ATU-100 Automatic Antenna Tuner

Attention: The core design data of this antenna tuner comes from the automatic antenna tuner open-source project of its original author N7DDC.

Technical characteristics (basic model)

Permissible power supply voltage range: 10-15VDC

Maximum current consumption: 400 mA

Maximum working power: 100W

Maximum possible measured power: 150W

Minimum power required to start tuning: 5W

Minimum possible measured power: 0.1W

Measurement resolution up to 10 watt hours: 0.1W

Measurement resolution for power greater than 10 watts: 1W

Power measurement accuracy error: ± 10%

Maximum installed inductance: 8.53 μH

**Minimum installation step of inductance: 0.05 μH**

Maximum installed capacity: 1869 pF

**Minimum capacitor installation steps: 10 pF**

Typical consumption 100-200 mA

This product is pure manual welding, providing 3.1 program support with SSD1306 controller, with a resolution of 128x32 pixels and a diagonal of 0.91 inch monochrome OLED display. This circuit contains a set of 7 inductors and 7 capacitors, which allows it to operate over a wider frequency range and effectively cover the amateur 1/7 radio range from 1.8MHz to 50MHz.

ANT TX

Power

2VDC
0.5A

368543A_V15

Reset
Tune

ATU-100 HF Auto Tuner
1.8MHz~30MHz
