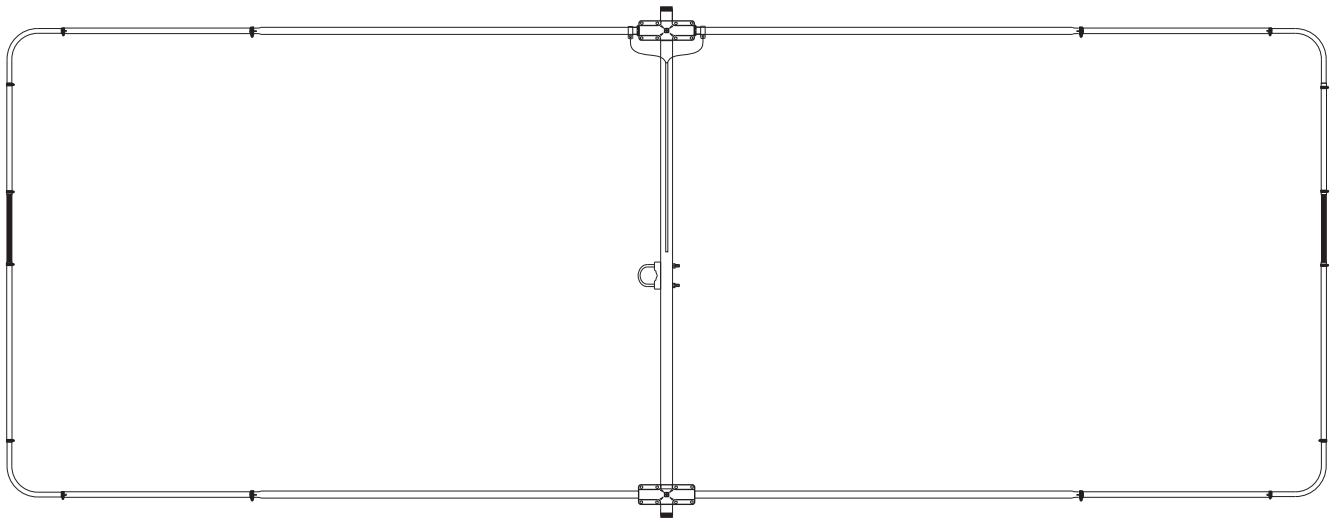


# MFJ-1890

2 Element Moxon Beam for 10 meters

## INSTRUCTION MANUAL



CAUTION: Read All Instructions Before Operating Equipment

# MFJ

300 Industrial Park Road  
Starkville, MS 39759 USA  
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## **GENERAL DESCRIPTION**

The Moxon Rectangle is a close-spaced 2-element Yagi consisting of a driven element and a reflector with the element tips folded toward each other to reduce turning radius. The Moxon features a broad cardioid pattern with roughly 3.3 dBd of forward gain and front to back ratio measuring -30 dB or more. Spanning just over 12 feet and weighing only a few pounds, it is well suited for rooftop installations using lightweight TV hardware.

## **Choosing a location**

For best performance on receiving and transmitting, mount the antenna in a clear location above or away from buildings, towers, feedlines, utility wires, and other antennas. While your own ingenuity and particular circumstances will determine the final mounting method, we'll pass along a few ideas for both permanent installation and portable operation.

**Never** mount this antenna in a location that will permit unsuspecting people to come in contact with the antenna elements.

**Never** mount this antenna where a mechanical failure might allow the antenna to contact power lines or other utility wires.

