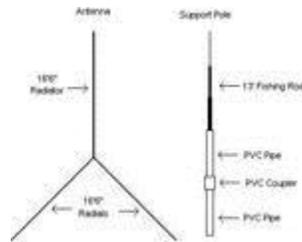


# 20 METER GROUNDPLANE



Most hams are familiar with the quarter wavelength ground-plane antenna design. It is often the first antenna they buy or build for use on 2 meters after receiving their technician license. It is a design that performs well and exhibits low input impedance, making it ideal for use with ham equipment without the need for special matching techniques. The antenna is easy to construct and due to this simplicity is also highly economical. When considering the type of antenna to build for field day to use with my PSK31 setup this design was the obvious choice. It provides both low take-off angle and omni-directional radiation, allowing me to maximize my operating capability from a simple station. The antenna is made up of a single pole which supports the radiating vertical element and is guyed in place with nylon rope. The two radial elements are spread out and held in place by ropes.



The base of the support pole is made of a ten foot piece of 1.25 inch schedule 40 PVC pipe that was cut in half for easier transport in my car. It is joined in the center by a 1.25 inch PVC coupler. Mounted on top of the PVC pipe is a 13 foot extendable fiberglass fishing rod which I purchased at Gander Mountain (I had originally planned on using a 16 foot rod but none were available when I went to the store, with additional height the radials can be lowered at a steeper angle which in turn raises the input impedance closer to the desired 50 ohms). I joined the fishing rod to the pipe by first removing some of the plastic at the base of the fishing rod so that it could slip inside the pipe. Next I drilled a single hole through the pipe and rod so that I could secure the two pieces together using a small bolt and nut to prevent the rod from sliding further into the pipe. I also wrapped the fishing rod with some electrical tape to compensate for the difference in diameter of the rod itself and its plastic base (this allows the rod to fit snugly inside the PVC pipe thereby stiffening the rod and pipe connection).



The radiating element and both radials are 16.5 foot long 14 AWG insulated stranded copper wire. For ease of assembly I soldered the radiating element to the center of a SO-239 connector and attached solder lugs to the radials. This allows me to attach the radials to the SO-239 with two small bolts passed through the holes on the connector, simplifying construction in the field. I taped the radiating element to the pole prior to raising the antenna. The radials were attached after the antenna was erected and securely guyed since the feed point is only 5 feet off the ground providing easy access for mounting. From start to finish assembling the antenna and guying it in place took about 30 minutes to do by myself (with more people it could easily be erected in 5-10 minutes).

The performance of this antenna was better than expected. It matched perfectly on the lower end of 20 meters despite being cut for the center of the band (this is due to my use of insulated wire which adds capacitive loading to the antenna, electrically lengthening it). Whether you are looking for a solid performing base antenna or a light, compact, portable antenna this may be the project for you.

Source: <http://www.highonsolder.com/blog/2007/6/12/20-meter-groundplane.html>