



# MFJ VERSA TUNER V

MODEL MFJ-989

OWNER'S MANUAL

CAUTION: Read All Instructions Before Operating Equipment.

**MFJ ENTERPRISES, INC.**

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## MFJ-989 VERSA TUNER V

### INTRODUCTION

The MFJ-989 Versa Tuner V is an antenna tuning unit designed for use in high power amateur transmitting installations. The tuner is designed to match most antenna systems from 1.8 to 30 MHz and will handle up to 3KW PEP RF output power. This tuner has a built in 50 ohm, 300W dummy load for easy tune up of your exciter. The MFJ-989 also has an SWR/wattmeter to allow you easy tune up and power measurement.

### ROLLER INDUCTOR

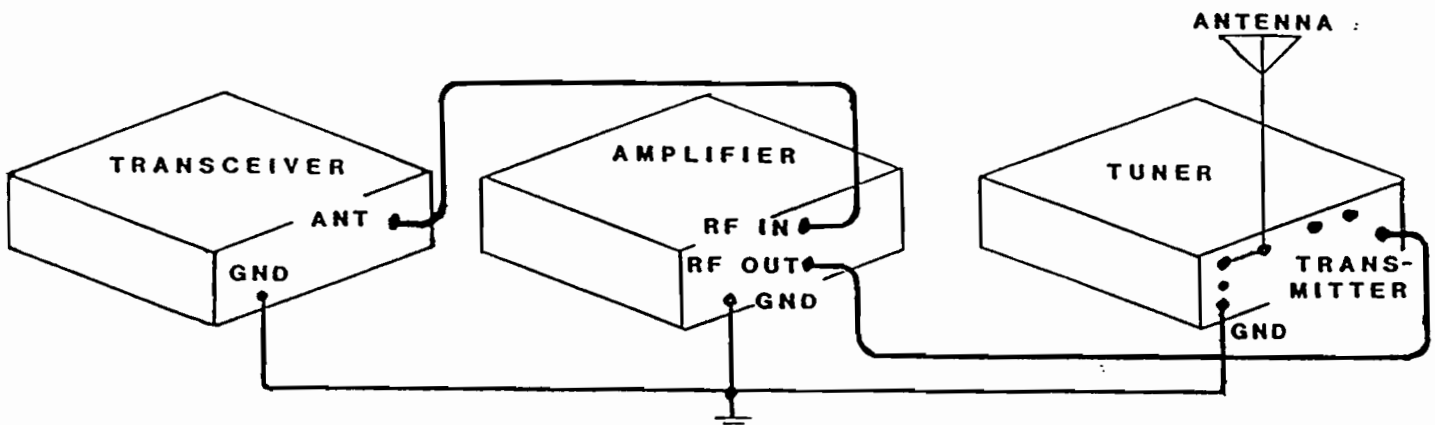
The MFJ-989 has a quality infinite resolution roller inductor with silver plated contacts for minimum loss. A counter is used to indicate the position of the roller inductor for accurate resetting of the inductor.

### ANTENNA SELECTOR

The ANTENNA SELECTOR allows you to select 2 coax fed antennas either direct or through the tuner, a 50 ohm dummy load, and a wire or balanced line antenna.

### INSTALLATION

1. Locate the tuner in a convenient location at the operating position. NOTE: LOCATE THE TUNER SO THE REAR IS NOT ACCESSABLE DURING OPERATION. If random wire or balanced line operation is used the ceramic feed through insulators will have high RF voltages which can cause serious RF burns if touched when transmitting.
2. Install the tuner between the transmitter and the antenna as shown in the diagram below. Use coax cable such as RG-8/U to connect the transmitter to the connector marked TRANSMITTER on the tuner.
3. Connect the antenna(s) to the tuner as follows:
  - A. Coax cable feed lines to the coax connectors 1 and 2. Both coax lines may be fed direct or through the tuner as selected by the ANTENNA SELECTOR switch.
  - B. Wire antenna is connected to the WIRE terminal.
  - C. Balanced line is connected to the BALANCED LINE terminals. For balanced line operation a jumper must be connected between the wire terminal and the top balanced line terminal as indicated by the dotted line.
4. A five-way binding post is provided for ground connection.



CONNECTION DIAGRAM

## OPERATION

The roller inductor has a maximum inductance at 0, and a minimum at 99 on the reference counter. The capacitors have a maximum at 1 and a minimum at 6.

1. Tune the exciter up into the dummy load. (Most solid state transmitters are pretuned to 50 ohms and do not require tuning up into the dummy load.)
2. Select the desired antenna with the ANTENNA SELECTOR SWITCH.
3. Set the ANTENNA and TRANSMITTER controls to about 4.
4. Starting from minimum on the INDUCTOR, tune for maximum noise and signals. If the maximum noise and signal setting is not found set the inductor to the setting in Table 1 and proceed to the next step.
5. With the linear amplifier OFF or in stand-by set the METER switch to set, transmit a low power signal (10 to 50 W), and adjust the SWR SET control to full scale on the meter. Switch the meter switch to SWR and read the SWR.
6. Adjust the ANTENNA and TRANSMITTER controls for minimum. If the SWR is not 1:1 adjust the inductor up or down and repeat step 6. If the capacitors are at maximum capacitance, increase the inductance. If the capacitors are at minimum capacitance, decrease the inductance.
7. After minimum SWR is achieved the amplifier may be turned on and tuned up according to the manufacturers instructions.
8. For quick retuning of the tuner, record the INDUCTOR and CAPACITOR settings. Table 2 has been provided for this purpose.

