

Photo A. The portable 20-meter ground plane set up in the author's back yard. The feed point is about four feet off the ground.

Wire antennas are popular for field use because they are compact and effective. However, keeping them tangle-free can be a challenge. K2RFP has one D-I-Y solution designed to fit in a backpack.

A Portable 20-Meter Ground Plane Antenna and Spooler

BY RICHARD PAV,* K2RFP

This article describes a portable ground-plane antenna for 20 meters and a simple spooler for storing and transporting it. It has been used several times, and in each case it performed as expected, with an SWR of about 1.5:1 or less.

A Simple Ground Plane

Since it is a wire antenna, you must have some way to support it. A tree with a horizontal branch up about 20 feet works just fine. Simply attach a string to the top end of the vertical element to hang from the tree. Photo A shows the antenna set up in my back yard.

*85 Radio Ave., Miller Place, NY 11764
e-mail: <k2rfp@arrl.net>

To build the antenna, I started with an SO-239 coax receptacle and ground off one of its corners so it would lie on that flat side in the spool I was going to build. Then I attached five 16-foot wires¹ as shown in photo B. In this setup, the feed point is about four feet above the ground with the four radial wires equally spaced and pinned to the ground with short lengths of clothes-hanger wire.

I used #22 stranded black-and-white twisted pair wire because that is what I had on hand. As it turns out, that makes the wire rather visible, which is a good thing for temporary locations where one would not normally expect to see wires in place. Having used twisted pair wire in the construction, I could untwist them to make eight radials and probably make them shorter as well. I did not try this nor did I try trimming the length of the vertical segment. Since it is meant to be a

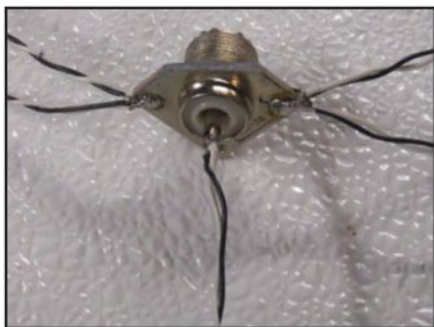


Photo B. Close-up of the SO-239 around which this antenna is built. One side has been ground flat to lie in the spool the author built for tangle-free transport and storage.

portable antenna, I reasoned that any “right on the money” trimming at one location is likely to be different when moved to another location.

A Do-It-Yourself Spool

Portable antennas tend to become a tangled mess during take-down and storage, so I set about building a spool to store and transport it. I started with two 8-inch disks cut from 1/8-inch plywood I bought at a craft store. I glued 3/4-inch pine blocks to one disk as shown in photo C. I checked the spacing with another SO-239 before letting the glue dry.

I then cut this disk into three pieces—one half and two quarters. I rounded the corners and sanded everything smooth. Then I glued the pieces one at a time to the other disk, checking the fit as I went along before the glue set. Photo D shows the spool with the last quarter yet to be glued in place. After final sanding, I gave it a few coats of wipe-on poly varnish.

Photo E shows the finished spool and a few others I’ve made for additional portable antennas, including a 40-meter version of this ground plane and different length end-fed antennas. The spools are all sized to fit in my backpack as part of my portable QRP station.

Note

1. Using the classic formula of $234/f(\text{MHz})$ for a 1/4-wave antenna at the popular QRP CW frequency of 14.060 MHz would give you an “ideal” length of about 16 feet, 8 inches, for each of the elements. However, the impedance—and thus the SWR—of a ground plane changes with the angle of the radials. Again, ideally you would have the radials sloping down at 45-degree angles for 50-ohm impedance. However, the reality of field use is that this is not always possible and in practical use, any length between the author’s chosen 16 feet and about 16-1/2 feet should be quite effective.—W2VU



Photo C. Basic components of the spool prior to assembly. See text for details.

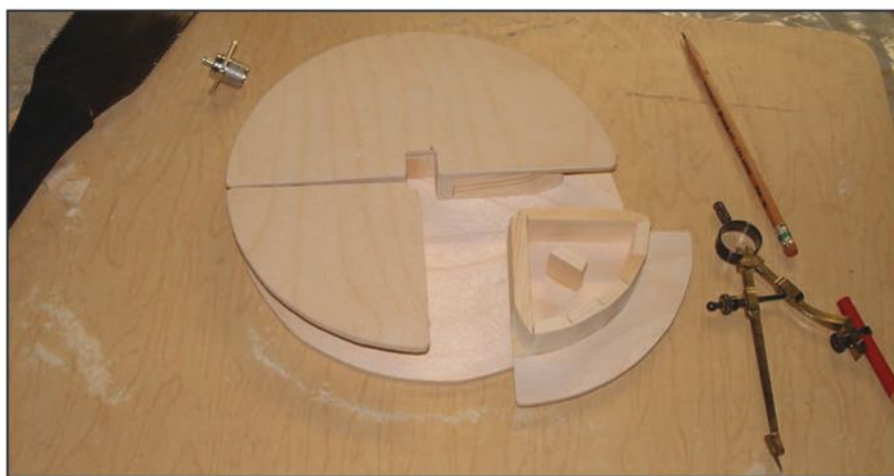


Photo D. Almost done ... the final 1/4 segment measured and about to be glued in place on the bottom disc.



Photo E. Several finished antenna spools. Two (top-left and lower right) are for ground planes while the other three for are different-length end-fed antennas.