

The Simplified 2 meter J-Pole

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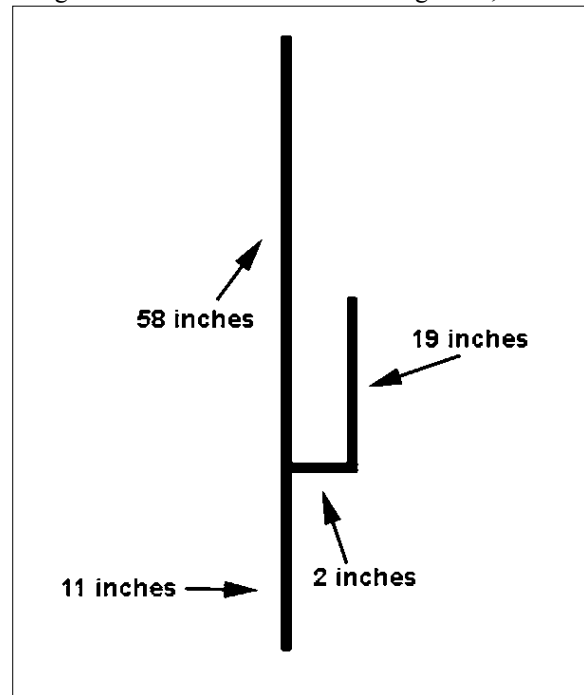
Many a new ham's first antenna has been the 2 meter J-Pole. Our club regularly has a J-Pole antenna party where the new hams can socialize with other hams and get a good antenna to boot. The J-Pole is an excellent antenna for working the local repeaters and 2m simplex voice and digital modes.

The J-Pole antenna can be best described as a $\frac{1}{2}$ wave vertical with a $\frac{1}{4}$ wave matching stub. Many old-timers call the J-Pole an end-fed Zep, as it is similar in design to the end-fed antennas of the 1930's; most notably the antennas used on the Zeppelin dirigibles. Average gain with a 2 meter J-Pole is about 3 db. Many like to compare the gain and antenna pattern to that of a Ringo Ranger. The biggest advantage of the J-Pole is that it is at DC ground, so it can be mounted just about anywhere and still work. Be aware, though, that the J-Pole will couple with nearby large objects or structures, so try to keep it at least 6-8 feet from buildings.

A highly durable J-Pole antenna can be built out of copper tubing very inexpensively. The only tools you need are a tape measure, hack saw or pipe cutter, propane torch, solder and flux. You will need the following materials:

- 1 10 foot piece of $\frac{1}{2}$ inch copper tubing
- 1 $\frac{1}{2}$ inch T connector
- 1 $\frac{1}{2}$ inch elbow
- 2 $\frac{1}{2}$ inch end caps
- 2 $\frac{1}{2}$ - 1 inch hose clamps for attaching coax

Cut the copper tubing into four pieces according to the diagram to the right. If you are mass-producing J-Poles, you will get four Js out of three 10-foot pieces of copper. Clean the ends of the tubing and the connectors with sandpaper. Apply solder flux and solder together according to the diagram. Use rosin core solder, acid solder won't hold up to the environment. Put end caps on the tops of the radiator and the stub, but leave the bottom piece open for moisture to drain.



Use the hose clamps to attach the coax to the J. The center should attach to the radiator and the braid to the stub. The hose clamps should be positioned about 2 inches up from the T connector, but you will want to use an SWR meter or antenna analyzer to find the best feedpoint with the lowest SWR. Once the antenna is tuned you should be close to 1.0:1 across the entire 2m band. Although slight variations in construction and placement will affect the SWR. You definitely should be able to get below 1.5:1 without any trouble. Tape or seal the coax so that water will not get into the foam dielectric.

For a more permanent feeding solution, you can solder an SO239 chassis connector to the radiator and run a piece of 12ga wire out of the center pin and solder it to the stub. Since this is permanent, use the hose clamp method to find the lowest point of SWR first. Be very careful in soldering the SO239, as it doesn't take much heat to melt plastic insulator. Tinning the SO239 and the pipe before soldering it to the antenna works the best.

Mount the J-Pole on a mast with at least 2 hose clamps or U-bolts. In these plans the mounting section is 11 inches long, but you can leave that part as long as you need it to facilitate mounting. Just make sure that the mounting mast does not extend above the T connector.

The copper J-Pole is extremely durable. I have one installed at home that has gone through two winters without any problems. These antennas can also be mounted on a mast and jammed into the ground for an emergency station. Local ARES groups could work with emergency government to place J-poles on the roofs of fire stations and shelter locations. These antennas require no maintenance and are inexpensive enough that they can be installed everywhere.