

## MFJ 971

# MFJ-971 Manual Antenna Tuner and SWR Meter Instruction Manual

Model: MFJ-971 | Brand: MFJ

## 1. INTRODUCTION

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This manual provides instructions for the MFJ-971 Manual Antenna Tuner and SWR Meter. This device is designed to match a wide range of impedances for amateur radio antennas operating within the 1.8 to 30 MHz frequency range, handling up to 200 watts of power. It includes a built-in SWR/wattmeter for convenient monitoring of antenna performance.

## 2. SAFETY INFORMATION

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- Always ensure proper grounding of your radio equipment, including the MFJ-971 tuner, to prevent electrical shock and minimize RF interference.
- Never operate the tuner without an antenna or a suitable dummy load connected to the output. Operating without a load can damage your transceiver.
- Do not exceed the maximum power rating of 200 watts. Exceeding this limit can cause damage to the tuner.
- Disconnect power to your transceiver and the tuner before making any connections or disconnections.
- Keep the device away from moisture and extreme temperatures.

## 3. FEATURES

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- **Frequency Coverage:** 1.8 - 30 MHz, covering all amateur radio bands.
- **Power Handling:** Up to 200 Watts PEP (Peak Envelope Power).
- **Built-in SWR/Wattmeter:** Provides simultaneous readings of forward power, reflected power, and SWR.
- **QRP and High Power Modes:** Selectable power ranges for accurate metering at both low (6W) and high (300W) power levels.
- **Antenna Versatility:** Supports coaxial fed antennas, single wire antennas, and balanced line antennas.
- **Compact Design:** Suitable for portable and field operations.

## 4. CONTROLS AND INDICATORS

### 4.1 Rear Panel Connections



Image: Rear panel of the MFJ-971 Manual Antenna Tuner. From left to right, it shows the ANTENNA SO-239 connector, a red binding post labeled WIRE, two red binding posts for BALANCED LINE with an instruction for a jumper wire, a wingnut terminal for GROUND, a 12VDC input for METER LAMP, and a TRANSMITTER SO-239 connector. A switch for 6W/300W power range is also visible.

- **ANTENNA (SO-239):** Connect your coaxial fed antenna here.
- **WIRE (Binding Post):** Connect a single wire antenna (e.g., long wire, random wire) to this terminal.
- **BALANCED LINE (Two Binding Posts):** Connect your balanced feedline (e.g., ladder line, open wire line) here. *Note: A jumper wire must be installed internally when using balanced lines. Refer to the setup section for details.*
- **GROUND (Wingnut Terminal):** Connect a good quality earth ground or counterpoise to this terminal for optimal performance and safety.
- **12VDC (Power Input):** Connect a 12V DC power source (e.g., wall adapter, battery pack) to illuminate the meter lamp.
- **TRANSMITTER (SO-239):** Connect your transceiver's antenna output to this connector using a coaxial cable.
- **Power Range Switch (6W/300W):** Selects the appropriate power range for the SWR/wattmeter. Use 6W for QRP operations and 300W for higher power levels to ensure accurate readings.

### 4.2 Front Panel Controls (General Description)

While not shown in the provided image, the front panel typically includes controls for tuning the antenna and operating the SWR/wattmeter. These usually consist of:

- **Antenna Tuning Controls:** Variable capacitors and/or inductors to adjust the impedance match.
- **SWR/Power Meter:** An analog meter displaying SWR, forward power, and reflected power.
- **Meter Function Switch:** To select between forward power, reflected power, and SWR readings.

## 5. SETUP

### 5.1 Initial Connections

1. Ensure your transceiver is turned off.
2. Connect a coaxial cable from your transceiver's antenna output to the **TRANSMITTER** SO-239 connector on the MFJ-971.
3. Connect your antenna to the appropriate terminal on the MFJ-971:
  - For coaxial fed antennas, connect to the **ANTENNA** SO-239 connector.
  - For single wire antennas, connect to the **WIRE** binding post.
  - For balanced line antennas, connect to the **BALANCED LINE** binding posts. Ensure the internal jumper wire is installed as per the tuner's internal instructions (typically found by opening the case and following the diagram).
4. Connect a reliable earth ground to the **GROUND** wingnut terminal. This is crucial for safety and performance.
5. If desired, connect a 12V DC power source to the **12VDC** input for the meter lamp.

## 6. OPERATING INSTRUCTIONS

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### 6.1 Tuning Procedure

1. Turn on your transceiver and set it to a low power output (e.g., 5-10 watts) in CW (Continuous Wave) or AM mode. Avoid using SSB for tuning.
2. Set the MFJ-971's power range switch to the appropriate setting (6W for low power, 300W for higher power).
3. Set the meter function switch (on the front panel) to read **FORWARD POWER**.
4. Key your transceiver briefly and adjust the front panel tuning controls (e.g., Antenna, Inductor, Capacitor) for maximum forward power reading.
5. Switch the meter function to read **SWR**.
6. Key your transceiver again and carefully adjust the tuning controls for the lowest possible SWR reading (ideally 1.5:1 or lower). Make small, incremental adjustments.
7. Once a satisfactory SWR is achieved, you can increase your transceiver's power output to your desired operating level, ensuring it does not exceed the tuner's 200W rating.
8. For each significant frequency change, repeat the tuning procedure.

### 6.2 Using the SWR/Wattmeter

The built-in SWR/wattmeter allows you to monitor your antenna system's performance. The meter typically has scales for forward power, reflected power, and SWR. Always select the appropriate power range (6W or 300W) for accurate readings.

## 7. MAINTENANCE

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- **Cleaning:** Use a soft, dry cloth to clean the exterior of the tuner. Do not use abrasive cleaners or solvents.
- **Inspection:** Periodically inspect all connections for corrosion or damage. Ensure all cables are securely fastened.
- **Storage:** When not in use for extended periods, store the tuner in a dry, dust-free environment.

## 8. TROUBLESHOOTING

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- **High SWR Readings:**
  - Ensure all connections are secure and correct.

- Verify the antenna is properly connected and functional.
- Re-attempt the tuning procedure carefully.
- Check your ground connection.
- **No Meter Lamp Illumination:**
  - Verify the 12V DC power supply is connected and functional.
  - Check the polarity of the 12V DC connection.
- **No Power Output from Tuner:**
  - Ensure the transceiver is transmitting.
  - Check all coaxial cable connections between the transceiver, tuner, and antenna.

## 9. SPECIFICATIONS

<b>Brand</b>	MFJ
<b>Model Number</b>	971
<b>Frequency Range</b>	1.8 - 30 MHz
<b>Power Handling</b>	200 Watts (PEP)
<b>Tuner Type</b>	Analog, Manual
<b>Included Components</b>	MFJ-971 Tuner
<b>Item Weight</b>	2.5 Pounds
<b>Color</b>	Black
<b>Water Resistance Level</b>	Not Water Resistant
<b>UPC</b>	650619002539

## 10. WARRANTY AND SUPPORT

For warranty information and technical support, please refer to the documentation provided with your purchase or contact MFJ Enterprises directly through their official website or customer service channels. Keep your proof of purchase for warranty claims.