ANTUNER
小巧 便携 系统强大

AT-100M Shortwave Automatic Antenna Tuner

Advanced Operations Manual

(system version v1.22.8c)

August 16, 2022

www.antuner.com

Table of contents

To my dearest users

Dear Customer: Hello:

First of all, thank you for your support to me. I am committed to the research of radio peripheral products and equipment, from the bottom of the software and hardware of the product layer development. This operation manual applies to the instructions for use of Antuner series tuners. Please read carefully before operating the tuner.

Read this manual to ensure your normal use of the tuner and avoid unusability due to misoperation. what you are reading Adjust product manual for Antuner series.

BI3QWQ

May 1, 2022

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User Agreement

Please strictly abide by the national and local laws and regulations related to radio, and any illegal use is prohibited. Users will purchase

Responsible for all actions and use of products. Please read this manual carefully before using the product. If you have any questions, please contact us.

Please contact us, we will give you a satisfactory answer as soon as possible. Due to product upgrades and changes, there may be

The functionality described in is subject to change and may be modified without notice. I reserve all rights of interpretation.

When you continue to read this manual, this agreement will come into effect automatically.

1. Product introduction

1.1 Appearance introduction

Forward

The front panel mainly includes power switch, screen and buttons.

Directly above

The appearance size of the product is: length 13.9cm (including antenna interface), width 7.4cm, thickness 2.9cm

1.2 Product performance

Supported stations: Kenbu, ICOM, Yaesu, Xiegu, USDX , QRP and any other station

Support antenna: dipole, GP, long line, end-fed, Yagi and vehicle short-wave antenna, etc.

Frequency range: 1.8MHz-30MHz

Support mode: 1-18MHz or SSB/CW 0.1W-100W

18-30MHz or FM/AM/FT8 0.1W-50W

Appearance size: 13.9cm x 7.4cm x 2.9cm

Product weight: 370g

Working current: USB 5V/Max 3W

Charging current: USB 5V 1A (supports over-discharge and over-charge protection)

Battery capacity: 3300mAh

Shutdown current: about 15ÿA

Standby time: about 13mA, about 150~200 hours of standby (without any tuning action)

Tuning state: start 1~3 relays consume current 130~330mA, about 10~25 hours standby time

Charging time: about 4 hours, the LED indicator is red when charging, and green when fully charged

1.3 Factory accessories

Factory Parts List

1) Tiantune host x1

2) USB charging cable x1

3) Hex L-type wrench x1

1.4 Precautions (important)

1) Please use FM mode, low power (0.1w-10w) for antenna tuning, and then adjust to normal after tuning

Power, too high power tuning will cause damage to the radio or tuner.

2) Before operation, please confirm whether the operating frequency is within the range of 1.8-30MHz, and the output power of the radio station is adjusted on this day

within the holding range.

3) If the power and standing wave values displayed by the professional standing wave power meter or the radio station are inconsistent with the values displayed by the tuner, please use a professional

The device or radio station shall prevail, and refer to Section 3.6 to recalibrate the device.

4) During the communication process, please observe the standing wave and power displayed by the radio station at any time, and stop transmitting in time if any abnormal situation occurs.

Make contact after checking.

2. Quick start

2.1 How to connect the tuner to the radio station and antenna feeder

Radio - Antenna - Antenna feeder connection

Please use an M male jumper to connect the radio and the tuner

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2.2 Precautions when using the tuner for the first time

1) Antenna feeder system

When using this antenna adjustment product, please check the antenna feed system to ensure that the antenna feed system has a good grounding.

According to customer feedback, a good antenna feeder grounding can greatly improve the tuning ability of this product, and can provide you with a pleasant communication experience.

2) Power supply instructions

This product supports USB, built-in lithium battery power supply, under normal circumstances please use the built-in lithium battery or USB power supply up to

to a stable voltage requirement.

3) Set the radio type

The default factory configuration radio type of this product is 100W mode, and the optional parameter is 100w or 10w. to bring you

To have a good power accurate and functional experience, please adjust it according to the maximum output power of your radio station, please refer to the advanced

Operate Chapter 3.6 to adjust ÿFIX RADIOÿto modify the radio type.

The setting of this radio type will not affect or damage the components of the tuner, but only affect the power detection algorithm and the correlation within the tuner system.

Function interface maximum value.

