

# A Low-Profile 10-Meter Antenna

Put this simple whip antenna on your roof and have fun!

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**B**ecause I recently upgraded to a Technician Plus license, I wanted to take advantage of my new HF privileges. I already have an 80-meter dipole and I really enjoy CW on that band. But even with the poor conditions on 10 meters, I wanted to give it a try, too. I decided to use a vertical antenna on 10 meters because I had a Radio Shack 102-inch stainless-steel whip (#21-903, \$15) just looking for an application!

## Construction

The construction is very simple and took all of an hour to complete. I purchased a Radio Shack mirror/luggage rack bracket (#21-937, \$10) and removed the bolts and the back plate. I bolted the bracket to the fascia board on one end of my roof peak with 3-inch lag bolts to make sure I tapped into the roof truss (see Figure 1). I was concerned about strength, but the antenna survived some recent 40-mph winds (gusting to 50 mph)!

This vertical requires a ground plane, and it's best if it angles down to bring the feed-

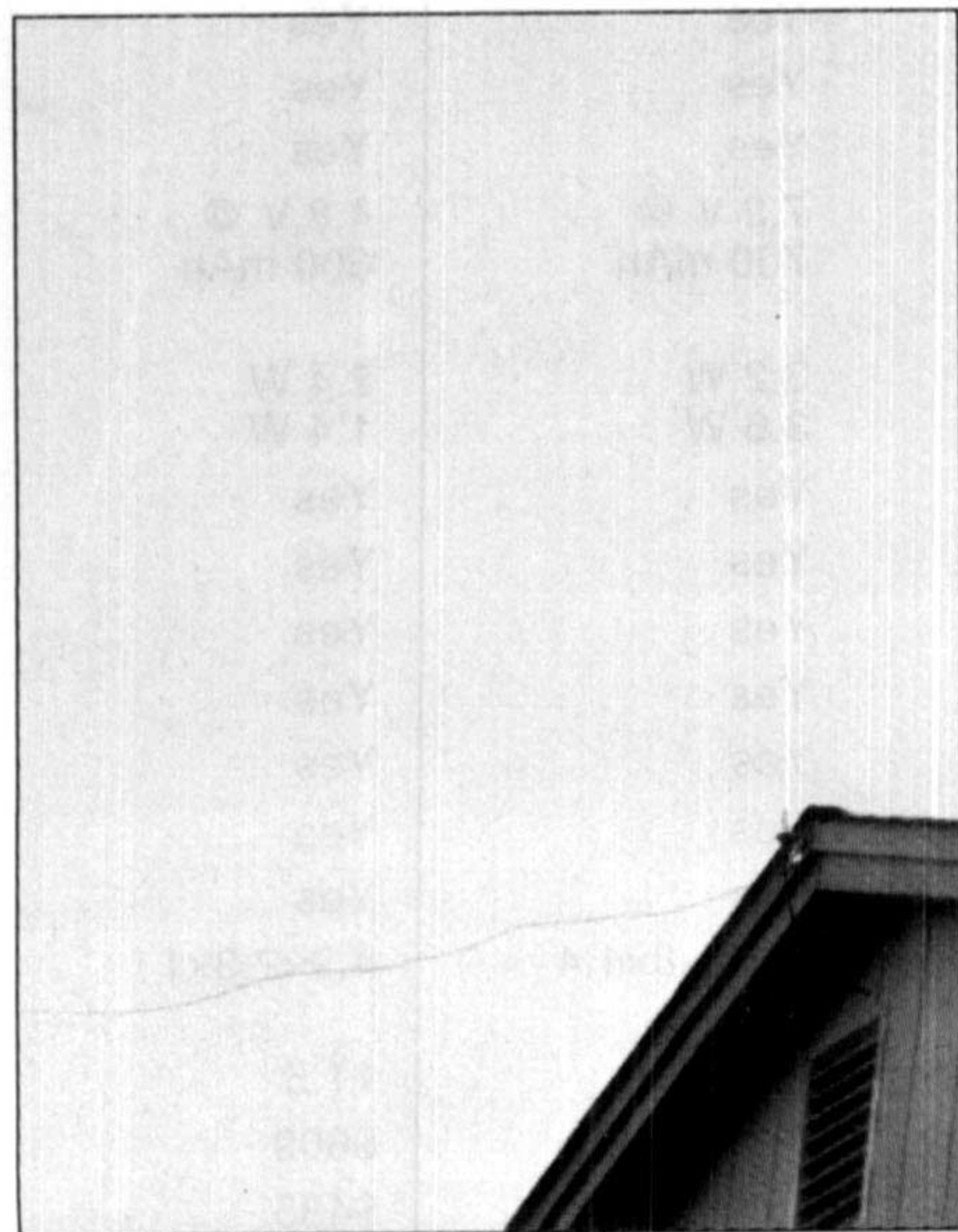


Figure 1—The sleek, low-profile whip antenna is hardly visible against the daylight sky. One radial wire can be seen sloping away from the bracket at roughly a 45° angle.

point impedance close to 50 Ω. I used three radials made of 8-foot pieces of scrap wire I had in my junk box. I crimped a spade connector to one end of each wire and connected these under the lag bolts (Figure 2). My roof line has a couple of levels and this makes radial installation easy. Two of the wires follow the roof line away from the peak at a 45° angle. I shoved the wires under the shingles in a few places to hold them down. The third wire angles toward the lower roof peak and is fastened with a screw eye and some string.

