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Ready to Hang Half-Wave Dipole Antenna

The half-wave center-fed dipole is one of the most popular antennas in use by Ham Radio operators. In free space the center-fed half-wave antenna has an input impedance that is a close match to 50 ohm coax and to most radios that have a 50 ohm output impedance.

Our half-wave antennas are built using #14 hard drawn 7/22 stranded wire (7 strands of #22 twisted together) to meet the National Electrical Code for antennas. Hard drawn wire is preferred in antennas because it will stretch less than soft drawn wires. Testing has shown that #14 bare 7/22 is a good, low resistance wire that radiates well[1].

The half-wave antenna has maximum gain off of both sides of the antenna (see Figure 1). Off of the ends of the antenna the gain is the lowest. This means that when you install the antenna you must point the two sides of the antenna in the directions you wish to communicate the most. This does not mean that the antenna will not work at all off the ends but the gain will be less.

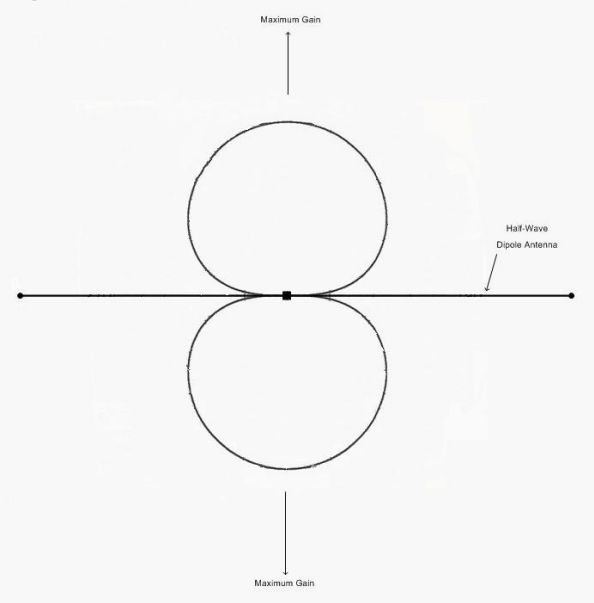

Figure 1

Figure 1 shows the ideal free space radiation pattern of the half-wave dipole. This pattern will vary depending on how high you install the antenna, what kind of ground is located below the antenna, what buildings and structures are close to the antenna, etc.

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Installing the Antenna

There are two main ways to install the half-wave antenna: as a straight dipole and as an inverted V. In either case the antenna will work better the higher you can put it up.

As a straight dipole you tie ropes to both ends of the dipole and raise it as high as is possible. If what you are tying both of your ropes to are both fixed objects like buildings or towers you should have no problems. If, like most people, you are using trees then you have to allow for the trees to move. It is better to only tie one end securely and to use a spring or pulley and weight system to hold the other end. Most of the Antenna Handbooks that are available will go into detail about how to do this.

To install the half-wave dipole as an inverted V you need three tie points but only one of them needs to be up high. Using a rope tied to the top-center eye bolt on the Dipole Center Insulator pull the center of the antenna up as high as possible. Tie off the two ends to supports that are lower down. Again, if the supports can move, use springs or a pulley system to reduce the strain on the wires.

There are several alternate ways that people have installed half-wave dipoles and have had some success. Some people have installed them in their attic and stretched them from end to end. Others, who did not have much room, have installed them with twists and turns in various places. Be sure to use insulators at any point where the antenna wires can touch. If you do something like this you will have to carefully tune the antenna as is explained in the next section.

1. Rudy Severns, N6LF, "Conductors for HF Antennas," *QEX Magazine*, November/December 2000, pp 20-29, see Table 6.