4) Adjustment calibration

When this product leaves the factory, the power and standing wave value algorithm curve of the tuner has been calibrated, and the 100W mode uses FT891

Radio calibration, 10W mode uses ICOM705 calibration.

After changing the use environment, antenna feeder, and radio station, there may be differences between the actual output power and the power and standing wave value displayed by the antenna.

Deviation, please refer to chapter 3.6 of advanced operation to adjust [FIX PWR] and [FIX SWR] values to calibrate the power, dwell

wave value.

If the power and standing wave values displayed by the radio station are inconsistent with the values displayed by the tuner, please take the radio station as the standard.

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5) Default mode

The factory mode of this product is ÿNormal Modeÿ, which is suitable for most users to operate.

function of this book.

After learning, using, and fully understanding this mode for a period of time, users can try to enable [User Storage Mode] or

Higher-level advanced parameter adjustment, in order to fully customize the various functions of the antenna, to achieve the performance suitable for your own radio station and antenna feeder

parameter.

For details, refer to the [Advanced Operation] chapter.

2.3 Start tuning preparation (important)

In order to protect your radio from being damaged, please make sure the following two parameters are adjusted before using the tuner.

1) Launch mode

Please change the signal mode of the radio station to FM mode, which can ensure that the radio station transmits signals continuously instead of intermittently

Transmit, the continuously transmitted signal helps the tuner to detect standing waves and automatically control the relay tuning.

If there is no FM mode, try using AM/CW mode in order.

If you use SSB mode, you need to keep talking to the microphone without interrupting the calling, or use your mobile phone to play

Recording, just keep the signal output, if the call stops in SSB mode, the tuner will not be able to detect the signal, and the standing wave will not be able to

to tune.

2) Transmission power

Please adjust the radio power to the lowest value and ÿ 0.1W or ÿ 10W to ensure that the radio will not be damaged by high standing waves.

Although some DIY or QRP radio stations set power greater than 0.1W, the actual output is affected by the performance of the radio's own power amplifier tube

It may be lower than 0.1W, which will cause the antenna tuner to fail to detect the signal output. At this time, you can increase the transmission power or adjust the tuner to the lowest

For the sampling value of the starting power and voltage, refer to Chapter 3.5.7 of Advanced Operation to modify the value of [TUNE MIN ADC] parameter.

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And some antenna feeder systems are not well grounded, which may cause the antenna tuner to fail to detect even if the output power of the radio station is increased.

To the radio output signal, at this time, the antenna feeder system should be adjusted to be well grounded.

2.4 Auto/Manual Tuning

Please read chapter 2.3 completely before proceeding with this chapter, otherwise your radio may be damaged or not effective

tuning.

1) Auto tuning mode

The factory default parameter of this day's tuning is that when a standing wave ÿ 1.80 is detected, the tuning operation will be started automatically.

When a standing wave < 1.10 is detected in , the tuning will stop.

The factory defaults to automatically store 10 sets of results this day, and does not enable user storage of results. Basically meet the needs of ordinary users

Standard tuning operation, basically in seconds. If you want to modify the relevant parameters, refer to Chapter 3.5 for modification.

During the process of automatic tuning, the program will perform automatic tuning in the following order:

a) If the number of user stored results [USER COUNT] is greater than 1, then find the standing wave value from the user stored bit

Lowest relay combination.

If ÿUSER COUNTÿis equal to 0, skip this step.

b) Cycle through the automatic storage results [TUNE COUNT] in order to find the relay combination with the lowest standing wave value.

c) If a certain relay combination is found to be lower than [TUNE AUTOSWR] through steps a and b above, stop tuning

harmonious.

d) If the relay combination with the lowest standing wave value cannot be found through the above steps, it will automatically enter the tuning state.

e) When entering the automatic tuning state, it will start tuning when it detects that the transmission power voltage is greater than [TUNE MIN ADC],

All combinations of relays will be controlled sequentially, and matching capacitance and inductance relays will be performed at [TUNE SETP] span intervals

device, each time a group of relays is controlled, it waits [TUNE DELAY] milliseconds to detect the current standing wave to ensure

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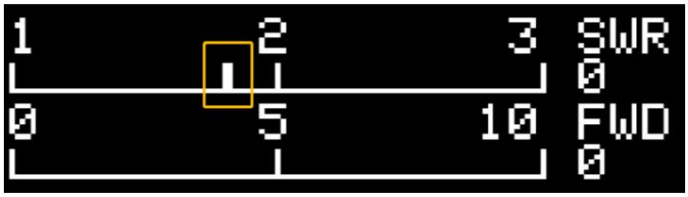
The proof is completely absorbed. Until the current standing wave ÿ [TUNE STOPSWR] is detected, it is considered that the most

good combination.

