MFJ MFJ-941E

MFJ-941E Versa Tuner II Instruction Manual

Model: MFJ-941E

Introduction

This manual provides comprehensive instructions for the setup, operation, and maintenance of your MFJ-941E Versa Tuner II. The MFJ-941E is a versatile 300-watt HF antenna tuner designed to match a wide range of antennas to your transceiver, ensuring efficient power transfer and optimal performance across the 1.8 to 30 MHz frequency range. Please read this manual thoroughly before operating the device.

Safety Information

Observe the following safety precautions to prevent damage to the tuner, transceiver, or personal injury:

- Always ensure proper grounding of your amateur radio station, including the tuner.
- Do not operate the tuner above its specified power rating of 300 watts. Exceeding this limit can cause damage to the unit.
- Never transmit into an unmatched load or without an antenna connected, as this can damage your transceiver.
- Disconnect power to all equipment before making or changing antenna connections.
- Keep the tuner away from moisture and extreme temperatures.
- Do not open the tuner casing. There are no user-serviceable parts inside. Refer all servicing to qualified personnel.

Product Overview

Front Panel Controls

Image: Front panel of the MFJ-941E Versa Tuner II, showing the cross-needle meter on the left, followed by the Antenna Selector, Transmitter, Inductor, and Antenna tuning controls.

- **Cross-Needle Meter:** Displays Forward Power (WATTS), Reflected Power (WATTS), and Standing Wave Ratio (SWR) simultaneously. Features selectable power ranges (30W and 300W).
- **LAMP Switch:** Toggles the meter backlight on or off. Requires 12 VDC power for illumination.
- **30W/300W Switch:** Selects the full-scale power range for the meter. Use 30W for low power measurements and 300W for higher power.
- **Antenna Selector:** An eight-position rotary switch for selecting the antenna or load. Options include COAX 1 (Tuned), COAX 2 (Tuned), Balanced Line (Tuned), Random Wire (Tuned), COAX 1 (Bypass), COAX 2 (Bypass), Dummy Load (Bypass), and Dummy Load (Tuned).
- **TRANSMITTER Control:** A variable capacitor used for tuning the input impedance to the transceiver.
- **INDUCTOR Control:** A multi-position rotary switch that selects the appropriate inductance for tuning.
- **ANTENNA Control:** A variable capacitor used for tuning the output impedance to the antenna.

Setup

Connecting the Tuner

Follow these steps to properly connect your MFJ-941E tuner to your amateur radio station:

1. **Power Off:** Ensure your transceiver and any other connected equipment are powered off and disconnected from the mains.
2. **Transceiver Connection:** Connect the RF output of your transceiver to the**TRANSMITTER** SO-239 connector on the rear panel of the MFJ-941E using a high-quality 50-ohm coaxial cable.
3. **Antenna Connection:**
    - For coax-fed antennas, connect them to the**COAX 1** or **COAX 2** SO-239 connectors on the rear panel.
    - For balanced line antennas, connect the twin-lead or ladder line to the two binding posts labeled **BALANCED LINE**.
    - For random wire antennas, connect the wire to the binding post labeled**RANDOM WIRE**.
    - If using an external dummy load, connect it to the**DUMMY LOAD** SO-239 connector.
4. **Grounding:** Connect a good earth ground to the**GROUND** terminal on the rear panel. A proper ground is crucial for safety and performance.
5. **Meter Lamp Power (Optional):** If you wish to use the meter lamp, connect a 12 VDC power supply (e.g., MFJ-1312D adapter, sold separately) to the **12VDC** jack on the rear panel.

Operating Instructions

Basic Tuning Procedure

The goal of tuning is to achieve the lowest possible SWR (Standing Wave Ratio) for efficient power transfer to your antenna. Always use low power (e.g., 5-10 watts) for initial tuning to prevent damage to your equipment.

1. **Select Antenna:** Set the **Antenna Selector** switch to the desired antenna input (e.g., COAX 1, Balanced Line, Random Wire) in a **TUNED** position.
2. **Set Power Range:** Set the **30W/300W** switch to **30W** for initial tuning.
3. **Apply Low Power:** Set your transceiver to a low power output (e.g., 5-10 watts) in CW or AM mode, or use a tune function if available.
4. **Adjust INDUCTOR:** While transmitting low power, slowly rotate the **INDUCTOR** control through its positions. Observe the SWR meter. Select the position that gives the lowest SWR reading.
5. **Adjust TRANSMITTER and ANTENNA:** With the **INDUCTOR** set, alternately adjust the **TRANSMITTER** and **ANTENNA** controls for the lowest possible SWR reading. Make small adjustments to each control, iterating until the SWR is minimized (ideally 1.0:1 or very close).
6. **Increase Power (Optional):** Once a low SWR is achieved at low power, you can increase your transceiver's power output. Switch the **30W/300W** switch to **300W** if transmitting above 30 watts. Re-check SWR at full power; minor adjustments may be needed.

