3 Ls 4 2m

This three-element stubfed coaxial vertical is dirt cheap, sturdy, and very effective.

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I had an extended J-pole antenna up at my home in the hills of Arkansas. Built of half-inch copper tubing, it worked well, but was easily bent when the wind whipped up. I needed something sturdier, but it had to be cheap and easy to build.

I can't claim invention of this antenna. Similar ones can be found in handbooks dating back over half a century. I did use a unique feed that eliminates insulators and provides a DC ground. This *might* help with lightning. It certainly reduces static buildup and its consequent noise. I also used a coaxial balun and a short length of twinlead to drive the stub. There is probably no particular advantage to this other than making it easy to drive the stub and mechanically easy to tap to the stub.

My entire antenna is made up from one-and-one-quarter-inch-OD galvanized fencetop rail. I cut and welded mine, but that is merely because I had the tools to do so. The instructions here are for PVC pipe. You might bolt yours together.

The center section is made up of a 39-inch length of one-and-one-quarter-inch pipe, wrapped with a 38-inch length of common aluminum available at the hardware store. It is sold by the foot and normally used for roof flashing. A six-inch-wide piece is just right. For those of you who might be worried about the high resistance across the overlap, the antenna currents are parallel to this, so it is of little consequence.

You might have noticed that the dimensions (**Fig. 1**) are short for two-meter use. That is because of the "fatness" of the "wire." Some shortening was necessary to bring everything into resonance. The quarter-wave stub seems especially short. Bear in mind that this stub is quite wide at six-inch spacing. Make sure that you have resonance before fixing it permanently into place. Tack weld it for tuning. The horizontal bar just below this is merely for reinforcement and makes a dandy place to connect your guy ropes.

Since putting this thing on the air, I have had great success with it. I've worked mobiles 30 miles away while running a half watt with my hand-held HTX-202 from Radio Shack™, and was full quieting. I can hear things better than ever, and a great many stations I never heard before.

Some caveats are in order. Lacking sophisticated measuring devices, I cannot be quite sure that the dimensions are the best that they can be. This thing works so well for me, though, that I'm entirely satisfied. Rain, which plagued my J-pole, doesn't affect this one. I'm waiting for the snow and ice. Also, since the wire is fat and there are three collinear elements, the tuning is quite broad. This might not suit some people, but I love it—and my scanner loves it, too.

Before sliding the half-wave center section in place, you should give the upright a good coating or two of clear acrylic to keep it from corroding (if you use metal like I did). A high resistance here will ruin performance. Two sheet metal screws, one just below and one just above the PVC, hold it in place.

When construction is completed, make sure to seal up the gaps (I used a mile of tape) and give *everything* a nice coat of clear acrylic. This not only staves off rust and seals everything, but also locks the tape in place.

Guying is a good idea if you expect any wind. I guyed my antenna with half-inch parachute cord, but that is up to you. If your antenna is mounted on a tower with very little mast extension, you might be all right. Just remember that this tubing isn't all that strong.

