

MFJ-1778M G5RV JR.

40m through 10m Antenna

INTRODUCTION

The MFJ-1778M antenna is a multi-band center-fed dipole antenna capable of 1500 Watts. The MFJ-1778M consists of 52 feet flat-top fed with 17 feet of 450 ohm matching section ending in an SO-239 coaxial connector.

This antenna generally requires the use of a suitable matching network (antenna tuner) since the SWR of the G5RV JR is almost certainly not 1:1 on any band. The use of a tuner will guarantee maximum performance from solid-state excitors.

The MFJ-1778M is a balanced antenna that is fed by an unbalanced coaxial line. This feed system causes unwanted parallel RF currents to appear on the shield of the coaxial feedline. A choke type balun such as the MFJ-915 should be used with this antenna to eliminate or reduce the undesirable parallel feed line currents. Failure to use a choke balun may result in RFI, RF feedback, or other symptoms of RF "in the shack". The Balun Requirement section describes how to construct a choke balun for this antenna.

WARNING: Always mount this antenna so that it is out of the reach of adults and children. Contact with any part of this antenna can cause RF burns or other injuries.

TOOLS AND TIME REQUIREMENTS

This antenna requires no assembly. The time needed for installation will vary with your skill and equipment.

No special tools are required to install this antenna. Nylon ropes are needed to support the ends of the antenna from a suitable structure or tree. If a tree is used, you will need a way to get ropes over it. The most common method is to use a weighted arrow or a fishing rod and a heavy sinker to place a small line over a tree. A larger line is then pulled up and used to pull the support rope over the tree. The [ARRL Antenna Handbook](#) has detailed suggestions for installing wire antennas.

SAFETY PRECAUTIONS

WARNING:

- This antenna is an electrical conductor. Contact with power lines can result in death or serious injuries. Do not install this antenna where there is any possibility of contact with power cables or the service drop. The antenna should not be close to power lines during installation, operation, or removal.
- Keep this antenna out of reach of adults, children, and animals.
- Any contact with this antenna while transmitting can cause RF burns.
- Never place this antenna close to electric power lines or utility wires.

INSTALLING THE ANTENNA

Please read the following suggestions and examples.

The best location for this antenna is as high and far away as possible from utility wires, other antennas, and other structures. It is difficult to find a perfect location, so the best compromise usually must be accepted.

The antenna can be installed in three basic ways:

Horizontal Antenna

This method requires two tall supports separated by at least 52 feet. Suspend the antenna with at least a 50-pound working load nylon rope or another equivalent strength weather resistant non-metallic rope. Never use wire or wire core rope to support the ends of the antenna. Attach the rope to the end insulators through the empty holes.

Important: Use weather resistant rope rated at a minimum of 50 pounds working load to support this antenna.

Inverted "V" Antenna

This method requires only one tall support and also places the least strain on the antenna. Hang the antenna from the support using a nylon rope or other non-

conductive rope tied to the center hole of the center insulator. The center insulator should be the highest point of the antenna.

The ladder line should drop vertically from the center insulator for at least 10 feet and kept away from conductive objects. If the antenna's ladder line has to be installed near conductive objects, space the line at least 6" from the object with non-conductive supports (for example: PVC pipe standoff supports 6" long). Use nylon cable ties to secure the feed line to the insulated supports.

Sloper Antenna

This antenna can also be used as a sloping dipole. This requires one tall support and one short support. The center of the antenna must be at least 30 feet above the ground in this configuration. The antenna radiates mainly in the direction of the downward slope. The optimum angle of "slope" will vary with the desired coverage distance and the frequency of operation, but will almost always be somewhere between 45 degrees and almost vertical.

BALUN REQUIREMENT

The G5RV is a balanced antenna fed with a balanced 450 ohm line that terminates in a SO-239 connector. When feeding this antenna with an unbalanced line (such as coaxial cable), it is a good idea to use a 1:1 choke BALUN at the coax to feed point connection. The balun will reduce or eliminate parallel currents on the outside of the coax shield. This will prevent or reduce RFI, RF feedback, RF burns, and other effects of excessive RF in the station.

The best balun for this antenna is an **air-core choke balun**. Avoid using other types of baluns, such as ferrite sleeve or transformer type baluns. This antenna has a high reactive component at the feed point SWR of more than 2:1. The high SWR increases loss in ferrites and may cause excessive core heating, core saturation, or arcing in the windings.

AIR WOUND BALUN CONSTRUCTION

The air wound balun required for this antenna can be constructed by winding the coaxial feed line cable in a single layer solenoid coil with at least 10 turns of 4 to 6 inch diameter. The turns can be taped or secured by nylon cable ties. The balun can be wound on PVC pipe or any other non-metallic form. Place the balun immediately at the feed point connection. The feed line shield should not be grounded on the antenna side of the balun.

WARNING: The balun should be kept away from any conductive material!

TUNING THE ANTENNA

The MFJ-17778M requires a tuner to match it to the transmitter impedance. Operating this antenna without a tuner is not recommended. The use of a tuner like the MFJ-962D or MFJ-986 will provide proper matching on all HF bands.

Important: If you have a problem tuning this antenna on any band, try changing the length of the coax (by 3-6 feet) from the tuner to the antenna.

GROUNDING CONSIDERATIONS

This antenna requires a good earth ground connection to reduce the risk of lightning damage to the station equipment and to improve operator safety. Adequate protection can be obtained by burying the coaxial feedline *directly* in the ground for 20 feet (or more) before the feedline enters the building. The feedline's shield should be grounded to the station ground at the entrance point of the building before reaching the operating position. Failure to follow these precautions will increase the risk of lightning damage to equipment and reduce safety.

The earth ground should consist of at least one copper ground rod driven into the earth a minimum of 6 feet. Multiple ground rods and buried wires are superior to a single rod for lightning and RF protection.

Never use woven flexible braiding for ground connections unless *absolutely necessary*. Braiding has high resistance to RF and lightning. Copper flashing, wide copper foil, or large gauge solid copper wires are the proper materials for use in RF and lightning grounding applications. Never ground the feedline on the antenna side of the balun.

In-line coaxial lightning arrestors offer a minimal improvement in lightning protection. The best method of protecting station equipment is to disconnect the feedline outside the building.

MAINTENANCE

This antenna is constructed of heavy duty materials and should withstand normal climates for many years. The use of some type of coaxial connector moisture protection is recommended at the bottom coax connection. This is especially true in coastal areas where salty mist is commonplace.

E makes a pure silicone grease called "*silicone dielectric compound*" that can be applied *sparingly* to the threaded area of the female connector. This compound, or even a clear silicone heat sink compound, will prevent moisture from entering the connector through the threads and protect the connectors from corrosion. ***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". This is a pliable black sealing compound.

When installing any coax sealer, ***never*** completely cover the barrel of the coax connector. The sealer should ***only*** be placed near the junction of the threaded part of the connector and the knurled area of the male connector. The bottom of the male connector's outer sleeve should be left open to permit the connector to "breathe". Mount the connector vertically with the unsealed barrel end down so it does NOT collect moisture!

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, Inc., 300 Industrial Park Road, Starkville, MS 39759; by Facsimile 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.