**Always** ground the feedline at the point where it enters a building to a good earth ground for lightning protection.

**WARNING** **Always mount this antenna so that it is out of reach of adults and children. The elements can cause injury and/or severe RF burns.**

# **WARNING**

***WHEN INSTALLING YOUR SYSTEM, TAKE EXTREME CARE TO AVOID ANY ACCIDENTAL CONTACT WITH POWER LINES OR OVERHEAD OBSTRUCTIONS. FAILURE TO EXERCISE THIS CARE COULD RESULT IN SERIOUS OR FATAL INJURY***

## Permanent Installation

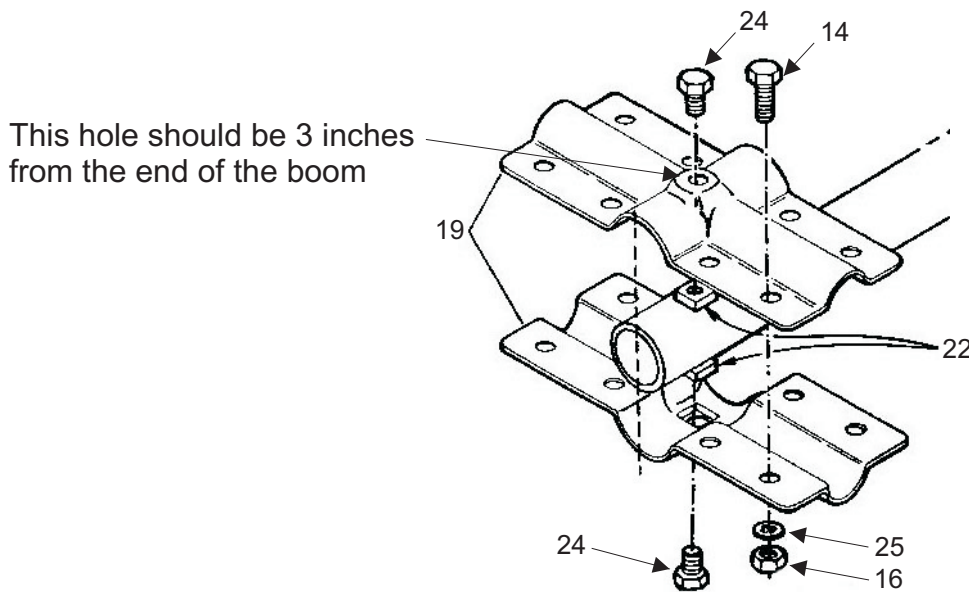
The ideal installation is a rigid pole or roof mount that puts the antenna completely in the clear. If the ideal installation is not possible, choose the best compromise. TV mast, heavy-duty rigid electrical conduit, and steel water pipes are suitable mast materials. The use of soft or thin wall mast is not recommended.

## Portable Operation

The MFJ-1890 may be easily transported to temporary locations for portable, emergency, and contest operation. Even for temporary or portable operation, do not be casual about selecting a suitable mast. If the antenna falls, it can be damaged and may cause serious injury. Whatever type of installation you choose, remember that the antenna should be installed where it cannot be contacted by people or animals or come in contact with power lines.

