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Earning 160 Meter WAS in 117 Days

This feat can be a lot easier than you may believe, even from a small lot using SSB.

Greg Crossman, WEØD

This article is not only about showing you how you can achieve a Worked All States (WAS) award on 160 meters, but also about how it can be done in a community with antenna restrictions.

I have been licensed since 1959 and have never been much into award chasing or contesting. I do enjoy listening and joining a conversation when I have something to add. Phil McMillan, K9ZK, a friend of mine in Florida moved to Illinois. Once there, he had his house built and then he started building his station. He had a friend in Frank Baker, WØKH, who checked into the 3905 Century Club Net on 1.892 MHz. Phil became interested in this band and net so he put up a double bazooka and a vertical antenna for 160 meters. The double bazooka antenna is similar in size to a dipole, about 240 feet long. Phil worked his WAS during his first season on 160 meters.

Figure 1 — A rare view of the antenna in elevated position. This normally only happens at night, when the neighbors can't see it and 160 meters is open.

A Goal to Meet

It interested me to see if I could also achieve such an award, but to do it on 160 meters SSB. Wow, that would be impressive! I live in a community with antenna restrictions, however, so I wondered whether it would even be possible for me to work WAS on 160 meters. I decided to find out.

The only antenna I thought that might be practical, because of the antenna restrictions, would be a short vertical. After all, my lot size was really too small for a horizontal 160 meter antenna. Another consideration was how to put up a 160 meter vertical antenna so that my neighbors wouldn't notice.

The Solution at Hand

I eventually settled on building a telescoping, base loaded, short vertical that I could raise up at night when I would go on the air, and that I could take down when it was not in use (see Figure 1). I purchased a multisection 32 foot fiberglass pole from Max-Gain Systems to serve as the support.[1] I then dug a 2½ foot deep hole, and put a short length of 2 inch inside diameter PVC tubing into the hole. This was to serve as the base for my antenna (see Figure 2). The bottom section of the fiberglass antenna pole itself had a 2 inch outside diameter, so it fit nicely inside the PVC base.

Hooking it Up

I then attached an electrical box with a banana jack on top and an SO-239 UHF connector on the side to the PVC base (see Figure 3). The antenna wire can be plugged into the jack at night. The box also provided a convenient spot to terminate my radial field and grounding system. The coax leading to the transmitter connects to the UHF jack. Details of the connection arrangements are shown in Figure 4.

[1]Notes appear on page 45.

The next thing I had to do was rig the short vertical. With the multisection fiberglass pole fully collapsed and lying on the ground, I attached a length of piano wire to the top of (and outside) the highest section using a hose clamp.[2] I then extended the top section out as far as I could and repeated the process using a new hose clamp, making sure the wire above the clamp was tight. For each section I did the same until I reached the bottom section. I used the bottom section as the form for the loading coil.

Making it Tune

A loading coil would be needed since the antenna itself was only 30 feet high. I had to wind nearly 100 feet of wire around the 2 inch round bottom section of the fiberglass pole, more than needed so I could trim off small lengths of wire until the vertical became resonant at 1.892 MHz. Each time

Figure 2 — Close-up view of the base construction. A standard PVC pipe is used as a socket for the mast, forming a telescoping arrangement that can be removed when not in use. The three 18 inch capacitance hat wires are connected to the top of the wire.

Figure 3 — The hardware store electrical box contains all the interconnections.

