

# THE TACTICAL J-POLE ANTENNA

*“16 minutes from storage and transit to sixteen feet and ready to transmit”*

## Shopping List

10 foot section 3-inch rigid PVC  
10 foot section one-inch rigid PVC  
10 foot section 3/4-inch rigid PVC  
10 foot section 1/2-inch rigid PVC  
4 – 3-inch PVC caps  
2 – 3-inch PVC T’s (reducing to 1 1/2-inch)  
2 – 1 1/2-inch (reducing to 3/4-inch) PVC couplers  
1 – one-inch PVC “T”  
1 – one-inch female screw (PVC) connector  
1 – one-inch male screw (PVC) connector  
1 – one-inch to 3/4-inch (reducing) female screw (PVC) connector  
1 – 3/4-inch to 1/2-inch (reducing) female screw (PVC) connector  
1 – 1/2-inch male screw (PVC) connector  
1 – small can of PVC cement  
1 – assorted length bungee cord package  
24 – 12-ounce cans of beer (chilled)  
50 feet of parachute cord  
40 feet of RG8X (mini) coaxial cable  
1 – SO-239 Panel Receptacle  
2 – PL-259 connectors  
2 – PL-259 RG8X (mini) inserts  
15 feet 300 ohm TV antenna wire (twice as much as you’ll need)

Building the antenna was much easier than I thought. I already had the base built (from another project). The two-foot sections of 3-inch PVC (not cemented together) provided both stability and storage (which is why you don’t glue them shut). Just an inch or so, in from where the 3-inch cap fits on the end of each “leg”, I drilled a pilot hole and then screwed in a rather stout eyehook (for guy wires). After 30 seconds of work, requiring the use of a power-tool, you’ll probably be ready for a beer... I sure was.



At the 3-inch to 1 1/2-inch reducing “T”, insert a 1 1/2-inch to 3/4-inch reducing connector to a 4-foot section of 3/4-inch PVC and let a one-inch “T” slide freely between the two “legs”. This sliding “T” will allow



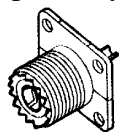
you to adjust the antenna to the grade of the surface where you set up, so that the J-Pole section is as vertical as conditions will allow.

**NOTE: NONE OF THESE “BASE” PIECES ARE CEMENTED TOGETHER!!!**

Next you cut your 5-foot sections of one-inch and 3/4-inch PVC and get ready to cement in place the (PVC) connectors that allow you to screw them together. Don’t cut the 1/2-inch pipe yet...

**NOTE: IF YOU DIDN’T CUT THE 1/2-INCH PIPE, REWARD YOURSELF WITH ANOTHER BEER**

The one-inch segment will require a non-reducing male thread to screw into the one-inch “sliding T”. Cement the one-inch male threaded (PVC) connector to the pole. Cement the one-inch female threaded (PVC) connector to the “sliding T”. If you like, you can drop a 36-inch long one-inch diameter dowel into this section of pole to add rigidity (and weight). At the other end of the one-inch pole, cement a (one-inch reducing to 3/4-inch) female (PVC) connector. If you cemented both ends before you added the dowel in this section, it’s too late. You can use it as a weapon to protect your Tactical J-Pole from those operators who have antenna envy issues.



SO-239 Panel Receptacle



PL-259 Connector



PL-259 insert (super-8)