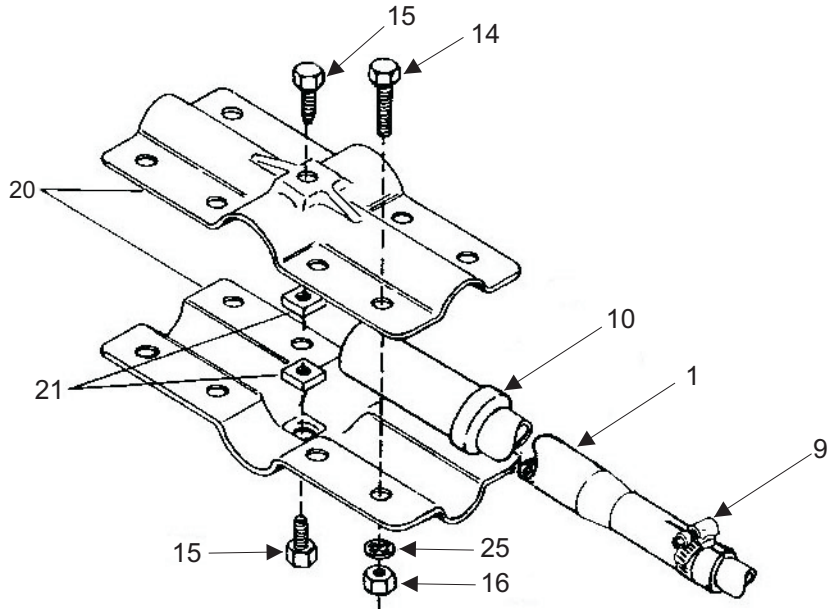
## Antenna Assembly

Assemble the antenna on a flat level surface. Avoid assembly over grass as you may drop some of the parts and never find them again. You may use a couple of saw horses or other means of support to aid assembly. Loosely assemble the #1 and #11 brackets using the 1/4-20 nuts, bolts and washers as shown in figure 1. Don't forget the square nuts that go inside the brackets. The square nuts are different for each bracket and also take different bolts.



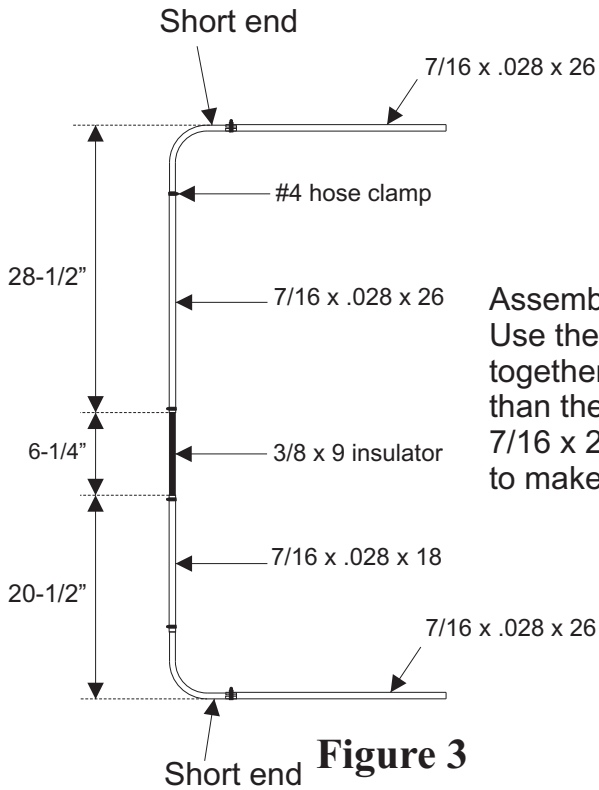
**Figure 1**

Install the 5/8 elements into the bracket while it is loose on the boom. Tighten them enough to hold the element but allow for the bracket to rotate on the boom as you will have to align the elements with the mast when the antenna is fully assembled.



