

be the top side. One will usually out perform the other depending on building material used in the building and height off the ground. Figure 3 shows a close up view of the dorm antenna. A gamma match is used to match the dipole to the 50 ohm feedline. This increases the efficiency of the antenna. All construction of antennas on this page use brazing rods available from your local welding shop, buy the longest rods you can find. The center of the coax is connected to a short rod (7 inches long, 1 inch inserted in dowel) that is inserted into the wood dowel about 3/4-1 inch away from the antenna radiator. A metal clip connects this short rod to the antenna radiator (see figure 7). This clip should be able to slide up and down the two rods, this is to be done to match the antenna to 50 ohms, or 1.0:1 SWR (or as close as you can get it). In the case of the radiator two rods were fused together with a torch to make a rod that was A+A long (see element cutting chart). When tuning up this antenna place the clip about 3 inches away from the dowel. place antenna at least 3 feet (if not more) away from all objects and apply RF energy from your transmitter and check SWR (you will probably need at least 100mw of output power to do this). Move the clip 1/2" either direction and measure SWR again, if it goes up you went the wrong way, if it goes down your moving the right direction. Try for the lowest SWR reading. You may want to make the rod a little bigger than A+A so you can trim it down with a pair of wire cutters, this will also help you 'match' your antenna.

Figure 6 shows the construction of a groundplane antenna. A 2 inch diameter wood dowel is used as a base. A hole is drilled down its center, and the bottom is cut out a bit to accommodate the top of a UHF connector (used in CB and other radios). A 2 x 2 inch of metal is used to connect the UHF connector (ground side) to the ground plane radials. Holes should be drilled at an angle to accommodate the radials so that the radials are 135 degrees from the radiator. Drill the metal so it will accommodate the UHF connector and the groundplane radials when up against the dowel. Connect the UHF connector to the metal plate with solder or screws, making sure that the center of the UHF connector is not touching the metal plate (ground). Slide the radiator (main radial) down the center of the dowel so it sticks through the dowel several inches and solder it to the center of the UHF connector. Shoot some glue in the holes that are going to accept the ground plane radials. Slide the plate up so it touches the dowel and align the holes for the ground plane radials. Insert the radials. Let the glue dry and then solder the radials to the metal plate. Tune antenna with SWR meter. Start with radials just a bit longer and trim down 1/8th of an inch at a time until lowest SWR appears.

Figure 7 shows the construction of a gamma match for the dipole antenna. Two small rectangles of sheet metal are drilled in the center and a machine screw sandwiches them together compressing on the gamma match rod and the radiator. A wingnut helps for fast adjustment. Copper circuit board, or any other highly conductive material could be used in place of the sheet metal. I know of people that solder a UHF connectors ground side to the radiator and solder its 'hot' side to the gamma match rod. This enables them to use connectors on the ends of the coax cable, thus creating a much cleaner antenna.

Figure 8 shows several ideas when it comes to mounting antennas. A) shows a groundplane antenna used as an out the window dorm style antenna. B) shows a typical mounting of a groundplane antenna with metal straps, or duct tape, or ... C) shows a horizontal dipole on the top of a pole or dowel. A dipole could also be supported between two structures.

It should also be noted that an antenna is tuned to a particular frequency. If one day you will be broadcasting on 100 Mhz and the next day 106 Mhz you will not have a match on both frequencies. The two choices are to A) tune your antenna to 103 Mhz (a happy medium) or B) use two separate antennas. Remember, when broadcasting low power, every little bit helps.

On the Road

Two-meter ham radio antenna are well suited for mobile operation of FM broadcast band transmitters. Most have a little Alan wrench set screw that holds the radiator in place. Simply remove the stock radiator and replace it with a brazing rod of length A (see figure 5). Tune up by simply cutting the rod down in size or loosening the set screw and raise or lower the rod and tighten back up in between SWR measurements. With a mobile setup you can broadcast all night long from a very high location (ideal for good coverage) and see the magic vans coming for miles.

In Closing

There are enough ideas here to get you started. But there are many more antenna designs. Some that offer gain (increased output in desirable directions), or are highly directional (broadcasting only in one direction). Consult the ARRL Handbook for many more ideas and better explanations of some of these ideas and designs shown here..