About this Article

This material was included with the downloadable supplemental content accompanying the *ARRL Antenna Book*.

You may print a copy of this material for personal use. Any other use of the information requires permission from the ARRL.

Copyright/Reprint Notice

By Ron Herring, W7HD

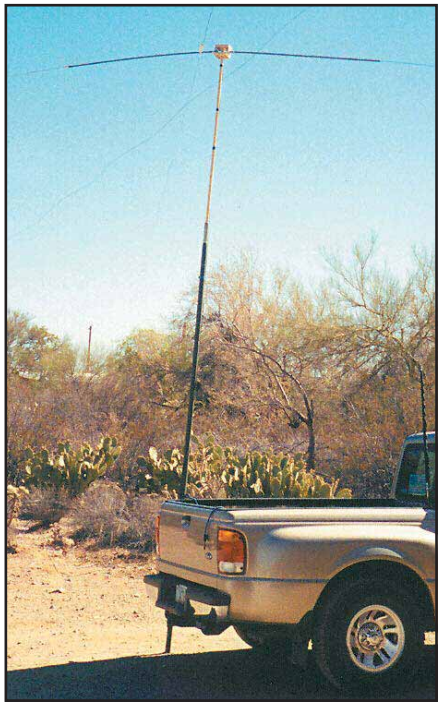
A Small, Portable Dipole for Field Use

The title says it all—a practical, transportable antenna for Field Day and a valuable addition to your emergency kit.

This antenna came about because I wanted something small and portable that could be used on any band and would perform just like a dipole. Since I didn't want to have to find two trees the right distance apart (difficult to do in arid Arizona) for stringing up a regular dipole, something of a more "stand-alone" nature was needed. Looking through my accumulation of antennas, I discovered that I had a pair of Hamstick mobile antennas for 20 and 40 meters.[1] Needing something for my brand-new PSK20 rig for Field Day, I decided to try building something that would both fit the bed of my pickup truck and be quickly assembled and tuned at a site.

I hit on the idea of using two of these antennas to build a portable dipole. Since a single Hamstick antenna was designed as a mobile antenna and uses the vehicle as a counterpoise, a pair of these appeared ideal for my purpose. I made a quick trip to the local hardware store to pick up some nuts and bolts; a piece of ¾″ by 4″ hardwood (I used oak); a good quality wooden broomstick and some angle-iron with pre-drilled ³/₈″ holes. I then pro-

[1]Lakeview Company, 3620-9A Whitehall Rd, Anderson, SC 29626; 864-226-6990; **www.hamstick.com/**.



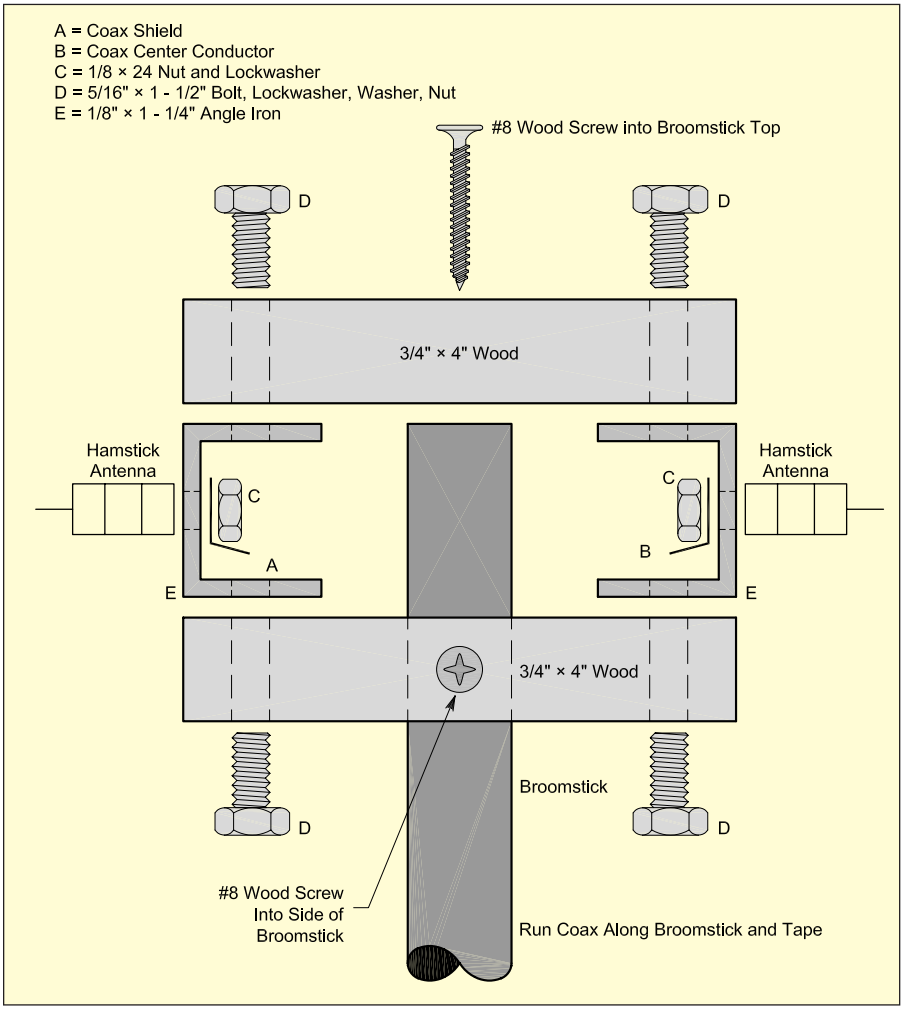


Figure 1—Assembly details for the portable dipole.

