

# Antennas — Keeping Them Up

**Basic Amateur Radio:** Here is a potpourri of ideas designed to make the installation of your next antenna a little more permanent than the last.

By E. W. Ljongquist,\* W4DWK/W1CQS

**A**fter 55 years of planning, constructing, and erecting antennas, and with the aid and information from many knowledgeable hams, I feel some of my experiences may be of use to the fraternity. The thoughts are not so much as to how the antennas went up, but why they fell down!

It may seem ridiculous to mention, but the antenna is the most important single item in an amateur's setup. Next comes a good receiver and a good operator who knows the tricks. Of course, an exotic call may be worth a few dB. (I have worked many a DX station who was using 5 watts or less, and a good antenna.) I will not overemphasize the importance of height. Instead I will point out that your antenna system — feed line, supports and the antenna itself — is the most exposed part of your real estate. Night and day, year in and year out, it is up there, being flexed, rained on, iced and contaminated with soot, maybe salt spray, gases and dust. Of course, there are physical and financial limits to construction, and to the strength of an antenna's supports and wire size, or an array's weight and wind-load limits. That, plus a few handy, easily affordable gadgets and adaptations, is what I wish to go into here.

Probably the most popular antennas in use are the half-wave dipole and its cousins, the inverted V and the sloper. All of these antennas require a center insulator. I have bought and used many types, from a completely sealed weather-tight assembly to a simple glass insulator. The simplest and best that I have used is made from an odd piece of Plexiglas, 3/16- or 1/4-inch (4- or 5-mm) thick, drilled as shown in Fig. 1. The rope and antenna wire holes should be smooth, but this is not necessary for the coax mounting holes. I have yet to have one fail. One has been holding up an 80-meter inverted V for eight years. A balun can be mounted on a larger piece, using epoxy to cement

the balun network to the Plexiglas. Baluns, by the way, do not necessarily improve the operation of a dipole antenna. This type of insulator will also work well with open-wire feed line. It will hold a lot.

## Wire

Have you tried to buy wire lately? After many years of changes and splicing, some of my wire looked more like solder than copper. That, and the failure of two guys on my "Four Bands on a Pole" last March, sent me in search of some guying material. Four dollars today will buy you 50 feet of extremely fragile-looking stuff. On a long shot, I stopped at a wholesale electrical supply house. A meek request, plus mentioning that I was a ham, got me over 150 feet of electricians "pulling wire" for less than eight dollars. When installing it I did not strip it, but looped plastic and all through the insulators,

\*Ljongquist, "Four Bands on a Pole," *QST*, September, 1972.

stripping only enough to make the center connections.

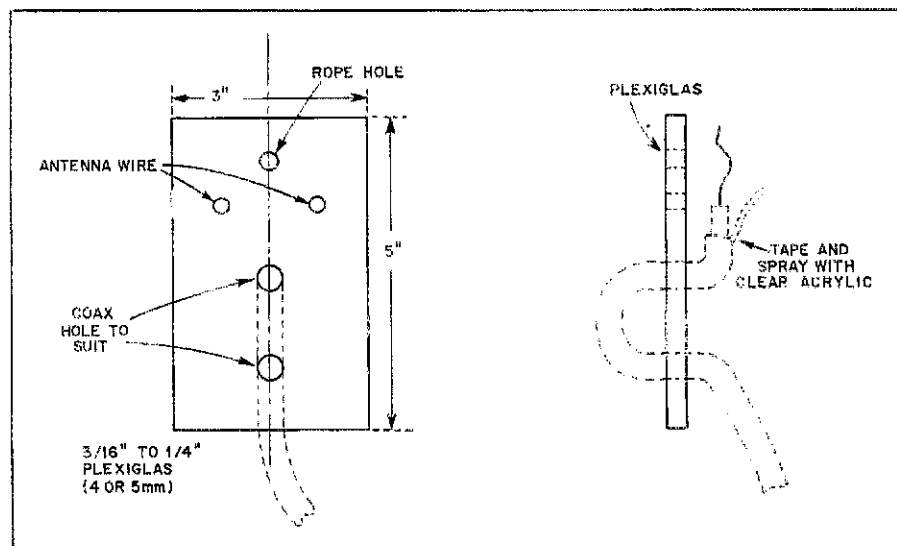
## Base for Verticals

Putting something under a vertical or pipe mast to keep it from sinking into the ground or shifting has long been a problem for hams. A simple solution is to punch a hole in an old automobile hubcap, and drive an 18-inch (457-mm) piece of rod or pipe through it into the ground. Small hubcaps work best because they are easier to mow around. I went first class with a Cadillac hubcap, shown in the photograph. Radials can be fastened to the cap by drilling holes around the circumference and using short stove bolts to attach the wires. To insulate the base of a vertical, PVC pipe can be fastened to the base of the vertical and slipped over the ground mounting pipe.

## Masts and Supports

Through the years I have used several methods to support my antennas,

Fig. 1 — An inexpensive, nearly indestructible center insulator for dipole antennas.



including the wooden masts described in past editions of *The Radio Amateur's Handbook*. Wooden masts work well, but require a few precautions to assure long life. Never surround wood with concrete. The wood will rot and you may not realize it until too late. It is better to mount upright angle or flat stock in the concrete and fasten the wooden mast to these supports with bolts.

