

# mAT-30

## HF-SSB Automatic Antenna Tuner

*Instruction Manual Version V1.0*

### INTRODUCTION

The mAT-30 is an automatic tuner intended for use with modern Yaesu transceivers. It works with some Yaesu transceiver that supports an FC-30 , FC-40 or FC-50 Yaesu tuner; a partial list of compatible units includes: FT-100,FT-857,FT-897,FT-450D,FT-891. The interface cable is included. The operating is the same as the method of the Yaesu tuner, which is simple and convenient. The mAT-30 can work within the range of 3MHz to 54MHz.

The mAT-30 connects to the radio via its CAT/LINEAR jack to control the tuning cycle; the transceivers Tune button controls the tuner. The CAT/LINEAR jack also powers the tuner, so it requires no external power supply. The mAT-30 is specially engineered to integrate with your Yaesu FT-100/857/897/450D/891 HF radio. Tuning is performed when the TUNE button is pushed on the front of the transceiver and held for one second.

The mAT-30 provides automatic antenna tuning across the entire HF spectrum plus 6 meters, at power levels up to 120 watts. It will tune dipoles, verticals, Yagis, or virtually any coax-fed antenna. It will match an amazing range of antennas and impedances, far greater than some other tuners you may have considered, including the built-in tuners on many radios.

The mAT-30 is specially engineered to integrate with your Yaesu FT-100/857/897/450D/891 HF radio. The mAT-30 connects to the CAT (Computer Automated Transceiver) port on the back of the radio. The CAT interface allows an external device such as a PC or the mAT-30 to control the FT-100/857/897/450D/891 by sending it serial commands. The mAT-30 takes advantage of this interface to simplify the tuning process -- one button push is all that is needed in order to switch the radio to FM mode, reduce output power, transmit a carrier, measure the transmit frequency, and then restore the radio to its previous mode and power level!

The mAT-30 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-30 has 16,000 frequency memories. When tuning on or near a previously tuned frequency, the mAT-30 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-30 "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.
- Latching relays for ultra-low power operation.
- 16,000 memories for instantaneous frequency and band changing.

- Controlled from Yaesu TUNE button on radio. Powered from Yaesu radio.
- Works with most Yaesu radios that are FC-30,FC-40 or FC-50 compatible.
- Partial radio list: FT-100, FT-857, FT-897, FT-450D, FT-891.
- Tuning time: 0.1 to 5 seconds full tune, 0.1 seconds memory tune.
- 1.8 to 54.0 MHz coverage. Built-in frequency sensor.
- Tunes 5 to 1500 ohm loads.
- For dipoles, verticals, Vees, beams, long 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-30 is rated at 125 watts maximum power input at most. Many ham transmitters and transceivers, and virtually all amplifiers, output well over 125 watts. Power levels that significantly exceed specifications will definitely damage or destroy your mAT-30. 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 two LED indicator lights.

ONLINE: The tuner is Active or bypass.

POWER: Poser light.



#### REAR PANEL

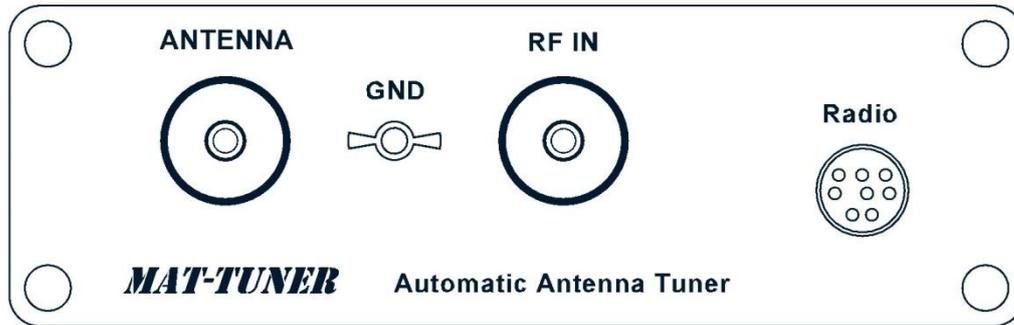
The rear panel of the mAT-30 features four connectors.

ANTENNA: Connect the 50-ohm coax antenna feedline to this standard SO-239 connector.

