

MAT-TUNER®

mAT-180H INSTRUCTIONS

Automatic antenna tuner
For ICOM & KENWOOD Transceivers

Thank you for choosing this MAT-TUNER product.

Please **READ ALL INSTRUCTIONS** carefully and completely before using this tuner.

IMPORTANT

- ◆ NEVER touch the antenna or antenna connector with your hand when the transceiver is transmitting, as it may cause burns!
- ◆ NEVER use the antenna tuner during a lightning storm. It may result in electric shock, cause a fire, or damage the tuner. Always disconnect the antenna before a storm.
- ◆ NEVER operate the tuner with its cover removed. Contact with internal components while transmitting may result in painful RF burns.
- ◇ Always turn your radio off before plugging or unplugging any cables. The radio may be damaged if cables are connected or disconnected while the power is on.
- ◇ This product is designed for indoor use only and is not water-resistant. If used outdoors (e.g., on Field Day), it must be protected from rain, dew, and moisture.

INTRODUCTION

The mAT-180H is an automatic antenna tuner specifically designed for modern ICOM and KENWOOD transceivers. It operates in the same manner as their respective brand tuners, making it simple and convenient to use. The mAT-180H supports two optional control cables: mAT-CI and mAT-CK, suitable for ICOM and KENWOOD transceivers, respectively. Standard accessories include only the ICOM control cable (mAT-CI). If you require the mAT-CK cable, please purchase it separately.

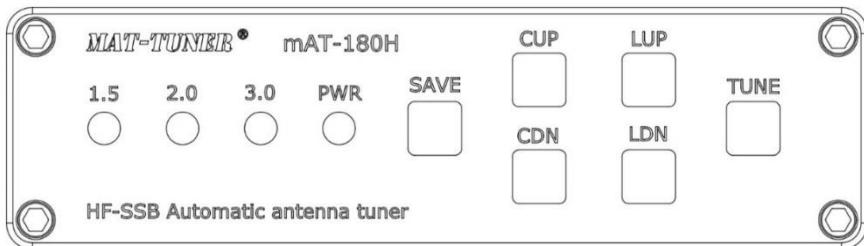
When connected to an ICOM transceiver via the mAT-CI control cable, the mAT-180H is fully compatible with original ICOM automatic tuners such as the AH-3 and AH-4. When used with a KENWOOD transceiver via the mAT-CK control cable, it is fully compatible with KENWOOD tuners like the AT-300.

The tuner can match a wide range of antennas and impedances, far exceeding the capabilities of many other tuners, including built-in tuners found in many transceivers.

The tuner features a metal enclosure with a front panel made using aluminum milling technology, making it both robust and aesthetically pleasing.

FRONT PANEL

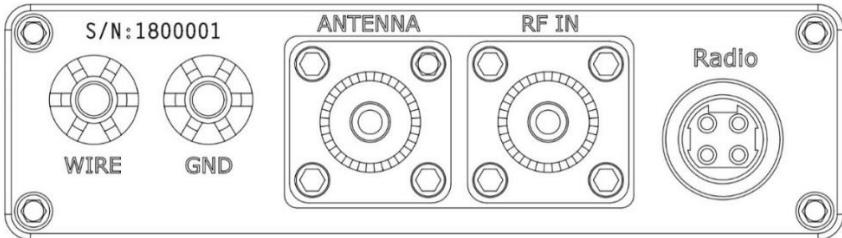
The front panel of the tuner includes 4 indicator lights and 6 buttons, as shown in the figure.



- 1.5, 2.0, 3.0: Display current SWR and tuner status.
- PWR: Power indicator.
- SAVE: Saves the current LC configuration to memory.
- CUP, CDN: Increase and decrease the capacitance of the tuner's LC circuit.
- LUP, LDN: Increase and decrease the inductance of the tuner's LC circuit.
- TUNE: Manually initiates a tuning cycle.

REAR PANEL

The figure below shows the rear panel of the mAT-180H tuner.



- **WIRE:** Connection for wire antenna.
- **GND:** Connection for antenna system ground.
- **ANTENNA:** SO-239 socket for connecting a 50-ohm coaxial cable to the antenna.
- **RF IN:** SO-239 socket for connecting to the transceiver's "ANT" socket using a 50-ohm coaxial cable.
- **RADIO:** This 4-pin socket is connected to the transceiver's "TUNER" socket via the included mAT-Cl cable.

CONTROL CABLE

The tuner supports two types of control cables: mAT-Cl for ICOM transceivers and mAT-CK for KENWOOD transceivers. The mAT-Cl cable is included by default. If you need the mAT-CK cable, please specify or purchase it separately.

INSTALLATION

The mAT-180H tuner is designed for indoor use only and is not water-resistant. If used outdoors (e.g., on Field Day), it must be protected from rain, dew, and moisture. Always turn off the radio before connecting or disconnecting any cables. Connecting or disconnecting cables while the power is on may damage the radio.

Compatible Transceivers

- Any ICOM transceiver with RF power up to 100 watts that supports the AH-3 or AH-4 tuners, including: IC-706, 703, 718,

7000, 7100, 7200, 7300, 7410, 746, 756, and 7600 series.

Note: This tuner is not compatible with the IC-705. For that model, please use the mAT-705 tuner.

- Any KENWOOD transceiver with RF power up to 100 watts that supports the AT-300 tuner, including: TRC-80, TK-80, TS-2000, TS-50, TS-450, TS-480SAT (excluding HX version), TS-570, TS-590, TS-850, TS-870, TS-990, etc.

