

A Disguised Flagpole Antenna

By Albert Parker, N4AQ
1717 Lilly Lane
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I moved to a retirement community in October 1991—a community which has restrictions against erecting any sort of antenna. I was eager to get on the air and began looking around for an inconspicuous antenna. It couldn't be just *any* antenna; I needed one with multiband capability. Many multiband antennas use tube-like assemblies made of coils and capacitors. These are known as *traps* and they electrically separate one part of the antenna from another, depending on the frequency of the transmitted signal. Traps do their jobs well, but they send a clear message when they're displayed in public: **HAM ANTENNA HERE!**

I was visiting a local ham dealer one day when I noticed a Hustler vertical antenna on the roof. I took a closer look and began to wonder how I could hide such a thing. Suddenly, it occurred to me that the antenna—including the traps—was thin enough to fit *inside* a 2-inch diameter PVC pipe. Hmm... an enclosed antenna would not only radiate well, it could serve as a flagpole to disguise its real function!

Construction Begins

I purchased the Hustler 4-BTV, a four-band trap vertical antenna. (I'm sure a five-band vertical would work just as well for my purposes but, of course, it would be taller.) As soon as I got it home, I took one of the trap assemblies to the local hardware store and tried to squeeze it inside a 2-inch PVC pipe. The trap's hose clamps were too large to fit! Knowing nothing about plumbing and even less about PVC pipes, I was very discouraged.

I journeyed to another hardware store



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Is it a
flagpole
or an
antenna?
Actually,
it's *both*.

that carried all sorts of plumbing and sprinkler supplies. I found another 2-inch section of PVC and again tried to insert the trap. To my great delight, it fit perfectly! This was *thin-wall* PVC. The first one I tried was heavy-duty PVC. Maybe there was hope after all!

I decided to go full blast with the project and purchased a 14-foot section of 2-inch



thin-wall PVC along with a 12-foot section of 1½-inch PVC. I assembled the Hustler and cut the 2-inch PVC to fit over the lower part of the antenna, ending about two inches above the 20-meter trap. At that point I used a reducer to couple to the 1½-inch PVC I had slipped over the thinner top section that remained. When I finished, the entire antenna was enclosed in PVC! The 40-meter section used an assembly called a *capacitance hat*, but I had to leave it off. I later found that I had no trouble operating on 40 meters without it.

I drove a 1½-inch thick wall pipe about 4 feet into the ground to serve as the base of the antenna. I trimmed the length so it would keep the feed point about 4 inches above the ground. I also drove a five-foot section of copper pipe into the soil to serve as my ground connection. This was hardly an ideal ground for a vertical, but it was impossible to bury a bunch of radial wires in the lawn without attracting unwelcome attention!

I fed the antenna with 50-Ω coaxial cable (discreetly buried, of course) and used about 10 turns of coax near the base to act as an RF choke. I placed a similar choke near the transmitter. Using my MFJ 989C antenna tuner, I was pleased to see that the antenna loaded very well on all bands.

Finishing touches consisted of adding a used toilet-tank-float ball on top of the pole as an ornament, and a three-inch bolt near the top to mount a pulley. The base is hidden by a group of flowers, which I water often to enhance my ground conductivity! My neighbors see the Stars and Stripes flying proudly day after day, unaware that the flagpole is really a multiband vertical antenna.

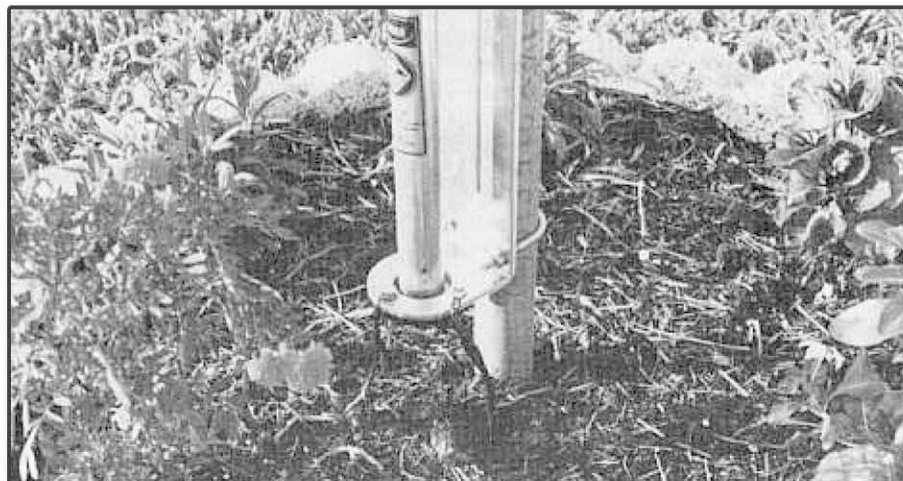
Conclusion

My disguised antenna works well on all bands from 40 meters through 10 meters. I use a Collins KWM-380 transceiver and get good reports on both CW and SSB. I can't compete with the big boys and their high-gain antennas, but it's a perfect alternative if you live in an area with tight antenna restrictions...and it makes a beautiful flagpole!

