

mAT-705

Automatic Tuner for ICOM IC-705 Transceiver

Instruction Manual Version V1.0

INTRODUCTION

The mAT-705 is a compact antenna tuner designed for ICOM IC-705 transceiver. The tuner connects directly to the TUNER socket of the IC-705 through a dedicated control cable mAT-705-CB supplied as a standard accessory of the tuner.

The tuner uses an all-aluminum metal shell. Front panel uses aluminum milling technology and laser engraving. Water-resistant but not water-proof, suitable for outdoor portable use.

The mAT-705 tuner is powered by a standard 9V alkaline battery, convenient for users to replace and for air transportation. Magnetic latching relays are used inside the tuner to save energy and inhibit the need for battery replacement. Consumes zero power when turned off. When powered off, retains the last frequency setting used and will be ready to operate when powered back on.

In addition to the tuner, the mAT-705 package includes control cable mAT-705-CB, and L-shaped wrench (for opening the case for battery replacement), and user manual. The user manual latest version can also downloaded directly from our web page.

The tuner comes with control cable mAT-705-CB. Both ends of the control cable are standard 3.5mm plugs. One side is connected to the TUNER socket of the transmitter, and the other plug is connected to the CON socket of the tuner. The transceiver controls the tuner through this cable for automatic tuning. An RF cable mAT-RC1 that connects the Icom 705 and the tuner is sold as an accessory item. mAT-RC1 is a common coaxial cable with male BNC plugs at both ends.

The tuner operates from 1.8 MHz to 54 MHz with a impedance matching range of 5-1500 ohms.

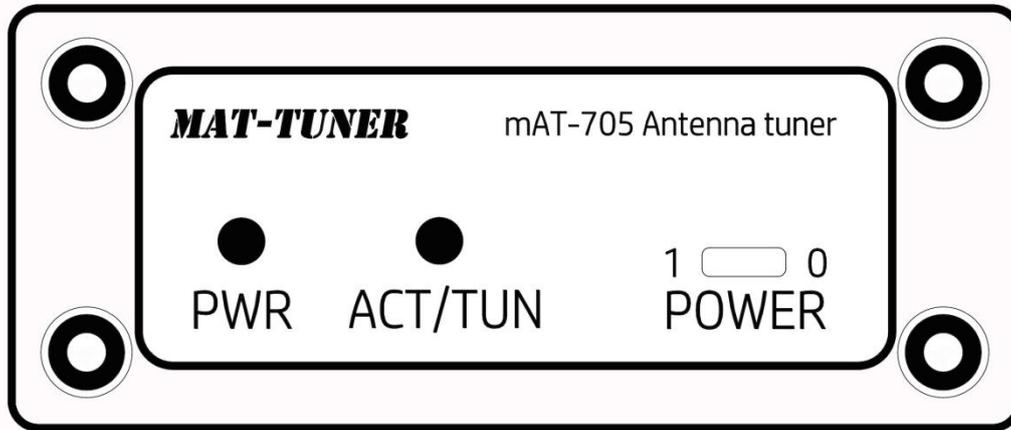
The mAT-705 has 16,000 frequency memories. When tuning on or near a previously tuned frequency the mAT-705 uses “Memory Tune” to recall the previous tuning parameters in a fraction of a second. If no memorized settings are available, the tuner runs a full tuning cycle, storing the parameters for memory recall on subsequent tuning cycles on that frequency. In this manner, the mAT-705 “learns” as it is used, adapting to the bands and frequencies as it goes.

SPECIFICATIONS

- 1.8 to 54.0 MHz coverage.16,000 memories for instantaneous frequency
- Tuning time: 0.1 to 5 seconds full tune, 0.1 seconds memory tune.
- For dipoles, verticals, Vees, beams, long wire or any coax-fed antenna.
- Powered by 9V alkaline battery
- Dimensions: 14cm x 6.7cm x 2.8cm, max 15.1cm x 6.7cm x 2.8cm (L x W x H).
- Weight: 250g, gross weight 500g.

