

mAT-30

Automatic Tuner For YAESU Transceivers

Instruction Manual Version V3.0

INTRODUCTION

The mAT-30 is an automatic tuner intended for use with modern YAESU transceivers, the operating is the same as the method of the YAESU tuner, which is simple and convenient. YAESU transceivers that support use of FC-30, FC-40 or FC-50 tuners can be used with the mAT-30, a partial list of compatible units includes: FT-100, FT-857D, FT-897D, FT-450D, FT-891, FT-950, FT-991, FT-991A, FTDX-3000. Other models of YAESU transceivers have not yet been verified, but if they can use FC-30/40/50, they can also use mAT-30. We will continue to verify more YAESU transceiver models and add them to the support list. Some old YAESU transceivers, such as FT-80C, FT-757, can't use mAT-30.

At present, the mAT-30 does not support FT-817/818. If you operate them, you can choose another tuner: mAT-10, which is specially designed for QRP transceivers and perfectly supports FT-817/818 and other QRP devices. You can visit our website for information about the mAT-10 tuner.

Menu options of YAESU transceivers may need to be changed to support external tuners. You can visit our website to learn more about the menu settings of each different type of transceiver. We will continue to validate more models of Yaesu transceivers and publish their menu settings for tuners on our website.

The mAT-30 can work within the range of 1.8MHz to 54MHz, 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 transceivers.

The tuner is connected to the CAT/LINEAR port of the transceiver through control cable mAT-CY. The transceivers Tune button controls the tuner. The CAT/LINEAR jack also powers the tuner, so it requires no external power supply. Tuning is performed when the [A](or [TUNE]) button is pushed on the front of the transceiver and held for one second. The control cables mAT-CY are provided with tuners, and users do not need to buy them separately.

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. You can also start a tuning cycle manually whenever necessary.

SPECIAL EXPLANATION:

After actual comparison test, mAT-30 can tune the antenna with SWR higher than 3 when FT-891 is matched.

SPECIFICATIONS

- 0.1 to 120 watts SSB and CW peak power, 30 watts on PSK and digital modes, and 100 watts on 6 meters.
- 1.8 to 54.0 MHz coverage. 16,000 memories for instantaneous frequency
- Tunes 5 to 1500 ohm loads.
- 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.
- Controlled from YAESU TUNE button on transceiver. Powered from YAESU transceiver.
- Partial transceiver list: FT-100, FT-857D, FT-897D, FT-450D, FT-891, FT-950, FT-991, FT-991A, FTDX -3000.
- Dimensions: 20cm x 13cm x 4cm (L x W x H).
- Weight: 0.8Kg.

AN IMPORTANT WORD ABOUT POWER LEVELS

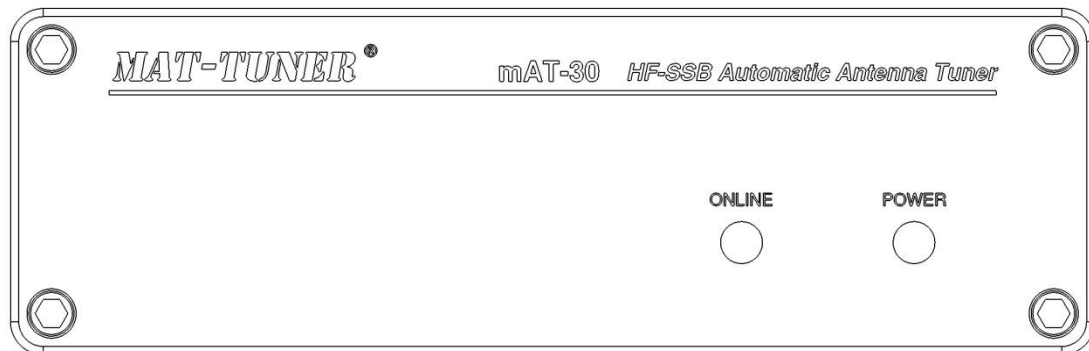
The mAT-30 is rated at 120 watts maximum power input at most. Many ham transmitters and transceivers, and virtually all amplifiers, output well over 120 watts. Power levels that significantly exceed specifications will definitely damage or destroy your mAT-30. If your tuner fails during overload, it 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: Power light.

