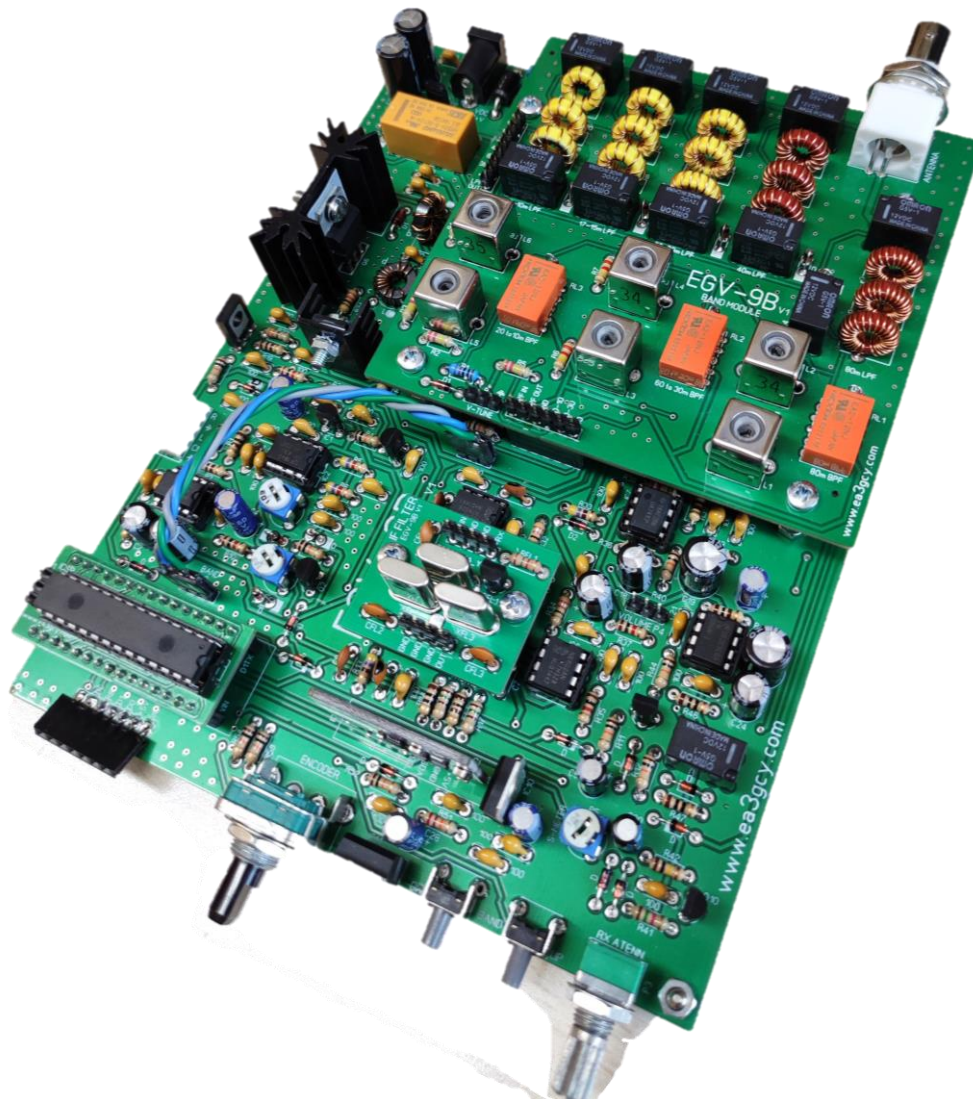# SETTINGS and USER MANUAL

EGV-9B v1

QRP CW transceiver KIT

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Latest updates and news in: **www.ea3gcy.com**

INTRODUCTION

Using the *EGV-9B* transceiver is very easy. It has no frills. But it has all the necessary functions to enjoy QRP with a device assembled in your home.

Efforts have been made to make changes to menu functions as quick and comfortable as possible.

Tuning, step changes, adjustments and all other functions are performed using a rotary encoder with a built-in push button.

A single knob for all functions!

The ATMEGA328P processor (Arduino NANO compatible) module is already programmed at the factory. There are initial values and frequency settings that will help get you up and running. ***With the default values, your EGV-9B will be able to start working.*** However for each assembly some slight re-adjustments must be made in the display settings menu.

The default settings are:

- **CW-LSB BFO** = *4.913.2 MHz. **User must re-adjust according to IF tolerances***
- **CW-USB BFO** = *4.914.2 MHz. **User must re-adjust according to IF tolerances***
- **CALIBRATE XTAL** = -800 ***User must re-adjust according to Sl5351 module Xtal***
- **CALIBRATE VOLTS** = *User must adjust.*
- **RIT ON/OFF:** *OFF*
- **CW MODE:** *CW-LSB*

DIAL DISPLAY
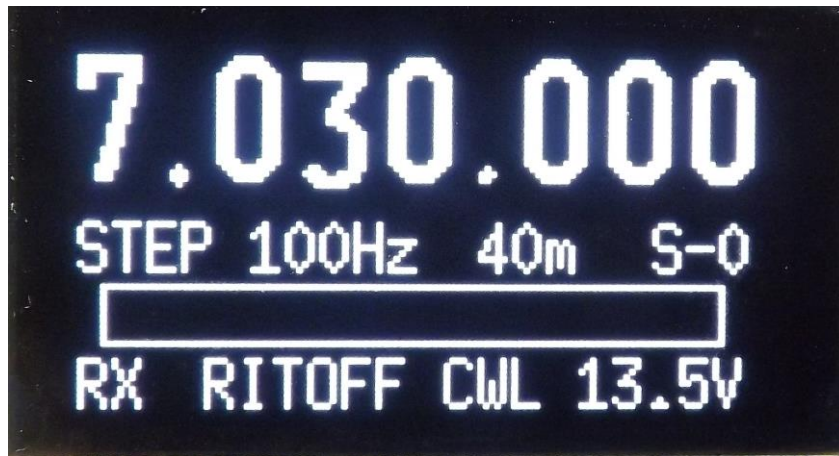
On the working dial display, you can see the tuned frequency, the current step, Band, the S-Meter, the current status (RX or TX), the RIT status (ON / OFF), the CW mode (CWL or CWU) and the supply voltage.

