

MFJ-1768
Instruction Manual

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MFJ-1768

Instruction Manual

Introduction

The MFJ-1768 is a National Bureau of Standards (NBS) style yagi that provides optimum gain and front to back ratio on both the 2 meter and the 70 centimeter bands. On the 2 meter band the MFJ-1768 is a 4 element antenna, on the 70 centimeter band the MFJ-1768 is a 7 element antenna. It is constructed using lightweight and strong 6061-T6 aluminum material for both the elements and the boom. The MFJ 1768 elements are insulated from the boom to eliminate the problem of poor electrical contact to the boom. This antenna uses a dual balance driven element that provides a clean pattern with minimal skewing. The antenna's 1/4" diameter driven elements provide wide bandwidth that covers both bands with a low SWR. This antenna uses a single feedline with a ferrite decoupled current balun for both bands. This technique eliminates the need for extra coax cables, and stops all the parallel RF current on the coax shield. This prevents unwanted radiation.

The MFJ-1768 is an excellent antenna for use with dual band transceivers. Since the MFJ-1768 is a dual band antenna there is no need to switch antennas when changing bands. With the use of a duplexer (such as the MFJ-916) you can connect two different radios (two different bands) to the MFJ-1768 at the same time.

Choosing a Location for the Antenna

The MFJ-1768 can be mounted on any 1" to 1 1/2" mast (*conductive or non-conductive*) capable of supporting the weight of the antenna and the torque developed by the boom. The MFJ-1768 can be mounted vertically (generally used for FM transmission), or horizontally (commonly used for SSB transmission).

The best performance on receiving and transmitting will be obtained by mounting the antenna as high as possible in a clear location above or away from buildings, feed lines, utility wires, and other antennas. Your ingenuity and particular circumstances will determine the final mounting method.

The MFJ-1768 is a directional antenna with a major high gain forward lobe and fewer lower gain side and back lobes. The operating frequency of this antenna is used only in line of site communication. For that reason it is best to mount the MFJ-1768 on a rotor and be able to orient its major lobe toward the desired location and obtain maximum performance. Also since the side and the back lobe exist but with low gain, it is possible to use these lobes for local area communication without rotating the antenna.

Tools And Time Requirements

The estimated time of assembly for this antenna (including reading time) is 1 hour.

Tools required for this antenna are as follows:

- #1 Phillips screwdriver
- 1/4" nut driver
- 7/16" open end wrench
- Push nut assembly tool (supplied)
- Eye protection
- Temporary mast and a table, or flat ground

MFJ-1768 Parts List

The MFJ-1768 parts and hardware are stainless steel, aluminum, or non-corrosive material.

As you unpack your antenna you should find the following list:

- [] One bundle of long elements for the two meter band
- [] One bundle of short elements for the 440 MHz band
- [] One bag containing the following hardware:
 - Twenty 3/16" ID insulators
 - 30 push nuts 3/16" ID
 - Two 1 1/8" red end caps
 - One U-bolt and saddle clamp assembly
 - Push nut assembly tool
 - Two capacitor thin plates for 2 m elements
 - Two 4-40 x 1/2" SST screws
 - Ten 4-40 SST nuts
- [] One 1 1/8" diameter (6061-T6) aluminum tubing boom

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 service drop to buildings.**
- **The antenna supporting mast and/or tower should not be close to any power lines during installation or removal in the event the system should accidentally fall.**
- **Follow the guidelines for antenna installation recommended by the U.S. consumer product safety commission.**

- Keep this antenna out of reach of adults, children, and animals. Any contact with this antenna while transmitting will cause severe RF burns, and voltages that KILL.
- Never place this antenna close to electric power lines or utility wires.
- Do not transmit with over 20 watts of power when people are near the antenna.
- Keep the antenna away from you to prevent exposure to high levels of electromagnetic field radiation.
- Never operate this antenna near RF sensitive medical devices such as pacemakers.
- Keep the feedline of this antenna away from utility lines.
- Be careful while climbing and carrying the antenna. It is heavy enough to cause you to lose your balance if it is handled too casually.
- Mount the antenna high enough so that it is out of reach of adults and children. The end of the elements can cause eye injuries, serious RF burns, or both.
- Make sure the mast and rotator are strong enough to support the antenna's weight and wind load of approximately 2 square feet.