**REAR PANEL**

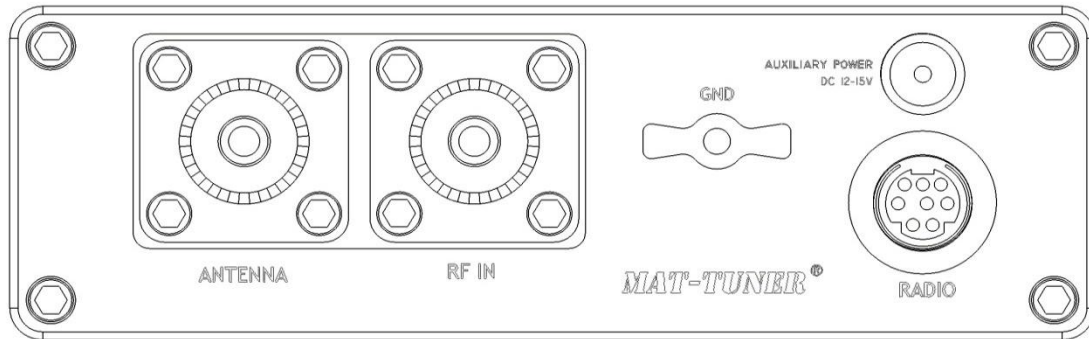
The rear panel of the mAT-30 features five connectors.

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 transceiver control cable mAT-CY, which connects to the mAT-30 tuner port on the transceiver. DC power is also supplied over this jack.

GND: Connect to antenna system ground.

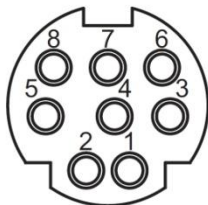


(The picture of the panel above is for your reference. It may change later, depending on the tuner you receive.)

CONTROL CABLE mAT-CY

The mAT-30's control cable mAT-CY provides control signals between YAESU transceiver and the tuner, it can also be used for mAT-10 tuner. As the figure shows, the cable have two mini-DIN 8-pin plugs. Push and hold the transceiver's [A](or [TUNE]) button for two seconds to start the tuning process. Push [A](or [TUNE]) quickly can switch the state of the tuner, online or bypass.

mAT-CY 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 control cable and solder a jumper wire between all the connections, or you can buy plugs and cables to make a control cable of a specific length.



- | | |
|------------|-----------|
| 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 waterproof. If you use it outdoors (Field Day, for example), you must protect it from the rain. Always turn your transceiver off before plugging or unplugging anything. The transceiver may be damaged if cables are connected or disconnected while the power is on.

IMPORTANT WARNING

When the tuner is working, there is a high voltage inside. In order to ensure personal safety, do not use it when the shell is opened!
Don't touch the antenna with your hand when the transceiver is transmitting, it will cause burns!

COMPATIBLE TRANSCEIVERS

The mAT-30 is designed to be used with some YAESU 100 watt transceiver that supports the YAESU FC-30,FC-40,FC-50 antenna tuners.

1. 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.
2. Connect the supplied control cable mAT-CY to the mini-DIN 8-pin jack on the rear of the mAT-30, marked "Transceiver".
3. Connect the other end of this cable to the "CAT/LINEAR" or "TUN/LIN" jack on the rear of the YAESU transceiver.
4. Connect the antenna feed line coax to the "ANTENNA" jack on the rear of the mAT-30.
5. Grounding the mAT-30 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, or a cold water pipe can suffice. We strongly recommends the use of a properly installed, high quality lightning arrestor on all antenna cables.

TRANSCEIVERS SETTING

Each type of transceiver has a unique setting menu for external tuners. It is necessary to set these menus correctly before you can use mAT-30. To set these menus, please read the user manual of these transceivers and refer to the setting of FC-40 or FC-50 tuners. You can find this information on the mAT-30 page of our website. Following is an example of FT-857D/897D to illustrate the settings of these menus:

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 mAT-30 and FT-897 per the illustration, then turn on the transceiver's power again. **Do not set up the mAT-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](or [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 transceiver 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 transceiver 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 successful, the match data 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/en/>.

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.

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