

# **mAT-180H**

## **Automatic Tuner For ICOM Transceivers**

*Instruction Manual Version V2.0*

### **INTRODUCTION**

The mAT-180H is an automatic tuner intended for use with modern ICOM transceivers. It works with any ICOM transceiver that supports an AH-3 or AH-4 ICOM tuner; a partial list of compatible units includes: IC-706, 703, 718, 7000, 7100, 7200, 7300, 7410, 746, 756, 7600 (and all variants). The interface cable is included. The operating is the same as the method of the ICOM tuner, which is simple and convenient. The mAT-180H can work within the range of 1.6MHz to 54MHz.

The mAT-180H connects to the radio via its tuner jack to control the tuning cycle; the transceivers tune button controls the tuner. The tuner jack also powers the tuner, so it requires no external power supply. The mAT-180H is designed specifically for use with ICOM transceivers. Tuning is performed when the TUNER/CALL button is pushed on the front of the transceiver and held for one second.

The mAT-180H also features advanced memory tuning, providing 16000 memory locations; when tuning near a previously used frequency it will recall the settings for nearly instant tuning. It learns your favorite frequencies and bands as you use it. You can also start a tuning cycle manually whenever necessary.

The mAT-180H has 16,000 frequency memories. When tuning on or near a previously tuned frequency, the mAT-180H uses "Memory Tune" to recall the previous tuning parameters in a fraction of a second. If no memorized settings are available, the tuner runs a full tuning cycle, storing the parameters for memory recall on subsequent tuning cycles on that frequency. In this manner, the mAT-180H "learns" as it is used, adapting to the bands and frequencies as it goes.

### **SPECIFICATIONS**

- 0.1 to 120 watts SSB and CW peak power, 30 watts on PSK and digital modes, and 100 watts on 6 meters.
- 16,000 memories for instantaneous frequency and band changing.
- Controlled from ICOM TUNER/CALL button on radio. Powered from ICOM radio.
- Works with most ICOM radios that are AH-3 or AH-4 compatible.
- Partial radio list: IC-7000, IC-706 (all), IC-718 (select AH-4), IC-746.
- Tuning time: 0.1 to 5 seconds full tune, 0.1 seconds memory tune.
- 1.6 to 54.0 MHz coverage. Built-in frequency sensor.
- Tunes 5 to 1500 ohm loads.
- For dipoles, verticals, Vees, beams, whip, wire or any coax-fed antenna.
- Includes interface cable.
- Dimensions: 20cm x 13cm x 4cm (L x W x H).
- Weight: 0.8Kg.

**AN IMPORTANT WORD ABOUT POWER LEVELS**

The mAT-180H is rated at 120 watts maximum power input at most. Many ham transmitters and transceivers, and virtually all amplifiers, output well over 120 watts. Power levels that significantly exceed specifications will definitely damage or destroy your Mat-180H. If your tuner fails during overload, it could also damage your transmitter or transceiver. Be sure to observe the specified power limitations.

**FRONT PANEL**

On the front panel there are six pushbuttons and four LED indicator lights.

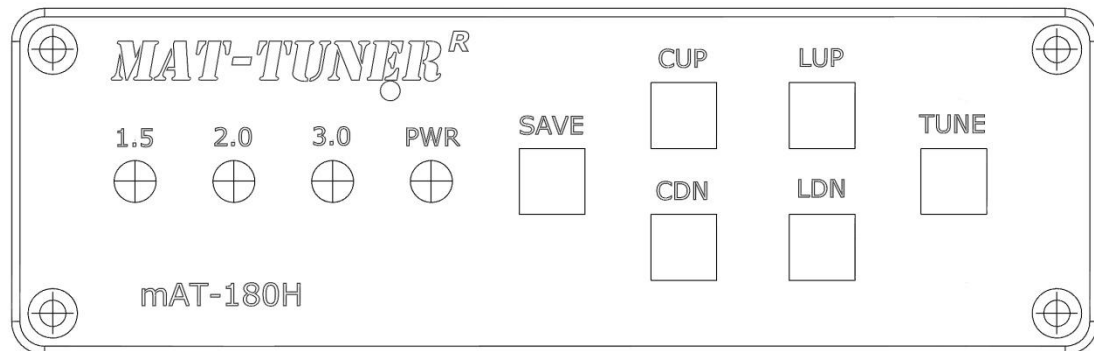
SAVE: Save current configuration to memory.

