CS-818 Auto Tuner

User Manual
V1.1

Chelegance Co., Ltd.

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1. Introduction

1.1. Description

JNCRadio CS-818 is an antenna tuner, operates on 1.8-54MHz, 0.5-30-Watt. With Yaesu FT-818/817 integration, it controls the tuning process for FT-818/817 with the CAT cable supplied with the unit. For other radios, CS-818 is used as a regular tuner(make sure you do not operate more than its maximum power limit).

When working with Yaesu FT-817/818, CS-818 interfaces to the CAT port (ACC) on the back of FT-817/818 radio with the provided cable. The tuning process is very simple: Press the tune button on CS-818 and it will automatically switch the radio to PKT mode, transmit a carrier, tune the antenna, then restore the radio to the previous mode. CS-818 will also function as a general purpose antenna tuner with other QRP radios. Just transmit a carrier and press the tune button on the tuner.
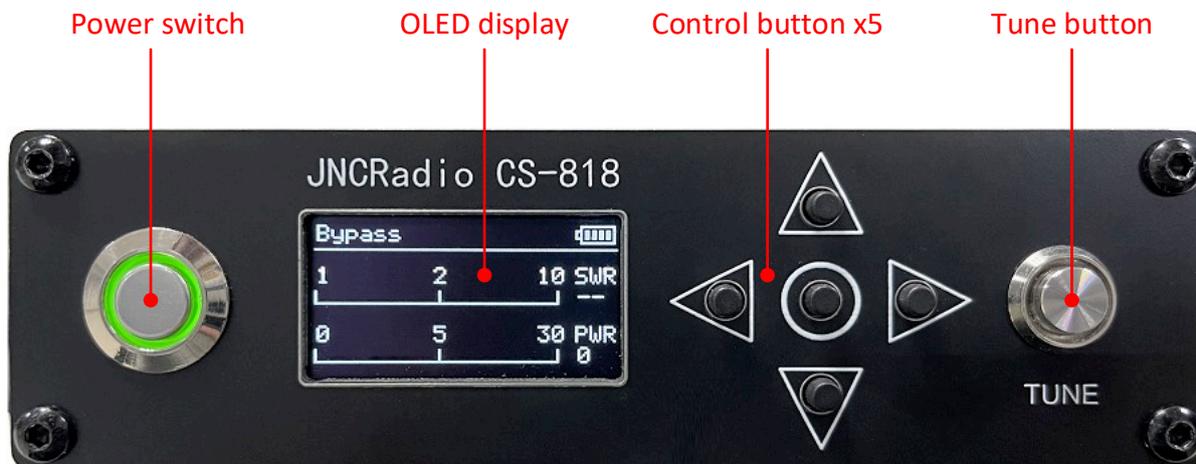
CS-818 is designed with metal case, physical menu buttons and 1.3-inch high-light OLED display. The High-brightness OLED displays are suitable for outdoor use. Latching relays are used, so CS-818 consumes quite low power when not tuning, and the battery life is up to 50 hours.