For the modification of starting the tuning standing wave 1.80 and stopping tuning the standing wave 1.10, please refer to the modification and adjustment in chapter 3.5 of advanced operation

[TUNE AUTOSWR] and [TUNE STOPSWR] parameters.



The white line marked in yellow is the starting wave standing wave value

The white line marked in yellow is the peak power

The user can determine whether there is a white scale between 1.0-2.0 of the standing wave bar (as shown in the yellow area in the figure above).

The automatic tuning function is turned on, and the standing wave value position is adjusted.

The yellow mark is the peak power, which is the maximum power value after continuous acquisition [FIX AVG] times.

Standing wave value of waiting signal, tuning, tuning result

At this time, if the user keeps the radio transmitting state, you can observe the current standing wave value and power value, when the standing wave value ÿ 1.80

, it will automatically enter the tuning state, and the screen will display "WAIT" as shown in the figure below, waiting for the radio to transmit.

When the signal continues to be transmitted, the screen will display "TUNE" and the relay is being tuned, and the day tuner will automatically tune to the cutoff set by the system

When standing wave < 1.10, stop tuning and the screen will display the lowest tuning value "1.00"

ÿ

Note: Please make sure that the radio is in FM mode, low power and good antenna feed system when tuning. For details, refer to

2.3 Section.

If the standing wave and power deviation are detected, please refer to Chapter 3.6 of Advanced Operation to calibrate.

2) Manual tuning mode

When the auto-tuning mode is not turned on, there is no white scale for 1.0-2.0

If the automatic tuning is not enabled or the standing wave is < 1.80, you want to realize the tuning operation, you can long press the [button] to enter the tuning mode, the screen will display "WAIT" waiting for tuning, "TUNE" detecting that the signal is being tuned, and the standing wave value boundary after tuning noodle.

3) Abandon tuning

If the transmission is terminated during the radio transmission, the screen will display " FAIL"

If you need to give up tuning during tuning, please stop the radio transmission directly, and the screen will display "FAIL".

Long press the [button] and the screen will display "RESET" to give up tuning

If you have finished tuning and want to give up this tuning result, you can long press the [button] to give up tuning, and the screen will display "RESET"

That's it.

2.4 Normal mode and user storage mode switch

The switch between normal mode and user storage mode is set by [USER COUNT] under the advanced menu. For details, refer to

Exam advanced operation 3.4 chapter.

[USER COUNT] setting > "1" is to open the user storage mode, and "0" is not to open.

2.5 Introduction to Functional Interface of Normal Mode

In normal mode, 10 groups of tuning results are turned on by default, and a maximum of 20 groups can be set. This mode directly displays the tuning results after power on.

Rate, standing wave, line graph, relay status and other interfaces.

The user can short press the button to switch the interface.

1) Bar interface (standing wave value, forward power value)

This function interface mainly displays the power value and standing wave value graphically and in bar form, among which SWR is the standing wave value (range

1.0-9.9), FWD is forward power (range 0-200).

There is a white scale when the [Auto-tuning] mode is turned on

When the [Auto Tuning] mode is turned on, the standing wave bar displays the white scale position to automatically tune the standing wave value.

Adjustment in Chapter 3.5 for level operations.

There is no white scale when the [Auto-tuning] mode is not turned on

When the [Auto Tuning] mode is not turned on, the standing wave bar does not display a white scale.