## OPERATING NOTES

1. The tuner is designed to have as large a tuning range as possible. But there are limits to the tuning range of the capacitors and inductor. This means that some antennas may require more or less inductance or capacitance than the controls have. In these cases the SWR may not be reduced to 1:1. If the SWR is higher than the limits on your rig, try changing the length of the antenna to bring the impedance to within the tuning range of the tuner.
2. In tuning the tuner use the minimum inductance required to obtain a minimum SWR. This will help reduce the losses in the inductor and reduce the chances of tuning the tuner to a point where the tuner absorbs the power instead of transferring it to the antenna system.
3. If the INDUCTOR counter slips out of calibration turn the INDUCTOR fully clockwise. Then, with a small screw driver or pencil push the reset lever through the hole beside the counter and set the counter to "000".

Table 1  
Initial Tune-up Inductor Settings

BAND	INDUCTOR
160 M	99
80 M	48
40 M	18
20 M	8
15 M	4
10 M	2

NOTE: These settings are approximate. The exact setting will depend on the particular antenna system.

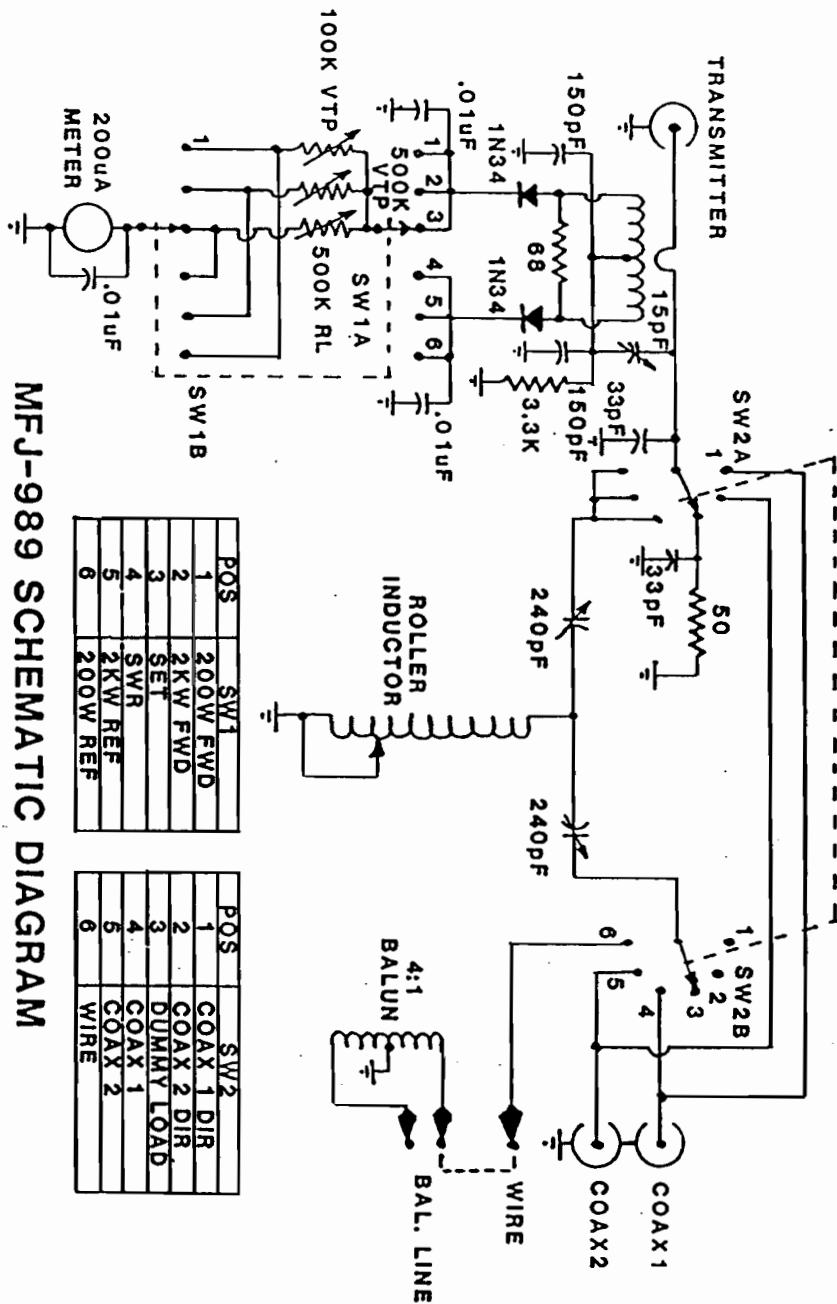
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FREQUENCY RANGE	1.8 to 30 MHz including all the new bands.
POWER CAPABILITY	3KW PEP into most antennas.
CAPACITORS	40 50 250 pf, 6KV
INDUCTOR	0 to 36uH, 14ga Wire, silver-plated roller contact.
ANTENNA SWITCH	1.5KV, 9A carry.
DUMMY LOAD	50 ohm 10%, 300W .5 min., 100W 1.5 min., 50W 3 min.
SWR/WATTMETER	0 to 200W, 0 to 2000W, 1:1 to 6:1 SWR
INPUT	Coaxial cable, SO-239 connector.
OUTPUT	2 coax connectors, 1 feed through for WIRE, 2 feed throughs for BALANCED LINE
DIMENSIONS	10-5/8 x 4-3/4 x 14-1/2



MFJ-989 SCHEMATIC DIAGRAM

POS	SW1
1	200W FWD
2	2KW FWD
3	SET
4	SWR REF
5	2KW REF
6	200W REF

POS	SW2
1	COAX 1 DIR
2	COAX 2 DIR
3	DUMMY LOAD
4	COAX 1
5	COAX 2
6	WIRE