Note: The TS-430 and TS-440 are too old to be compatible with this tuner.

Installation

1. Connect the "ANT" jack on the transceiver to the "RF IN" jack on the mAT-180H using a 50-ohm coaxial cable rated for 150 watts or higher.
2. Connect the control cable (mAT-Cl or mAT-CK) to the 4-pin "RADIO" jack on the mAT-180H.
3. Connect the other end of the cable to the "TUNER" jack on the transceiver.
4. If using a coaxial cable antenna, connect it to the "ANTENNA" socket on the tuner.
5. If using a wire antenna, connect it to the "WIRE" terminal.
6. For grounding:
 - If using a coaxial antenna, it is recommended to connect the "GND" terminal to a good ground wire to improve safety and antenna performance.
 - If using a wire antenna, the "GND" terminal **must** be connected to a good ground wire. If no suitable ground is available, connect a wire of sufficient length (at least 5 meters) to the "GND" terminal as a counterpoise.

NOTE: Do not connect antennas to both "ANTENNA" and "WIRE" at the same time!

TRANSCEIVERS SETTING

Most transceivers can use an external tuner without additional menu settings, but some may require configuration. If unsure,

refer to the section on external tuners in your transceiver's user manual. For ICOM transceivers, refer to AH-4 tuner settings; for KENWOOD, refer to AT-300 settings.

Below is an example for the ICOM IC-718:

- Hold down [PWR] for 1 second to turn the power off.
- While holding down [SET], press [PWR] to turn the power on.
- Press [UP] or [DN] to select [TUNER].
- Rotate the main dial to select "4" (AH-4 TUNER).
- Hold down [PWR] for 1 second to turn the power off.
- Press [PWR] to turn the power on.

For other ICOM or KENWOOD transceivers, please refer to their respective operation manuals. The mAT-180H requires the same menu settings as the corresponding original external tuner.

OPERATION

Automatic Tuning:

For both ICOM and KENWOOD transceivers, press and hold the [TUNER] button on the transceiver for more than 2 seconds to start an automatic tuning process. After tuning is complete, the four indicator lights on the front panel will display the current SWR.

You may hear a "clicking" sound from the tuner during operation, which is normal and indicates relay switching. After automatic tuning, you can fine-tune the SWR by pressing the [CUP], [CDN], [LUP], or [LDN] buttons. During this process, the transceiver should output a stable 10W carrier signal to allow SWR observation. Once the lowest SWR is achieved, press [SAVE] to store the LC settings. The 3.0 indicator will flash once to confirm manual saving.

Manual tuning:

1. Set the transmitter's RF output to 5–15 watts. Use RTTY or

FSK mode to provide a stable carrier signal.

2. Hold down the PTT button to output a stable carrier.
3. Press the [TUNER] button on the tuner to start a tuning cycle. Wait for it to complete.
4. Use [CUP], [CDN], [LUP], and [LDN] to minimize SWR. Press [SAVE] to store the settings. The 3.0 indicator will flash once to confirm.

Tip: After automatic tuning, if no manual adjustments are made, the tuner will save the configuration automatically—no need to press [SAVE].

WARNING: During manual tuning or fine-tuning, do not let the transmitter output exceed 20W, as this may damage the tuner!

SUPPLIED ACCESSORIES

- mAT-CI Control Cable
- Operation Manual

TECHNICAL SPECIFICATIONS

- Frequency range: 1.8 – 54 MHz
- Maximum input power: 120W (SSB), 60W (DATA mode)
- Tuning power required: 0.5 – 15W
- Tuning time: Max 5 seconds (full tuning), 0.1 seconds (memory tuning)
- Power supply: 10 – 15V DC, 0.5A
- Operating temperature: -10°C to +60°C (14°F to 140°F)
- Number of memories: 16,000
- Dimensions: 200 x 130 x 35 mm (7.9 x 5.1 x 1.4 inches)
- Weight: 800g (28.2 oz)

TECHNICAL SUPPORT

Visit website at <http://www.mat-tuner.com/> for more information.

The website provides links to product manuals in case you misplace this one. It also includes complete product specifications and photos to help you make informed purchase decisions. You'll also find links to authorized MAT-TUNER dealers ready to assist you.

SUPPLEMENTARY NOTES

Note 1: For transceivers with built-in tuners (e.g., KENWOOD TS-480, TS-2000, TS-590/S/SG), the external tuner must be connected to ANT1. These transceivers will not initiate an external tuning cycle if ANT2 is selected, as the built-in tuner is fixed to ANT2. Always refer to the transceiver's operation manual for proper connection.

Note 2: Some ICOM transceivers (e.g., IC-M710, F7000) have non-standard tuner sockets. The mAT-180H can still be used after modifying the "TUNER" socket, ensuring correct wiring. Refer to the transceiver's manual for pin definitions. The same applies to certain KENWOOD models.

Note 3: Enabling the "PTT TUNE" function on ICOM transceivers can greatly simplify operation. Most ICOM transceivers support this function. Please refer to the transceiver's manual for instructions on enabling and using this feature.

PURCHASE ADVISORY

To ensure access to reliable after-sales service and technical support, we strongly recommend purchasing our products exclusively through our authorized dealers. A detailed list of authorized distributors across major countries and regions is available on our website: <http://www.mat-tuner.com/buy.php> Please note that products purchased through unauthorized channels may not be eligible for after-sales service or technical support.

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