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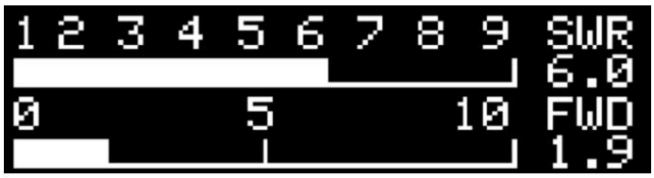

When the radio power is lower than 10W and the standing wave exceeds 3, the display interface

When the standing wave value < 3, the maximum value displays 3.00; when the standing wave value > 3, the maximum value displays 10

When the forward power < 10W, the maximum value displays 10W; when 10Wÿ forward power < 100W, the maximum value displays

display 100W; when > 100W, the maximum display is 200W

2) Large font interface (forward power, reverse power, standing wave value)

Various values in the emission state

The interface of this function is displayed in large font, suitable for friends who are older and have poor eyesight, where FWD is forward power (range

range 0.0-999), REF is the reverse power (0.0-999), SWR (1.00-9.99) is the current standing wave value.

3) Standing wave line graph interface

Standing wave change trend

This function interface mainly displays the standing wave change trend in real time in the form of a broken line graph, and the detectable standing wave range is 0-9.99

"1.70" in the upper right corner of the screen is the standing wave value monitored in real time.

When switching to this time, if the standing wave is lower than 3.0, 3.0 will be the maximum value, and if it exceeds 3.0, 9.99 will be displayed as the maximum value.

You can use this interface to continuously adjust the frequency with the radio station to realize the "antenna analyzer" function and understand the standing wave of the antenna feeder

trend.

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4) Forward power line graph interface

Positive Power Trend

This function interface mainly displays the change trend of positive power in real time in the form of a line graph, and the realistic range is 0-10W

or 0-100W ,

If the actual transmission power or the power detected by the standing wave meter deviates from the power detected by the tuner, you can press the advanced operation

3.6 chapter [FIX PWR] to calibrate. You can also modifyÿFIX RADIOÿAdjust the radio power type and modify here

maximum value.

5) Relay status interface

Relay switch status

This function interface mainly displays the switching status of all relays, SWR is the standing wave value (range 0.0-9.9), L is the voltage

Inductance value (unit: ÿH), C is capacitance value (unit: pF).

Through this interface, you can know the capacitance value and inductance value after tuning, and at the same time, you can graphically observe the continuation of the operation.

Location and quantity of appliances.

"3.99v" in the center of the bottom of the screen is the current battery voltage, and "88%" is the current remaining power.

2.6 User storage mode function interface introduction

The user storage mode is a mode with multiple stored tuning results, and in this mode, the storage result selection interface is displayed by default after power on.

In the transmission process, the power value, standing wave value, line graph, relay status and other interfaces can be displayed.

This function is to help you quickly switch to the stored relay combination and quickly reduce the standing wave. You can store frequently used

The tuning result of the frequency or the status of the antenna system can be switched quickly when in use.

The user can short press the button in the launching state to switch the interface.

1) Default interface

The default interface of user storage mode is 1-9 optional storage, as shown in the above figure, "3" is ÿUSER COUNTÿ

value, where "1" bit is selected, L is the stored inductance value (unit: ÿH), C is the stored capacitance value (single

Bit: pF), "88%" is the current remaining power.

If the lowest standing wave is not found in the user stored results during autotune, the temporary stored as will be used, then

The screen display is shown above as "TEMP*". Among them, "3.99v" is the current battery voltage, and "88%" is the current remaining battery

quantity.

If you want to modify the number of stored results, you can refer to Chapter 3.4 [USER COUNT] of the Advanced Manual to adjust the stored results.

storage quantity.

2) Manually switch storage results

Short press the [button] to manually switch between stored results

If you want to manually switch between different tuning results, please short press the [button] to complete the switching selection.

3) Manually store tuning results

If you want to save the tuning result to the specified position number, please long press the [button] and the screen will display "WAIT"

Wait for tuning. When the power signal is detected, the screen will display "TUNE" for automatic tuning. After tuning, if the standing wave <

1.8 is automatically saved to the current number.

For details, refer to manual tuning in chapter 2.4.

4) Automatically select the lowest standing wave combination from the stored results

If you want to automatically select the combination with the lowest standing wave when transmitting from among multiple stored results, if detected

When the standing wave is ÿ 1.80, it will automatically switch from multiple stored results to find the lowest standing wave.

If the lowest value between the stored results is less than 1.80 of the standing wave, it will automatically switch to the relay of the current stored results

In the state of the transmitter, the user can launch normally.