https://chelegance.com/

1.2. Specifications
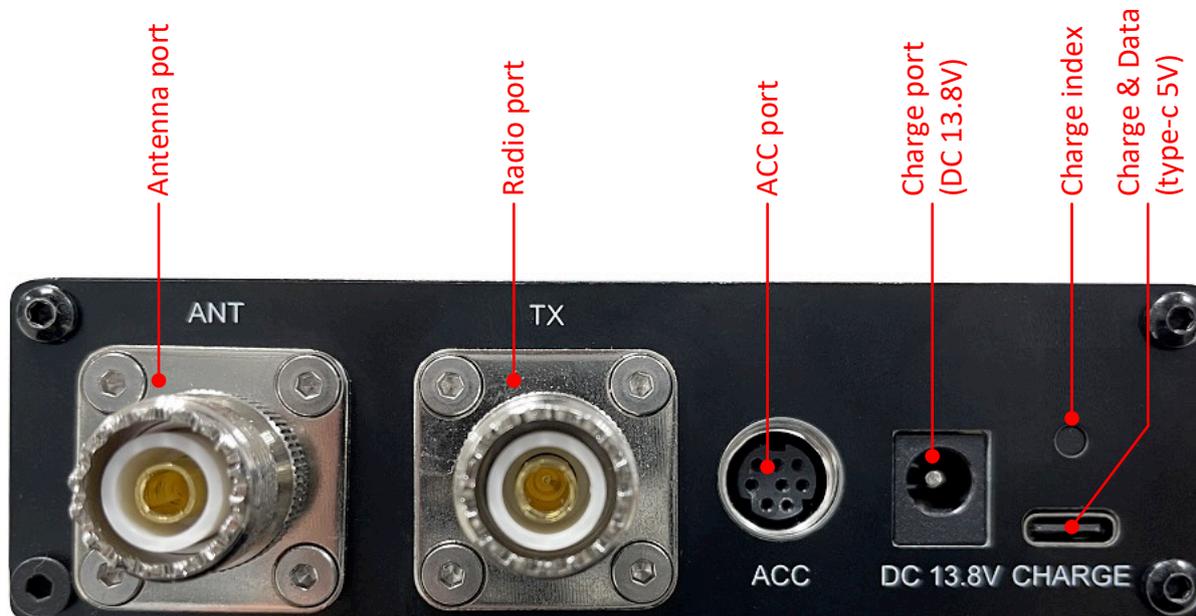
- RF power:

    0.5 ~ 30 watts SSB, CW;

    0.5 ~ 15 watts FM, AM, and digital modes;

- 1.8 ~ 54 MHz coverage (160 to 6 meters);

- Tunes 5 to 500 ohms (15 to 150 ohms for 1.8 ~ 3 MHz)；

- Fast tuning: 5 seconds typical for a new tuning, less than 1 second for memory recall;

- Latching relays are used for ultra-low power consumption;

- Built-in CAT port interface;

- Designed specifically for Yaesu FT-817/818 QRP HF transceiver;

- Also works with any transceivers with maximum 30 watts power rating;

- 20,000 memories for FT-817/818 and 10 memories for other radios;

- 1.3-inch OLED display;

- Built-in rechargeable 18650 lithium-ion battery: 3.6V/3350mAh;

- Battery life: 50 hours;

- Charging method: USB Type-C 5V or DC 13.8V;

- Metal case for electromagnetic shielding;

- Designed with bottom anti-slip rubber pad;

- Dimensions (including RF connectors): 145mm x 115mm x 36mm;

- Net weight: 510g;

- Come with 50cm CAT cable and USB Type-C cable;
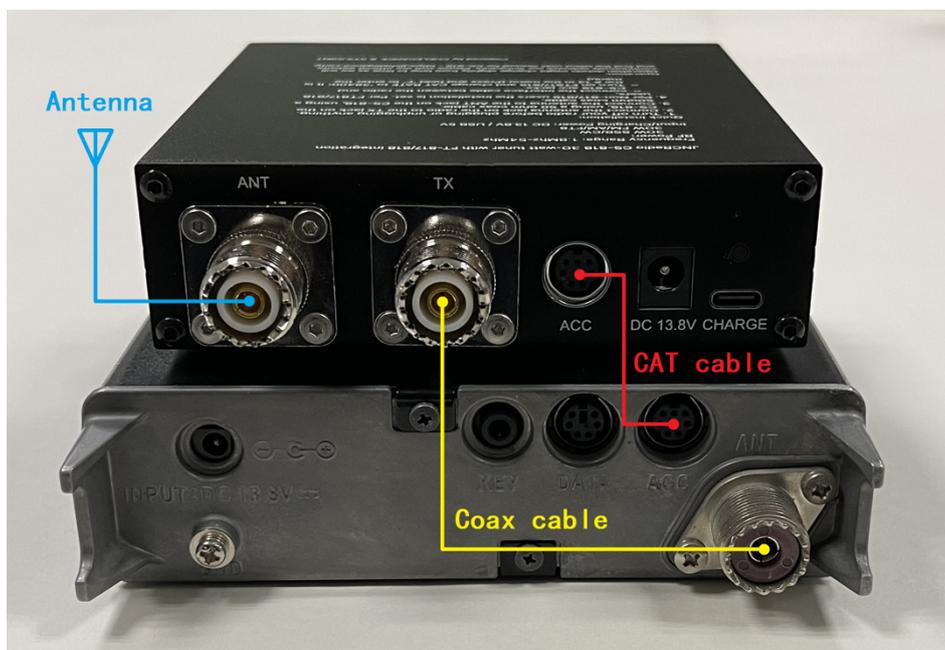
2. Appearance

