



MFJ VERSA TUNER III

MODEL MFJ-962



OWNER'S MANUAL

CAUTION: Read All Instructions Before Operating Equipment.

MFJ ENTERPRISES, INC.

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INTRODUCTION

The **MFJ-962 Versa Tuner III** is an antenna tuning unit designed for use in Amateur transmitting systems. The tuner is designed to match most antenna systems from 1.8 to 30 MHz, and will handle 1.5 KW PEP RF output power.

SWR/WATTMETER

The SWR/Wattmeter circuit is calibrated for 0-200 Watts and 0-2000 Watts both forward and reflected power. SWR can be read directly from 1:1 to 6:1 on the SWR scale. The meter may be back lighted by connecting a 9-12 Vdc power supply to the 2.5 mm jack on the rear panel. The tip of the plug is positive and the sleeve is grounded.

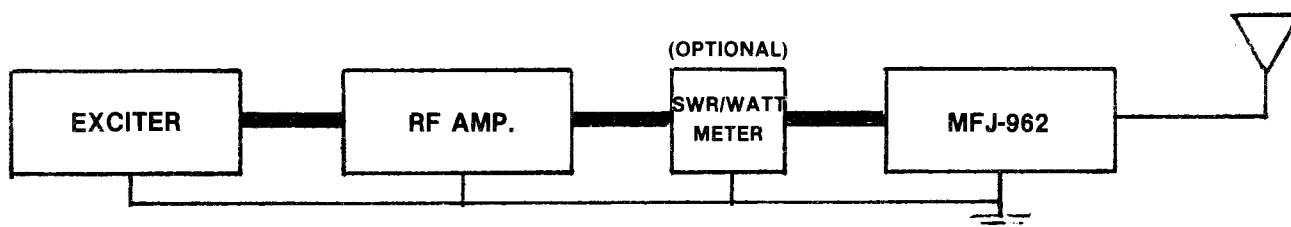
ANTENNA SELECTOR

The ANTENNA SELECTOR switch allows the selection of two coax fed antennas through the tuner or direct, a balanced line antenna, or a wire antenna.

The balanced line circuit employs a 4:1 balanced to unbalanced transformer (balun) specially designed to minimize the power loss and give good frequency response. The balun uses a high permeability ferrite toroid core with a minimum number of turns to give both good low frequency and high frequency response.

INSTALLATION

1. Locate the tuner in a convenient location at the operating position. **NOTE: LOCATE THE TUNER SO THAT THE REAR OF THE TUNER IS NOT ACCESSIBLE DURING OPERATION.** If random wire operation or balanced line operation is used the rear ceramic insulators will have high RF voltages which can cause serious RF burns if touched.
2. Install the tuner between the transmitter and the antennas as shown in the diagram. Use coax cable such as RG-8/U between the transmitter output and the SO-239 connector marked TRANSMITTER on the tuner.



3. Connect the antenna(s) to the tuner as follow:
 - A. Coax feed lines to the coax connectors. Up to two coax lines may be connected to the tuner at the same time.
 - B. Balanced feed lines are connected to the terminals marked BALANCED LINE.
 - C. Random wire antennas or single wire lines are connected to the WIRE terminal.**NOTE: ROUTE ALL SINGLE WIRE AND BALANCED LINES TO PREVENT RF BURN HAZARD.**
4. A five-way binding post is provided for a good ground connection. Ground the tuner to the transmitter, amplifier and earth ground.

OPERATION

The INDUCTOR switch on the MFJ-962 has a minimum inductance at position A and maximum at L. The ANTENNA MATCHING and TRANSMITTER MATCHING controls are at maximum capacitance when set to 0. For optimum operation of the MFJ-962, tune the exciter into a 50 ohm load. For convenience connect the external 50 ohm load to one of the coax outputs so the exciter will not have to be disconnected when it is tuned up (use COAX DIRECT).

NOTE: For solid state exciter which has a 50 ohm output impedance, it is not necessary to tune it into a 50 ohm load.

After proper exciter tuning, set the ANTENNA SELECTOR to the desired antenna and tune the tuner for minimum SWR as described below.