If you'd like more details on the materials or construction, I would be delighted to help. When you write, however, please enclose a self-addressed, stamped envelope.

Born in Bonneau, South Carolina, Albert received his ham license in 1949 as W4AX. He spent 25 years in the Navy, retiring as a Master Chief Communications Technician. After leaving the Navy, Albert spent two years in Turkey before moving to Saudi Arabia for three years while working in the Lockheed C-130 program. When he upgraded to Extra Class, Albert received his current call sign, N4AQ.

QST



The base of the flagpole antenna. Note the copper pipe ground connection and the flowers strategically placed to hide the coax. (photos by Albert Parker, N4AQ)



Al Parker, N4AQ
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Thank you very much for your interest in the flagpole antenna. I hope the following information will help you in the construction of the antenna. My antenna works our quite well on 10, 15, and 20 meters with no tuner. The SWR is less 2:1 on these bands, both on the CW and SSB frequencies. On 40 meters, I have a higher SWR and use the MFJ-989C tuner to tune it flat on this band. This is due to the fact that I had to leave the spider capacity hat off the antenna when I put it in the PVC pipe. I hope the diagrams will be clear enough to help you. I believe the only problem you will face in installing this system will be in sinking the mounting post and the ground rod. If your ground isn't too hard, it will be no problem driving the conduit with a sledge hammer. I used conduit with one end threaded so that I could screw a cap on it to act as a buffer in order not to split the pipe while driving it in with a sledge hammer. It worked just fine. As I drove it into the ground, I kept it straight with a level at all times. I left about 24" sticking up from the ground and then cut it off at the top to the proper lenght for the antenna mounting. If these plans are not clear, please forgive me and do not hesitate to contact me for any further information you desire. My reason for sending this article to QST was to give Hams in my situation an alternative for getting back on the air. My best 73's and good Hamming.

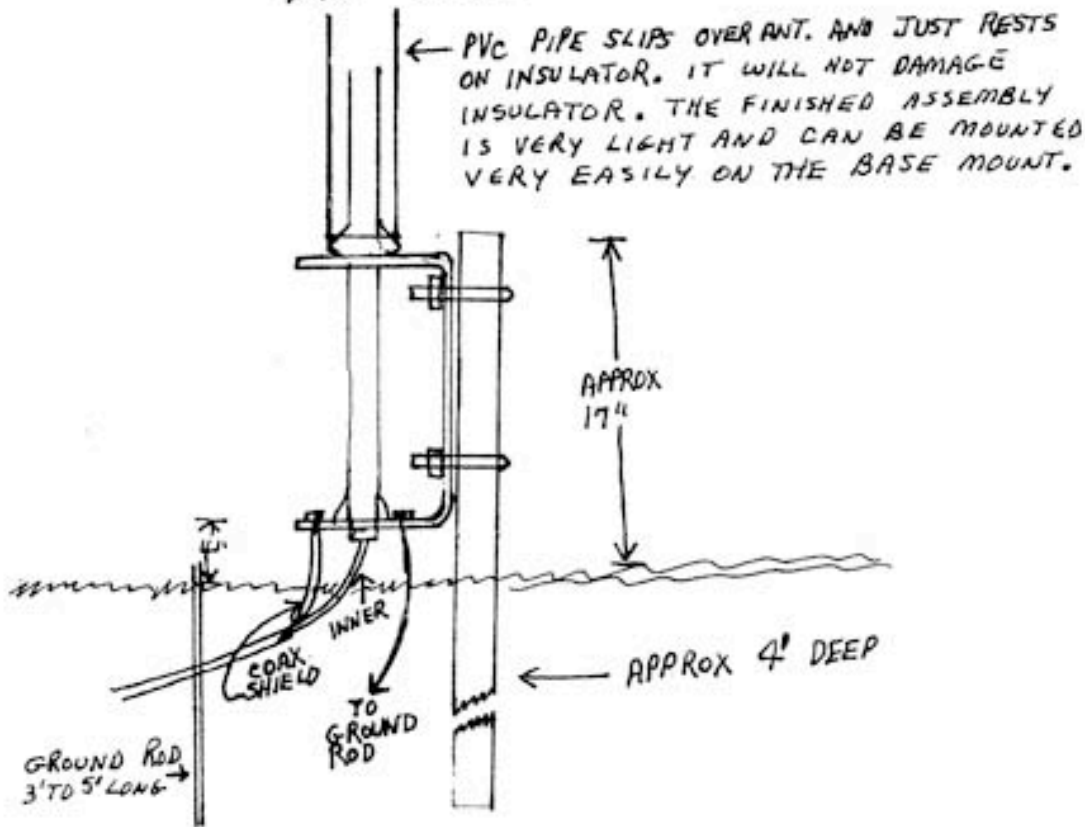
My parts list for my antenna:

