

QRP Dummy Antenna

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I needed a small dummy antenna for testing my Elecraft K2. It was to be small and capable of being used into the VHF range. It had to have a BNC connector, and it needed to dissipate up to 15 watts to match the K2. The photograph (above) shows the finished product. The dummy antenna uses a short piece of RG-58 or RG-59 coax, a screw-on BNC connector, four 200-ohm resistors and two copper disks to provide short RF lengths.

The materials are as follows:

Two (2) copper disks cut from flashing copper. Draw circles using a quarter as a guide and cut the copper with heavy scissors or tin shears. Small pieces of PC board may be substituted as well.

One (1) twist-on male BNC for RG-59/U Cable, Radio Shack part number 278-104; also Mouser Electronics part number 523-31-5136-RFX. If you are using RG-58/U coax, use Radio Shack part number 278-103, Mouser part number 523-31-5137-RFX

Four (4) 3-watt 200 ohm metal oxide power resistors, Mouser part number 283-200.

Three-inch length of RG-59/U coax cable (double shielded, braided over foil) or RG58/U (single tinned copper braid shield). Both coaxes need to have solid center conductors, as the screw-on connectors will not work with stranded center conductors. Some of the RG-59 and RG-59 have stranded center conductors, so avoid these.

Crimp-on connector (terminal lug-type) with tinned or plated metal crimp barrel to fit size 14/16 wire.

Tools:

Small electric drill motor

3/16" (0.1875" / 4,7mm) and 1/32" (0.03125" / 0,79mm) drill bits.

Heavy-duty soldering iron, 100 watts or more.

Solderless connector crimp tool.

Construction:

Drill a 3/16" hole in the center of the first copper disk.

Drill four 1/32" holes around the periphery of both disks, 1/8" from the outside, and 90 degrees apart.

Drill one 1/32" hole in the center of the second disk.

Install the screw-on coax connector on one end of the coax per its instructions.

Strip 5/8" of the outer cover from other end of the coax.

Thread both shields of the RG-59 and the single shield of the RG-58 through the 3/16" hole in the first copper disk. Spread out the outer braid all the way down to the first copper disk.

If the coax has a copper shield, trim it to about 1/2" so it can be soldered directly to the first copper disk right where it comes through the hole.

If the braid is aluminum, twist the braid tightly together and trim to about 1/2 inch. Insert the twisted braid into the crimp-on connector. Move the crimp-on connector close to the first copper disk and crimp with the crimp tool. Cut off the connector part of the connector and any plastic cover, leaving just the metal barrel that is crimped around the outer braid so that it can be soldered to the first copper disk.

If you are using coax that has a double shield, the inner (foil) shield should be left intact. Cut any inner shield back 1/8 inch from the end, and cut the inner insulation back 1/16 inch.

Insert one lead of each of the four 200-ohm resistors into the four holes of the first copper disk. Solder the resistors and also solder the copper shield (or the crimped connector barrel) to the first copper disk.

Insert the remaining resistor leads and the coax center conductor lead into the holes in the second copper disk and solder.

Check to make sure the inner shield is not touching the second copper disk.

This completes the construction.

Notes:

1. The piece of coax is so short that it doesn't matter if it is 50-ohm or 75-ohm.
2. I measured the impedance of a dummy antenna constructed with RG-59 with an Autek Research model RF-1 RF analyzer. It read 50 ohms from 1.8 to 23 MHz, and 51 ohms from 23 to 35 MHz.
3. The dummy antenna is capable of dissipating 12 watts continuously and twice that for short periods.