

The Flagpole Antenna

This antenna may work around your homeowners association restrictions.

John Ellis, NP2B

Many of us are governed by homeowners association “covenants, conditions, and restrictions” (CCRs) that preclude deploying HF antennas. Rather than argue the point, it’s a lot easier to put up an antenna that doesn’t offend anyone. This flagpole antenna may be the answer.

Select a Site

Locate a site away from metallic objects like aluminum downspouts, concrete walls with reinforcing steel, and light fixtures (see the lead photo). Make sure you are not violating any setback rules. If your homeowners association requires approval for its location, by all means get it.

This is a vertical antenna that requires radials, so the more radials, the better. You can hand-trench them, or call a company that installs invisible dog fences. They can quickly put down 1,000 feet of wire, and the next morning you’ll never see it.

Construction

Figure 1 lists the materials needed. Procure your flagpole kit, the extra 4-foot section, the acetal rod, and the 2-foot length of PVC before you begin construction. Carefully cut the extra flagpole section in half, taking care that you don’t bend or dent it. It is used as a spacer, ensuring the acetal rod is rigidly secured within the PVC, yet it can be removed in the event of a storm or for repairs. Place the untapered piece within the PVC, and the acetal rod within this untapered section. Assemble the flagpole pieces first, and make sure everything fits. The inside of the PVC pipe is slightly larger than the



[Jeanette Ellis, NP2C, photo]

outside of the extra flagpole piece that you just cut, and the acetal rod is slightly smaller than the inside of that piece. Everything should fit snugly. This is why it’s so important not to deform or dent the flagpole piece that you just cut.

Working on the Ground

Dig a hole about 30 inches deep and line the bottom with large gravel or small stones to a depth of 6 inches. The hole should be just wide enough to accept the PVC and a couple of bags of ready-mix concrete. Place the PVC, the cut section, and the rod in the hole, and adjust the height of the PVC and cut piece so they are about 1 – 2 inches above ground level. The acetal rod should protrude another 2 feet. Ensure that everything is vertical, and pour the concrete.

Next, install the radial system. A combination of long and short wires is fine, because you’re not looking for resonance on any frequency. A good way to tie all these wires together at the base is with a radial plate. A nice one that’s resistant to corrosion and made of high-grade stainless steel is available from DX Engineering (www.dxengineering.com). Install a piece of conduit from the shack to the base of the flagpole to accommodate connections to the tuner. I recommend using a conduit rather than directly burying the cables, just in case you have any problems with the connectors or cable.

Assembly

Drill a small hole, about 1/8 inch by 1 inch deep, through the PVC that you installed in the ground, through the cut piece, and into the acetal rod. Install a #10 by 1-inch stainless-steel self-tapping screw. This will keep the entire base assembly in its current position. Assemble your five-section flagpole, placing the bottom section over the acetal rod, leaving a 1/2- to 3/4-inch gap between the base and the bottom sec-