- 1 Hustler, 4-BTV, four band vertical antenna
- 1 14' section of thinwall, 2" PVC tubing
- 1 12' section of thinwall, 1 1/2" PVC tubing
- 1 Toilet tank bowl float
- 1 50' cotton rope to hoist flag
- 1 Pulley for hoist rope
- 1 Metal tie to secure rope to bottom of flagpole.
- 1 3" bolt to secure pulley to top of flagpole.
- 1 Ground rod or copper pipe
- 1 1 1/2" heavy duty conduit pipe for mounting post
- 1 Proper length of 50ohm coaxial cable
- 2 Hooks for attaching flag to rope

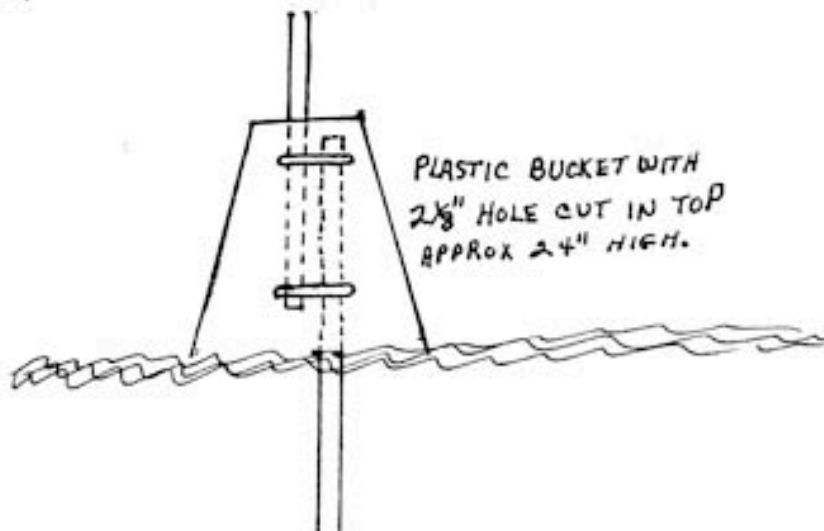
Dear Sir, QST published an article in May issue of QST, page 65. I have received more than 100 requests for info. I have sent these plans to each Ham. I thought you may be interested in knowing that your 4-BTV is being used. If you would be so kind, I would like information on your 5 and 6 Band Verticals. I would like to go to those if I could use the same idea. Thank you for the best 4 bander on the market.

73's Al

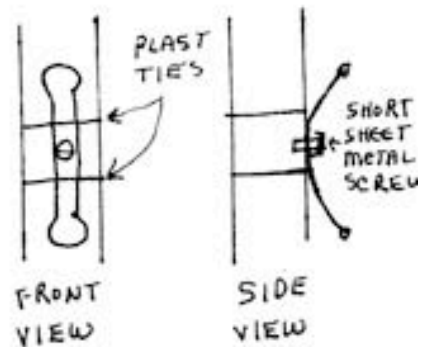
BASE DETAIL



I HAVE A WHITE PLASTIC SHEET WRAPPED AROUND THE BASE, TIED WITH WHITE CORD. IT BLENDS IN WITH THE WHITE PVC AND MY FLOWERS IN THE BED & FURTHER CONCEALS THE BASE. TERRY SCHIELER, NØDFH USES A VERTICAL AND CONCEALS HIS BASE WITH A PLASTIC BUCKET AS DESCRIBED BELOW. MY THANKS TO TERRY AND I AM GOING TO USE HIS IDEA.

