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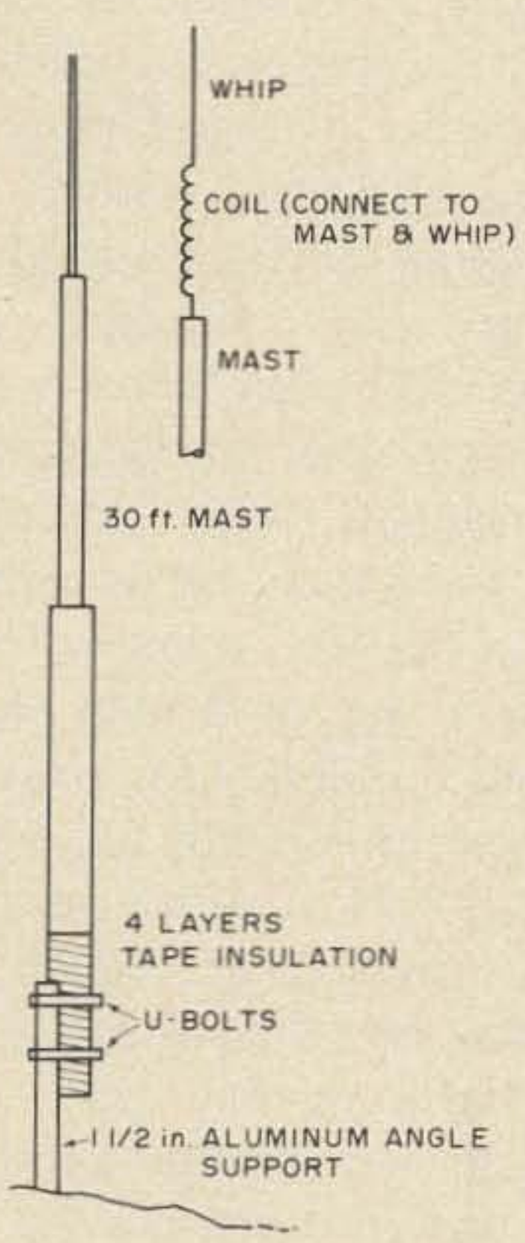
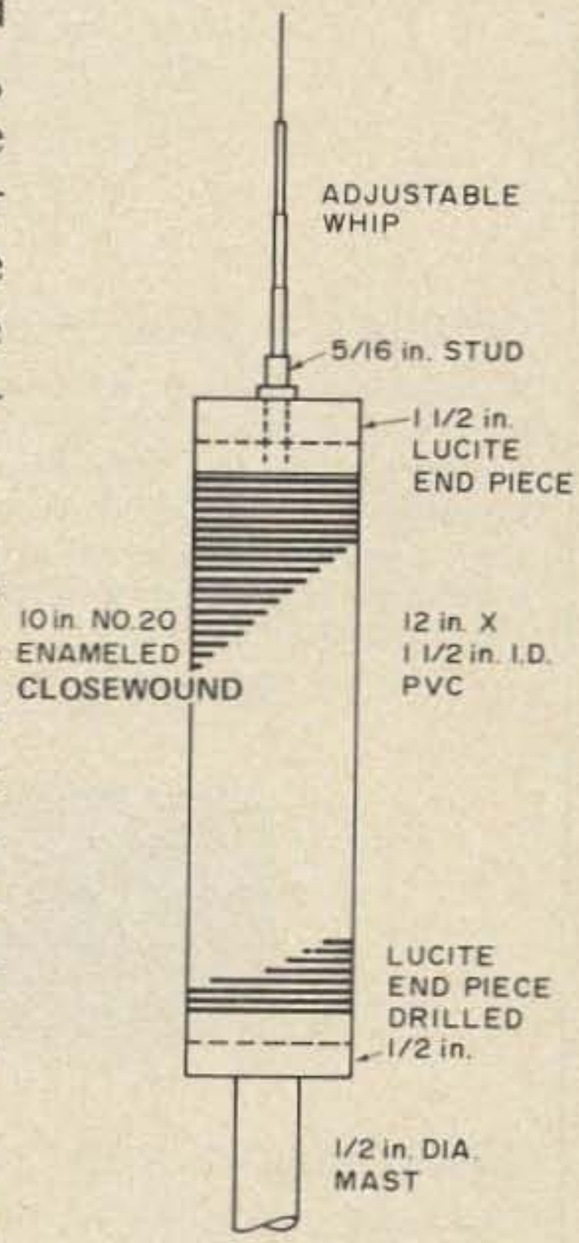
A Simple, Short 160m Antenna

Great for portable use



A thirty-foot vertical, top-loaded and using as good a ground as possible, can produce good results on 160. The antenna described here was designed for field day and portable operation, but may be made a permanent installation. It makes use of readily available materials and is inexpensive to build and easy to tune up.