2.1. Front panel

Power switch OLED display Control button x5 Tune button

2.2. Rear panel

Antenna port Radio port ACC port Charge port (DC 13.8V) Charge index Charge & Data (type-c 5V)

CS-818 has a built-in rechargeable lithium battery, it can be charged in 2 ways: USB 5V or DC 13.8V. The charging indicator on the rear panel indicates the charging status: a red light indicates charging, while a green light indicates that the battery is fully charged.
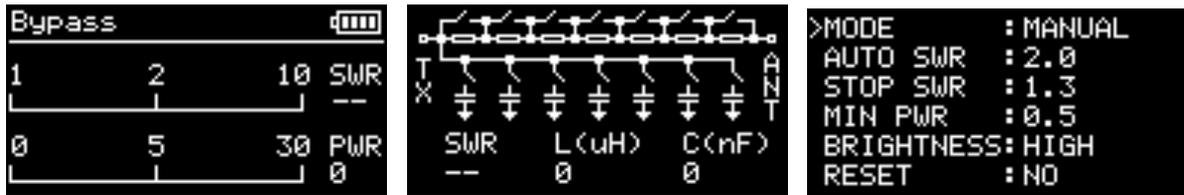
https://chelegance.com/

3. Installation

1. Turn off your radio before plugging or unplugging anything;
2. Connect the antenna jack on the radio to the TX jack on the CS-818, using a 50-ohm coax cable;
3. Connect the antenna to the ANT jack on the CS-818, using a 50-ohm coax cable;
4. Per Non-FT817/818 users the installation is set. Per FT817/818 users,
   ○ Connect the CAT cable between the radio and CS-818 acc jacks;
   ○ Turn on FT-817/818, hold in the F key for one second to access the extended menus. Rotate the SEL knob until menu #14, "CAT RATE" appears. Rotate the dial knob until "38400" is selected. Hold in the F key again for one second, to return to normal operation.

CS-818 tuner is designed for indoor operation only. It is not water resistant. If you use it outdoors, you must protect it from the rain.

4. Operation guide

There are 3 screen pages on CS-818. Press the button ◄ or ► to switch the pages.
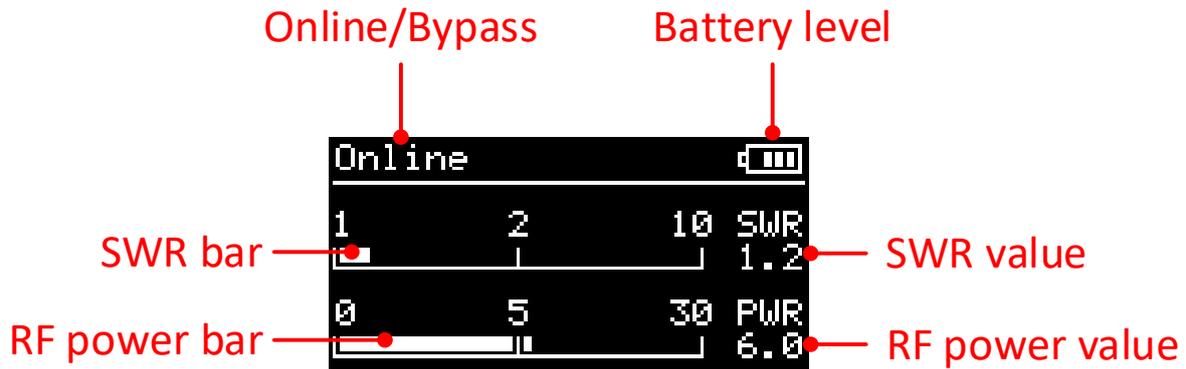
Page1. Main page   Page2. Network viewing page   Page3. Config page

4.1. Main page

The Main page shows the bypass/online state, battery level, SWR bar and value, RF power bar and value.