"TEMP*" is displayed when temporarily storing results and no storage number will be selected

If the standing wave ÿ 1.80 after cycling through all the stored results, and the auto-tuning function is turned on, the tuner will enter the auto-tuning function.

automatic tuning status, and store the tuning results in the temporary results, as shown in the figure above when the transmission is stopped; if the automatic tuning is not enabled

In the harmonic state, the tuner will continuously switch between the stored results.

Please refer to Chapter 3.4 [USER COUNT] of advanced operations for automatic switching of storage results or modifying the quantity.

Automatic tuning function switch, start tuning standing wave 1.80 For modification, refer to Chapter 3.5 of advanced operation [TUNE AUTO] and [TUNE

AUTOSWRÿÿ

5) Launch status function interface

If transmitting in storage mode, it will automatically enter the status interface of normal mode, such as bar graph, large font,

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Line chart, relay status and other interfaces, when the transmission is stopped, the program will automatically maintain the status for about 3 seconds and return to the storage mode

default interface.

Short press the button in the long launch state to switch the interface.

3. Advanced operation

This chapter mainly introduces advanced advanced functions and parameter adjustments. You can fully customize the function parameters of the tuner, fully develop

Play the tune performance.

3.1 Enter the advanced configuration menu

Press and hold the [button] in the off state and then turn on the machine

Enter the advanced configuration menu

1) Keep the tuner turned off

2) Press and hold the [button] without letting go, and then turn on the machine

3) Tiantiao will enter the configuration interface

4) Short press the button to switch the menu, long press the button to enter the modification

3.2 Menu quick overview

No.	Main Category	function options	menu name	Set scope default parameters or functions	
1	Buzzer	Buzzer switch BEEP ON		NO/YES	Default: YES , when the button is pressed or the standing wave is over Beep when high
2	user modes	Storage Quantity USER COUNT		0-9	Recommended: 0 , user-defined storage quantity
3	auto tune	ÿAutomatic tuning switch TUNE AUTO		NO/YES	Recommendation: YES, when the standing wave exceeds the threshold, it will automatically adjust harmony
4		ÿAutomatic storage quantity TUNE COUNT		1-20	Recommended: 10, the system automatically stores the tuning results in The number of caches, generally the number of frequencies used
5		ÿAutomatic starting wave TUNE AUTOSWR 1.00-2.50			Recommendation: 1.80-2.00 When ÿ the standing wave exceeds this value then auto tune
6		Stop tuning standing wave TUNE STOPSWR 1.00-2.50 Recommended: 1.10			
7		Tuning delay TUNE DELAY		10-80	Recommended: 32-40, this value affects the tuning speed
8		ÿTuning step speed TUNE SETP		1-8	Recommended: 4, this value has a great influence on the tuning results ring
9		ÿMinimum starting power voltage sampling value	TUNE MIN ADC 5-50		Recommended: 5-10 (approximately 0.1W), the lower the value, the lower the starting power
10	Calibration function	ÿRadio type FIX RADIO		100W/10W	Default: 100W, according to the maximum output power of the station set this parameter
11		Correction power value FIX PWR		60%-150% default 100%	
12		Corrected standing wave value FIX SWR		60%-150% default 100%	
13		ÿSample average times FIX AVG		1-10	Recommended: 3-6
14	Signal switching signal relay switching switch SWITCH ON			NO/YES	Recommendation: NO, control the pull-in state of the relay, close This will save battery
15	function test	Relay test TEST RELAY		ENTER	Used to troubleshoot relay faults barrier
16		Standing wave, power, battery power pressure, ADC using the test	TEST ADC	ENTER	Used to troubleshoot signal, battery voltage failure
17	Reset the system to restore the default parameters RESET			ENTER	reset

Note: "ÿ" is a function option that is focused on or frequently used, which will affect the tuning success rate and the minimum standing wave value after tuning.

3.3 Buzzer

3.3.1 Buzzer switch (BEEP ON)

The default factory parameter of this function is YES, and it will sound when the start button is pressed and the standing wave exceeds the threshold; NO means no sound.

When the device is far away from the user's operating position or hung on a remote tree, it can be judged whether the current standing wave is

No more than the threshold [TUNE AUTOSWR].

Note: AT-100M version 1 hardware does not support this function.

3.4 User storage mode

3.4.1 Number of user storage mode results (USER COUNT)

The default factory parameter of this function is 0, and the adjustable range is 0-9 ÿ

Modifying this parameter can achieve multiple user-defined storage relay combination results, if it is greater than 1, then ÿ USER AUTO ÿ

take effect.