If you don't have a roof line like mine,

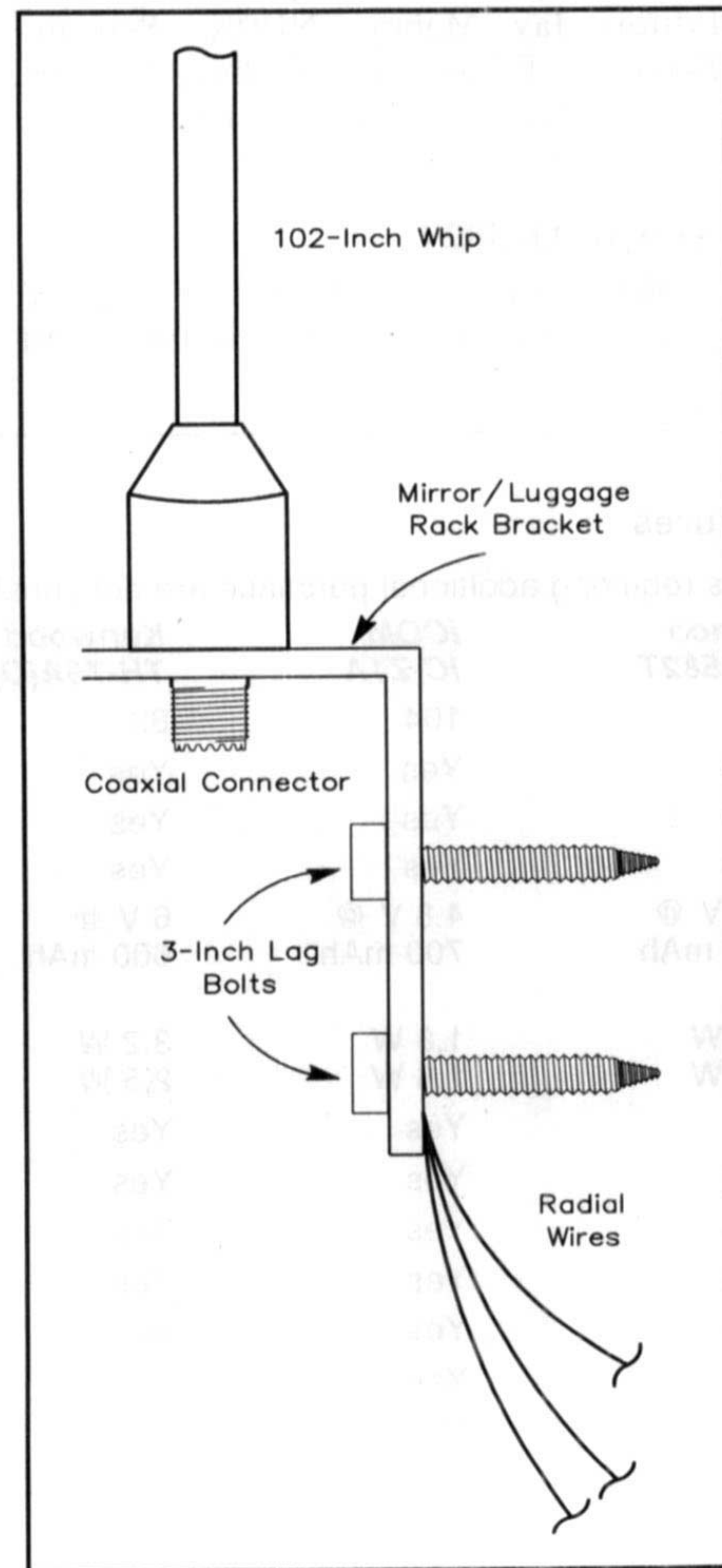


Figure 2—There isn't much to this design. Just remove the back plate from a Radio Shack mirror/luggage mount and thread your lag bolts through the holes. The radial wires make contact with the bracket at one of the lag bolts. The whip screws onto the top of the mount.



it's very simple to mount the bracket along the peak of your roof and run four radials down along the shingles. This might even perform better than my setup!

Connect your coax to the bracket with a PL-259 connector. I sealed my PL-259 against the weather with some Coax-Seal putty wrapped tightly around the mating connectors and the cable. The bracket has a 3/8-inch threaded stud to accept a whip antenna, so that it accepts the 38-inch threaded stud of the 102-inch whip. So, the last step is to screw the stainless whip into the stud. Don't tighten it down yet, because you'll be removing it for tuning later.

## Tuning

The Radio Shack 102-inch whip is cut for 11-meter CB, so we'll have to shorten it a bit for use on the 10-meter amateur band. Since I planned to use this antenna for the 10-meter Novice/Technician phone subband, I decided to aim for a resonant frequency of 28.4 MHz, right in the middle of the subband.

Check the SWR at 28.4 MHz. You'll find it is a bit high, so unscrew the whip and cut off about half an inch. Screw the whip back on the mount and check the SWR again. Repeat this until the SWR gets down to where you want it. Don't cut off too much at a time. You'll have a hard time adding to the whip if you cut too much! If you're fortunate enough to own an SWR analyzer, this process will be much quicker; I had to climb up and down the ladder and basement stairs a few times to take these measurements!

I cut off a total of 2 inches to get the SWR down to 1:1. (Anything below 2:1 is acceptable for most rigs.) At this length, I found that my SWR ranged from 1:1 at 28.1 MHz to about 1.1:1 at 28.5 MHz. Not bad! This tells me the whip probably will have sufficient bandwidth to operate well on the rest of the 10-meter band when I upgrade.

## Performance

Luckily for me, there was a good 10-meter opening the day I put up the antenna. I received 59 signal reports all along the East Coast, and 57 to 59 reports in California and the rest of the West Coast. In about two weeks' time I worked 20 states and 15 countries (mostly South Americans)! A DX contest in progress certainly helped!

In all, I'm very pleased with the performance of my whip antenna. It has a low enough profile to pass the marital bliss test, and it is also fairly inexpensive. You might give it a try!