MAT-TUNER®

mAT-125E INSTRUCTIONS

General automatic antenna tuner

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, it will cause burns!

◆ NEVER use the antenna tuner during a lightning storm. It may result in an 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 the components inside the tuner while transmitting will result in painful RF burns.

◇ 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.

◇ The product 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 rain, dew and steam.

◇ This product contains lithium battery, please comply with the relevant regulations during transportation.

■ INTRODUCTION

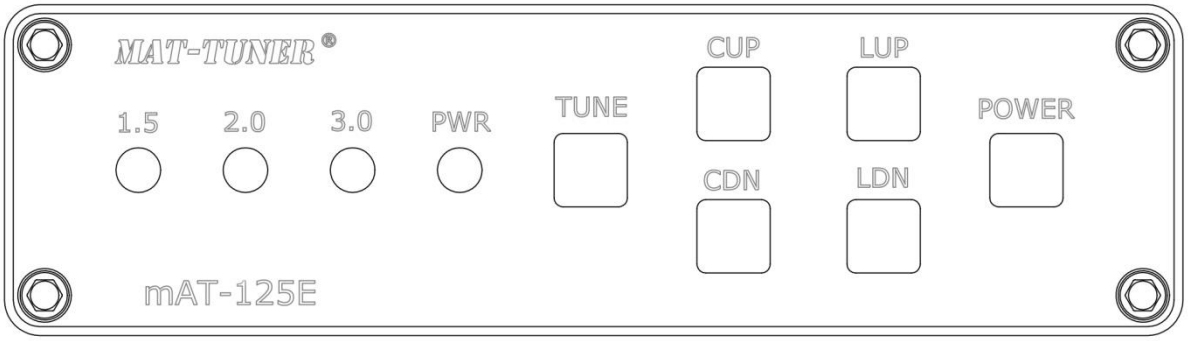
mAT-125E is a universal automatic antenna tuner that can be used in most HF transceivers. It has a working frequency range of 1.8-54MHz and a maximum allowable RF power of 120 watts. It has built-in lithium batteries, charged via the type-C USB interface, especially in outdoor portable applications. The mAT-125E does not need a control cable to connect the transceiver. It only needs an RF cable to connect the transceiver to work well.

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 tuner uses a metal shell, and the panel is made of aluminum milling technology, which makes it strong and beautiful.

■ FRONT PANEL

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



1.5, 2.0, 3.0 light: Show current SWR and status.

When the tuner is turned on, if the 1.5 indicator flashes once, it means that the tuner is in Semi-automatic mode; if it flashes twice, the tuner is in Automatic mode.

When the tuner is turned on, if the 2.0 indicator flashes once, it means that the automatic shutdown function is blocked, and the tuner will not automatically shut down.

PWR light: Power light, and charging status.

When the tuner is working, lit green.

When the tuner is charged, it is lit red. If it flashes quickly, means that the battery is dead, check the battery. When the battery is fully, it will go out.

[TUNE]: Initiates a tuning cycle, Online/Bypass state switching, Multifunctional keys.

[CUP] / [CDN]: Manually increase/decrease capacitance.

[LUP] / [LDN]: Manually increase/decrease inductance.

[POWER]: Power key.

[TUNE]+ [CDN]: Online/Bypass, You can also switch by pressing [TUNE] quickly.

[TUNE]+ [LUP]: Manually save the current matching data of tuning network to memory.

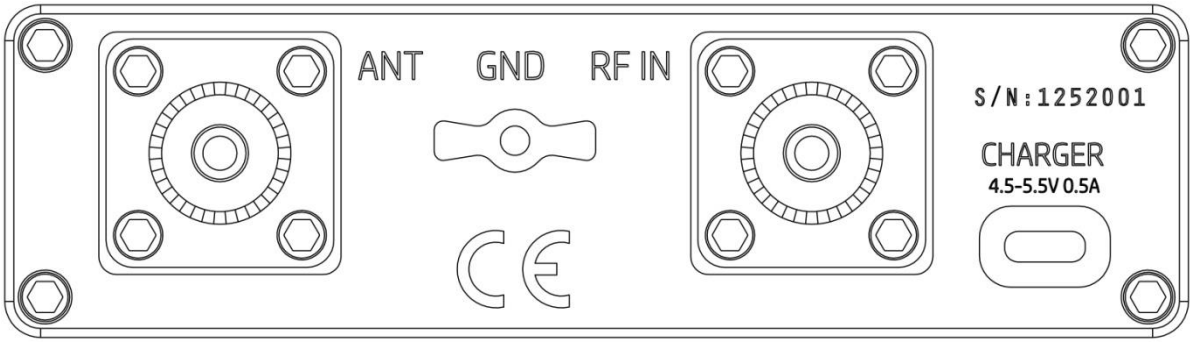
[TUNE]+ [LDN]: Automatic/Semi-automatic, the default is automatic mode.

[TUNE]+ POWER ON: Enable/disable "Auto-Shutdown" function. In shutdown state, press on the [TUNE] and press [POWER] to boot, can enable or disable this function. When the 1.5 light blinks once, means that this function is activated. When the 3.0 light blinks once, this function is turned off.

[A] + [B] means: first press and hold the [A] key, then press the [B] key, and then release together.

■ REAR PANEL

The figure below is the rear panel of the mat-125e tuner.



GND: Connected to antenna system ground. Correct and good ground wire can ensure the safe operation of the tuner.

ANTENNA: SO-239 socket, connect antenna with 50 ohm coaxial cable.

RF IN: SO-239 socket, connected to the transmitter's "ANT" socket, using 50 ohm coaxial cable.

