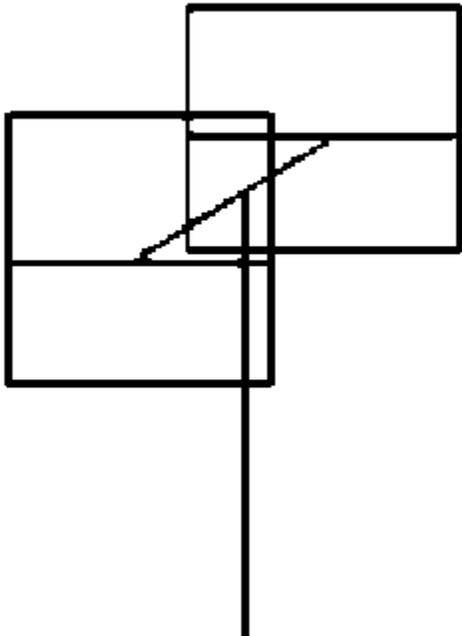


A Two Element Quad for DF and DX



Here is a two element quad portable antenna that we use for bunny hunts. It is good for any time you need a compact antenna that can be used on a 2 Meter rig. It allows a ham to hear signals that were not even there with the rubber duck. It originated with other hams and has evolved.

Materials list:

- 1) 3 to 10 foot BNC extension coax RG-58u or better flexible 50 Ohm
- 2) 88" pieces of 12 or 10 gauge Romex wire, stripped or bare copper
- 4) 11" pieces of 1/2" white PVC pipe, any thickness
- 2) 1/2" T's, slip joints on 2 ends, threaded on the side
- 1) 24" to 36" piece of 3/4 inch pvc, schedule 40 preferred for strength
- 1) 3/4 " slip joint T, cut down the length for some movement
- 1) 1/2" sprinkler riser 10" long, plastic with 1/2" threaded ends
- 1) 4" piece of 3/4" flexible black sprinkler pipe, or a lot of tape for a shim

- 1) BNC chassis mount socket for the BNC connection at the antenna
- 1) 10" piece of insulated 14 gauge Romex wire for the matching section

Note: All instructions are only suggestions. This antenna should perform well as described, but most hams will feel better making some changes to make it better for them. Some will eliminate the matching altogether and feed the coax to the loop, which is sometimes considered better.

Tools and supplies needed:

12 or 10 gauge drill bit on a drill for plastic, soldering iron of any heavy type, with rosin solder, plastic tape, hack saw and/or plastic pipe cutter, optional plastic PVC glue, tape measure, tune up meter - SWR or antenna analyzer.

Assembly:

The support:

Put the 3/4" pipe into the matching T and cut one wall of the T to allow the T to be stretched by the riser that is going inside. Some people use clamps around the T to tighten it to the riser. Shim the riser and make it fit tight inside the T and center it.

The elements:

Drill holes in 2 of the 11" pipes 1/2" in then 1 1/4" in on the other 2 pipes. Mount the pipes in the T's, with or without the glue, but align the holes perpendicular to the threaded T entrance. Thread the bare romex wire through the holes of the pipes drilled 1/2" down, making the wire 21 1/2" on a side, and 22" on the soldered side to form a square. This will be the reflector, with no coax attached. Thread the holes of the remaining pipe that is drilled 1 1/4" down, so that the wire is 20 1/4" on a side and 20" on the soldered side, to form the second square of wire for the driven element. Use a bit of black tape to hold the elements in place on the supports.

The 2 Meter design calls for a 86 1/2" reflector and a 80 3/4" driven element. The 88" allows for overlap.

The matching network:

Solder the BNC connector to the driven element, using a scrap of the Romex wire. The fitting should point to the center of the element. The fitting should probably be very close to the support holes, so temporarily move the wire away from the PVC holes enough to solder without ruining the plastic. Use two of the holes in the connector and thread wire to wrap around the element a few times and solder to connect the ground of the fitting to the wire element. Solder a 10" piece of insulated Romex to the center conductor of the fitting.

Recenter the element in the plastic mount when it cools. Tape the wire to hold the wire in the center position on the pipes. Just 1/2" of tape wrapped around each side on the wire will hold it quite well. Fashion the matching 10" piece of wire to go down the element as follows: 7/8" out, bend and parallel the element for 6 1/2", then bend to the element and wrap around the element 4 1/2 turns. Don't cut the wire until the antenna is tuned up, as this is a starting point. After both elements are soldered and shaped to squares, put the elements on the mast and check the antenna on a SWR bridge or antenna analyzer.

Tuning:

Have someone hold the mast upright with the coax attached and all elements in place. Insert the meter and move the matching wire to reduce the reflected power to a minimum. First, move the wrapped section in and out a bit, to look for the low reading. When the best reading is found, try to unwrap and wrap the turns 1/4 at a time to find a lowest reading. If a near perfect reading can be made, cut the wire close to the wrap. Recheck and now try to move the parallel section in and out and move the wrapped wire to get the very best reading. Use suitable glue, such as vinyl glue, hot glue, or epoxy to secure the wrapped section. Many people like to secure and seal the fitting at the wire solder joint for support and weather proofing. This antenna should tune with 1:1 SWR or close. Do not use an antenna that reads over 2.0 on transmit for long periods of time.

By WA7ABU, Dan Bathurst - - - this design developed from one by WB6BYU