1. Set the ANTENNA and TRANSMITTER controls to about mid-range.
2. Rotate the INDUCTOR switch to maximize received signals and noise.
3. Set the METER switch to SET. Apply power (about 20 to 50 watts) and adjust the SWR SET control for a full scale reading on the meter. Switch the METER switch to SWR and read the SWR on the SWR scale.
4. If the SWR is not 1:1, then adjust the tuner for minimum SWR:
 - A. Using the exciter only (RF amplifier in stand-by mode) and the INDUCTOR switch still in the setting from Step 2, alternately adjust the TRANSMITTER and ANTENNA controls for minimum SWR. Since the two controls interact, the two controls can best be adjusted by turning the TRANSMITTER control a small increment at a time then rotate the ANTENNA control for minimum SWR. Repeat until minimum SWR is obtained.
 - B. If a SWR of 1:1 is not achieved, increase or decrease the INDUCTOR switch a position and repeat Step 4A. If a SWR of 1:1 is not achieved repeat Step 4A for each inductor setting until the lowest SWR is found.
5. After minimum SWR is achieved with the exciter, the amplifier may be switched in. Tune the RF amplifier according to the manufacturer's instructions.

Note: When the tuner is tuned to a 1:1 SWR it will present a 50 ohm load for proper tune up of the RF amplifier.

OPERATING NOTES

1. Even though this tuner is designed to have as large a tuning range as possible, it may not always be possible to tune an antenna system to a 1:1 SWR. A SWR of 1.5:1 to 2:1 is usually acceptable to most transmitters (see your transmitter instructions). If a higher SWR is not acceptable there are several things which can be tried. For example, if the antenna is very short try lengthening it. A loading coil or a capacitive hat may also help raise the impedance to within the tuner range.
2. A SWR of 1:1 can occur for more than one control setting. If this should occur use the setting which gives the highest received signals and noise.
3. Once the tuner is tuned for a given antenna and band, record the tuner settings for easier retuning to the same spot.

WARNING

1. NEVER OPERATE THE TUNER WITH THE COVER REMOVED. THE VOLTAGES INSIDE ARE VERY DANGEROUS DURING OPERATION.
2. NEVER ROTATE THE "INDUCTOR" OR THE "ANTENNA SELECTOR" SWITCH WHILE OPERATING, DAMAGE TO THE SWITCH MAY RESULT.
3. LOCATE THE TUNER SO THAT IT WILL NOT BE ACCESSIBLE FROM THE REAR.
4. DISCONNECT THE ANTENNAS FROM THE TUNER DURING LIGHTNING AND STORMS.
5. ALWAYS TUNE WITH LOW POWER (i.e. LESS THAN 100 WATTS). APPLY MAXIMUM POWER ONLY AFTER TUNING.
6. DO NOT KEY TRANSMITTER INTO HIGH SWR FOR LONG PERIODS OF TIME.