Antenna Selector Functions

- **COAX 1 (Tuned), COAX 2 (Tuned):** Selects the corresponding coaxial antenna for tuning.
- **BALANCED LINE (Tuned):** Selects the balanced line input for tuning. The internal 4:1 balun is engaged.
- **RANDOM WIRE (Tuned):** Selects the random wire input for tuning.
- **COAX 1 (Bypass), COAX 2 (Bypass):** Bypasses the tuner circuit, connecting the transceiver directly to the selected coaxial antenna. Useful for antennas that are already resonant.
- **DUMMY LOAD (Bypass), DUMMY LOAD (Tuned):** Connects the transceiver to the dummy load. Use the 'Bypass' setting for direct connection to an external dummy load for testing, or 'Tuned' if you need to tune into a reactive dummy load.

Meter Usage

The cross-needle meter provides simultaneous readings of forward power, reflected power, and SWR. The intersection of the two needles indicates the SWR. The left needle indicates forward power, and the right needle indicates reflected power. Ensure the correct power range (30W or 300W) is selected for accurate readings.

Maintenance

The MFJ-941E Versa Tuner II is designed for reliable operation with minimal maintenance. Keep the unit clean and free from dust. Use a soft, dry cloth for cleaning the exterior. Do not use abrasive cleaners or solvents. Ensure all connections are secure. Periodically check the coaxial cables and connectors for signs of wear or corrosion. No internal user-serviceable parts are present.

Troubleshooting

Problem	Possible Cause / Solution
Cannot achieve low SWR	• Antenna system issue (e.g., open, short, severe mismatch). Check antenna and feedline. • Incorrect tuner settings. Re-read tuning procedure and try again. • Poor ground connection. Ensure a solid earth ground. • Tuner operating outside its frequency range (1.8-30 MHz).
Meter lamp not lighting	• No 12 VDC power connected to the rear jack. • LAMP switch is in the OFF position. • Faulty 12 VDC power supply or cable.
No meter deflection	• No RF power from transceiver. Check transceiver output. • Loose or faulty coaxial connections. • Tuner is in a BYPASS mode. Switch to a TUNED position. • Faulty meter (unlikely, but possible).

Specifications

Feature	Detail
Frequency Range	1.8 - 30 MHz (HF Bands)
Power Handling	300 Watts (Maximum RF Output)
Meter Type	Cross-Needle (Forward Power, Reflected Power, SWR)
Meter Power Ranges	30 Watts, 300 Watts
Antenna Inputs	2 x Coaxial (SO-239), Balanced Line (Binding Posts), Random Wire (Binding Post), Dummy Load (SO-239)
Balun	Built-in 4:1 Current Balun
Meter Illumination	Requires 12 VDC (optional adapter)
Dimensions (Approx.)	19.49 x 11.85 x 9.61 inches (Package Dimensions)
Weight (Approx.)	4 pounds

Warranty and Support

For information regarding warranty coverage and technical support for your MFJ-941E Versa Tuner II, please refer to the official MFJ Enterprises, Inc. website or contact their customer service directly. Keep your purchase receipt as proof of purchase for any warranty claims.

Related Documents - MFJ-941E

	MFJ-939 Plug&Play IntelliTuner Automatic Antenna Tuner Instruction Manual This instruction manual provides comprehensive guidance for the MFJ-939 Plug&Play IntelliTuner™ Automatic Antenna Tuner. It is designed to help amateur radio enthusiasts install, configure, and operate the tuner with various compatible radio models from brands such as Icom, Alinco, Kenwood, and Yaesu.
	MFJ Versa Tuner II MFJ-941E User Manual and Technical Guide Comprehensive guide to the MFJ Versa Tuner II MFJ-941E, covering general information, cross-needle SWR/Wattmeter usage, antenna selector functions, installation, operation, tuning adjustments, troubleshooting, and antenna matching techniques. Includes technical assistance contact information.
	MFJ-1204 USB Radio Interface Instruction Manual - Connect Your Radio to Computer Comprehensive user manual for the MFJ-1204 USB Radio Interface, detailing setup, connection, configuration, and troubleshooting for Ham Radio digital modes.
	MFJ-927 Remote Intellituner Automatic Antenna Tuner Instruction Manual Optimize your amateur radio setup with the MFJ-927 Remote Intellituner Automatic Antenna Tuner. This comprehensive instruction manual guides you through installation, operation, advanced features, and safety precautions.
	MFJ 2017 Ham Catalog: Antenna Tuners and Radio Accessories Explore the MFJ 2017 Ham Catalog, featuring a comprehensive range of high-performance antenna tuners, SWR meters, analyzers, power supplies, and essential ham radio accessories from MFJ Enterprises.
	MFJ-422E/422EX Electronic Keyer Paddle with Memory Instruction Manual Instruction manual for the MFJ-422E/422EX Electronic Keyer Paddle with Memory, detailing its features, operation, installation, and troubleshooting for amateur radio enthusiasts.