Assembly And Installation

During assembly of this antenna refer to figures in this manual and the picture on the front cover. The assembly instructions tell you, step by step, how to install the insulators, the driven and parasitic elements, and the U-bolt assembly.

All parasitic elements, for 2 meter and 70 cm band, are color coded at their ends and alphabetically labeled on figure-1 and on figure inside front cover to facilitate the antenna assembly. Pay extreme care while assembling the antenna and always refer to the mentioned figures.

Step by Step Procedure

- 1- Prepare a strong mounting mast that can withstand a wind load of at least 2 square feet and permit easy installation. Set up a table or other stable support.
- 2- Sort out parts you have unpacked into groups of similar parts. These consist of:
 - [] twenty 3/16" ID black insulators
 - [] 30 push nuts 3/16" ID
 - [] One U-bolt assembly
 - [] Two capacitor thin plates for 2 m elements
 - [] Two 4-40 x 1/2" SST screws and ten 4-40 SST nuts
 - [] One 1 1/8" diameter (6061-T6) aluminum tubing boom with matching network and SO-239 connector on an "L" bracket (*pre-assembled*)
 - [] One bundle of long elements for the two meter band

GROUP 1

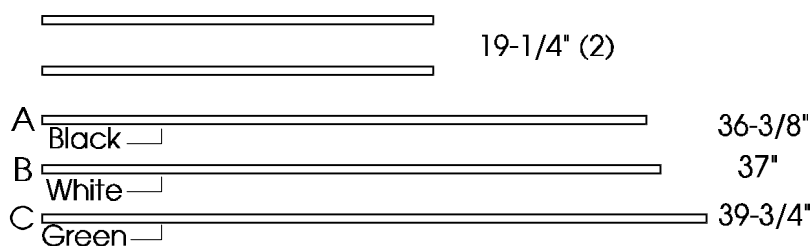
- Two 19 1/4" x 1/4" long tubes
- One 36 3/8" long.....A.....Black
- One 37" long.....B.....White
- One 39 3/4" long.....C.....Green

[] One bundle of short elements for the 440 MHz band (eight of them)

GROUP 2

- Two 6 3/8" x 1/4" short tubes
- Two 11 3/8" long.....D.....Red
- One 11 1/2" long.....E.....Yellow
- One 11 7/8" long.....F.....Black
- One 11 5/8" long.....G.....White
- One 13 3/4" long.....H.....Green

Group 1



Group 2



FIGURE 1

3- Insert eighteen of the 3/16" ID black insulators using your thumb into the designated holes on the sides of the 1-1/8" boom.

Refer to figure on inside front cover and figure 2 to locate the designated holes and the installation example

4- Lay the antenna boom on a flat surface, a table perhaps, with the feed plate facing up.

5- Refer to Figure 3 and start the assembly of the driven elements as follows:

A- The 2 meter driven element:

Align the holes drilled on the end of a 19 1/4" x 1/4" tube with the 4-40 screws located on the rear end of the feed plate (*see figure 3 for exact location*). Insert the 4-40 screws into these holes. Thread 4-40 nuts over the two screws and tighten to ensure good connections. Repeat the same procedure for the remaining 19 1/4" x 1/4" driven element.

B- The 440 MHz driven element:

Align the holes drilled on the end of a 6 3/8" x 1/4" tube with the 4-40 screws located on the front end of the feed plate (*see figure 3 for exact location*). Insert the 4-40 screws into these holes. Thread 4-40 nuts over the two screws and tighten to ensure good connections. Repeat the same procedure for the remaining 6 3/8" x 1/4" driven element.