3.5 Auto-tuning

3.5.1 Auto-tuning state (TUNE AUTO)

The default factory parameter of this function is YES, and the adjustable range is NO/YES ÿ

When this parameter is currently YES, the auto-tuning function is turned on, and all tuning-related parameters in 3.5 TUNE in this chapter are generated.

effect.

3.5.2 Automatic storage quantity (TUNE COUNT)

The default factory parameter of this function is 10, and the adjustable range is 1-20 ÿ

When the standing wave exceeds the set [TUNE AUTOSWR] value, the program will automatically save the result to the memory, the

The value is the number of the latest N times of tuning relay combination results that are automatically stored. The larger the value, the more saved, and at the same time

It takes longer to tune after changing the frequency.

This value is generally recommended to users according to the number of frequencies that are frequently used automatically, and it can be adjusted in seconds when tuning later.

3.5.3 Start to automatically tune the standing wave (TUNE AUTOSWR)

The default factory parameter of this function is 1.80, and the adjustable range is 1.00-2.50 ý

At present, this parameter is effective when [TUNE AUTO] is YES. When the standing wave is greater than or equal to this value, the tuner will automatically tune

standing wave.

3.5.4 Stop automatic tuning standing wave (TUNE STOPSWR)

The default factory parameter of this function is 1.10, and the adjustable range is 1.00-2.50 ý

Currently, this parameter is effective when [TUNE AUTO] is YES. During the automatic tuning process, when the standing wave is lower than this value

Tuning will stop automatically.

3.5.5 Relay delay time (TUNE DELAY)

The default factory parameter of this function is 32, and the adjustable range is 10-80 ý

This parameter is the time for waiting for the relay to complete the action when the relay is turned on and off during the automatic tuning process.

The smaller the value, the faster the tuning speed; the larger the value, the slower the tuning speed.

3.5.6 Relay combination stepping (TUNE STEP)

The default factory parameter of this function is 4, and the adjustable range is 1-8 ý

This parameter is the step-by-step test speed for the relay combination during the automatic tuning process. The smaller the value, the slower the speed.

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The higher the tuning accuracy is; the larger the value, the faster the tuning speed and the rougher the tuning accuracy.

3.5.7 Minimum starting power voltage value (TUNE MIN ADC)

The default factory parameter of this function is 10, and the adjustable range is 5-50 ;

This parameter is the sampling value at the lowest starting power, using FT891 to test FM mode, and the value is 55 when transmitting at 5W;

The value is 10 when ICOM705 tests FM mode and 0.1W transmission ;

Generally, when the radio station is listening, the forward voltage and reverse voltage collected by the tuner fluctuate about 1~4, depending on the

The value will change due to the influence of the antenna feed system. If the setting is too low, the screen of the antenna will enter the tuning state abnormally.

3.6 Radio type, power, standing wave calibration

3.6.1 Setting Radio Power (FIX RADIO)

The default factory parameter of this function is 100W, and the adjustable range is 100W ; 10W ;

Please make a reasonable choice according to the maximum power of your radio station, so as to achieve a more accurate power calculation value.

The setting of this parameter will not affect or damage the components of the tuner, but only affect the power detection algorithm and related functions in the tuner system

interface max.

3.6.2 Calibrate the adjustment power value (FIX PWR)

The default factory parameter of this function is 100%, and the adjustable range is 60%-150% ;

The calculation formula is:

Real power value ÷ display value of this day's bar x100= set value

For example, when the radio is transmitting, the power displayed on the screen of the tuner is 10W, but it is 11W when tested with a professional power meter. Therefore,

Here the value should be modified to 110% ;

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11÷10x100=110

3.6.3 Calibrate the standing wave value (FIX SWR)

The default factory parameter of this function is 100%, and the adjustable range is 60%-150%

The calculation formula is:

Real standing wave value ÷ local adjustment display value x100= set value

For example, when the radio is transmitting, the screen of the tuner shows that the standing wave is 2.0, but it is 1.5 when tested with a professional power meter. Therefore,

Here the value should be modified to 130% (the parameter step of Tiantun setting is 5, so choose an approximate value of 130).