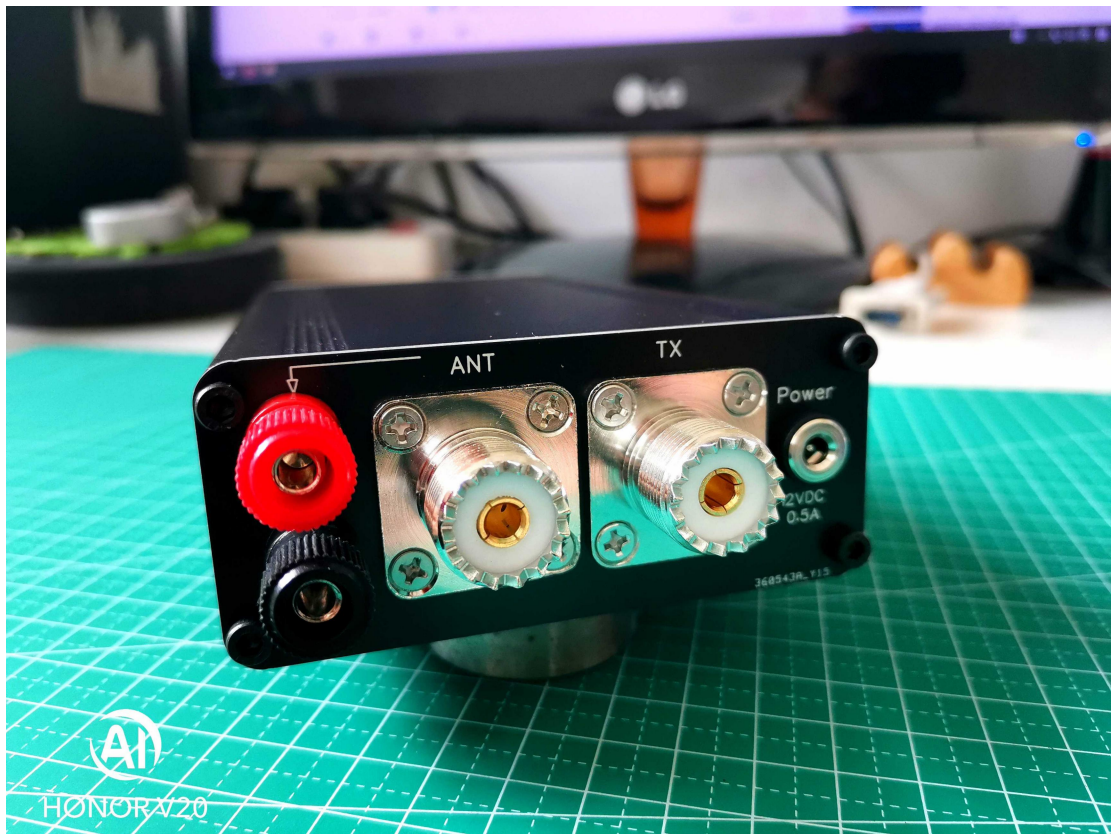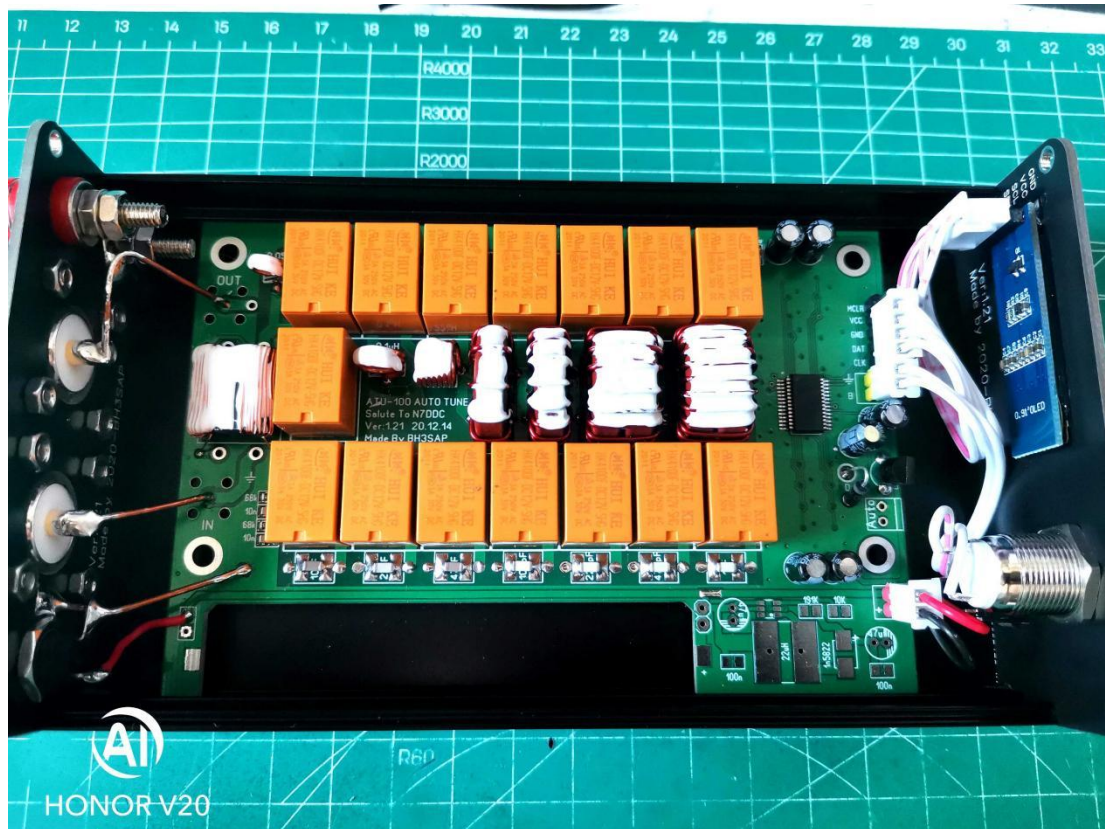
Power O

Note: The white object is 704 silicone, which is a fixed hollow inductor and magnetic ring inductor.

Operating instructions

The DC socket is connected to a power supply of 10-15V DC, with positive and negative voltage inside and outside. The POWER switch is in the open position, and the radio power is set to 5W-10W. Long press and hold the RESET/TUNE button, and the TUNE word will appear on the antenna tuner screen. At this time, the continuous power of the transmitter can be adjusted automatically. Short press the RESET/TUNE button, and the antenna tuner will release the LC relay previously adjusted, and it will be in the straight through position.

For the sake of environmental protection and energy conservation, this antenna tuner can sleep on the screen after 10 seconds of inactivity and no emission.

At present, this antenna tuner work is in manual mode: the relay only adjusts after long pressing the RESET/TUNE button.
This antenna tuner can also work in fully automatic mode: there is no need for a button. The system automatically starts adjusting when it detects that the standing wave ratio is greater than 1.3:1 (this value can be adjusted).

The black and red terminals are experimentally used for adjusting long line antennas.