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 mini-DIN 8-pin connector connects to the supplied radio interface cable, which connects to the FC-30 tuner port on the transceiver. DC power is also supplied over this jack.

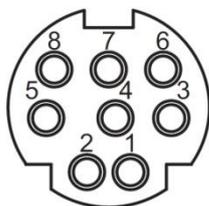
GND: Connect to antenna system ground.



**RADIO INTERFACE CABLE**

The mAT-30’s interface cable provides control signals between an Yaesu radio and the tuner. As the figure shows, the cable have two mini-DIN 8-pin plugs. Supported Yaesu radios are FT-100,FT-857,FT-897,FT-450D,FT-891. Push and hold the radios’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-30 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.



- |             |            |
|-------------|------------|
| 1、 +13.5V   | 2、 TX GND  |
| 3、 GND      | 4、 DATA IN |
| 5、 DATA OUT | 6、 SENSE   |
| 7、 RESET    | 8、 TX INH  |

**INSTALLATION**

The mAT-30 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-30 is designed to be used with some Yaesu 100 watt transceiver that supports the AH-3 or AH-4 Yaesu antenna tuners. Currently, this includes: Yaesu radios are FT-100, FT-857, FT-897, FT-450D, FT-891.

**Installation**

Connect the HF/50 MHz antenna jack on the transceiver to the “RF IN” jack on the back of the mAT-30, using a 50 ohm coax cable rated 120 watts or greater.

Connect the supplied radio interface cable to the mini-DIN 8-pin jack on the rear of the mAT-30, marked “Radio”.

Connect the other end of this cable to the “CAT/LINEAR” or “TUN/LIN” jack on the rear of the

Yaesu transceiver.

Connect the antenna feedline coax to the “ANTENNA” jack on the rear of the mAT-30.

Grounding the mAT-30 tuner will enhance its performance and safety. We recommends 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 recommends the use of a properly installed, high quality lightning arrestor on all antenna cables.

### TRANSCEIVERS SETTING

FT-897:

1. Press and hold in the **[F] ([FUNC])** key for one second to activate the Menu mode.
2. Rotate the **MEM/VFO CH (FT-857D: SELECT)** knob to recall Menu Mode No-001 [EXT MENU], then rotate the **DIAL** to change the setting to “ON” to enable the extended Menu Mode.
3. Rotate the **MEM/VFO CH (FT-857D: SELECT)** knob to recall Menu Mode No-020 [CAT/LIN/TUN]. The default setting for this Menu is “CAT.” Rotate the **DIAL** to change the setting to “TUNER.”
4. Press and hold in the **[F] ([FUNC])** key for one second to save the new setting and exit, then turn the transceiver off.
5. Set up the FC-30 and FT-897 per the illustration, then turn on the transceiver’s power again. **Do not set up the FC-30 and FT-897 before changing the Menu Mode, item No-020 [CAT/LIN/TUN].**
6. Press and hold in the **[F] ([FUNC])** key for one second to activate the Menu mode.
7. Rotate the **MEM/VFO CH (FT-857D: SELECT)** knob to recall Menu Mode No-085 [TUNER/ATAS]. The default setting for this Menu is “OFF.” Rotate the **DIAL** to change the setting to “TUNER.”
8. Press and hold in the **[F] ([FUNC])** key for one second to save the new setting and exit.
9. Press the **[F] ([FUNC])** key, as needed, to recall Multi Function Row “k” **[TUNE, DOWN, UP]**.

### OPERATION FROM THE YAESU TRANSCEIVER

Press the **[A] (TUNE)** key to turn the Mat-30 on. “Parentheses” will appear on both sides of the “TUNE” indication, and “TUNR” will appear on the LCD.

Press and hold in the **[A] (TUNE)** key to initiate automatic tuning. The FT-897D/857D transmitter will be activated, a carrier signal will be sent out, and the coils and capacitors in the mAT-30 will be selected/adjusted for optimum SWR. When tuning is complete, the transmission will cease, and you will be ready for operation on this frequency. Tuning data will be stored in the mAT-30’s Memory system.

To initiate a tuning sequence from the Yaesu transceiver, the radio will switch to CW mode, reduce power, and begin to transmit a carrier. The mAT-30 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-30 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 Yaesu transceiver front panel, press the **[A] (TUNE)** key momentarily.

**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 purchase decision.

**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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