"Online" indicates that a matching network is applied, while "bypass" indicates that there is a pass-through between the TX port and the ANT port, and no inductor or capacitor is connected. When the radio is transmitting, CS-818 detects the forward power and reflected power and shows the real-time SWR and RF power on the main page in numbers and bars. If there is no RF power detected, "SWR" will show "--", and the PWR value will be 0.

When it is on the main page, press and hold the center button of the control buttons for 3 seconds to switch the state between "online" and "bypass", except for AUTO mode.
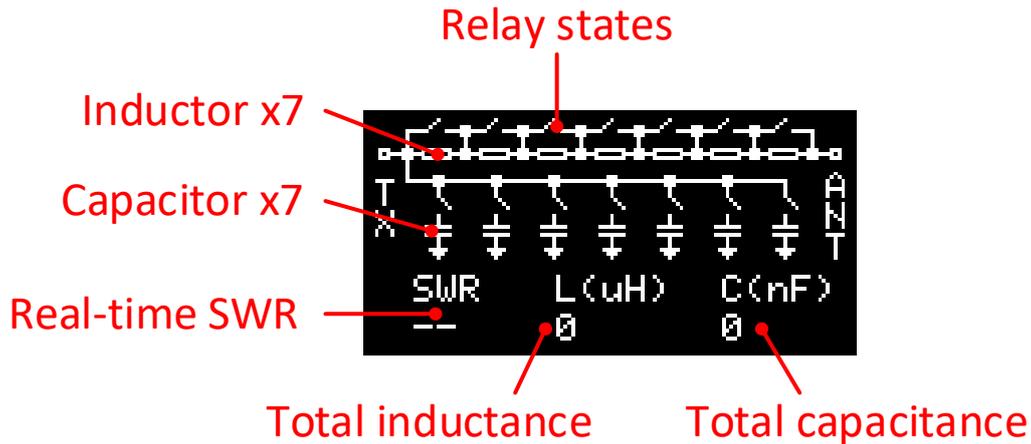
4.2. Network viewing page

The network viewing page shows the states of all the relays inside the tuner in graphic, so you will be able to get the details of the matching network.

When a relay in parallel with an inductor is closed, the inductor will be bypassed, otherwise the inductor will be connected to the matching network.

When a relay in series with a capacitor is open, the capacitor will not be connected to the matching network, otherwise the capacitor will be connected to the matching network.
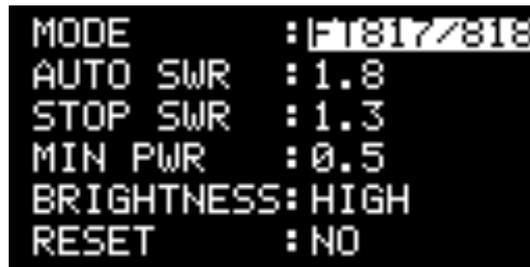
The real-time SWR and the total inductance and capacitance of the matching network will also be displayed on the page.

Relay states

Inductor x7

Capacitor x7

Real-time SWR

Total inductance   Total capacitance

4.3. Config page

You can press the button ▲ or ▼ to move the index arrow up and down, and press the center button to enter the corresponding menu item, and then you will be able to change the setting by press the button ▲ or ▼. Press the center button again to save setting and exit.

NOTE: the tune button will be invalid when it is on the config page.

```
MODE      :FT817/818
AUTO SWR  :1.8
STOP SWR  :1.3
MIN PWR   :0.5
BRIGHTNESS:HIGH
RESET     :NO
```

4.3.1 MODE
The CS-818 has 3 operating modes: FT817/818 mode, MANUAL mode, and AUTO mode.

● **FT817/818 mode**

FT817/818 mode is designed for Yaesu FT-817/817 radios. Please do installation first as described in Chapter 3;

When coupled with FT-817/818, tuning is very simple: set the radio power lower(suggested but optional, as FT-817/818 maximum power is 5/6 watts). Press the tune button on CS-818 and it will automatically switch the radio to PKT mode, transmit a carrier, tune the antenna, then restore the radio to the previous mode.

When tuning is complete, the screen displays "SUCCEED" if SWR is below the threshold, otherwise it will display "FAILED.

NOTE: if the screen displays "ACC NO LINK" after pressing the tune button, it indicates that CS-818 is not properly connected to the FT-817/817 radio.