Beer



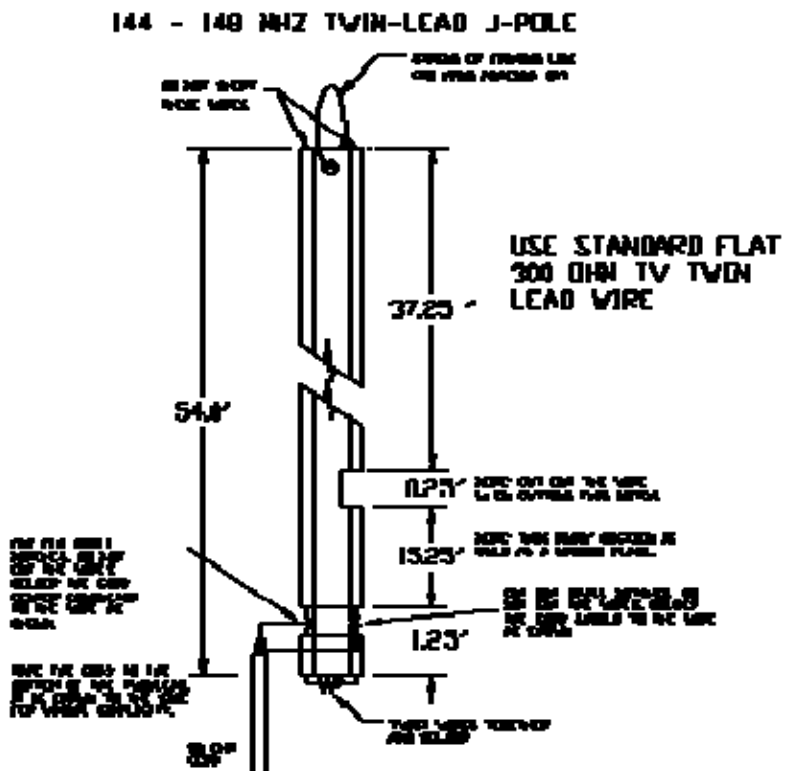


The 3/4-inch segment will require a couple of dowels to maintain rigidity. Test the ability of the dowel to fit (not only into the pole, but also through the (PVC) connectors) before you leave the store! This means that you'll need a larger dowel (extending 2 or 3 inches out of the connector) at the bottom of this section of pole, and a smaller one to extend 2 or 3 inches out of the reducing (PVC) connector at the top. Wrap some duct-tape around one end of the larger dowel (so it's snug) and stuff it half-way into the pole. Wrap the same amount of duct-tape around a section 4 or 5 inches from the end sticking out of the pole, and snug it into the pole leaving 3 or four inches protruding out of the pole. Dump a generous couple ounces of wood glue into the pole, so that it gathers where the dowels will meet. Wrap some duct-tape around one end of the smaller dowel (so it's snug) and stuff it all the way into the pole. Make a small mark on the smaller dowel where it meets the end of the pole. Pull 4 or 5 inches back out and (if it's not all sticky with the wood glue) wrap the same amount of duct-tape around a section 3 or 4 inches in from the mark (so it's snug)

and stuff it all the way into the pole. Leave the excess of the smaller dowels intact for now, we'll trim that later. Go ahead and drink Elmer's beer, while Elmer isn't looking. After all, he knocked your beer over when he was cutting the poles.

Cement the 3/4-inch male threaded (PVC) connector (with the larger dowel hanging out about 4 or 5 inches) to the bottom of this section of the pole. Cement the (3/4-inch reducing to 1/2-inch) female connector (with the dowel hanging out about 2 or 3 inches) to the top of this section of the pole. Drill four pilot holes into the connector/pipe/dowel for your slightly less stout eyehooks (for guy wires). Screw the eyehooks into the connector/pipe/dowels through the pilot holes. Loop two 10-foot pieces of parachute cord through the eyehooks and tie half-hitch knots in the ends. You'll attach bungee cords between the half-hitch loops and the eyehooks on the base later, to tighten and stabilize the antenna later. A cup of strong coffee will help to stabilize Elmer later. Go ahead and let him sleep; he was up late last night on HF.

Finally we get to the least complicated portion of the program... building the antenna. A moderately sober person in your group should do the wire cutting for this step...



Using a 56-inch length piece of 300-ohm (TV) antenna wire, strip ½ inch from each end and solder the two wires together.

A very sober person needs to accomplish this next procedure, as well as any step where an “exacto” knife is used.

Measure up an inch and a ¼ from the end you just soldered, and strip away about a ¼-inch section of insulation from each of the elements. This is where you will attach a one-foot section of RG8X (mini) cable which will, in turn, be soldered to a SO-239 Panel Receptacle (adapter).

The next step will turn a 10-cent piece of wire into a priceless lightweight J-Pole. If you can't make it 1:1 at your desired 2m frequency, invest another dime and do it again; but consider drinking a soda or maybe a nice glass of tea, instead of another beer this time.



Measure up 16 ½ inches from the end you soldered together, and totally cut away about ¼-inch of one of the elements, transforming it into the short side of the J-Pole. Solder the shield of the one-foot section of RG8X (mini) cable to the SHORT side and the center element to the other. Use a generous amount of electrical tape to insulate this connection. **BE CAREFUL NOT TO BREAK ANY WIRES AS YOU WRAP!** You usually

can tell where I messed up, by the bold underlined print...