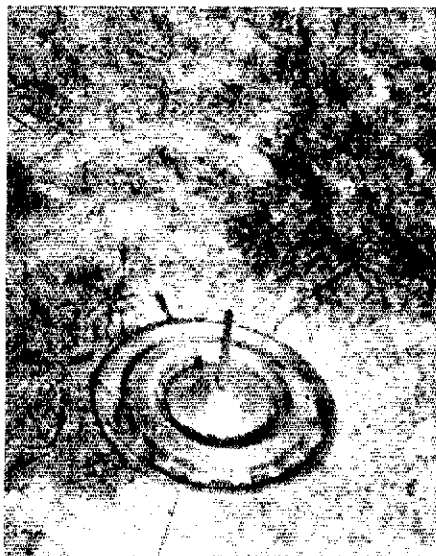
Probably the most popular mast is the telescoping variety, commonly used as a television antenna support. Some amateurs use them to support a small beam and rotator but their performance in the presence of torque leaves much to be desired. A TV mast can be fastened to your house, but do not try to fasten the mast support to the cornice or siding with the lag screws furnished in the mounting kit. Try to find solid support in the framing of the house, and use a backing block of 2 x 4 or heavy plywood to pick up the solid fastening and bolt the mount to this.

Extend the mast after it is mounted. Have a helper hold the bottom section in place and, starting with the uppermost section, extend it section by section. It is possible to put up masts alone, but it is dangerous and takes far longer without help. Gloves and hard hats are a good safety precaution in any antenna work.

I have used nontelelescoping TV mast for heights up to 50 feet but found that its flexibility and the maze of guy wires required can be a problem. After watching several sections of mast buckle, I had come to the conclusion that it is almost impossible to "walk up" a mast with antenna without disastrous results until the following technique was worked out. I use a section of iron pipe for the lowest two sections of the mast. Two guy wires are first anchored at the appropriate distance from the base (see Fig. 2) and the third guy wire is taped to the mast until it is needed. If you are using a second set of guy wires, tape them temporarily to the mast. It is more than annoying to find loops of guy wire dangling out of reach after the mast is vertical!

### Trees

One thing can be said about trees; they are almost never where you want them. When my sons were younger, the problem of getting a pulley and line up into a stout tree was greatly simplified. They loved an



No, this is not the start of another strange encounter. It is a nifty way to keep a vertical antenna from sinking into soft soil and provides a junction point for ground radials.

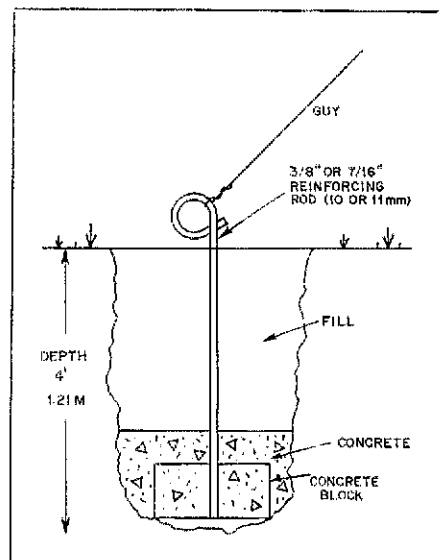


Fig. 2 — A method of making guy anchors from reinforcing rod obtained at a salvage yard. The concrete blocks can be obtained from the same source.

excuse to climb. They did fine jobs wiring a pulley in place, and heaving the line with a suitable weight attached, out through the branches. They have since gone out on their own. Recently, I was raising a long-wire antenna. I spotted a high, willow locust tree the appropriate distance from the house. Through the help of the local ham underground, I located a very experienced "tree shooter." He appeared as arranged, with his bow, arrows and a long pole on the end of which was fixed a cone of grocers' twine. He tied the twine to an arrow. I held the pole as high as I could, and he shot the arrow through the top-most branches of the tree. I tied a length of plastic clothesline to the twine and pulled it up over the tree. The insulator and wire was attached to the plastic clothesline and pulled into place. The feed line was run into the shack, connected to a Transmatch, and some contacts were made. During the night a breeze sprung up, but seemingly nothing unusual. The next morning I turned on the rig and tried to tune up. Nothing doing; I looked out the window, and there was my new long wire on the ground! Going outside I found that the wire had parted. I hauled down the end attached to the tree,

repaired it, and hauled it up again. Just then another gust of wind came along and down came my wire, again. I had never noticed how much a high, thin tree can toss about in the wind. So, sacrificing height for a stable anchorage, I finally ended up with a long wire not quite as high as the original, but one that worked almost as well.

### Sheaves and Halyards

Never use "wire-reinforced" line, such as plastic-jacketed wire clothesline, as a halyard. Moisture enters the jacket and the result is hidden corrosion and weakness. A good substitute is plastic clothesline that has a core of stranded fiberglass. Braided nylon rope makes an excellent halyard though it does tend to stretch a bit. This can provide a shock-absorbing action though. Remember to leave enough slack line to allow complete lowering of the antenna.

Good, tight sheaves are hard to find. There is nothing more frustrating than to have a line run off a pulley and jam 50 feet in the air. Try to find a pulley that has the block close to the wheel so there will be less of a chance of the rope falling off and becoming jammed!

## Strays

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