FRONT PANEL

The front panel of the mAT-705 is shown in the figure below. There are two indicator lights and a power switch. Set to '1' to power the tuner off, '0' to power on. When the power switch is set to '0', no power drain is realized from the 9V battery.



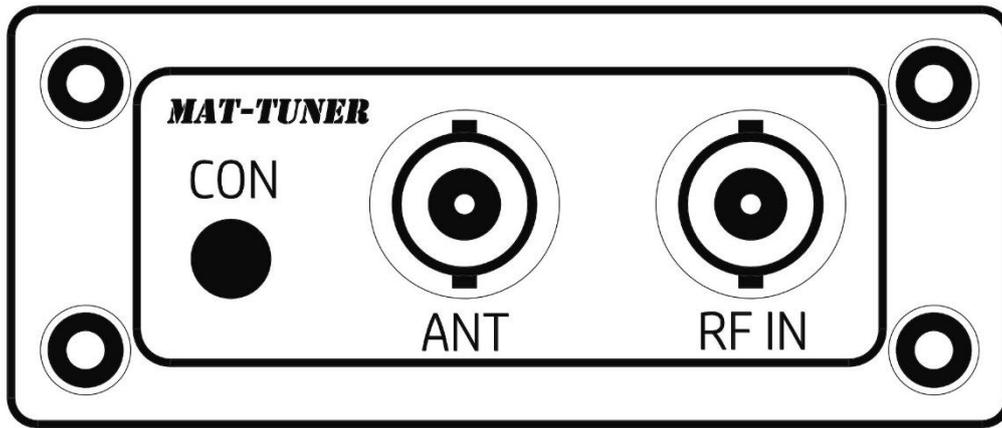
Function of indicator light:

- 1) The left side marked "PWR" is the power indicator. When the power switch is turned on, this green indicator light is lit. It should be noted that if this indicator flashes when the machine is turned on, it means that the battery power is low and the battery needs replacement.
- 2) The "ACT/TUN" on the right is the status indicator. When it is off, it means the tuner is in the "Bypass" state; when it is lit in green, it means the tuner is in the "ONLINE" state; when it is lit in red, it means the tuner is in the process of tuning.

REAR PANEL

There are two female BNC RF sockets and one control cable socket on the rear panel of the tuner. As shown in the figure below.

Control cable socket: The tuner comes with control cable mAT-705-CB. The ICOM IC-705 transmitter sends control commands to the tuner through this control cable to control the tuner to complete the tuning operation. One plug of the control cable is plugged into the socket marked "CON" on the rear panel, and the other plug is plugged into the "TUNER" socket of the transceiver. When connecting this cable please make sure the transceiver and tuner are turned off.



BNC RF sockets: There are two female BNC RF sockets on the rear panel, "ANT " and "RF IN". "ANT" is connected to the antenna. "RF IN" is connected to the antenna socket of the transceiver via a 50 ohm coaxial cable. The coaxial cable mAT-705-RC1 connecting the tuner "RF IN" and the transceiver antenna jack is an optional accessory not supplied with the tuner.

INSTALLATION

Installation of the tuner is simple. Please make sure that the power for transceiver and tuner are turned off before installation.

1. Connect the "CON" of the tuner and the "TUNER" socket of the transmitter with control cable.
 2. Connect the "RF IN" of the tuner and the antenna socket of the transmitter with a 50 ohm coaxial cable.
 3. Connect the coaxial cable connecting your antenna to the socket marked "ANT" on the tuner.
- The installation is complete.

TUNING OPERATION (TWO METHODS):

Method 1:



Enter the function menu of the transmitter, as shown in the figure, the [TUNER] option turns white to indicate that it is available.

Quickly touch [TUNER] to switch the tuner to "BYPASS" state. Touch for more than 1 second to start tuning and set the tuner to "ONLINE". When the tuner is tuning, in addition to the "ACT/TUN" indicator on the front panel lights up in red, the red text "TUNE" will flash on the transmitter screen. After the tuner completes the tuning cycle, when it is online, the white text "TUNE" will always be lit on the transmitter screen, except for the "ACT/TUN" indicator on the front panel that lights up green. as the picture shows.