CUP / CDN: Manually increase/decrease capacitance.

LUP / LDN: Manually increase/decrease inductance.

TUNE: Initiates a tuning cycle.

1.5, 2.0, and >3.0 LEDs: Indicate SWR.

**REAR PANEL**

The rear panel of the mAT-180H features five connectors.

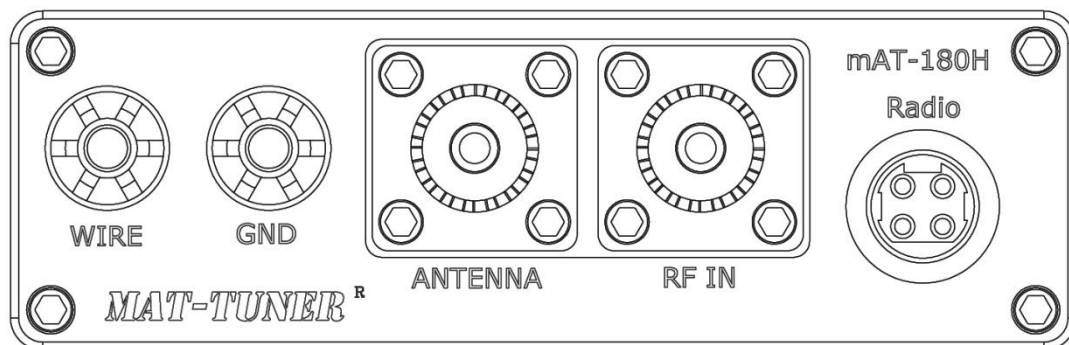
**ANTENNA:** SO-239 connector for coax cable from antenna. When using the ANTENNA connector, there should be no wire attached to the WIRE binding post.

**RF IN:** Connect a 50 ohm coax jumper cable from this standard SO-239 connector to the ANT jack on the back of the transceiver.

**Radio:** This 4-pin mini-DIN connector connects to the supplied radio interface cable, which connects to the tuner port on the transceiver. DC power is also supplied over this jack.

**WIRE:** Binding post for connecting single wire antennas. When using the WIRE binding post, there should be no coax cable connected to the Antenna connector

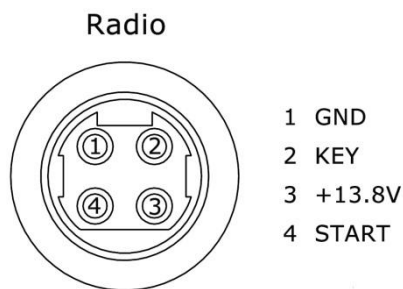
**GND:** Connect to antenna system ground.



**RADIO INTERFACE CABLE**

The mAT-180H's interface cable provides control signals between an ICOM radio and the automatic tuner. Supported ICOM radios are IC-706, 703, 718, 7000, 7100, 7200, 7300, 7410, 746, 756, 7600, and any ICOM radio that supports the ICOM AH-3 or AH-4 tuner. Push and hold the radio's [TUNER] button for two seconds to start the tuning process. Push [TUNER] quickly to bypass the tuner.

The supplied radio interface cable is 50 centimeters long. If it is desired that the mAT-180H is positioned farther from the transceiver than this cable length allows, a custom cable will need to be constructed. This can be accomplished in two ways: Cut the supplied cable and solder a jumper wire between all the connections, or purchase new connectors and cable to construct a custom-length interface cable from scratch.

**INSTALLATION**

The mAT-180H tuner is designed for indoor operation only; it is not water resistant. If you use it outdoors (Field Day, for example), you must protect it from the rain. Always turn your radio off before plugging or unplugging anything. The radio may be damaged if cables are connected or disconnected while the power is on.

**Compatible Transceivers**

The mAT-180H is designed to be used with any ICOM 100 watt transceiver that supports the AH-3 or AH-4 ICOM antenna tuners. Currently, this includes: IC-706, 703, 718, 7000, 7100, 7200, 7300, 7410, 746, 756, 7600.