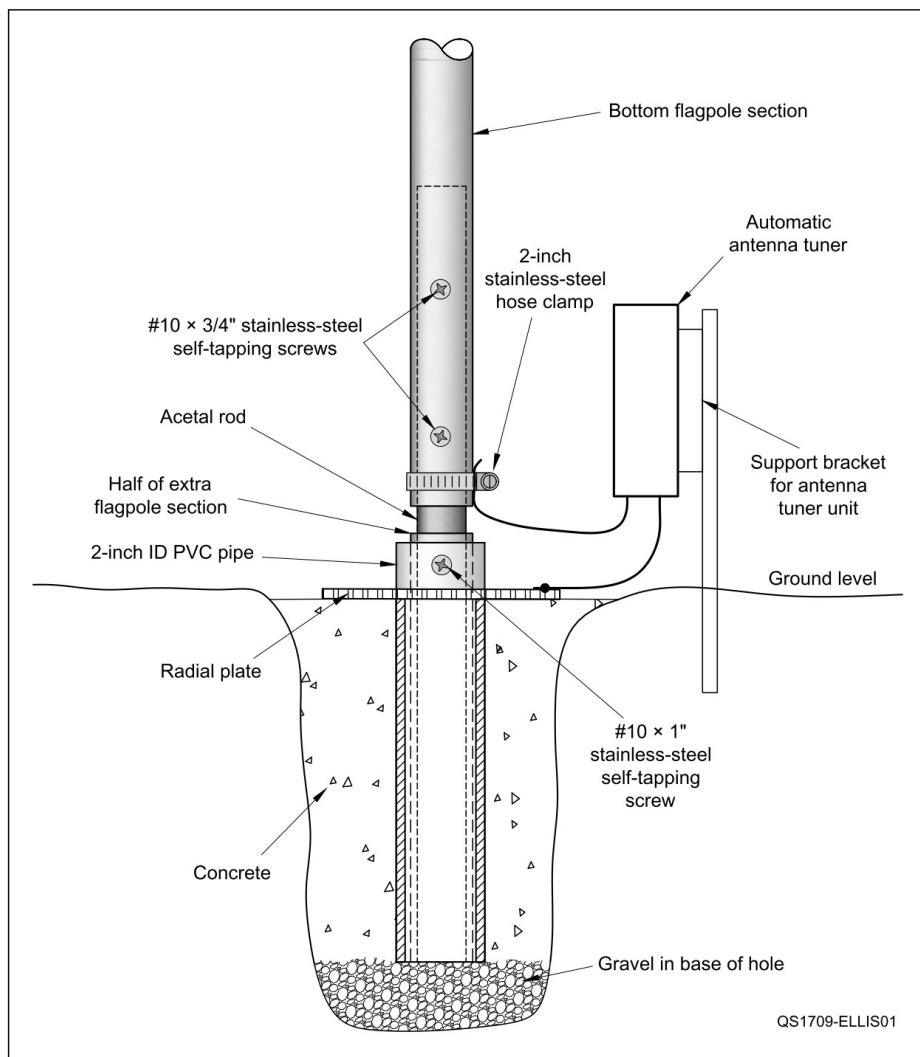


Figure 1 — Materials needed for the flagpole antenna are pictured, and listed here. [Jeanette Ellis, NP2C, illustration]

Flagpole kit with extra 4-foot section — Valley Forge Flag Company model APF20F (www.valleyforgeflag.com) or equivalent
Schedule 40 PVC pipe — 2-foot length, 2-inch inside diameter

Acetal rod — 4-foot section of acetal (polyoxymethylene) rod, 1.875 inches diameter, from Interstate Plastics (www.interstateplastics.com)

Antenna tuner unit (ATU) — fully automatic, weatherproof, and capable of tuning a wide impedance range

tion of the flagpole. This is your center insulator. Secure the bottom section of the flagpole to the acetal rod, maintaining the gap separation by drilling two small holes through the pole into the rod, and secure with two #10 by $\frac{3}{4}$ -inch self-tapping stainless-steel screws. The #10 screws are strong enough because the pole is very light.

Finally, mount the antenna tuner as close to the base as possible, and install with all electrical connections facing down to avoid accumulation of water,

dirt, or debris. Connect the output of the tuner to the bottom section of the flagpole using a stainless-steel hose clamp and a short piece of wire. Don't use the screws you installed to secure the pole to the rod for the electrical connection. Connect the ground of the tuner to the radial plate with a short piece of heavy wire. Pull your cables from the tuner to the ham shack, plug everything in, power it up, and call CQ!

[Remember to pay attention to proper lightning safety grounding of the



Figure 2 — The antenna tuner unit is the black box at the base of the flagpole. [Jeanette Ellis, NP2C, photo]

cables entering the house. See the Lightning Protection sections in *The ARRL Antenna Book* or *The ARRL Handbook*.¹ — Ed.]

If you have difficulty tuning on any particular band, try adding the leftover 2-foot section to the top. Also, some folks have had improved 80/75-meter performance by adding a random piece of wire from the top to a nearby structure.

¹ *The ARRL Antenna Book*, ARRL Item no. 0444, and *The ARRL Handbook for Radio Communications*, ARRL Item no. 0628, are available from your ARRL dealer, or from the ARRL Store. Telephone toll-free in the US 888-277-5289, or 860-594-0355, fax 860-594-0303; www.arrl.org/shop/; pubsales@arrl.org.

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