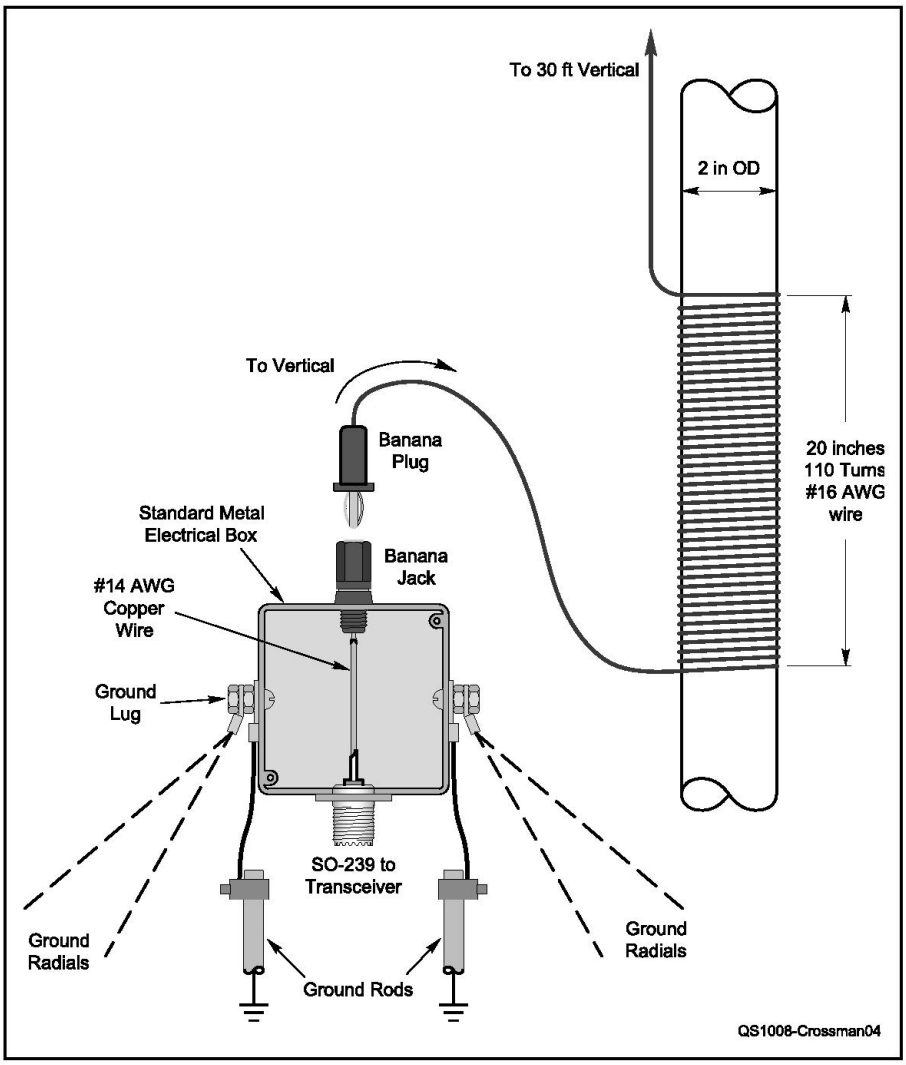

Figure 4 — Construction and wiring details for the collapsible antenna system.

before trimming the loading coil, I would check for resonance using my antenna analyzer, and then trim a short piece of wire until my desired resonant frequency was reached.

Into the Air in the Dead of Night

If fully collapsed, the antenna assembly in its base was only 4½ feet above the ground. To raise the antenna, I simply raised each section until the wire above was tight, and then I clamped that section to keep it up (there is a preinstalled compression clamp at the top of each section). I did this for all six sections of the fiberglass pole. It took less than 2 minutes to fully extend the antenna. To lower the antenna, I simply unclamp each section, one at a time. I could also unplug the banana plug, pull the antenna out of the PVC base, and place the entire assembly on the ground, if I had a good spot to store it.

With the PVC base 2½ feet in the ground, the now 160 meter base loaded vertical stood straight and tall. I used only four radials because that's all the room I had on my lot. Of course, it is recommended to use many more.[4] I would check the SWR before going on the air. It looked good, not a lot of bandwidth, but good enough to operate with my radio and amplifier on full power without the need for an antenna tuner.

On the Air

With much excitement I waited to hear the first station of the 3905 net come on the air at 10 PM local time. On October 1, 2008 I made my first contact with Dale Casterline, KM5MS, a net controller in Mississippi. I got a 5-8 signal report. Then I worked KM4MH in Alabama with a 5-9 report. By this time I was really hooked on 160 meters. By January 25, 2009 I finally worked my 50th state, all on 160 meter SSB with my homemade short vertical. I can't describe how I felt after achieving WAS.

I feel the antenna I built served me well. No one ever seemed to notice the antenna, because it only went up at night. There is lots of excitement still on 160 meters, so come and join the fun and see how easy it really is, even if you have limited space and antenna restrictions.

Special thanks to the 3905 Century Club officers, net controllers and members.

Notes

[1]**www.mgs4u.com**

[2]The piano wire is a very flexible steel wire. I selected it for the radiating part of the vertical because I raise and lower the mast each night. Because of the flexibility of the piano wire and strength when the mast is lowered, the wire just curls very nicely and does not tangle at all. [While steel is less conductive than copper or aluminum, the difference in radiated signal is less than 0.5 dB, per an *EZNEC* model.[3] — *Ed.*]

[3]Several versions of *EZNEC* antenna modeling software are available from developer Roy Lewallen, W7EL, at **www.eznec.com**.

[4]R, Severns, N6LF, "An Experimental Look at Ground Systems for HF Verticals," *QST*, Mar 2010, 30-33.

Photos by the author.

ARRL member Gregory M. Crossman WEØD, was first licensed in 1959 and is now an Amateur Extra class licensee. Greg was an electronics technician petty officer in the US Navy aboard the USS Shangri-La CVA-38. He earned an FCC First Class Radiotelephone License in 1970. Greg worked in the engineering department at the US Military Academy at West Point and then for Radio Free Europe - Radio Liberty as a senior project engineer overseeing the installation of 500 and 100 kW shortwave transmitters throughout Europe. He became a broadcast engineering consultant overseeing high power transmitter installation and then worked for Nortel Networks as a Global Deployment Manager until 2001. He is now retired and enjoying Amateur Radio. You can reach Greg at 9429 SE 124th Loop, Summerfield, FL 34491 or at **gmxman@aol.com**.