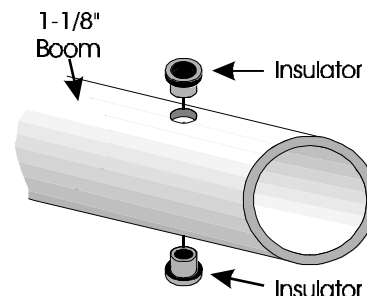
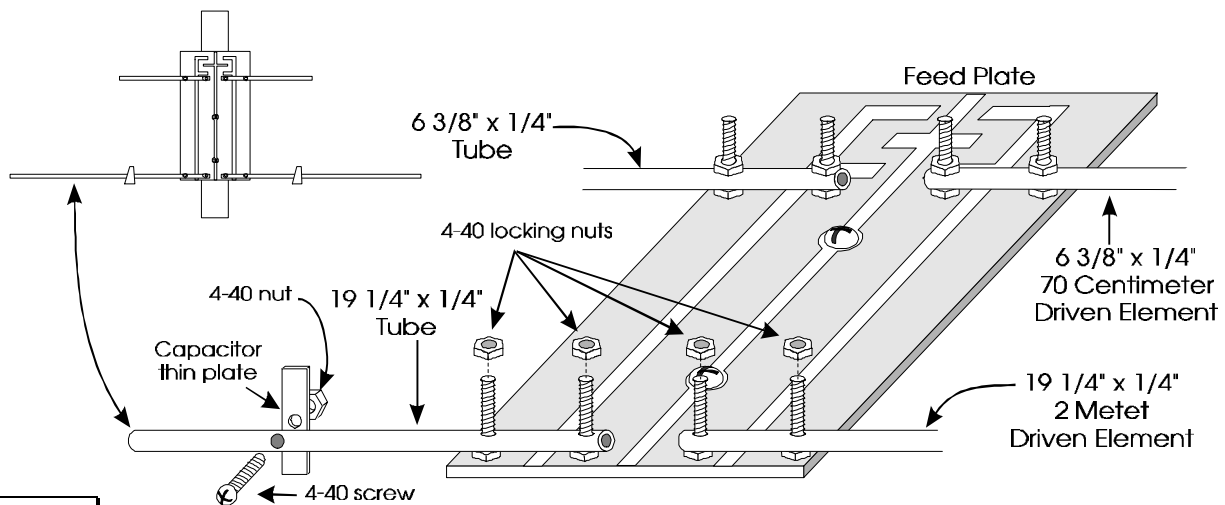


FIGURE 2

**FIGURE 3**

Refer to figure 4 and figure 5 and start the assembly of the parasitic elements

6- Assemble one push nut on each of the parasitic elements of both groups (labeled A-H) using the provided tool. Slide the push nut until it reaches the first mark on the element (see figure 4.)

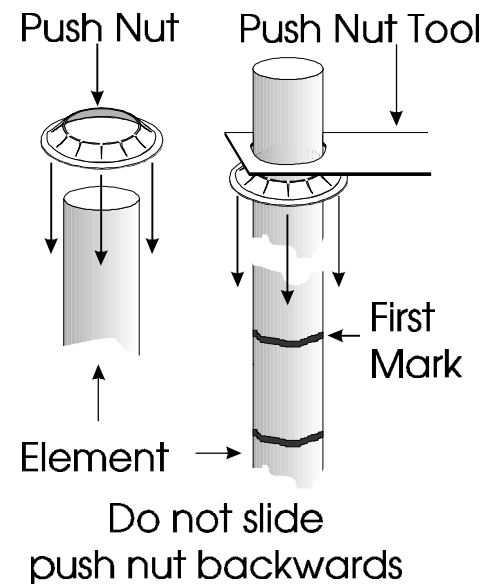
WARNING: If you passed the mark, do not try to slide the push nut backward. Sliding the push nut backward will tend to damage it, instead slide the push nut all the way off then reinstall it. **Note:** Extra push nuts are provided for replacement of damaged ones.

Note : for section 7 and 8 refer to figure 1, figure 4 and figure 5 while assembling

7- Insert element "A" (black end) from GROUP 1 into its designated hole in the boom, as shown in the figure on the inside front cover. Assemble another push nut from the other side (see figure 4 and figure 5), and slide it until it reaches the 3/16" black insulator. Make sure that the element is secured in place with minimum free play .

8- Repeat the previous procedure for the remaining elements from GROUP 1 and GROUP 2. See inside front cover and figure 1 for full detail on hole positions, elements locations, color code, and alphabetical label.

9- After installing all the parasitic elements, insert the U-bolt in its designated holes keeping in mind the polarization of the antenna (see figure 6).