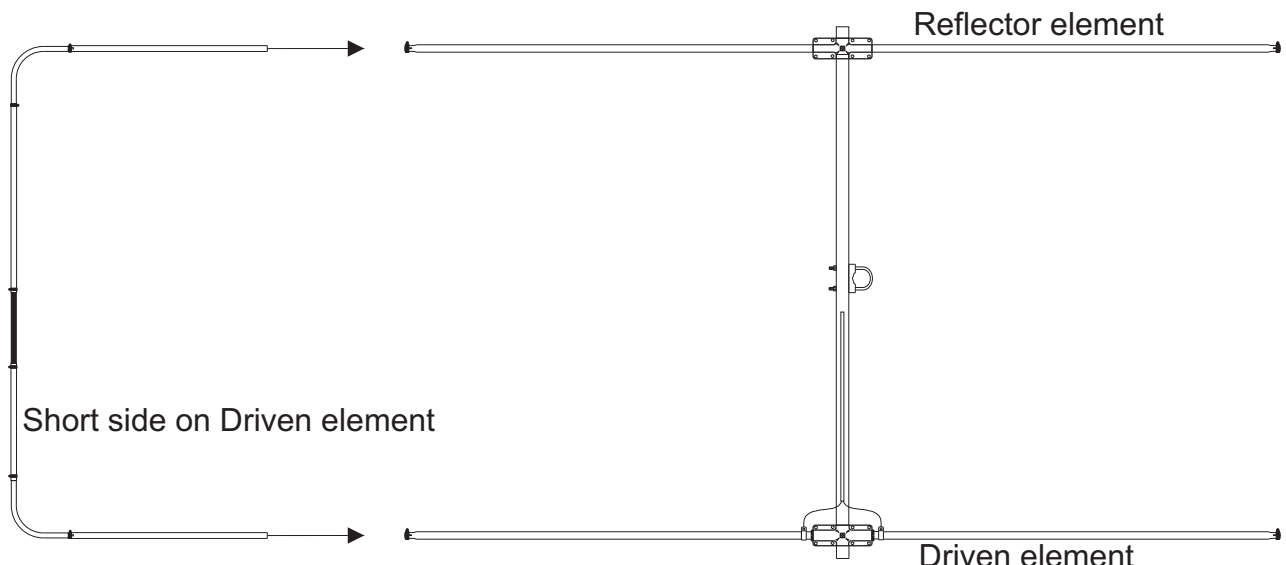
**Figure 2**

Secure the driven element insulator to the other end of the boom also allowing 3 inches from the center of the bracket to the end of the boom. Install the remaining two main elements to the insulator as shown in figure 2. Leave the bracket loose enough to align the elements when the antenna is finished.



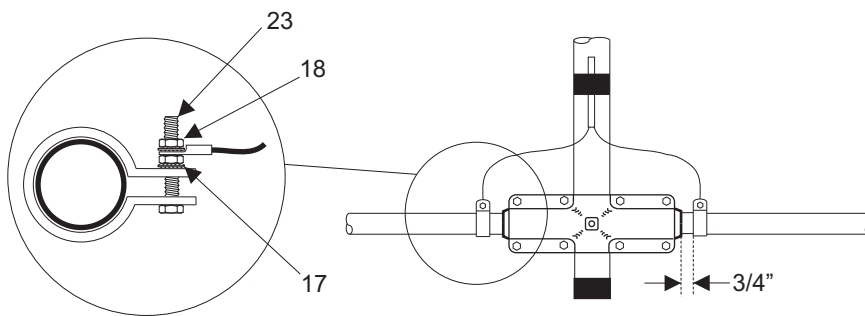
Assemble the end elements as shown in figure 3. Use the #4 hose clamps to secure the tubing together. The corner tubes have one side longer than the other. The short end should insert into the 7/16 x 20 elements. Repeat this assembly again to make the other side of the antenna.

