

The WA3WSJ Black Widow Vertical

I've received numerous requests on how to build this wonderful and very useful antenna so here are a few hints. The BW Vertical Antenna is nothing more than a basic 20m quarter-wave vertical that uses six ground radials. To operate on 30m and 40m you must load the radiator wire as it is much too short for those bands.

The BW Vertical is a tried and proven performer slipped over a 20 foot fishing pole or just hung from a tree using no pole. In fact many Dxers have taken my BW Vertical on vacations and just threw it up into a palm tree –hi! If put up properly, no tuner is needed as the SWRs on all three bands will be very low on cw. If you want to operate ssb, maybe a tuner will help to touch up the antenna on 40m.



The picture to the left shows the coil or main antenna part. This was my prototype coil and I still use it today as it works great! The coil form is nothing more than a 6" plumbing sink extension I bought at Home Depot for around \$2.00 or less. The O.D. of the coil form is 1-7/16 inches. This is what the coils are wound on.

As you can see, the coil form has two coils wound on it. The bottom coil consists of approximately eleven turns of #26, 19 strand "Stealth-invisible" copper clad steel wire purchased from [Davis RF](#). This is the 30m coil and the plug in the middle is where the vertical radiator wire plus into it for 30m.

The top coil consists of approximately seventeen turns of the same wire. To operate on 40m the BW Vertical utilizes both coils for loading the antenna. You simply plug your radiator wire into the top and you're on the air on 40m.

To operate on 20m you connect the radiator wire to the top plug and simply place a 10" – 3/4" jumper including the alligator clips from the bottom wire just above the BNC connector to the bottom of the top plug. This picture doesn't show that I soldered a paperclip wire from the bottom of the top plug into the coil form. Please look at the picture below for details. This makes it easy to connect the 20m jumper that jumps out both coils.

The radiator wire is made from the same wire as the radials and coils-hi! The vertical radiator wire is approximately 14'-6" in length including the male snap connector. You can buy the snap connectors and plugs from any automotive store or Kmart etc. On the top of the radiator I tie a brass fishing swivel. Just tie a knot with the wire to the loop in the swivel. The top of the swivel has a snap connection which opens to connect to the top section of a 20' fishing pole.

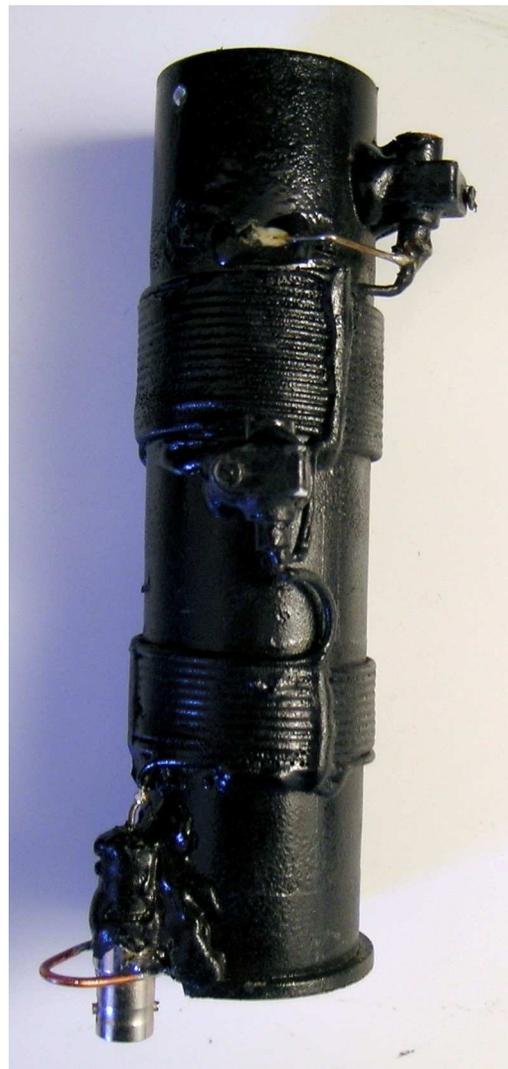
The key to making this antenna play very well is to mount the coil form at 48" to 50" off the ground. If using a 20' pole, just slip the coil over the top and secure it with a bungee cord and a bungee tie. The type that's on most backpacks etc. Another major item is to allow the six approximately 16' radials to droop down off the coil. **DO NOT use the radials as guy wires or your swr will be higher.**

Speaking of radials, I cut three radials 16' each and then solder all three onto an alligator clip. I do this for the other three radials too. The radials simply attach to the ground wire that is soldered onto the BNC connector.

To attach the BNC connector simply buy a **soft copper** pipe clamp that will be soldered to the BNC connector. If you buy hard copper, you'll have problems soldering the bnc connector to the clamp -hi! You'll also have to buy a good BNC connector with white Teflon insulation and not plastic. The cheap ones will melt when you solder it to the pipe clamp.

To get the proper size just take the bnc connector with you to the hardware store and make sure it's a snug fit. I believe 3/8" works fine. The clamp looks like the figure "U" with wings on either side and holes on each wing.

I use 2-56 screws and nuts to mount the bnc connector and the cable clamps for the plugs to the coil form. **Here's a major hint** – on the radiator coil plugs, drill a hole in the coil then feed the screw from inside the coil out through the TV cable tie support. Then heat the screw head with your soldering iron so it melts into the coil form. Just melt it so it's flush with the inside of the coil form – no more! Yes you can purchase TV cable coax supports from Home Depot or other stores. These are the type that have a small nail in the hole. I just remove the nail and drill out the hole so the 2-56 screw will pass through it.



Now that you have built your Black Widow Antenna, You can coat it and make it waterproof. I have used my BW Antenna in pouring rain with excellent results –hi! Take a look at the below coating. You just spray it on, but make sure you cover the connections so you don't coat the inside of the connections. I just use electrical tape cut to cover the tops of the snap connectors and then cover the BNC connector.



Synthetic Rubber Coating

Multi-purpose air dry, **synthetic rubber coating** that can be easily applied by spraying, brushing or dipping. Plasti Dip resists moisture, acids, abrasion, corrosion, skidding/slipping, and provides a comfortable, controlled grip. It remains flexible, stretchy and will not become brittle or crack in extreme weather conditions; -30°F to 200°F. Plasti Dip can be applied to anything that paint is applied to and more. Available in 7.25-oz Can, 11-oz Aerosol, 14.5-oz Can, 1 Gal, 5 Gal, 50-Gal Drum - UV and Fluorescent Formulas Available in 1 Gal, 5 Gal, 50-Gal Drum.

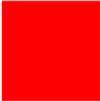
Available Colors



Yellow



White



Red



Clear



Blue



Black

Resources

[Plastidip Brochure](#)

Finally, after at least 24 hours, you want to put a hard coating over the Plasti-Dip so you don't scratch the coil. I spray on a clear coating of Minwax Helmsman Spar Urethane. I use the clear gloss type. After you spray it on, don't even touch it for 24 hours –hi!

Yes I know my BW Prototype looks a mess, but I've used it now for years on the trail, on ships, on the beach with a pole etc. It's been a real winner and I now use it on most all my portable adventures with my Elecraft KX1 Radio. They are a match made in heaven!

So if you hear WA3WSJ calling CQ, I'll probably be using my BW Vertical out on the trail etc. Just give me a call!

72,
Kangaroo Ed, WA3WSJ

