Hamstick Dipole Is A Practical and Portable Limited-Space HF Antenna

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When setting up portable or space restricted antennas, stand-alone mobile whips are often avoided due to the lack of a good grounding method. Stringing ground radials or using a ground rod in the field or the attic becomes increasingly difficult. While using one mobile whip by itself requires a good ground or counterpoise (usually the car body), a pair can be operated as a dipole. Lakeview (www.hamstick.com) makes a universal dipole mount for $13.95. They also supply quick-disconnect fittings with 3/8" X 24 threads which allow push-and-twist assembly of the mobile whips to the dipole mount within seconds for those of us wishing to make a quick setup or band change without tools.

Pro-Am makes Valor HF linear loaded whips that disassemble in half using a single threaded nut. This has the advantage that tuning adjustment is not lost when the antenna is disassembled. Hamstick whips have two small set screws that must be loosened to remove the stinger portion. Both brands cost about $24 per whip. The eight-foot whip disassembles to two four-foot pieces. Each whip is designed to cover one amateur band and can be adjusted from the phone to the CW sub-bands by changing the stinger length.

The 2:1 VSWR bandwidth is narrower on the lower bands since the whips are proportionally smaller compared to the longer electrical wavelengths. The 20-meter whips measured about 100 kHz, the 40-meter at 40 kHz and the 75-meter about 20 kHz. If your HF rig has a built-in tuner, the useable frequency span approximately doubles without significant loss of antenna efficiency.

An on-the-air comparison was made between the portable whip dipoles up 20 feet and half-wave dipoles for 40 and 75 meters. On 40 meters, two whips were about 1-1/2 S-units (about 10 dB) below the half-wave 40-meter dipole. Two 75-meter whips were almost three S-units (about 18 dB) below a half-wave 75-meter dipole (no wonder, since a 75-meter half wave dipole is 130 feet compared to the 16 feet of the two whips). On 20 meters, we were surprised to see only about one S-unit (6-dB) difference from a G5RV dipole antenna. Getting the portable whip dipole higher than 20 feet improves efficiency on the lower bands. This portable dipole was used to make contacts with European Russia on 20 meters from a condo in San Luis, CA as well as by Ed to San Juan Puerto Rico, Prince Edward Island and Mexico City from the Pentagon south parking lot in Washington, during the Marine Corps Marathon.

A pair of Radio Shack 10-foot TV mast sections supported my antenna parallel to the plastic rain gutter on the corner of the house. Bungee cords were used to hold it in place. Raising and lowering the antenna and masts to change bands can be done by one person, but two make the job easier when the wind is blowing.

Ed uses four 5-ft. mast sections for ease of vehicle transport and storage. He recommends that whips be equipped with quick-disconnects, color-coded by band and stored with a 4' ground rod in capped 3" diameter PVC pipe. RACES may need to set up in a paved area such as an EOC parking lot. To do so, bolt a folding 3-ft. TV roof tripod onto a triangular support frame constructed of three 5' pieces of 1" angle iron, using 1/4-20x3" bolts and wing nuts. Similarly attach a length of 2x6" across the open end opposite the TV tripod. Park a front tire of your vehicle on the board or place sandbags across it to provide wind stability. All stash easily in an SUV. With practice, you can erect the antenna in 5 minutes!

With the Lakeview bracket, some RF current flows through the mast, creating a slight imbalance which may affect tuning. Isolating the grounded side of the mount by using a fiberglass or PVC mast section and using a current balun eliminates this effect, but is less handy. The lower bands (75 and 40 meters) are affected less than 20 meters and higher since a typical mast of 10 to 20 feet represents a small, non-resonant capacitive stub. At these low heights, most of the antenna radiation is at a high angle, so any pattern distortion due to the mast would not be noticeable.

Without a balun, the coax feedline may actually contribute a greater effect to the antenna tuning and imbalance, especially if the feedline length approaches a quarter wavelength (or odd multiples) on the band of operation. This may also result in a "hot chassis" effect at the rig which would be noticed by distorted audio (RF getting into the mic preamp).

To minimize this effect, coil the feedline with at least a half-dozen turns of 1 foot diameter to reduce the RF current (common mode RF choke). If possible, 4 to 5 Fair-rite #2643102002 cores placed over the coax near the bracket would serve better (approx 15 microhenries or 350 ohms impedance on 75 meters). These cores are part of my "Go-Kit" and are also used over the DC power cords to minimize RFI noise pickup from external sources (generators, computers, etc).

A variation provides dual HF band coverage with a single coaxial feedline. Two hamstick dipole mounts were bolted together with their center-isolated posts connected together using #12 gauge wire. Two sets of whips for 40 and 75 meters were assembled. Coax was attached to one of the mounts. There is minor interaction between the whips, although the #12 gauge wire looks slightly capacitive. Connecting the coax to the lower band dipole mount reduces the effect of the #12 gauge wire.

Either arrangement provides a viable, convenient, portable, horizontally polarized, high-angle antenna for NVIS operation on 40 and 75 meters. It is also a directional antenna on the higher frequencies, which is an effective performer for those who live in antenna restricted communities. As with any transmitting antenna, be sure the radiating elements, especially the stinger end sections, are kept safely away from bystanders. 73☢