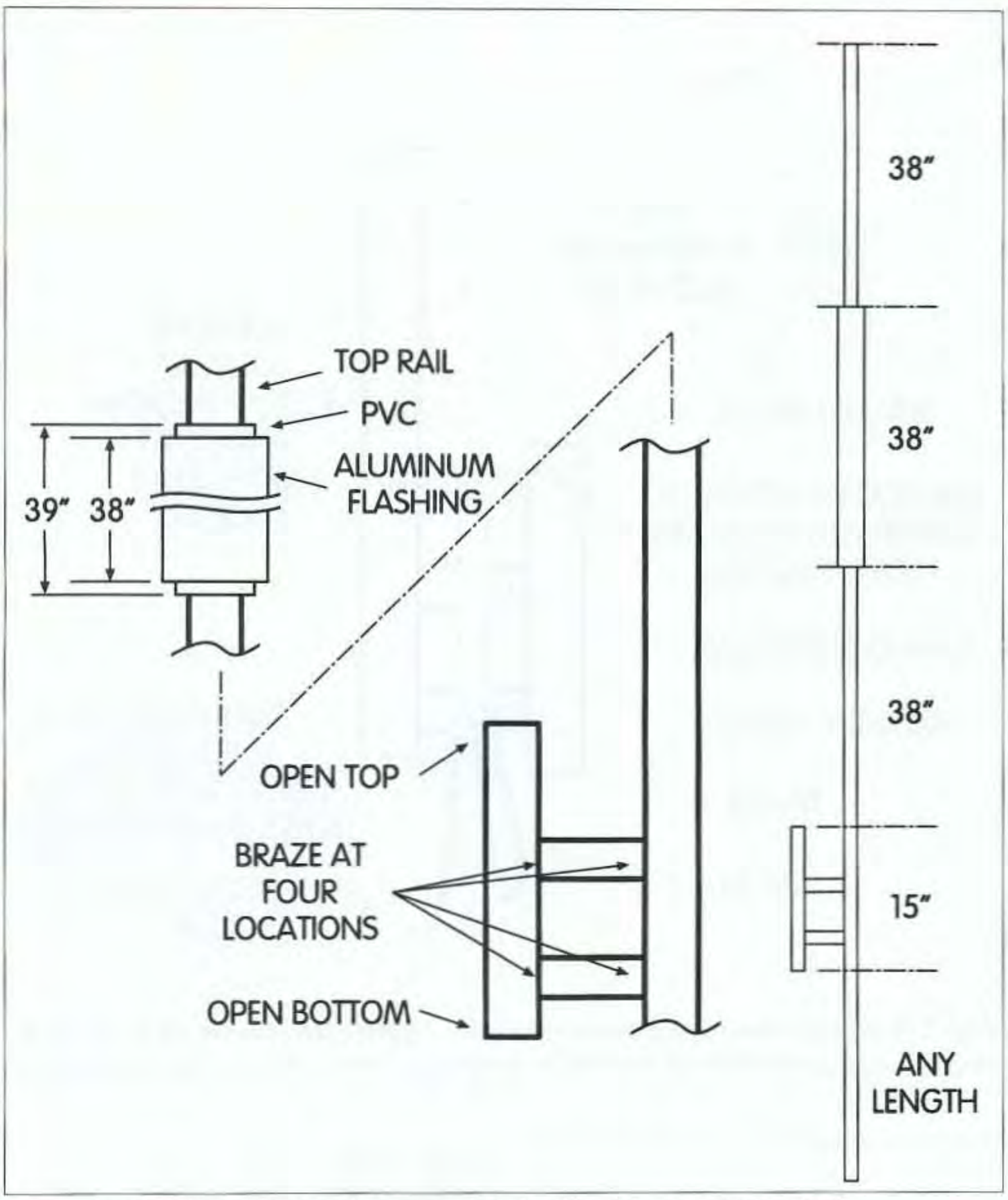

Fig. 1. Overall dimensions and construction details of the coaxial vertical.

And if it is galvanized steel, someday it is bound to rust. The clear acrylic mentioned above should protect it for many years, though.

Referring to the figures for details of the feed system should make everything clear without further explanation.