**Figure 3**



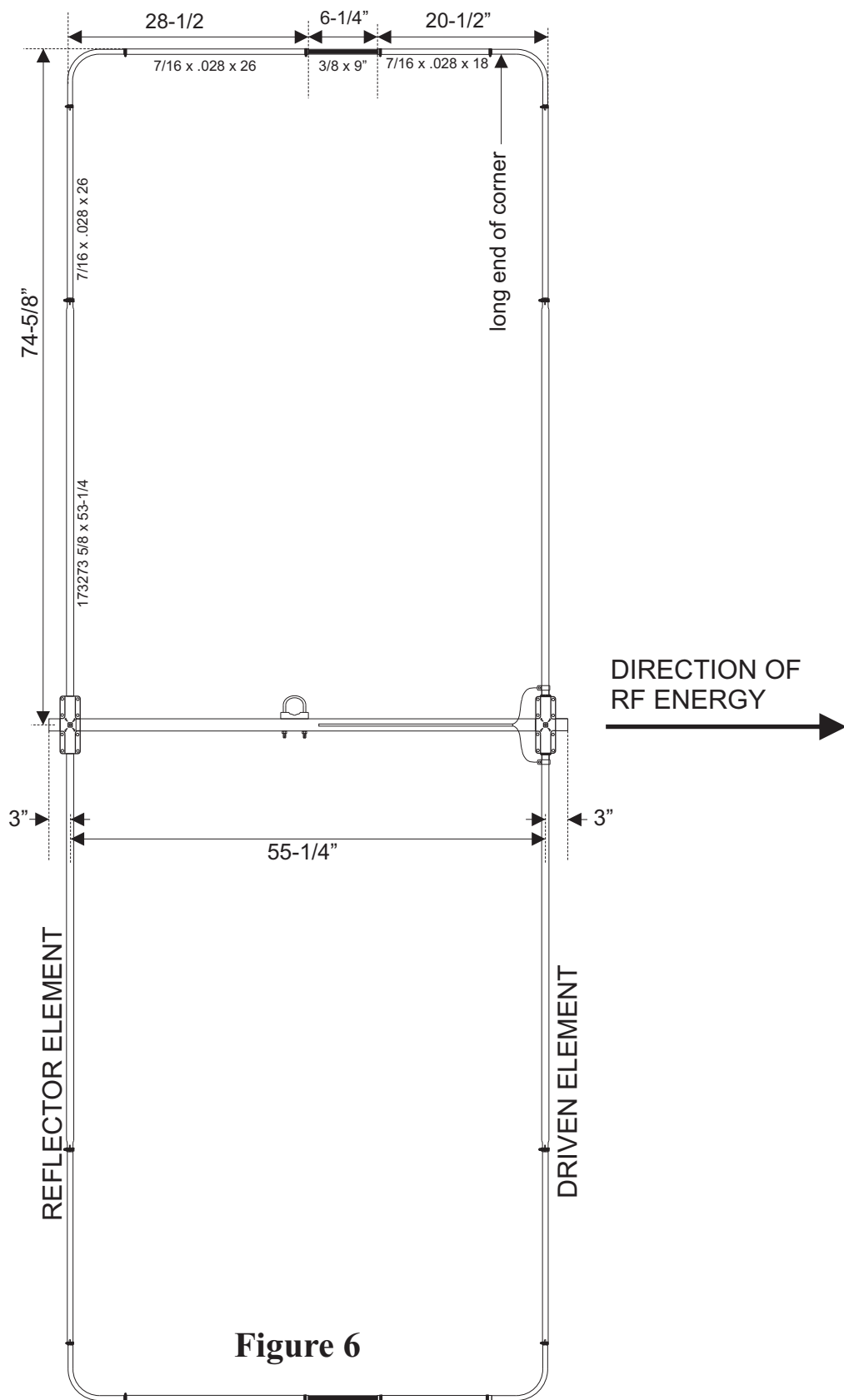
**Figure 4**

Install the end pieces onto the elements using the #4 hose clamps. Sliding these end pieces in and out will be how you adjust the final length of each element. Measure the distance from the center of the boom to the outside of the element. This distance will be the same for all four elements. Use the antenna diagram on the next page to verify all your measurements. Install the u-bolt on the boom. Place the 1-1/4 end caps on each end of the boom.



**Figure 5**

Attach the feed line to the driven element as shown in figure 5. Place the 5/8 clamps 3/4 inch away from the insulator. Use the 10-24 bolts nuts and lock washers to tighten the clamps to the tube. Place the feed line eyelets over the remaining section of the bolt and secure with another lock washer and nut. Secure the coax to the boom with electrical tape or other suitable fasteners.



**Figure 6**

## **Final Assembly**

Check the alignment of the elements and make sure all hardware is tight. Mount the antenna in the final location.

Connect the coax balun to a high quality low loss cable such as LMR-400 or equivalent.

## **SWR Check**

Resonance can be checked with an MFJ-256 or MFJ-269. Alternately a transceiver and SWR meter can be used. Resonance may be changed by adjusting the length of the elements. If the resonance point is too low, shorten the element length. If the resonance point is too high, lengthen the element length.

## **Grounding Considerations**

Although this antenna is designed to operate efficiently without the requirement of an earth ground, safety grounding must still be provided to protect equipment, property and persons from the hazards of lightning strikes and other weather related electrical discharges. In addition, the coaxial cable feeding the antenna should have the shield grounded to eliminate the risk of any indoor equipment failure allowing hazardous voltages that could create a shock hazard. Adequate protection can be accomplished by grounding the shield of the coax to a good earth ground where it enters the building, or directly burying the cable in the earth for several feet before it enters the building. For maximum lightning protection, the coaxial cable should be totally disconnected from the station during threatening weather conditions.