● **Manual mode**

Manual mode is suitable for general radios. In manual mode, please operate as the following steps:

① Do installation as described in Chapter 3;

② Press and hold the PTT key of your radio to transmit a carrier;

③ Press the tune button on the CS-818;

④ Wait for the tuning to complete.

NOTE: do not release the PTT key during tuning, otherwise tuning will be terminated, and the screen will display "NO SIGNAL".

● **Auto mode**

In auto mode, CS-818 will automatically initiate tuning when the SWR above the threshold defined by the menu item of "AUTO SWR".

WARNING: if the operating power of your radio is greater than 5W, it is not recommended to set the CS-818 to auto mode as tuning under high RF power may destroy your radio.

4.3.2 AUTO SWR

This is a threshold that determines whether the CS-818 will initiate tuning.

For example, if "AUTO SWR" is set to 1.8, and CS-818 will automatically initiate tuning once it detects that the SWR is above 1.8.

NOTE: the value of "AUTO SWR" must be higher than that of "STOP SWR".

4.3.3 STOP SWR

If the SWR is lower than "STOP SWR, it indicates that the tuning was successful.

NOTE: if the "STOP SWR" is set too low (e.g., 1.1 or 1.2), it may take a long time for CS-818 to achieve the goal.

4.3.4 MIN PWR

If the RF power detected by the CS-818 is lower than "MIN PWR", tuning will not be initiated.

The minimum value of "MIN PWR" is 0.1W and the default value is 0.5W.

4.3.5 BRIGHTNESS

The brightness of the display is adjustable with three levels: HIGH, MID and LOW.

4.3.6 RESET

This menu item is used to factory reset the CS-818. Selecting "YES" to perform the recovery and all the settings will be restored to default.

4.4. Prompt messages

4.4.1 NO SIGNAL

The screen displays "NO SIGNAL" when tuning is initiated but no RF power is detected by CS-818. Please confirm that the radio is transmitting and the RF connection between CS-818 and the radio is reliable.

4.4.2 LINKING

In FT817/818 mode, when the tune button is pressed, the screen displays "LINKING. . .", which indicating that CS-818 is trying to connect to the FT-817/818 radio.

LINKING...

4.4.3 ACC NO LINK

In FT817/818 mode, if the screen displays "ACC NO LINK", it indicates that CS-818 failed to communicate with the FT-817/818 radio. In this case, please check the cable connection and the CAT RATE of the radio.

ACC NO LINK

4.4.4 TUNING

When tuning, the screen displays "TUNING. . ."

TUNING...

4.4.5 SUCCEED

When SWR is below the threshold, the screen displays "SUCCEED", and tuning is complete.

SUCCEED

4.4.6 FAILED

If the screen displays "FAILED", it means that CS-818 failed to lower the SWR below the target value.

FAILED

There are several possible reasons why tuning fails:

① The transmitting frequency of the radio is incorrect;

② The initial SWR of the antenna is too high and beyond the tuning range of

CS-818;

③ There is a faulty connection between the antenna and the CS-818;

④ The "STOP SWR" is set too low.

For the above case, please set the CS-818 to manual mode and switch it to "Bypass" state, and then transmit a carrier to check the initial SWR of the antenna. Maybe the "STOP SWR" should also be adjusted. After doing that, please try to tune again.

5. Firmware upgrade

The firmware of CS-818 can be upgraded by virtual U-disk without a programmer (such as J-LINK). Upgrading can be done with a USB Type-C cable.

Firmware upgrade steps:

① Download the latest firmware from https://www.chelegance.com/;

② Unzip the file you downloaded to get the file named CS818APP.bin;

③ Connect CS-818 to a Windows PC with the USB Type-C cable;

④ Press and hold the TUNE button and power on CS-818, the screen will display "FIRMWARE UPGRADE". At PC side, the CS-818 will act as a disk drive, which should appear in File Explorer;

⑤ Copy 'CS818APP.bin' into the root directory of that disk;

⑥ Restart CS-818, and the upgrade has been done.

You can check the firmware version on the startup screen of CS-818.

6. Part List

- CS-818 auto tuner (with battery）   ×1
- 50cm CAT cable   ×1
- USB Type-C cable   ×1

HAVE FUN WITH CS-818, 73!