CHARGER: This is a type-C USB socket to charge the tuner. The charging voltage is 4.5-5.5V and the current is less than 0.5A. The wrong charging voltage will cause the tuner to fail to charge or permanently damage, and even cause fire.

■ INSTALLATION

Which transceivers can use mAT-125E? Most HF transceivers can use mAT-125E, they only need to satisfy two conditions: the RF power level can be adjusted below 20 W, and they have at least one of AM, FM, CW, FSK, RTTY modes to output constant carrier. It should be noted that in the tuning process, a larger VSWR is detected in the transceiver, because the output power of the transceiver is very small, this high VSWR will not damage the transceiver. But some transceivers in Yaesu are very sensitive to this high VSWR, and they may turn off the transmitting carrier, which will cause the tuning to stop, you can't get a good SWR. If you happen to use such a transceiver, we recommend that you choose another tuner, mAT-30, which has a specially designed circuit and will not stop the tuning.

Installation

1. Connect the antenna jack on the transceiver to the "RF IN" jack on the back of this tuner, using a 50 ohm coax cable rated 120 watts or greater.
2. Connect the antenna coax cable to the “ANTENNA” jack on the rear of this tuner.
3. Grounding the 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.

■ OPERATION

As with other general tuners, a constant RF signal of 1-20 watts power level is needed to be input to the tuner during the tuning cycle, this signal should be CW, FM, FSK, or RTTY, it can’ t be SSB. The power level of the input RF signal must not be greater than 20 watts, otherwise it will shorten the life of the tune, and even the tuner will be damaged. The mAT-125E have two modes of operation: automatic and semi-automatic, for better operation, you need to know more about the differences between the two models.

The mAT-125E have two modes of operation: automatic and semi-automatic, Users can easily switch between the two modes of work by using multi-functional combination keys. For better operation, you need to know more about the differences between the two models.

Automatic Mode: When the RF signal is input into the mAT-125E, the tuner verifies that the power at its input (FORWARD) is within the predefined range (1-20W). Power above this range can damage the relays during the Hot Switching, while power below the predefined range can cause inaccurate tuning. If the tune power is within the specified range, the tuner captures a 20ms sample of the signal. The sample signal frequency is divided by 128 and measured by a counter. The tuner reads the tuning data corresponding to the measured frequency from its internal memory (such data exists if tuning was previously performed for this frequency). The tuner sets the tuning network according to that data and measures the resulting VSWR, and display the current VSWR by the LED of the front panel. Even if SWR is higher than 2, the tuning cycle will not be activated unless the TUNE key is pressed and released.

Semi-automatic: When the RF signal is input into the mAT-125E, the tuner only measures the current VSWR and displays the results through the LED on the front panel, a tuning cycle is not initiated until the [TUNE] key is pressed. When the [TUNE] key is pressed and released, similar to the automatic mode, the tuner measures the frequency of the input signal, reads the configuration data from the corresponding memory, and configures the LC tuning network. After completing the above operation, the tuner will measure the current VSWR. If VSWR<1.5, the tuning is completed. If it is higher, a new tuning cycle is started. When the tuner completes the tuning process it stores the tuning network data in memory in a location corresponding to the current frequency.

Manual: Regardless of whether the tuner is in automatic or semi-automatic mode, you can fine tune the current LC tuning network by pressing the [CUP], [CDN], [LUP], and [LDN] key. After the manual seat adjustment is completed, you can save the current LC data in the corresponding memory by pressing the [TUNE]+[LUP] combination key.

The steps to start tuning are as follows:

- Set the radio to the FM, FSK or RTTY mode, in order to make the transceiver output a stable carrier signal
- Make the power reduced to 20 watts or less.
- Press and hold the transceiver's [PTT] button, then press the [TUNE] button once on the front panel of mAT-125E to start the automatic tuning.
- Return to the previous mode and power level after tuning, the tuning process completion.
- After tuning, the front panel's three lights are used to display the current VSWR.

Online/Bypass state switching

There are two ways to switch the state of the tuner. Shortly press the [TUNE] key and the [TUNE] +[CDN] combination key. If the 1.5 indicator flashes once, it means that the current state is online, and if the 3.0 indicator flashes once, it means that the current state is offline.

■ AUTO-SHUTDOWN

The tuner has automatic shutdown function for saving electric energy, when the function is activated, the tuner will turn off automatically if no key is pressed in about 3 minutes. Because the tuner uses magnetic latching relay, the current tuning state will not be affected after the tuner is turned off.

In shutdown state, press on the [TUNE] key, and then press [POWER] key to boot, you can open or close the function, When the 1.5 light blinks once, it indicates that this function is activated. When the 3.0 light blinks once, this function is turned off.

■ BATTERY REPLACEMENT

The tuner uses two 18650 lithium batteries. When the tuner is first used or the battery is replaced, it must be charged to activate the internal protection circuit before it can work properly.

■ SUPPLIED ACCESSORIES

Type-C Charging Cable

■ TECHNICAL SUPPORT

- Frequency range: 1.8 ~ 54 MHz
- Maximum input power: 120W(SSB)， 60W(DATA mode)
- Tuning power required: 0.5-15W
- Tuning time: Maximum 5 seconds (Full tuning)
  0.1 seconds (Memory tuning)

- Battery: Two lithium batteries (18650), 3.7V, 2000mAh
- Charge: TYPE-C, 4.5 ~ 5.5V, 0.5A
- Usable temperature: -10℃ ~ +60℃, 14℉ ~ 140℉
- Number of memories: 16000
- Dimensions: 200 x 130 x 35 mm, 7.9 x 5.1 x 1.4 inches
- Weight: 800g, 28.2oz

■ TECHNICAL SUPPORT

Visit the web: http://www.mat-tuner.com/ for more information.
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.

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