## PARTS LIST

1	173273	Tube 5/8 x 53-1/4 swaged -----	4
2	20-1890-1	Tube, Boom, 1-1/4 .058 x 61-1/4" Drilled -----	1
3			
4	20-1890-3	Tube, 7/16 x .028 x 26" slotted -----	6
5	20-1890-4	Tube, 7/16 x .028 x 18" slotted -----	2
6	20-1896-5	Tube, 3/8 corner -----	4
7	20-1890-6	Rod, Fiberglass 3/8 x 9" -----	2
8	13-1890-1	Balun Assembly -----	1
19	161422	Bracket, # 11 -----	2
20	165138	Bracket, # 1 -----	2

17-1890-1

### Parts Pack MFJ-1890

9	745-3104S	Hose Clamp #4 -----	16
10	461057	Insulator 1-1/4- 5/8 -----	2
11	171329	Clamp, 5/8 -----	2
12	455630	Caplug, 1-1/4 ABS -----	2
13	758-9199	U-bolt 1-3/4 -----	1
14	505266	Bolt, 1/4-20 x 3/4 -----	16
15	500156	Bolt, 1/4-20 x 3/8 -----	2
16	554099	Nut, 1/4-20 Hex -----	16
17	711-1037S	Washer, #10 Internal lock -----	4
18	554071	Nut, 10-24 Hex -----	4
21	551367	Nut, square 1/4-20 -----	2
22	555362	Nut, square 10-24 -----	2
23	504069	Bolt, 10-24 x 1 -----	2
24	500158	Bolt, 10-24 x 1/2 -----	2
25	562961	Washer, 1/4 Internal lock -----	16





## SITE SELECTION

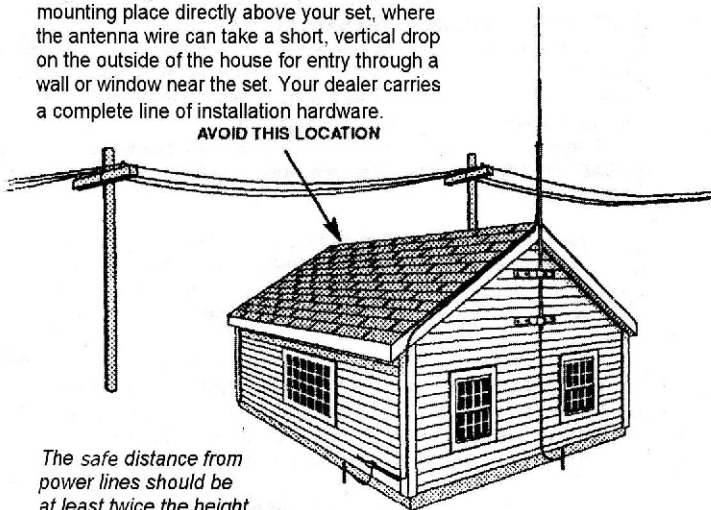
Before attempting to install your antenna, think where you can best place your antenna for **safety** and performance.

To determine a safe distance from wires, power lines and trees:

1. Measure the height of your antenna.
2. Add this length to the length of your tower or mast, and then
3. Double this total for the minimum recommended safe distance.

If you are unable to maintain this safe distance, **STOP! GET PROFESSIONAL HELP.** Many antennas are supported by pipe masts attached to the chimney, roof or side of the house. Generally, the higher the antenna is above the ground, the better it performs. Good practice is to install your antenna about 5 to 10 feet above the roof line and away from power lines and obstructions. Remember that FCC limits your antenna height to 60 feet. If possible, find a mounting place directly above your set, where the antenna wire can take a short, vertical drop on the outside of the house for entry through a wall or window near the set. Your dealer carries a complete line of installation hardware.

