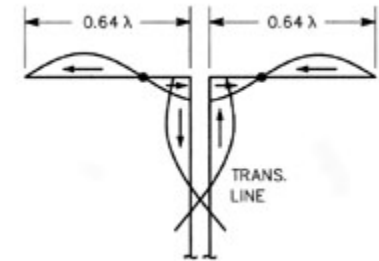## INTRODUCTION

The MFJ-1742 is center fed wire antenna that, when properly erected and fed with balanced feedline, will give up to three decibels (dB) power gain on the 20-Meter amateur band, along with directivity broadside to the antenna. In addition, with a proper antenna tuner it will also give good results on all amateur bands from 5 to 50 MHz. It also will work acceptably well on the 3.5 MHz band, although it is somewhat shorter than a half wavelength. This antenna will handle 1500 watts of RF power (with a suitable antenna tuner). Its total length is approximately 84 feet.

Center-fed wire antennas, when extended beyond a half wavelength in length, begin to exhibit gain and directivity over a halfwave dipole. Such antennas are called collinear arrays, and their gain and directivity increase as their length increases, up to a point.

The simplest of these collinear arrays is a centerfed antenna one wavelength long, called "two half waves in phase" or a "Double Zepp." Such an antenna has about 1.6 dB of gain over a dipole.

An *extended* double Zepp (figure at right) is longer: 0.64 wavelengths per side, or about 5/8 wavelength per side. The formula to determine the length of each side in feet is 599 divided by the frequency in MHz.

This antenna has some 3 dB of gain over a dipole on 20 Meters. A technical discussion of how this antenna works is beyond the scope of this manual, but, in simple terms, at 0.64 wavelength per side the current points of the wires are moved out from the feedpoint, providing electrical spacing between the two sides (elements) of the antenna. This results in gain and directivity.

Unfortunately, increasing the leg lengths beyond 0.64 wavelength makes the

WARNINGS: *Always mount antennas so that they are out of the reach of adults and children. Contact with any part of this antenna can cause RF burns or other injuries.*

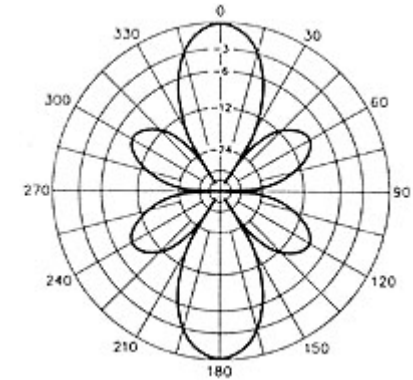***Constructing or erecting antennas where they may contact electrical power lines can result in injury or death.***

whole system look like a "long wire" antenna of random length, and the gain decreases.

The gain of the double extended zepp is contained in two large "lobes" at right angles to the antenna (figure at right). Minor lobes exist in other directions, giving the antenna about the same gain (i.e. 1) as a dipole in these directions.

Because a double extended zepp is not resonant at its design frequency, its input impedance is complex and very high, so it must be fed with balanced feedline through an antenna tuner.

Assembly

This antenna comes assembled and ready to install. The lengths of the antenna wires are quite critical and should not be changed. Nylon ropes are needed to support the ends of the antenna from suitable structures or trees.

Installation

The best location for this antenna is as high and far away as possible from utility wires, other antennas, and other structures. It is impossible to find a perfect location, so the best compromise must be accepted. In order to perform properly the antenna must be installed as a h*orizontal antenna,* using two tall supports separated by more than 85 feet.

Suspend the antenna with at least a 50-pound working load nylon rope or equivalent strength weather resistant non-metallic rope. Never use wire or wire core rope to support the ends of any antenna. Attach the rope to the end insulators through the empty holes.

Try to keep the antenna as horizontal (level) as possible. The antenna should be at least 35 feet above ground to give acceptable performance and as high as possible for the best overall performance. The feedline should drop vertically from the horizontal section of the antenna as far as is practical.

If you are using trees for end supports, be sure to allow enough slack or use some type of pulley and counterweight system to prevent the antenna

or rope from breaking when the trees sway in the wind. It is also possible to use masts, towers, or other tall structures for supports. Try to keep the ends of the antenna at least five feet from metallic supports.

100 feet of high-quality 450-ohm balanced feedline is provided and can be shortened if desired. Keep in mind that changing the length of feedline in a balanced antenna system can change the tuning characteristics of the system. Usually, a good antenna tuner will easily adjust to these changes. Occasionally, it may be necessary to add or remove a small amount of feedline, especially, in the case of this antenna, if it is desired to use it on bands other than 20 meters.

This antenna *will not* work as an extended double zepp on 20 meters if it is erected "inverted vee" or "sloper" fashion, at least not to textbook standards. It should be as straight and level and possible.

Maintenance

This antenna is made of heavy duty materials and should withstand normal climates for many years. General Electric makes a pure silicone grease called "*silicone dielectric compound*" that can be applied **sparingly** to the connections at the antenna's center insulator. This is the same type of sealer that commercial antenna installers and CATV companies use with great success.

A less desirable but adequate sealer is the automobile seam sealer commonly marketed as "coax seal," a pliable black sealing compound.

Technical Assistance

If you have any problem with this unit first check the appropriate section of this manual. If the manual does not reference your problem or your problem is not solved by reading the manual you may call *MFJ Technical Service* at **662-323-0549** or the *MFJ Factory* at **662-323-5869**. You will be best helped if you have your unit, manual and all information on your station handy so you can answer any questions the technicians may ask.

You can also send questions by mail to MFJ Enterprises, 300 Industrial Park Road, MS 39759; by FAX to **662-323-6551**; or by email to techinfo@mfjenterprises.com. Send a complete description of your problem, an explanation of exactly how you are using your unit, and a complete description of your station.