**FIGURE 4**

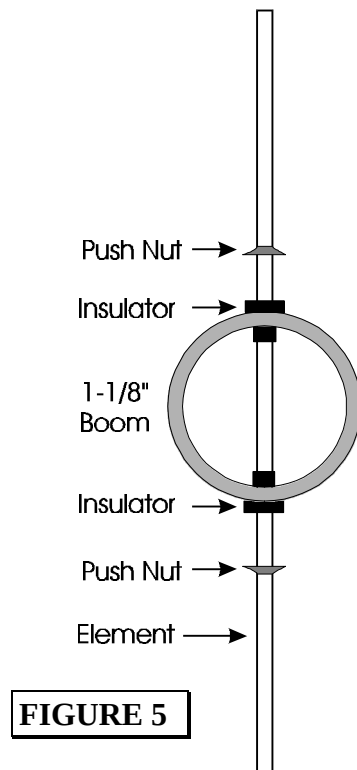


FIGURE 5

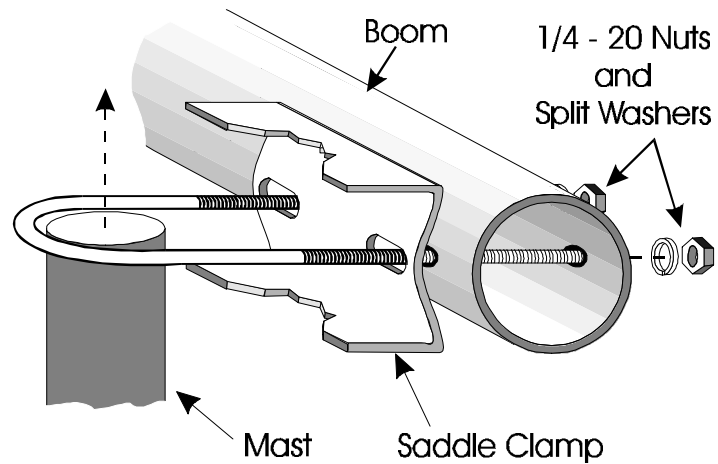


FIGURE 6

10- Lay the antenna on a flat surface to install the thin capacitor plates for the 2 meter driven elements. Insert a 4-40 x 1/2" screw through the hole located in the middle of the element, pass it through a thin capacitor plate. Thread a 4-40 nut on the screw and tighten. Repeat this procedure for the second driven element (see Figure 3).

IMPORTANT: Make sure the capacitor thin plates form a 90 degrees angle with the 2 meter driven elements

11- The antenna is ready now to be mounted on the permanent mast and ready to be used on the air.

Note: Make sure to dress the feed coax cable along the boom and run it along the permanent mast. Hold it in place using either electric tape or black cable ties

Tuning

The MFJ-1768 is pre-tuned on both bands, additional tuning is not required. The antenna bandwidth is very wide, it covers the entire 2 meter and 70 centimeter band with an SWR less than 2:1.

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 from allowing hazardous voltages from appearing indoors and creating a shock hazard.

Adequate protection can be accomplished by grounding the shield of the coax where it enters the building to a good earth ground or directly burying the cable in the earth for several feet before it enters the building. The coaxial cable should be totally disconnected from the station during threatening weather conditions for maximum lightning protection.

A less effective method of protecting station equipment is to install an in-line coaxial lightning arrestor with a heavy duty ground wire to a suitable earth ground, or a safety switching system as part of the basic ham station equipment.

Maintenance

Your antenna is constructed of heavy duty non corrosive 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 and also around the center-feed connections, especially in coastal areas where salty mist is commonplace.

GE 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 still adequate sealer is the automobile seam sealer commonly sold as "coax seal". This is a pliable black sealing compound.

When installing any "coax seal", NEVER completely cover the barrel of the coax connector. The sealer should ONLY be placed near the junction of the threaded part of the chassis connector and the knurled area of the male connector. This will leave the bottom of the male outer sleeve open and permit the connector to "breathe" 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 toll-free at 1-800-647-TECH (8324). Outside of the continental U.S.A. call 601-323-5869. 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., PO. Box 494, Mississippi State, MS 39762; by FAX to 601-323-6551 or on Compuserve at 76206.1763@Compuserve.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.

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 or machine reproduction of 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 no 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 charges 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 unrepai red.
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 charges will be shipped COD to the owner.
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.