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› Malahit ATU-100 Automatic Antenna Tuner 1.8-50 MHz 100W Shortwave User Manual

## Malahit OOXM1618

# Malahit ATU-100 Automatic Antenna Tuner 1.8-50 MHz 100W Shortwave User Manual

## INTRODUCTION

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This manual provides detailed instructions for the Malahit ATU-100 Automatic Antenna Tuner. This device is designed to automatically match the impedance of your antenna system to your transceiver, ensuring efficient power transfer across the 1.8-50 MHz frequency range with up to 100W of power. Please read this manual thoroughly before operating the device.

## PACKAGE CONTENTS

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Verify that all items listed below are included in your package:

- 1 x Assembled Malahit ATU-100 Automatic Antenna Tuner (metal casing, no battery included)
- 1 x DC 5.5 x 2.1 Power Cable (0.75 square pure copper wire, 50 cm length)
- 1 x USB 5V to 9V Booster Board



Image: The Malahit ATU-100 tuner, power cable, and USB booster board as packaged in the box.

## PRODUCT FEATURES

- **Firmware Version 3.2:** Equipped with the latest firmware, version 3.2, which includes bug fixes and improvements over previous versions.
- **Automatic Operation:** This antenna tuner operates automatically, requiring no manual assembly or complex setup. It is ready for immediate use.
- **Compact Design:** The tuner features a compact and robust design with an assembled metal casing, making it durable and portable.
- **High-Quality Components:** Built with high-quality SMD capacitors, C-channel capacitors, 1000V high-voltage SMD capacitors, and an imported PIC chip for reliable performance.
- **UHF Connector:** Utilizes standard UHF connectors for antenna and radio connections.
- **Durable Construction:** The entire casing is made from CNC-perforated aluminum alloy, ensuring high durability.



Image: Front view of the ATU-100 tuner, showing the display, Tune button, Auto button, BYP button, and Power switch.

## SETUP

1. **Power Connection:** Connect the provided DC 5.5 x 2.1 power cable to the DC12V input port on the rear of the ATU-100. Ensure the power source provides 10-15 VDC. If using the USB 5V to 9V booster board, connect it to a 5V USB power source and then to the tuner's DC input.
2. **Antenna Connection:** Connect your antenna to the "ANT" UHF connector on the rear of the tuner.
3. **Transceiver Connection:** Connect your transceiver's antenna output to the "RF IN" UHF connector on the rear of the tuner.
4. **Power On:** Flip the red "POWER" switch on the front panel to the ON position. The display will illuminate.



Image: Rear panel of the ATU-100, illustrating the antenna (ANT), DC 12V power input, and RF input (RF IN) connections.

## OPERATING MODES

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The ATU-100 features several operating modes:

- **Automatic Mode:** When a dot ('.') appears on the display, the tuner is in automatic mode. In this mode, the tuner automatically adjusts to achieve the lowest SWR.
- **Bypass (BYP) Mode:** When a dash ('\_') appears on the display, the tuner is in BYP mode, meaning it is bypassed and not actively tuning.
- **Manual Mode:** When both the dot and dash disappear from the display, the tuner is in manual mode, allowing for manual adjustments.

### Tuning Process:

1. Ensure the tuner is powered on.
2. Transmit a low power signal (e.g., 5-10W) from your transceiver.
3. Press the green **TUNE** button. The tuner will automatically adjust the inductance (L) and capacitance (C) to minimize SWR.
4. Once tuning is complete, the display will show the SWR value.

### Advanced Operating Modes (Test and Fast Test)

- **Test Mode:** To enter Test Mode, press and hold both the **BYP** and **AUTO** buttons simultaneously, then power on the device. This mode is used for diagnostic purposes.
- **Fast Test Mode:** To enter Fast Test Mode, press and hold the **TUNE**, **BYP**, and **AUTO** buttons simultaneously, then power on the device. This mode provides a quicker diagnostic check.