Method 2: RF-sensed tuning. The "PTT TUNE" function of the IC-705 transmitter is turned on by default. When the transceiver is set to a new frequency, the transmitter will automatically start tuning when the user presses PTT for the first time. This method of starting the tuning cycle is more common. When the user wants to start a tuning cycle again on the current frequency (having not changed frequency from the last time a tuning cycle was actuated), you will need to use Method 1 for tuning. RF-sensing will not re-activate on the same frequency you just used to tune the tuner.

BATTERY REPLACEMENT

The tuner uses a standard 9V alkaline battery.

To replace the battery use the provided 2mm allen wrench to remove the rear panel of the tuner. Unscrew all 4 allen screws and remove the rear panel bezel. Turn the tuner upside down and shake the case gently to move the circuit board out along the slider tracks inside the case. When the circuit board sides are visible, grasp the sides of the board and slide the tuner out. Do not pull on the rear panel of the tuner to remove it from the case. The BNC connector wiring could possibly be pulled off the circuit board by pulling hard. **IF THE TUNER BOARD IS STUCK OR DOES NOT MOVE EASILY:** this can be because of pressure from the 9V battery against the top interior rails of the case (see note below). Remove the front panel 4 allen screws and take the front panel bezel off. Push the tuner board out the rear of the case from the front side. Be mindful of the plastic LED illuminators on the rear of the board. Don't pull on the rear panel because of the risk of pulling the BNC connections off the circuit board.

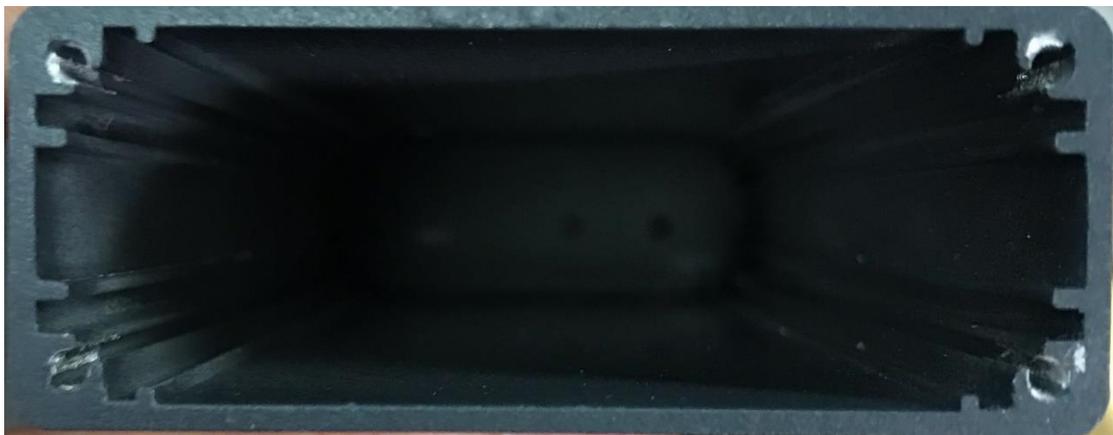


Figure: Interior of MAT-705 case

The board slides back into the bottom side channels shown above the 2mm holes. Note the two tabs at the top of the case, that are interior barriers running the length of the case. Position the 9V battery on the circuit board so the battery lands between the two channels and is not touching either. It will be harder to remove the board for a later battery change if the battery is under or rubbing against one of these top rails.

BATTERY LIFE INDICATOR

If the "PWR" indicator of the tuner flashes when the power is turned on, it indicates that the battery is low and needs to be replaced.

TECHNICAL SUPPORT

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

PRODUCT FEEDBACK

We encourage product feedback! Tell us what you 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'll share your comments with our staff, our dealers, and other customers at the **MAT-TUNER** website.