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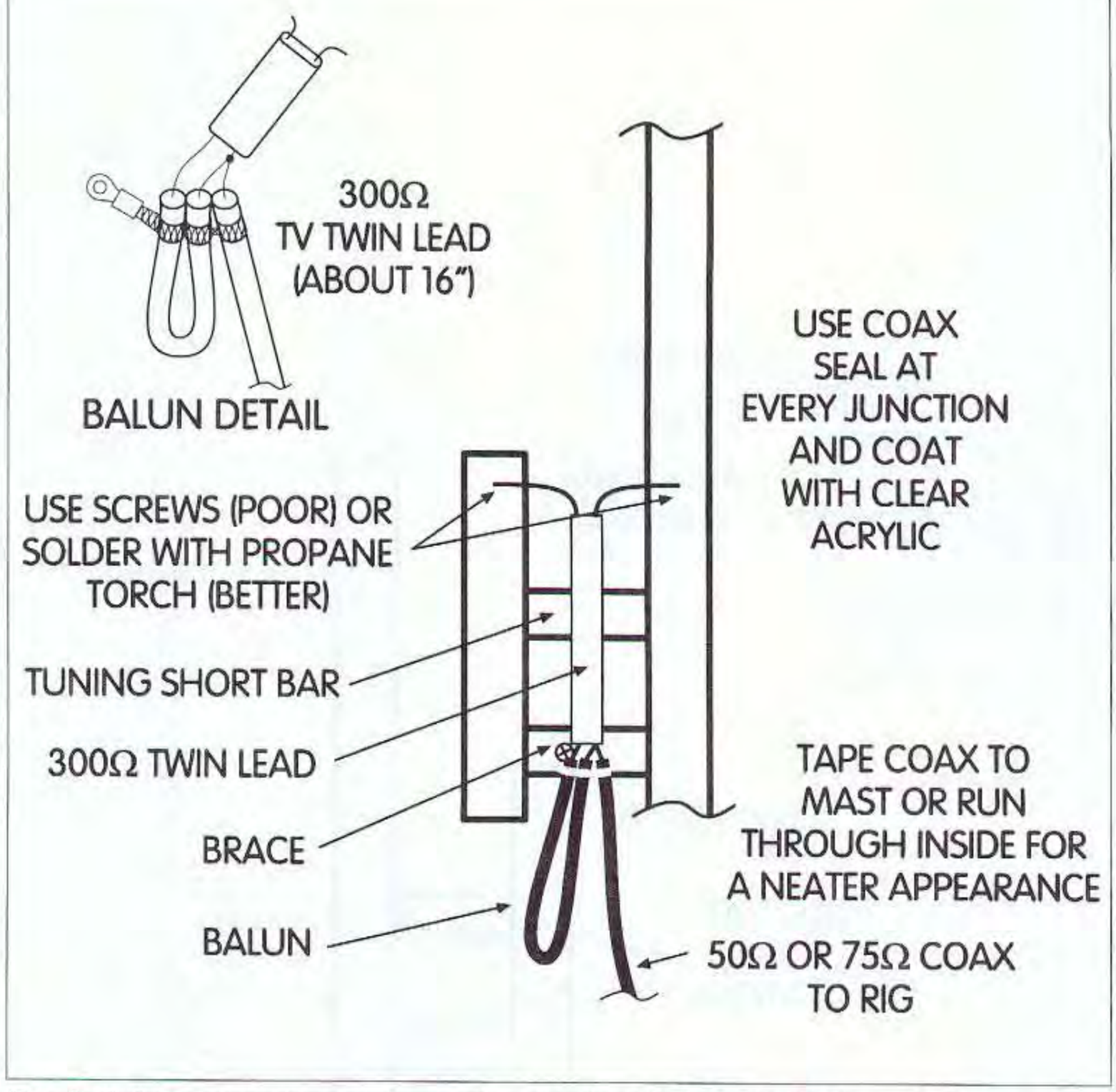

Fig. 2. Balun construction and mounting details. All three shields from the balun are attached to a ring terminal and then attached to the mast brace with appropriate hardware.

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To make a coaxial balun, if you've never done this before, it is simply a matter of figuring the velocity factor of your coax and cutting off a half-wavelength of it. Form it into a horseshoe shape. Connect the shields of each end to the shield of your feedline coax. Connect the center of the feedline coax to one of the horseshoe's centers. That is one feedpoint, and the remaining center is the other one. Using 50-ohm coax gives a feedpoint resistance of 200 ohms. Connect a 200-ohm resistor and check it for a 1:1 VSWR. Adjust the horseshoe's length until it is 1:1 or very close. Simple, huh?

For five bucks and a little work and some coax, I have an antenna that is sturdy, good looking (no stubs sticking out of the sides for birds to perch on), *and* it works better than the commercially-made antenna that I once had. Good luck with yours! 73