**Installation**

Connect the HF/50 MHz antenna jack on the transceiver to the "RFIN" jack on the back of the mAT-180H, using a 50 ohm coax cable rated 120 watts or greater.

Connect the supplied radio interface cable to the mini-DIN 4-pin jack on the rear of the mAT-180H, marked "Radio".

Connect the other end of this cable to the "Tuner" jack on the rear of the ICOM transceiver.

Connect the antenna feedline coax to the "ANTENNA" jack on the rear of the mAT-180H.

Grounding the mAT-180H tuner will enhance its performance and safety. We recommend that you connect your tuner to a suitable ground; a common ground rod connected to buried radials is preferred, but a single ground rod, a cold water pipe, or the screw that holds the cover on an AC outlet can provide a serviceable ground. We strongly recommend the use of a properly installed,

high quality lightning arrestor on all antenna cables.

### **TRANSCEIVERS SETTING**

NOTE: If using with an IC-718, be sure to select AH-4 mode. See the IC-718 owner's manual for details.

IC-718:

- Hold down [PWR] for 1 second to turn power OFF.
- While pushing and holding [SET], push [PWR] to turn ON the power.
- Push [UP] or [DN] one or more times to select [TUNER].
- Rotate the main dial to select "4." AH-4TUNER is selected.
- Hold down [PWR] for 1 second to turn power OFF.
- Push [PWR] to turn ON the power.

### **Operation From the ICOM Transceiver**

To initiate a tuning sequence from the ICOM transceiver, press and hold the TUNER/CALL button for one second. The radio will switch to CW mode, reduce power, and begin to transmit a carrier. The mAT-180H will begin a memory tuning sequence as described above. If an acceptable SWR match is found in the memory tuning cycle, the tuning cycle ends. Otherwise, the mAT-180H automatically begins a full tuning cycle in an attempt to find a good match. If the full tuning cycle is then successful, the match is stored in a memory associated with the selected frequency. When the tuning cycle is complete, an indicator on the display of the transceiver will show that the tuner is active. This indicator varies by model; consult the transceiver owner's manual for details on operation with an external automatic tuner. To bypass the tuner via the ICOM transceiver front panel, press the TUNER/CALL button momentarily.

After completing the tuning, you can adjust the standing wave narrowly by pressing the [CDN], [CUP], [LDN], [LUP] buttons on the front panel, with a view to getting the lowest SWR. After completing the detailed adjustment, you can save the adjusted settings by pressing the [SAVE] button.

### **Operation From the mAT-180H**

You can choose not to press the [TUNER] button of the radio, but directly perform a tuning operation on the front panel of the antenna tuner. The method is:

- Set the radio to the FM or RTTY mode.
- Make the power reduced to 10 watts or less.
- Press and hold the radio's [PTT] button, then press the [TUNE] button once on the front panel of mAT-180H to start the automatic tuning.

### **LEDS**

There are four indicator LEDs on the front panel of mAT-180H. The PWR LED is the power light, it is lit, indicating that the tuner has been turned on.

The 1.5, 2.0, 3.0 light, means the current SWR; The 1.5 light means that the current SWR is less than or equal to 1.5; The 2.0 light means that the current SWR is from 1.5 to 3.0; The 3.0 light

means the SWR is higher than 3.0.

### **TECHNICAL SUPPORT**

Visit the Support Center at: <http://www.mat-tuner.com>

The website provides links to product manuals, just in case you lose this one! When you are thinking about the purchase of other **MAT-TUNER** products our website also has complete product specifications and photographs you can use to help make your purchase decision. Don't forget the links to all of the quality MAT-TUNER Dealers also ready to help you make that purchasedecision.

### **PRODUCT FEEDBACK**

We encourage product feedback! Tell us what you really think of your MAT-TUNER product. In an email tell us how you used the product and how well it worked in your application. We like to share your comments with our staff, our dealers, and even other customers at the **MAT-TUNER** website.

Welcome to <http://www.mat-tuner.com/> for more information

**MAT-TUNER**

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