Below the DC socket. There is a microswitch. After pressing the A/M button, in AUTO mode, there is a "." after the PWR value on the screen. At this time, antenna tuner is in automatic mode, which immediately triggers the start tuning mode as long as the standing wave ratio is detected to be greater than 1:1.3. Press the A/M button again to turn off the AUTO mode and the '.' will disappear.

The Ver1.21 version adds an SX1308 boost circuit in the spare position of the motherboard (these components need to be purchased by customers), which can be switched between power supply modes through reserved SMT pads. And add an Auto fully automatic mode interface on the motherboard to facilitate DIY grinding.

Note: The noise interference that may occur after adding this DC-DC boost circuit is not used as a basis for product quality issues.
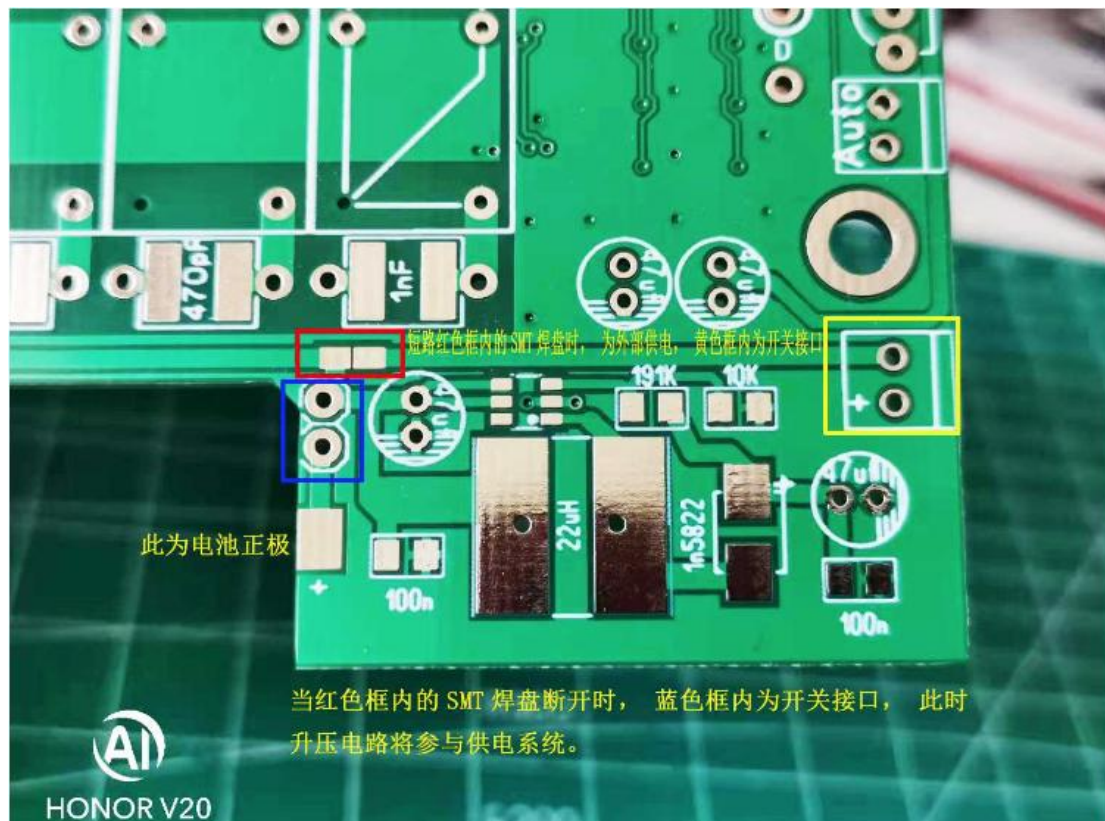
SX1308 is a fixed frequency, SOT23-6 enclosed current mode boost converter, with a working frequency of up to 1.2MHz, allowing for smaller specifications of peripheral inductors and capacitors. The built-in soft

start function reduces the starting impulse current. Internally integrated

80 mΩ power MOSFET, with a maximum boost efficiency of 97%

VCC

C16
47uF

GND

U9
SX1308

NC
IN
EN

SW
GND
FB

GND

R35
10K

GND

D12

R36
191K

C17
47uF

C18
104

L1

4.7-22uH

1N5822

12V