**AVOID THIS LOCATION**

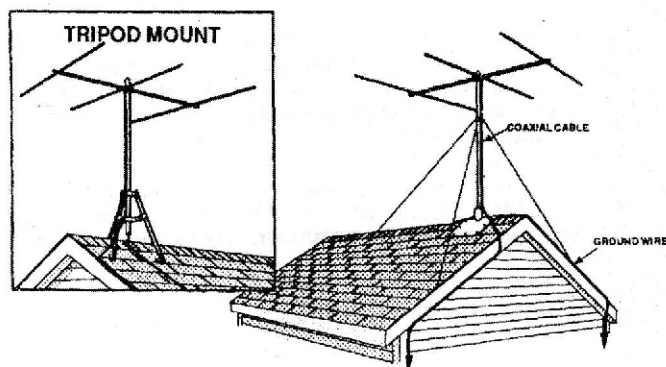


*The safe distance from power lines should be at least twice the height of the antenna and mast combined.*

## CHOOSE A PROPER SUPPORT AND MOUNTING METHOD

However you decide to mount and support your antenna always make sure that safety is your first concern. Some of the more common installation methods are illustrated below.

### ROOF MOUNTED



### ROOF MOUNTING

The swivel feature of "universal" type mounting brackets makes a convenient antenna mount for flat or peaked roofs. One clamp type bracket is used with 3 or 4 guy wires equally spaced around the mast and anchored to the roof or eaves by eyebolts. Apply roofing compound around the base of the bracket, screws and eyebolts for moisture sealing.

## TELESCOPING MAST

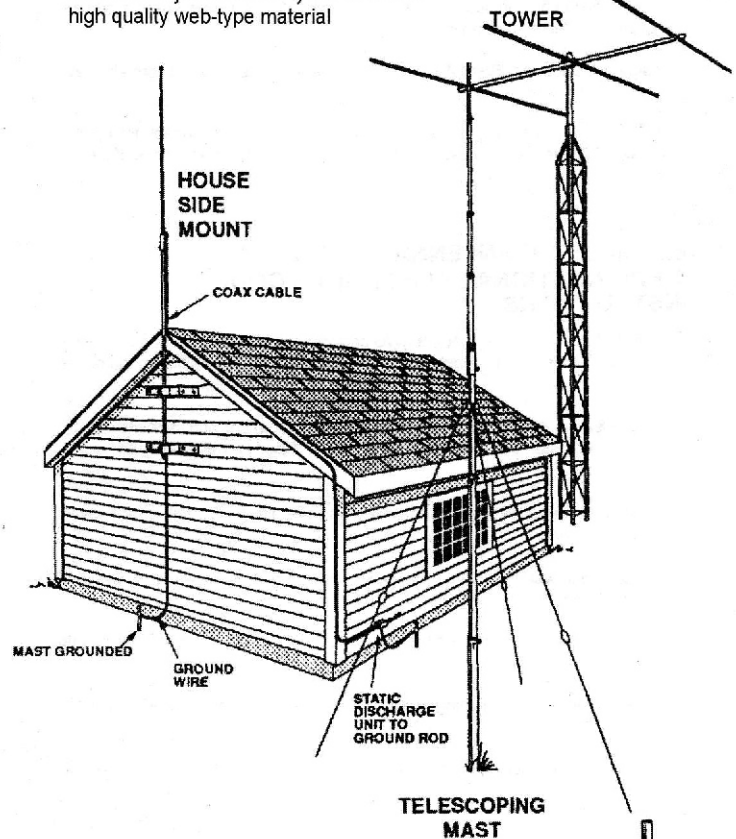
Guy wires should be equally spaced in at least three directions. Use at least three guy wires for each 10 foot section of mast.

## SIDE OF HOUSE MOUNTING

The safe distance from power lines is at least twice the height of antenna and mast combined. Where roof overhang is not excessive, the side of the house provides a convenient mounting. Position the brackets over a stud if possible, one above the other, and space two or three feet apart. For metal siding, first mark mounting holes, then drill pilot holes through the siding to accept mounting screws.