Most anything can be used for a mast, as long as it is capable of supporting the loading coil, and provided that it can be made a solid low-resistance structure. The mast I used was made of telescoping 8-foot sections of aluminum tubing, using self-tapping screws at the joints for good bonding. Other possibilities might be copper water pipe, thin-wall tubing such as conduit, or even a wooden mast with a few heavy aluminum wires stapled to it to form a low-resistance conductor. I used 90 lb nylon string for guys, but if a permanent installation is to be made, wire guys and suitable insulators should be used. Four layers of scotch electrical tape are wound over the bottom of the mast as an insulator, although a better insulator might be made by using a section of old bicycle innertube slipped over the end of the mast.



The adjustable end-section above the loading coil is a broadcast-band replacement automobile whip of the telescoping type, designed to fit over the broken-off stub of the old antenna, and is available at most auto supply stores and electronics stores. This whip is used as a tuning device. Varying its length will allow you to achieve resonance at the portion of the band desired, in the same manner that the commercial mobile whips are resonated.

The loading coil form is a piece of PVC water pipe, 1½ inches i.d., with a 1 7/8 o.d., and makes a light, strong coil form of excellent Q. It is readily available at plumbing supply, hardware or home handyman centers. The coil itself consists of 10 in. of #20 closewound, the ends secured with a drop of epoxy cement after passing through a hole in the form, and lugs soldered to the ends for connections as shown in the sketch.

The end pieces, which are held in place with a screw passing through the coil form and end piece, are made of 1-inch thick lucite, 1½ inches in diameter to fit inside the coil form. Mine were made for me by a friend who used a lathe, but they can easily be fashioned using a coping saw and a hand drill. The bottom end piece was drilled to fit over the end of the mast, in my case ½ inch, but if you are using different mast, change the dimensions to suit. The top stud is a 2 inch 5/16 bolt, passing through the center of the top end piece, and allows the whip to be clamped solidly over this stud, using the screws provided by the whip manufacturer.

After the entire loading coil assembly is completed, place a piece of shrink-tube over the coil and apply heat. This will form a good weather seal and offer protection to the coil windings.

Tuneup of the antenna is simplified by placing the coil on the top section of mast, supporting it temporarily, and adjusting the whip for resonance as indicated by lowest swr. Adjust for resonance 25 kHz HIGHER than you wish to operate, then when the rest of the mast is added, the frequency will be where you wish to operate. If a grid dipper lowered to where you wish to operate. If a grid dipper and impedance bridge are available, they will simplify the procedure. A direct connection to 50 Ohm coax was found to be satisfactory, and no elaborate matching system needed. My antenna showed 1.2 to 1 at resonance. In use, the antenna will show a VERY narrow frequency range, on the order of 8 kHz plus and minus the selected frequency for an swr below 2 to 1. However, this is not too bad on 160, since the band is most active on the bottom 1.800-1.825. Any segment which is active in your area may be selected and the loading adjusted for that frequency. (1)

The best available ground should be used. A rod driven a few feet into the ground is useless except for lightning protection. Use a connection to a cold water pipe, and at least two 130 foot wire radials, zig-zagged if necessary, to fit the space available. DON'T shorten the wires, even if the space is tiny. If you possibly can, run the radials straight out, and don't bury them unless you must, and then only a scant inch deep. (2) (3) (4).

This antenna works well for local contacts, and does well on DX if the band is quiet. See you on top-band next field day!

(1) See ARRL 160 meter allocations chart available from headquarters free.

(2) 73 Magazine, June 1974, "A Practical Ground System for 160," pg. 51.

(3) Ham Radio, April, 1973, pg. 16. "The Vertical Radiator."

(4) My own footnote; DON'T mount the antenna anywhere but on the ground. Most hams seem to think "if it's higher it's better." Look at the commercial antennas in the Jersey marshes. If it's a vertical it should be on the ground and well grounded, or more accurately, well ground planed.

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