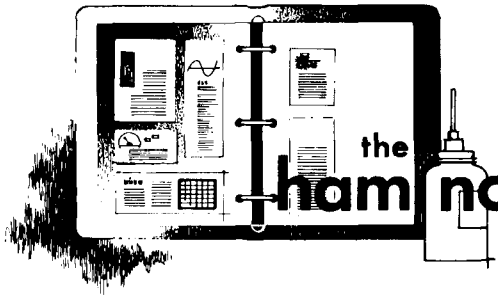

the ham notebook

5/8-wave whip for 2 meters

A standard 102-inch Citizens Band whip can be easily converted into either a fixed station 5/8-wave groundplane or an effective mobile gain antenna. Gain for either antenna was measured at about 2.5 dB over a quarter-wave groundplane. Both antennas are electrically sound and do not have mechanical joints to corrode and break down. The overall view of the home-station version is shown in **fig. 1**, and the mobile version in **fig. 2**.

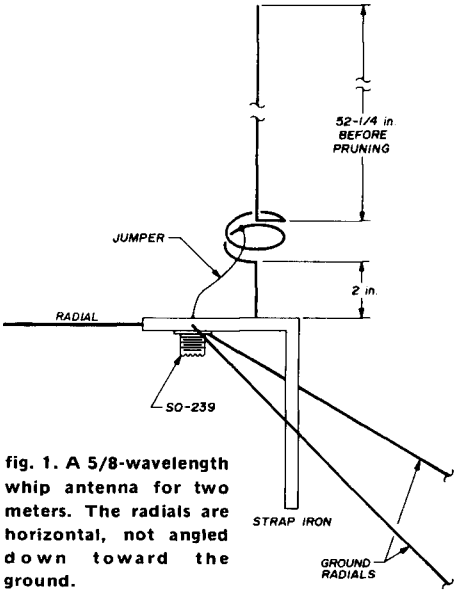

fig. 1. A 5/8-wavelength whip antenna for two meters. The radials are horizontal, not angled down toward the ground.

For the home-station groundplane, measure down 52¼ inches from the antenna's tip and place the antenna in a vise. Using a torch (propane does well), heat the whip cherry red and bend a 90° angle when the metal will allow itself to be bent without undue force. Using a jig made from 2-inch diameter pipe (**fig. 3**), bend the coil slowly while constantly applying heat. Bend 1½ turns with at least ½-inch spacing and finish the coil so that the straight section of the antenna below the coil is lined up with the longer section above the coil. Leave 2 inches of wire below the coil and remove the rest.

The antenna base is made from a seven-inch section of 3/8-inch by 2-inch galvanized flat iron. Drill the flat iron as shown in **fig. 4** for an SO-239 coax

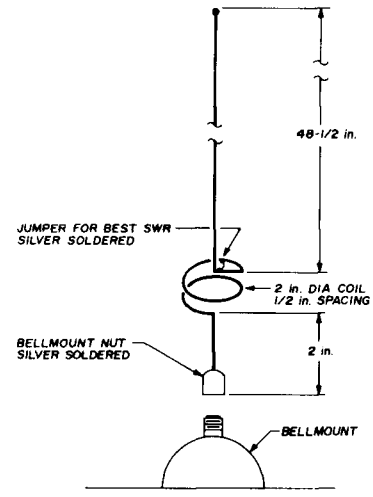

fig. 2. Using the 5/8-wavelength antenna for mobile operation.

connector and its mounting screws. Be sure to ream out the underside of this hole to allow the connector to sit flush with the flat iron. Drill 1/8-inch holes for the ground plane elements and the whip. Heat the iron and make a 90 degree bend as illustrated.

Cut three ground radials from 1/8-inch round rod such as galvanized lathers ceiling rod. Each radial should be 19-inches long. Insert them into the three holes drilled into the side of the bracket and bend the two side radials so there is 120° spacing between all three radials. Insert the whip into its mounting hole until its bottom is flush with the bottom of the hole. Weld or silver-solder the whip and the radials in place. Install the coax connector and solder a short length of solid number 12 copper wire to the center pin (this will go to the tap on the base coil eventually).

The rest of the procedure is simply tuning and pruning. Wrap the free end of the copper wire about one half turn from the bottom of the coil and, with a vswr meter in the feedline, adjust the tap point for best swr. Trim the end of the antenna by filing a notch and breaking off about 1/8-inch of rod at a time. By working back and forth between readjusting the tap and trimming the antenna length, you should be able to tune the antenna for zero reflected power. At this time, silver-solder the copper wire to the coil. Seal around the coax connector and around the copper wire with silicon seal to protect your rf feedline in case of heavy rain or ice build up. It is also worthwhile to paint any spots that might have been exposed to excess heat in the construction. Simply mount the base to your tower or mast.

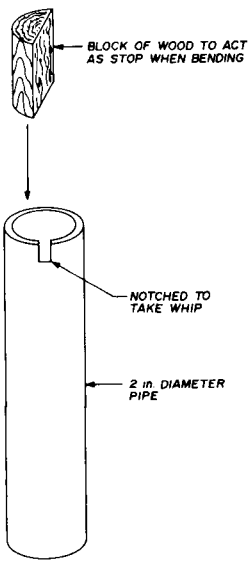

fig. 3. Jig used for bending the base coil (see text).

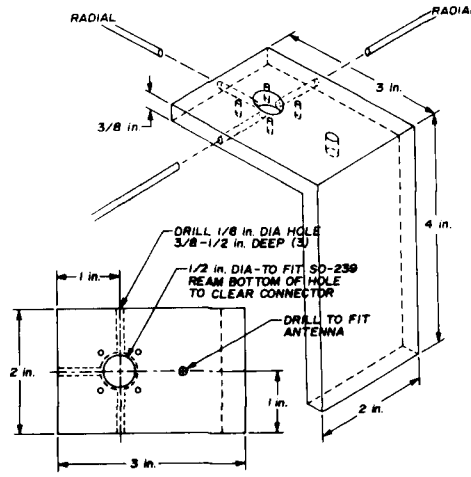

fig. 4. Construction of the antenna base. Horizontal radials are installed and welded in place.

A mobile version of this antenna is made in basically the same manner. The radiator (after the coil) is cut to 48½-inches rather than 52¼-inches, and the base of the coil is connected to an ordinary bell mount. The base coil is wound just like the home-station version. The mobile antenna is not a grounded system, however. It is tuned for minimum vswr by adjusting the tap point for a short jumper from the junction of the base of the radiator section and the top of the coil to a point on the coil. In my case, by juggling the antenna length and the tap point, I found the best tap point by shorting about 1¼ turns. Silver solder the jumper in place.

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