## Inside structure:

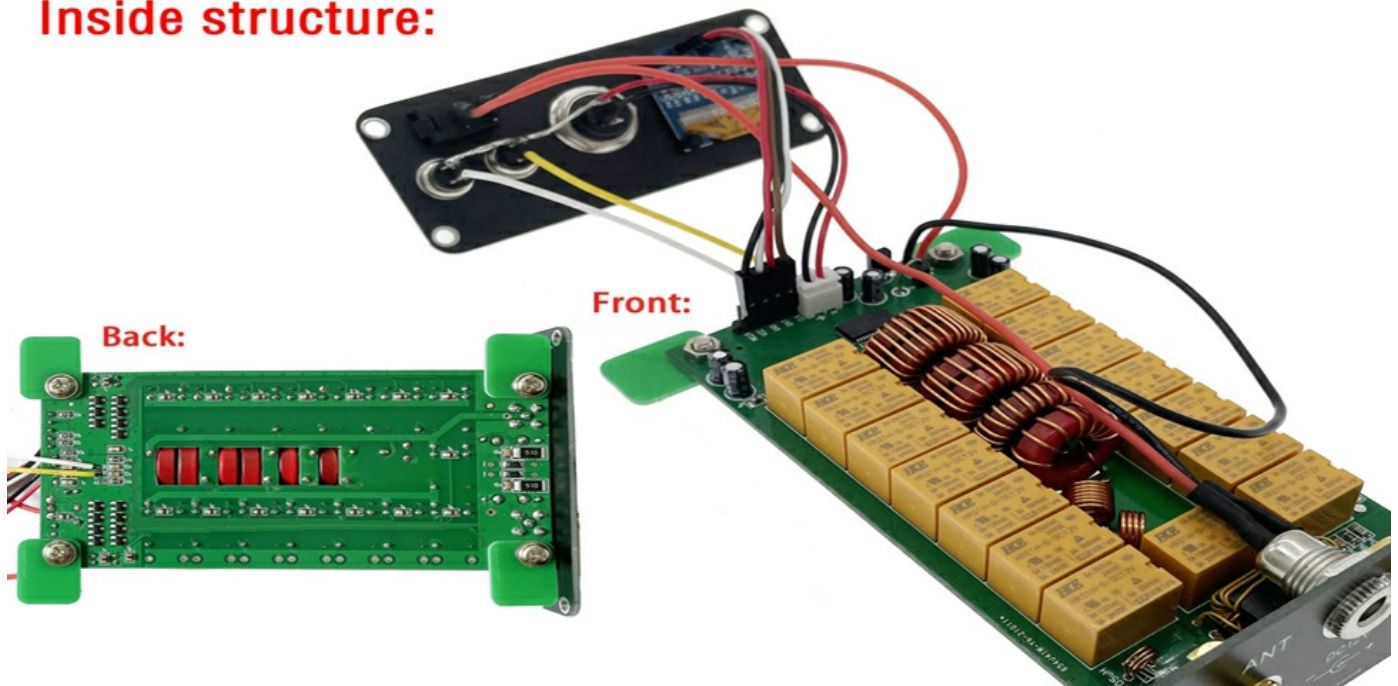


Image: A page from the ATU-100 manual illustrating the display indicators for Automatic, Bypass, and Manual modes, along with instructions for Test and Fast Test modes.

## POWER SUPPLY AND BOOSTER BOARD

The ATU-100 requires a 10-15 VDC power supply. A DC 5.5 x 2.1 power cable is included. For users who need to power the device from a 5V USB source, a USB 5V to 9V booster board is provided.

### USB 5V to 9V Booster Board Instructions:

1. Connect the booster board to a 5V USB power source using a USB cable (not included).
2. Solder the 5.5 connector power cable (included) to the booster board's output terminals.
3. Connect the 5.5 connector to the ATU-100's DC12V input.

### Voltage Regulation Method:

To adjust the output voltage of the booster board:

- Locate the potentiometer on the booster board.
- Turn the potentiometer clockwise to increase the voltage.
- Turn the potentiometer counter-clockwise to decrease the voltage.
- If the output voltage does not adjust initially and remains at the input voltage, rotate the potentiometer counter-clockwise more than 10 turns before attempting to adjust it normally.

### Booster Module Characteristics:

- Maximum Output Current: 2A
- Input Voltage: 2V-15V
- Maximum Output Voltage: >5V-28V
- Efficiency: >93%

## Important Notes:

- Input voltage should not exceed the maximum input voltage.
- Peak current output should not exceed 2A.

# ATU-100 EXT Antenna tuner



## Version 3.2 program

Image: Instructions and diagram for connecting and adjusting the USB 5V to 9V booster board.

## SPECIFICATIONS

Feature	Specification
Model Number	OOXM1618
Brand	Malahit
Frequency Range	1.8 - 50 MHz
Maximum Working Power	100 Watts
Maximum Measured Power	150 Watts
Minimum Power for Tuning Start	1 Watt
Minimum Measured Power	0.1 Watt
Power Measurement Accuracy	10%
Maximum Inductance Set	8.5 uH
Minimum Step for Setting Inductance	0.1 uH
Maximum Installed Capacitance	1870 pF
Minimum Step for Setting Capacitance	10 pF

Power Supply Range	10-15 VDC
Maximum Current	450mA
Impedance	50 ohms
Connectors	UHF
Color	Black
Dimensions (L*W*H)	140 x 88 x 38 mm
Weight	550g

## MAINTENANCE

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To ensure the longevity and optimal performance of your ATU-100 tuner, follow these maintenance guidelines:

- **Cleaning:** Use a soft, dry cloth to clean the exterior of the device. Avoid using abrasive cleaners or solvents, which can damage the finish.
- **Environmental Conditions:** Operate and store the tuner in a dry environment, away from direct sunlight, extreme temperatures, and high humidity.
- **Connections:** Periodically check all cable connections (power, antenna, RF IN) to ensure they are secure and free from corrosion.
- **Firmware Updates:** Check the manufacturer's website for any available firmware updates. Follow the provided instructions carefully for any update procedures.

## TROUBLESHOOTING

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If you encounter issues with your ATU-100 tuner, consider the following common troubleshooting steps:

- **No Power:**
  - Ensure the power cable is securely connected to both the tuner and the power source.
  - Verify that the power source is providing the correct voltage (10-15 VDC).
  - If using the USB booster board, confirm it is correctly connected and providing adequate voltage. Check the potentiometer adjustment.
- **High SWR After Tuning:**
  - Ensure your antenna system is properly connected and functional.
  - Verify that the power output from your transceiver is within the tuner's operating limits (1-100W for tuning).
  - Try re-tuning the antenna.
  - Inspect antenna cables and connectors for damage.
- **Tuner Not Responding:**
  - Power cycle the device (turn off, wait a few seconds, then turn on).
  - Ensure no buttons are stuck.

If problems persist, consult the manufacturer's support resources or a qualified technician.

## WARRANTY AND SUPPORT

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The Malahit ATU-100 Automatic Antenna Tuner comes with a 1-year availability for spare parts. For technical support, warranty claims, or further assistance, please contact your retailer or the manufacturer directly. Keep your proof of purchase for warranty validation.