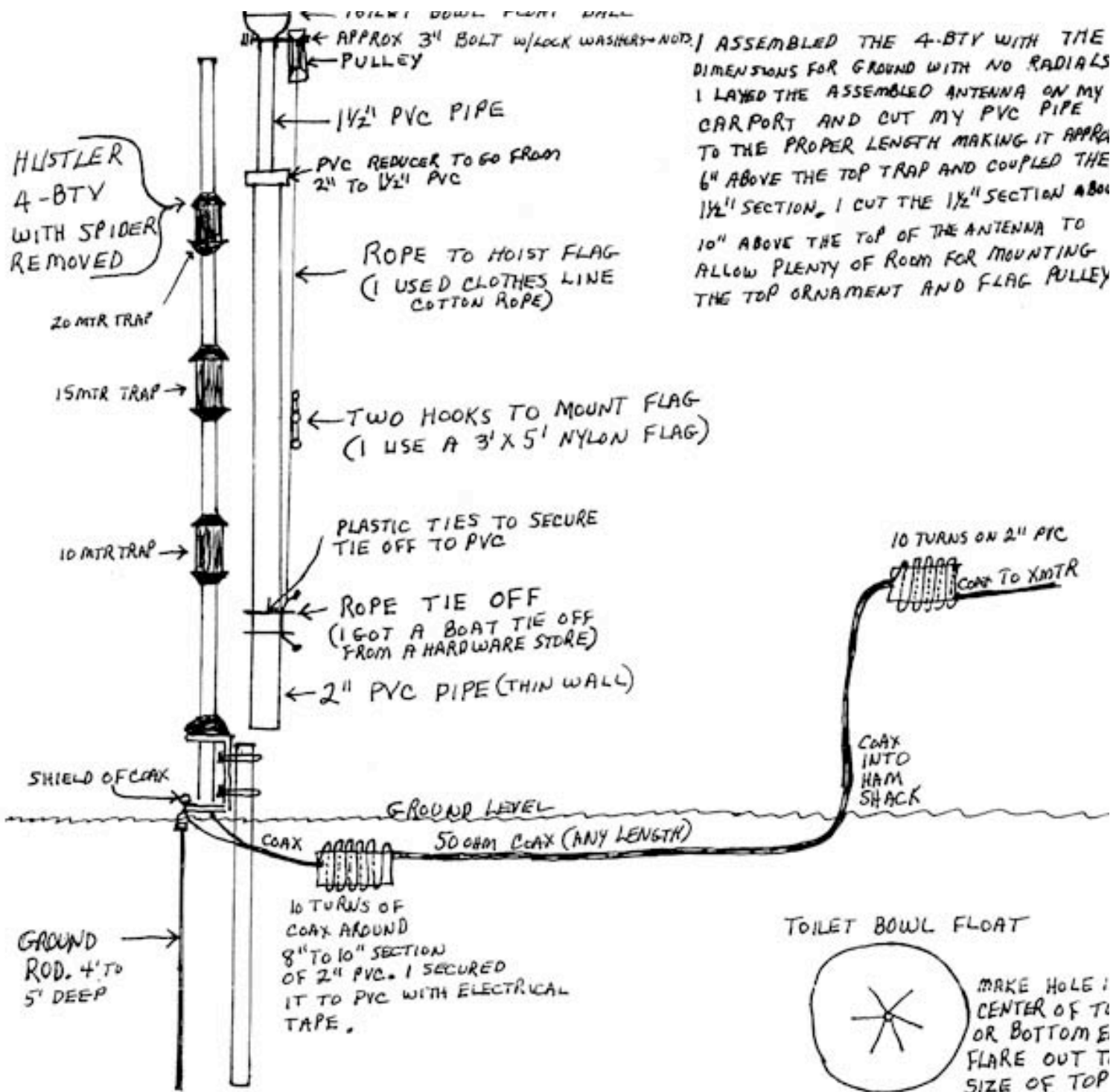


ROPE TIE DOWN



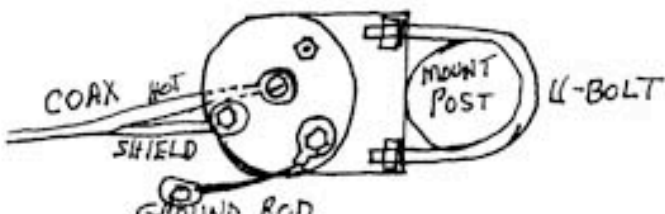
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ASSEMBLED THE 4-BTY WITH THE DIMENSIONS FOR GROUND WITH NO RADIALS I LAYED THE ASSEMBLED ANTENNA ON MY CARPORT AND CUT MY PVC PIPE TO THE PROPER LENGTH MAKING IT APPROX 6" ABOVE THE TOP TRAP AND COUPLED THE 1/2" SECTION. I CUT THE 1/2" SECTION ABOUT 10" ABOVE THE TOP OF THE ANTENNA TO ALLOW PLENTY OF ROOM FOR MOUNTING THE TOP ORNAMENT AND FLAG PULLEY

TOP VIEW OF MOUNTING



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SIDE VIEW