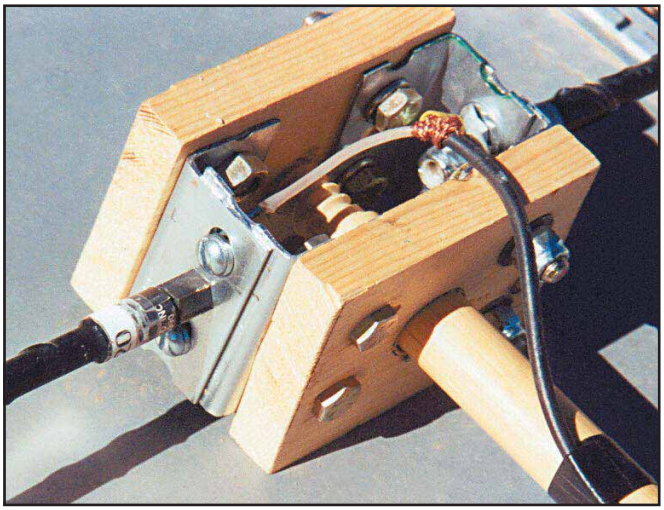


Figure 2—The completed dipole center support showing the broomstick mast, the antenna mounts and the connected transmission line.

Table 1
Portable Dipole Parts list

8—5/16 × 1 1/2″ bolts with lock washers, flat washers and nuts (nylon-type insert hold best) for mounting the angle iron "U" to the wood pieces.
4—5/16 × 1″ bolts with lock washers, flat washers and nuts for assembling the angle iron "U" pieces.
4— 1/8″ angle iron cut to 3″ lengths (cut so holes line up when mating).
2— 3/8″ × 24 nuts with lock washers and flat washers for the antenna mounts.
2— 3/4″ × 4″ piece hardwood about 5″ long.
2— 1/8″ × 1 1/2″ wood screws. (I used decking screws).
2— Mobile antennas that use 3/8″× 24 standard thread mounts (I used Hamsticks).
1—Coaxial cable (I used RG-58/U) stripped and tinned to allow connections about 5″ apart.

ceeded to drill, screw, tape, assemble and make it work. The total cost of materials, including $25 for each of the two Hamsticks, was about $90. Although the Hamstick was available, any suitable shortened (helically loaded) vehicular antenna can be used.

Using nothing more exotic than simple hand tools, a tape measure, power drill, wrenches and screwdrivers, the whole thing came together in about 3 hours. The best part was that it worked exactly as I had planned.

Some tips when you do your own assembly:

- Be sure to tune both antennas on the vehicle before mounting to the assembly.
- For safety, the radiating elements should be out of reach.
- Put a piece of tape on the Hamsticks, marked with the exact length of the "stingers" (the tuning rods) for ease of assembly at the site.
- Treat the wood support with waterseal, lacquer or marine varnish prior to assembly, to prevent deterioration. Just make sure that whatever you use for a coating is non-conductive at RF frequencies.

This antenna will even work on a balcony or supported by a couple of tree branches. My plan is to simply use bungee cords to attach it to the side of the camper at a Field Day site. Since it's a directional antenna, that mounting technique makes it easy to turn. For testing, I simply used bungee cords to attach the antenna to the side of my pickup truck. Table 1 lists the parts necessary to build your own version.

Figure 1 shows how the parts fit together. Figure 2 shows the completed mount. The assembly sequence I used was as follows:

1. Bolt two pieces of angle-iron together to form a "U," making sure that the hole for the antenna is properly aligned. Repeat for the other half.

2. Using the angle iron as a guide, drill two holes in each piece of 3/4″ × 4″ wood support to allow the bolts to pass through. Repeat this on both pieces of wood for each side. Make sure that the gap between the angle-iron pieces is more than an inch, since the broomstick has to pass through the gap.

3. Drill a 1″ hole in the bottom piece of wood for the broomstick to pass through. Additionally, drill a 1/8″ hole in the top piece of wood for a wood screw to secure the top of the broomstick. Drill a 1/8″ hole in the side of the top piece of wood for a second wood screw to anchor the broomstick so it doesn't turn in the mount.

4. Assemble as shown in the figure. Mount the angle-iron "U" pieces to the *inside* of each piece of wood. Be sure to attach the coaxial cable to the metal pieces—I just anchored the wire underneath the lock washers.

5. Stick the broomstick through the bottom hole and put the wood screws in place. (Drill a 1/16″ pilot hole in the broomstick before anchoring, so it won't splinter.)

6. Tape the coax to the side of the broomstick every 18″, leaving the coax free for approximately the bottom foot of the broomstick.

Okay… it's time to test! Place the antenna in the clear and attach your antenna analyzer or transceiver and SWR meter. Using a low power setting, check the bandwidth of the antenna. It should be about the same as when it was mounted on the mobile mount, perhaps slightly greater. Trim both sides for minimum SWR. Then check the SWR again using full power. Watch for arcing! If arcing does occur, your spacing is too close.

Put a label on the Hamstick giving the length of the "stinger" for the desired operating frequency. You may wish to do this for several favorite operating frequencies. This will save a lot of set-up time at your destination.

Ron Herring, W7HD, has been licensed since 1967 and worked in engineering for the Heath Company in 1968-69 (SB-103, SB-303, MWW-18). While there, he took a two-year course in computer design, which inspired his future. Working for the Kellogg Co (later Michigan Bell) and then Pacific Northwest Bell (Oregon) he also played a role in the development of the RadioShack Model 100 laptop computer. Ron has taught computer classes at Portland State University, as well as a private school. Currently living in Arizona, he works for the Pima County Sheriff's Department in Tucson, where he is a Network Manager. Ron can be reached at 10270 W Mars Rd, Tucson, AZ 85743; **w7hd@arrl.net**. QST