SPECIFICATIONS

FREQUENCY RANGE: 1.8 to 30 MHz

POWER CAPABILITY: 1.5 KW PEP RF output for most antennas

CAPACITORS: 6 KV breakdown voltage

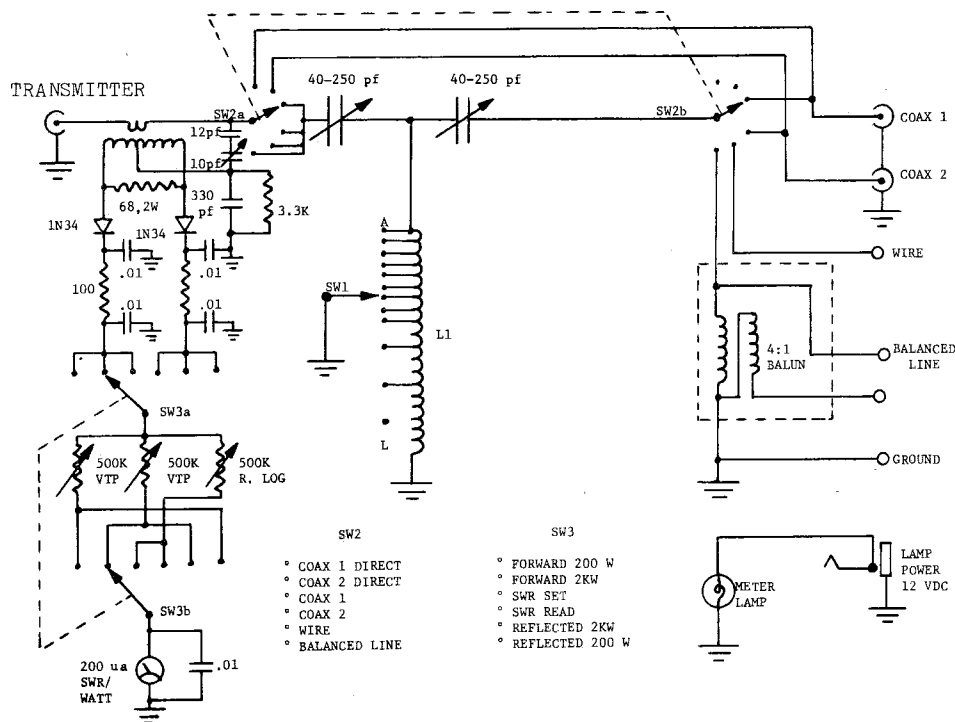
SWITCHES: 1.5 KV, 9 A carry, 0.35 A switch @ 115 VAC

SWR/WATTMETER: 0-200 watts and 0-2000 watts both forward and reflect power scales, SWR 1:1 to 3:1 on SWR scale.

INPUT: SO-239 connector

OUTPUTS: Two SO-239 connectors either through tuner or bypassed tuner, ceramic feed through post for balanced line and wire antenna, 5-way binding post for ground.

DIMENSIONS: 14" X 5" X 16"



MFJ-962 SCHEMATIC DIAGRAM

12 MONTHS 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 of 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, cancelled check, credit card or money order receipt, etc.) describing the product to establish the validity of warranty claim and must submit the original or a 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 of proof-of-purchase 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 (except as noted) provided the product is returned postage prepaid to MFJ Enterprises, Inc. with a personal check, cashier's check or money order for \$8.00 covering postage and handling.
3. MFJ Enterprises, Inc. will supply replacement parts (except as noted) free of charge for any MFJ product under warranty upon request. A dated proof-of-purchase and a \$3.00 personal check, cashier's check or money order must be provided to cover postage and handling. Defective parts must be returned to MFJ Enterprises, Inc.
4. This warranty is **NOT** void for owners who attempt to repair defective units. Technical consultation is available by calling (601) 323-5869.
5. Under no circumstances is MFJ Enterprises, Inc. liable for consequential damages to person or property by the use of any MFJ product.
6. This warranty does not apply to damage caused by lightning, flood, storm, or other acts of God, fire, mishandling, misuse, accident, neglect, improper maintenance, customer-made modification, voltage, current or other parameter in excess of rating, reverse polarity of DC supply. This warranty is void for units not operated and maintained in accordance with the instructions supplied and within the specified rating. This warranty is void if the unit is used for commercial or non-amateur radio purpose.
7. This warranty is given in lieu of any other warranty express or implied.
8. MFJ Enterprises, Inc. reserves the right to make changes or improvement in design or manufacture without incurring any obligation to install such changes upon any of the products previously manufactured.
9. **Out-of-Warranty Service:** MFJ Enterprises, Inc. will repair any out-of-warranty product provided the unit is delivered prepaid. All charges will be shipped COD to the owner.
10. All MFJ products to be serviced in-warranty or out-of-warranty should be addressed to **MFJ Enterprises, Inc., P. O. Box 494, Mississippi State, MS 39762, USA (UPS address: 921-A Louisville Road, Starkville, MS 39759)**, and must be accompanied by a letter describing the problem in detail along with a copy of your dated proof-of-purchase.
11. This warranty gives you specific rights, and you may also have other rights which vary from state to state.