Heliwhip Tuning without Pruning

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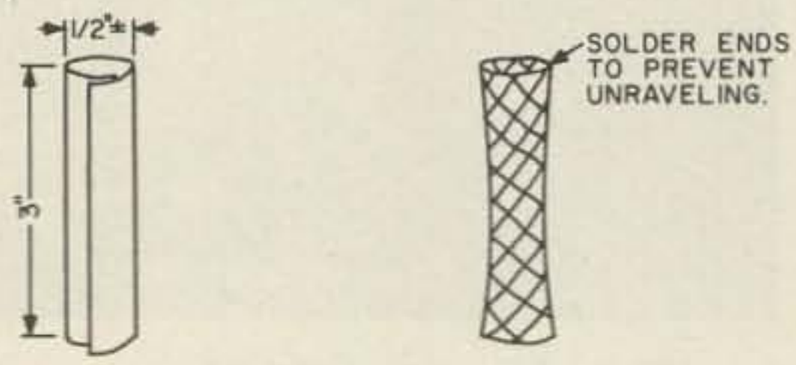


TYPES OF TUNING CYLINDERS
FIGURE 1

After using heliwhips for mobile operation during the past few months. I was able to arrive at a few conclusions you may find interesting. In the first place, the heliwhip is an efficient, high-Q antenna and offers the unique appearance. However, like base-loaded and advantages of short length and unobtrusive center-loaded whip antennas, the heliwhip is frequency conscious and restricts QSY operations to a narrow portion within a band.

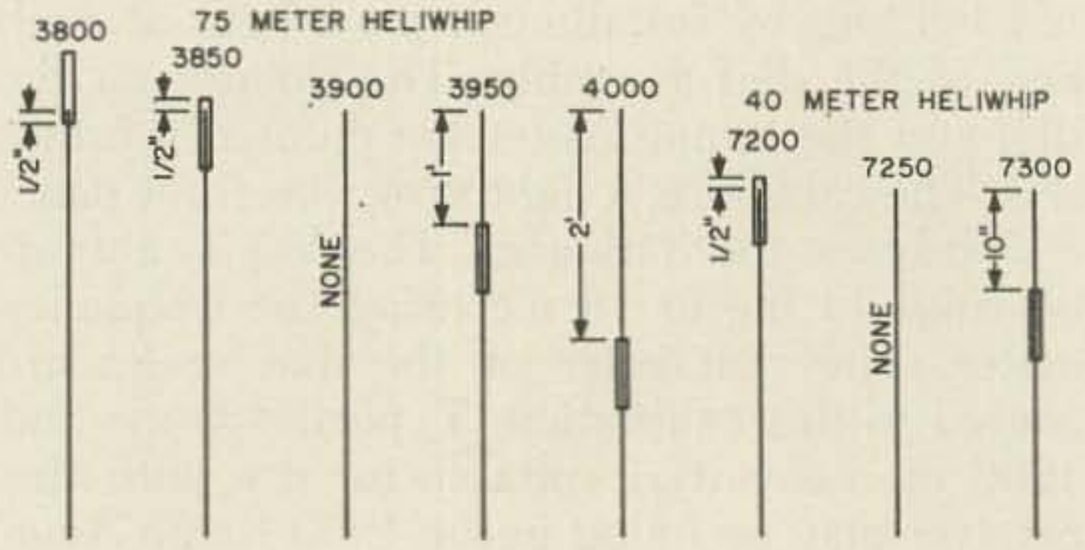
After a series of tests and measurements, I learned that a given heliwhip has a bandwidth that is approximately equal to 1 percent of the antenna's optimum frequency. For example, a heliwhip peaked to 3900 kc has a bandwidth of about 39 kc (.01 x 3900). Satisfactory operation with this heliwhip is therefore limited to the range of frequencies 3880 kc to 3920 kc, or roughly 20 kc either side of the optimum frequency.

The same bandwidth percentage (1%) is applicable to the other bands. For 40-meter operation, a heliwhip pruned to 7250 kc will be useful over the band 7215 kc to 7285 kc. A 20-meter heliwhip cut for 14,250 kc is good over the range 14,180 kc to 14,320 kc. When peaked to 21,300 kc, a 15 meter heliwhip permits satisfactory operation over a range of frequencies 100 kc on either side of the resonant point.

A review of the bandwidth capabilities of each antenna reveals that a heliwhip cut for optimum operation in the middle of the band will provide adequate coverage on all bands except 40 and 75 meters. Unlike the base-loaded and center-loaded whip antennas, the heliwhip has no provisions for altering the operating frequency. After the wires of the heliwhip had been irrevocably cut, or pruned, to a desired frequency, operators accepted the sad fact that QSY operations were severely limited. However, owners of heliwhips need not be shackled to a narrow band of operation. By using the simple tuning technique described in the next paragraph, the operator can peak-tune his heliwhip antenna to any part of the band, including the cw portion at the low end and the MARS frequencies outside the high end.

Heliwhip Tuning System

Heliwhips, as you know, are made by spirally winding the wire on a fibreglass core. Because of this unique construction, heliwhips can be peak-tuned to different parts of the band in less time than it takes to tune a guitar string. All you need is a 3-inch cylinder of copper or aluminum that will fit snugly over the helical windings of the antenna. By sliding this metal cylinder up or down on the heliwhip, the resonant frequency of the antenna is lowered or raised. Fig. 1 shows two types of tuning cylinders you can make. In an emergency, alu-



TUNING POSITIONS
FIGURE 2

minum foil from a pack of cigarettes can be used.

The table in Fig. 2 shows the position of the tuning cylinder for each 50 kc change in the range 3800 to 4000 kc. Similar settings for the 40-meter heliwhip are also given. Present calibration marks on the heliwhip permit rapid positioning of the tuning cylinder when optimum operation on a different part of the band is desired.

Operating Notes

Newly purchased heliwhips are designed by the manufacturer to resonate at the low-frequency end of the phone band. An unpruned 75-meter heliwhip will, therefore, operate best on 3800 kc. To facilitate QSY operations within a band, I peak-tuned each antenna to the middle of the band. In this way, the amount of deviation required to tune up on either band edge is kept to a minimum.

Heliwhips provide high-Q, above-average radiation efficiency when the antenna is peak-tuned to the desired frequency. However, QSY operations are handicapped by the lack of provision for tuning the antenna to different frequencies. To overcome this advantage, while enjoying the efficiency of these unobtrusive antennas, try the "tuning without pruning" sliding cylinder. Man, it's the most!

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