2.0÷1.5x100=130

3.7 Signal switching

3.7.1 Signal relay switch (SWITCH ON)

The default factory parameter of this function is NO, and the adjustable range is NO/YES

When this parameter is currently YES, the system will automatically switch the signal relay to the pull-in state after power-on, and the radio will

The signal will pass through the internal capacitor circuit of the tuner, and a relay will be generated to consume current; NO will default the relay to

In the disconnected state, the radio signal does not pass through the capacitor circuit in the standby state.

This parameter affects the later tuning speed, it is generally recommended to set it to NO to save power.

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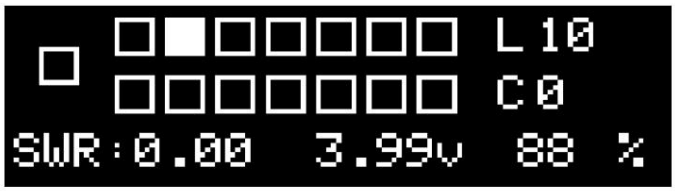
3.8 Functional test

3.8.1 Relay function test (TEST RELAY)



This function is mainly used to detect the status of the relay and troubleshoot the relay.

After entering the function test interface, the program will detect the relay switch from left to right in turn, and manually observe the battery voltage.

The voltage value or judge whether there is a fault according to the sound of the relay pulling in.

In the state of automatically switching the relay, the current switching state of the relay is continuously monitored. Please press and hold the button to realize the temporary

Stop and enter the next relay test, and realize the continuous current relay pull-in test. If you want to continue to test the next one, press and hold

Buttons will do.

3.8.2 Power sampling function test (TEST ADC)

After entering the function test interface, the program will be displayed in real time according to the correction value set by the user.

Among them, BAT is the current voltage and the remaining battery percentage, FWD is the positive ADC sampling value and power value, REF

is the reverse ADC sampling value, SWR is the current standing wave.

When testing the minimum starting power of QRP radio, please pay attention to the FWD ADC sampling value in the bottom row.

3.9 Restoring factory settings (RESET)

Long press the [button] to select RESET, and the screen will display "RESET" to indicate that the system is being reset successfully.

All system parameters will restore to default values.

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4. Frequently asked questions

4.1 I am a QRP radio station, what parameters do I need to configure?

The QRP radio may be affected by power amplifier tubes and power supply factors, and the power output is not in a stable state.

1) Modify [FIX RADIO] radio power type to "10W"

2) Modify [TUNE MIN ADC] minimum starting power sampling value to "10" or other values.

4.2 I want to modify the minimum starting power, how to modify?

1) Modify [TUNE MIN ADC] minimum starting power sampling value to "5" or other values.

4.4 I want to increase or decrease the speed of the auto-tuning relay, how to modify it?

1) Modify [TUNE DELAY] The smaller the value, the faster the speed, and the larger the value, the slower the speed.

4.3 How to set to automatically select the lowest standing wave among the results stored by the user?

1) Modify [USER AUTO] to "YES"

2) Modify [USER COUNT] to be greater than 0 to enable the user storage mode. After the device restarts, it will enter the user storage mode.

storage mode interface.

4.4 Why are the values displayed by the power meter, standing wave meter and the tuner inconsistent?

The tuner itself is limited by the performance and size of components, the displayed power value and standing wave value are for reference only, please use the radio itself to display

The displayed value or the value of professional measuring equipment shall prevail.

You can modify the parameters related to the sky tune to improve the accuracy.

1) Modify [FIX RADIO] to the maximum power of your radio, such as 100W or 10W

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2) Modify [FIX PWR] to correct by comparing the value of the power meter with the display value of the tuner.

3) Modify [FIX SWR] to correct by comparing the value of the standing wave meter with the value displayed by the tuner.

4.5 Why the screen always displays "WAIT" or "TUNE" when tuning

tuning?

If you press and hold the [button] to enter the manual tuning mode, and the radio station has been in the transmitting state, but it keeps displaying

"WAIT" or "TUNE", please follow the steps below to troubleshoot.

1) Troubleshoot hardware problems

Whether the connection interface between the radio station and the tuner is correct;

Whether the radio mode is FM, whether the power is between (0.1w-10W);

The station turns off VOX or PRC mode;

Whether the station has a good and stable power supply;

Whether the output power of the QRP radio is continuous and stable, you can try to increase the power;

Check whether the antenna feeder system is well grounded, replace the environment or troubleshoot the antenna feeder.

