

HFp Antennas

Ground-Plane and “L” Antennas

The HFp Dipole Center insulator has the usual horizontally-opposed studs on it, to allow its use in configuring a standard, horizontal dipole. But, there is also a third stud, in the middle of the top. This third stud has a number of special uses.

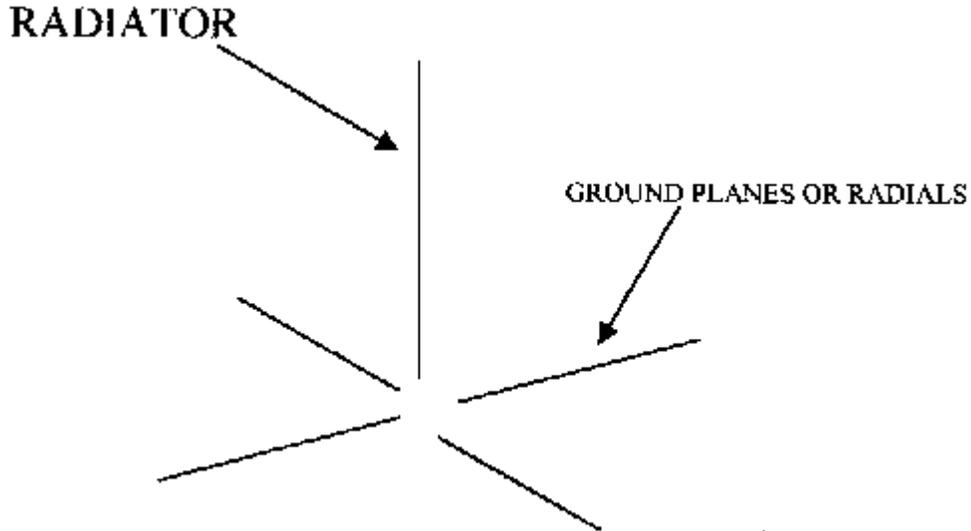
Possibilities for this third stud include:

- 1) A place to install an accessory ring, to allow the dipole to be suspended by a rope from any overhead support.
- 2) A place to install a gusset pole to support the special gusset guys necessary when the Dipole is configured for 40M or 30M. These gusset guys are necessary because of the extra length of the antenna on these bands.
- 3) A place to install guys when the dipole is mounted on top of a painter’s extension pole. This allows the Dipole to be set up on a painter’s pole without the pole being clamped to some support.
- 4) A place to install the vertical elements for an elevated ground-plane antenna, or an “L” antenna.

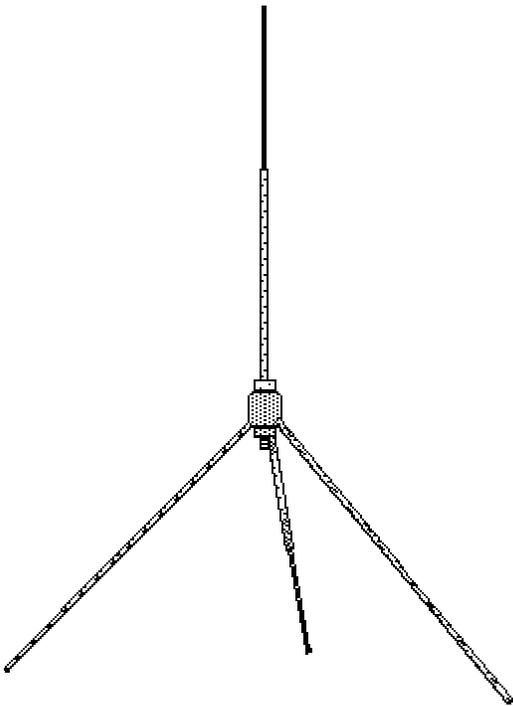


The HFp Dipole Center Insulator

A ground-plane antenna is a very familiar configuration to most people familiar with radio. Basically, it consists of a vertical element, connected to the center of the coaxial feed cable, and a set of radials, connected to the coax shield. The lengths of all the elements are approximately a quarter-wave at the operating frequency. It has a vertically-polarized, omni-directional radiation pattern. The impedance at the connection point is about 25 Ohms. This would result in a 2:1 SWR if connected to 50 Ohm coax.



If the radials on a ground-plane antenna are bent down to about a 45 degree angle, the impedance rises to about 50 Ohms. This makes a very good match to 50 Ohm coax.



An “L” antenna is simply a ground-plane antenna with only one radial. But, calculations show that the required droop angle of the “L” antenna’s single radial to make the feed-point impedance 50 Ohms is only about 15 degrees, instead of 45. With the “L” radial straight out, the feed-point impedance is about 42 Ohms, an SWR of only 1.2:1 when 50 Ohm coax is used. It is directional, in the direction of the “L” element, with about the same gain as the ground-plane in that direction.

To set up the HFp Dipole as a ground-plane or an “L” antenna, a couple of items must be considered. At higher frequencies, where only three or four HFp elements are used on each arm, the elements may be installed on the Center insulator in an “L” or “double-L” configuration, because the weight of the elements is not excessive, and the droop makes the antenna’s impedance close enough to 50 Ohms to provide a good SWR.



The HFp Dipole set up as an “L” antenna

For lower frequencies, when more than four elements are necessary, the HFp Vertical radials may be used to establish the ground plane for the antenna. In this case, the antenna would be supported by a painter’s pole, or by the accessory rope ring mounted on top of the vertical elements (without the whip). The radials would be attached to one of the side studs, and arranged in a triangular fashion, at about 45 degrees droop angle. The lengths of the radials may be adjusted to achieve resonance. It is important for this configuration that the ends of the radials be raised above the ground as far as possible. The resonance of the antenna and its impedance will be very strongly affected if the ends of the radials are very near the ground.

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