Solder the SO-239 adapter to the other end of the one-foot section of RG8X (mini) cable. This is only a temporary connection, so remember you'll be “un-soldering” it after you “tune it up”, so that you can feed the wire through a hole on the ½-inch section of PVC that will eventually shield and protect the antenna elements.

Solder the PL-259 connectors to the ends of the (39-foot) remainder of the RG8X (mini) cable, to create the antenna lead. Using a sewing needle and a small length of fishing line, make a loop that you can hang the antenna and lead from, so that you can tune it.



Find the sweet spot on the SWR meter (the frequency where it hits 1:1). If it's **BELOW** your desired frequency (145.000 MHz in this exercise) then clip off about a half-inch from the top (*where the ends are NOT soldered together*), and re-position the fishing wire if you have to. If your 1:1 reading is on a frequency **ABOVE** 148 MHz you need to invest another dime and do it again.

**The longer the antenna, the LOWER the resonant frequency.** Building the antenna slightly longer, than trimming makes less of a hassle than adding a length. Continue adjusting until you achieve perfection (it's possible).

Un-solder the (temporarily connected) SO-239 adapter from the end of the one-foot section of RG8X (mini) cable. Your ½-inch PVC pipe should be about a foot longer than your J-Pole, to accommodate the dowel from the “next” section, as well as the one-foot section of RG8X (mini) cable and adapter. Drill a hole (a little larger than the coax) about four inches from the bottom of the ½-inch PVC pole. Carefully feed the antenna into the ½-inch PVC (the fishing line comes in handy here) so that the end of the RG8X (mini) cable can be seen through the hole you just drilled. Use the dental tool (everybody's got one or two) and pick at the wires until you convince them to come through the hole (you just drilled). Solder the SO-239 adapter to the





ends again, this time for keeps! Carefully feed extra RG8X (mini) cable back into the PVC and epoxy it in place (on the side of the 1/2-inch PVC right over the hole). A couple of small screws can secure it in addition to the epoxy, as long as you're careful not to penetrate the wires with the screws. Once everything's dry, check the dowel length to make sure it doesn't touch the coax inside the pole, cutting away small portions of dowel as you go. Cement the 1/2-inch male screwing (PVC) connector in the bottom of the pole and (with the fishing line hanging out of the top); cement a 1/2-inch cap to the top. Trim away the fishing line when it's dry.

Next, (*sung to the tune of "The leg-bone's connected to the knee-bone"*) the 5-foot section of one-inch PVC is screwed into the sliding "T". The 5-foot section of 3/4-inch PVC is screwed into the one-inch section. You now have a ten-foot mast to attach your antenna to. Screw the (1/2-inch)

antenna section into the top of the 3/4-inch section. Attach the antenna lead to the SO-239 adapter (wire-tie it to the pole to keep stress off of the connection) and hoist her up.



Try different sizes of bungee cords (between the half-hitch loops and the eyehooks on the legs) until the antenna portion of the apparatus becomes vertical. Once you're vertical, wrap a wire-tie around the guy wires (an inch or two beneath the eye hooks) to secure them. Any fine tuning can be accomplished sliding the half-hitches up and down. At this point it's safe to wake up Elmer, so that he can take full credit for leading this project.

Now your Tactical J-Pole can be placed in the bed of a (stationary) pickup truck or wherever is best for your application, giving you a quality portable 16-foot antenna ready for use anytime, anywhere in less than 16 minutes.

The hardest part about building this antenna was the road-trips to the Home Depot, HAM Radio store and the multiple trips to the ice house as we seemed to go through a lot of beer. I'd tell you exactly how much it costs to build your own Tactical J-Pole, but it doesn't really matter now does it? Since I had a lot of PVC already, I only spent money on connectors, wire and beer. I spent more than \$20 and less than \$50.



One sober person probably could have built this thing in an hour or two; it took three of us five hours, twenty seven minutes and 2 twelve-packs. It's not Rocket Science. Rocket Science requires bourbon, some ice cubes, and Bing Crosby/Bob Hope tunes.

*Written by KD5YZU (newbie-greenhorn), edited for accuracy by W2IK (antenna guru), "Elmered" by WA5KRP (spiritual advisor)*