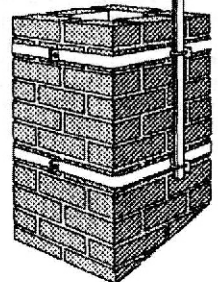
## TOWER

Tower safety is paramount to a good installation and requires that you take location, tree growth, soil depth and proximity to buildings into consideration. Tower foundations must be securely based on a solid concrete/ tower mounting plate. An alternative is to sink a 4-6 foot section of tower into a concrete base for an extremely rugged mount. Proper guying is essential to a safe weather-resistant installation that must handle severe wind loading and is best accomplished with preformed guy grips, torque brackets and turnbuckles. When working on towers always use a safety belt made of high quality web-type material



## CHIMNEY MOUNTING

The chimney is often an easy and convenient mounting place. But the chimney must be strong enough to support the antenna in high winds. Do not use a chimney that has loose bricks or mortar. A good chimney mount makes use of a 5 or 10 foot, 1-1 1/4" diameter steel mast, and a heavy duty two strap clamp-type bracket. Install the upper bracket just below the top course of bricks, and the lower bracket two or three feet below the upper bracket. For maximum strength, space the brackets as far apart as possible.



# NOTES

## FULL 12 MONTH WARRANTY

MFJ Enterprises, Inc. warrants to the original owner of this product, if manufactured by MFJ Enterprises, Inc. and purchased from an authorized dealer or directly from MFJ Enterprises, Inc. to be free from defects in material and workmanship for a period of 12 months from date of purchase provided the following terms of this warranty are satisfied.

1. The purchaser must retain the dated proof-of-purchase (bill of sale, canceled check, credit card or money order receipt, etc.) describing the product to establish the validity of the warranty claim and submit the original of machine reproduction or such proof of purchase to MFJ Enterprises, Inc. at the time of warranty service. MFJ Enterprises, Inc. shall have the discretion to deny warranty without dated proof-of-purchase. Any evidence of alteration, erasure, or forgery shall be cause to void any and all warranty terms immediately.
2. MFJ Enterprises, Inc. agrees to repair or replace at MFJ's option without charge to the original owner any defective product under warranty provided the product is returned postage prepaid to MFJ Enterprises, Inc. with a personal check, cashiers check, or money order for **\$7.00** covering postage and handling.
3. MFJ Enterprises, Inc. will supply replacement parts free of charge for any MFJ product under warranty upon request. A dated proof of purchase and a **\$5.00** personal check, cashiers check, or money order must be provided to cover postage and handling.
4. This warranty is **NOT** void for owners who attempt to repair defective units. Technical consultation is available by calling (601) 323-5869.
5. This warranty does not apply to kits sold by or manufactured by MFJ Enterprises, Inc.
6. Wired and tested PC board products are covered by this warranty provided **only the wired and tested PC board product is returned**. Wired and tested PC boards installed in the owner's cabinet or connected to switches, jacks, or cables, etc. sent to MFJ Enterprises, Inc. will be returned at the owner's expense unrepaired.
7. Under no circumstances is MFJ Enterprises, Inc. liable for consequential damages to person or property by the use of any MFJ products.
8. **Out-of-Warranty Service:** MFJ Enterprises, Inc. will repair any out-of-warranty product provided the unit is shipped prepaid. All repaired units will be shipped COD to the owner. Repair charges will be added to the COD fee unless other arrangements are made.
9. This warranty is given in lieu of any other warranty expressed or implied.
10. MFJ Enterprises, Inc. reserves the right to make changes or improvements in design or manufacture without incurring any obligation to install such changes upon any of the products previously manufactured.
11. All MFJ products to be serviced in-warranty or out-of-warranty should be addressed to **MFJ Enterprises, Inc., 300 Industrial Park Road, Starkville, Mississippi 39759, USA** and must be accompanied by a letter describing the problem in detail along with a copy of your dated proof-of-purchase.
12. This warranty gives you specific rights, and you may also have other rights which vary from state to state.

# MFJ

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