2) Troubleshooting of Tiantun parameters

Enter the tune advanced configuration interface [TUNE MIN ADC] is set too high;

Enter the advanced configuration interface of the tuner [TEST ADC] interface, keep the radio transmitting, and observe whether the value of "FWD" changes

change.

4.6 Why does the relay always operate and pause during the tuning process?

At this time, it means that the power input detected by the sky tuner is in a non-continuous state. Please follow 4.5 for troubleshooting.

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4.7 Why is the standing wave very low during low power tuning, but rises after normal transmission?

Please confirm whether the frequency and power of your current transmission are within the range supported by this product.

1) Magnetic performance

Affected by the size control of the antenna and the performance of the magnetic ring, in high frequency, high power, continuous transmission (FM/AM/FT8

Mode) and one of the states will cause the magnetic ring to heat up, which will cause the standing wave to rise slightly.

2) Antenna feeder system is not in good condition

When using this product, the antenna feeder system should have a good electromagnetic environment. According to feedback from customers, there is no good electromagnetic environment.

environment and antenna feeder system, after the standing wave is adjusted down, the standing wave may rise when high-power transmission is performed, especially for unbalanced antennas and ground grids.

It is more obvious when it is not ideal, the ground network is connected to the public ground of the building, and the geomagnetic environment is complex.

4.8 Why does the Tune automatically shut down, restart repeatedly, and the screen suddenly go black?

1) Whether the built-in lithium battery version is fully charged, it takes 4 hours to fully charge the battery.

2) Whether to use the included USB TypeC charging cable, do not use USER such as Huawei, Xiaomi or notebook

TypeC fast charging cable, the protocol is inconsistent and cannot be charged.

4.9 Can the tuner tune the standing wave greater than 9.99?

The characteristics, erection method, surrounding environment and natural resonance of each antenna are different, which can be determined by observing the antenna analyzer

The antenna resonance curves are also different, some resonance points are sharp, and some are gentle curves.

This product can tune down the standing wave most of the time, if the antenna and the surrounding environment are not conducive to communication, it may

Unable to tune down.

5. Upgrade log

v1.22.8c (August 15, 2022)

1. Optimize the memory space when the system starts

v1.22.8a (August 3, 2022)

1. Delete the USER AUTO user storage mode automatic tuning switch, and optimize it to USER COUNT for control.

Improve program execution efficiency

2. Increase the average value of FIX AVG to make the standing wave value and power value more stable, especially in SSB/CW mode

3. Increase the peak power to know the maximum power value

v1.22.7c (July 26, 2022)

1. Optimize the standing wave calculation method, consider the situation where the reverse voltage is greater than the forward voltage, and improve the tuning success rate

v1.22.7b (July 23, 2022)

1. Fix the problem of auto-tuning when auto-tuning is turned off in user storage mode

v1.22.7a (July 17, 2022, major upgrade)

1. Optimize variables and compress the overall code usage space.

2. Increase the automatic storage results to 20 groups

3. Increase the buzzer ringing function.

4. Optimize the tuning algorithm, and realize the second tuning with the tuning result.

5. Increase the battery power display.

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v1.22.6a (June 7, 2022)

1. Optimize variables and compress the overall code usage space.

2. Add 10 sets of automatic storage tuning results, greatly improving the tuning speed.

3. Add support for AT-100M second-generation motherboard.

v1.22.5h (May 29, 2022)

1. Solve the problem that it cannot be tuned after 1 tuning, and it needs to be restarted before it can be tuned

v1.22.5g (May 19, 2022)

1. Fix the problem that the FIX PWR algorithm does not take effect.

v1.22.5f (May 10, 2022)

1. Modify TUNE MIN ADC to default value 10 (0.1w), range 5-50, step 5. previous version

The software defaults to 50 (about 5w), and some QRP radio stations need to be manually set to 10. This modification is directly factory defaulted to 10

v1.22.5e (April 30, 2020, major upgrade)

1. When the corrected power is greater than 60-70 watts, the power is suddenly displayed as 20 30 watts BUG, is due to MCU memory

overflow caused.

v1.22.5ad (April 23, 2022)

1. Improve the response speed of the relay, and set the TUNE DELAY parameter to 26ms by default

2. In this upgrade, the relay test function interface will be entered by default when the device is turned on for the first time.