first time this one was used, it was used at a RACES drill. It was mounted to a small telescopic speaker stand by clamping the PL-259 to the stand with a single hose clamp. It was inside the building, and with 10 watts, we could hit both 2M and 70 cm repeaters up to 30 miles away (and that’s in East TN, the “Heart of the Smokies”!).

SWR results of the prototype were less than 1.5-1 on across both bands with 55 watts input. Your results may vary. Also, this antenna may be somewhat directional. Experiment with it. I would welcome computer-plotting results if some one would like to do them. Let me know how it works for you!