By turning right or left the rotary encoder the frequency respectively increases or decreases by the current "step". A quick push on the encoder will change the step.

There are two ranges of steps. The default range is 10Hz - 100Hz - 1kHz. To change to the second range of steps, go to main menu.

The current band, frequency, step, and CW mode are stored in a non-volatile memory automatically every 4 seconds (only if there has been any change). When you start it, you will always recover the frequency where it was last time.

MAIN MENU

To enter the main menu, you must push and hold the encoder pushbutton for >1 second. Then, you can move through the menu lines by turning the encoder. The last line is "EXIT" to exit without change.

⇨ *Band change:*

To change the band, push the UP or DOWN push-buttons (previous band or next band).

⇨ *RIT on/off:*

To activate the RIT, select the "RIT ON / OFF" line and press the encoder switch. Then, "RIT ON" will appear on the main screen. If the frequency increases, "RX+" will appear or if it decreases, "RX-" will appear. If the frequency does not change, "RX=" will appear.
When transmitting, the frequency will always return to the initial one.
To deactivate the RIT, proceed as in activation.

⇨ CW Mode:

There are two CW modes, LSB and USB". To switch from one mode to the other, select the "CW-LSB/CW-USB" line and press the encoder switch.

⇨ Step range change:

There are two ranges of steps. The default range is "1kHz - 100Hz - 10Hz" To change to the second range of steps, go to main menu and select the line "1MHz 100kHz 10kHz" and push switch encoder again. To return to the previous range, repeat the same operation.

⇨ SETTINGS:

Select this line, press push-button to enter the "SETTINGS" menu.

⇨ EXIT:

Return to the main tuning screen.

TIPS AND IDEAS FOR USE

⇨ RX GAIN Using the fader control.

When very strong signals are received, the AGC may receive strong pulses before reacting (the first dot or dash). When the band is open and the propagation is high, *it is highly recommended to use the Attenuator control potentiometer (RX ATT) to reduce the receiver sensitivity* enough for the AGC to work easily and the signals to be heard comfortably. *Then you can increase the volume control.*

When broadcast signals near the amateur bands are strong, you should also use the RX GAIN control to minimize possible interference.

⇨ TX Output Power.

The output power in TX changes according to the selected band. The EGV-9B can work in a wide power supply range (from 10 to 14V). The supply voltage greatly influences the output power. In some bands the power exceeds 5W (normalized power for QRP), so you can lower the power and you will get less power. To decrease power, the transmission circuitry of the EGV-9B can be modified. However, to carry out modifications, you must have considerable experience in this type of circuit. If you make changes, you are responsible for the results.

SETTINGS MENU

⇨ *CALIBRATE XTAL:*

IMPORTANT: This setting is the first you have to do (before the BFO).
This setting is essential to adapt the SI5351 module to your assembly.
An incorrect setting can cause a bad receive.

It is essential to make this adjustment before making the BFO.
The XTAL calibration adjustment affect BFOs (you scroll within IF filter bandwith)

Press the push-button to enter "CALIBRATE XTAL" sub-menu.
You can calibrate the frequency of the clock crystal oscillator of the SI5351 module. It has a range of adjustment -2000 to +2000. This value not is Hz and is inverse to the output frequency, that is, when it is increased, the frequency decreases and vice versa.

To make this adjustment you should use a professional frequency meter or a good quality receiver to read the output frequency of the SI5351. Must measure the frequency at CLK1 output on the SI5351 module (BFO out)

1- For example switch to CWL mode
2- Take note of the frequency displayed on the menu "BFO ADJUST> CW-LSB". For example 4.913.200
3- Enter the menu "CALIBRATE XTAL" and adjust until the frequency meter reads that same reading.

If you use a receiver to monitor the frequency of CLK1, you will need to tune to the expected frequency on CLK1 (the one in the "BFO ADJUST" menu) and adjust "CALIBRATE XTAL" until you get "zero beat" on the receiver.

This adjustment is essential, and compensates for the crystal tolerances of each SI5351 module. Very notable differences can be observed in different modules.
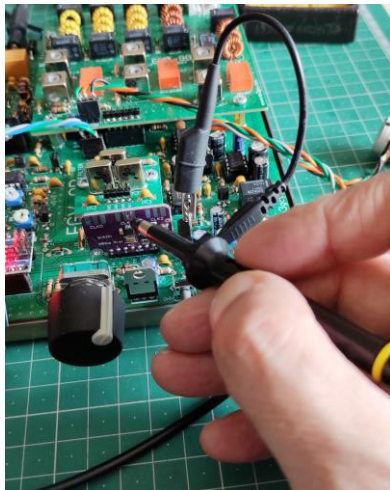
⇨ *CW BFO ADJUST:*

Press the encoder button to enter the "CW BFO ADJUST" sub-menu. Then, select the line "CW-LSB BFO" or "CW-USB BFO" and press the encode button.

IMPORTANT: This setting is essential to suit your assembly.

The "CW-LSB" and "CW-USB" settings are used to suit the tolerances of the IF crystal filter for each setup. These adjustments will notable affect the quality of reception. You should look for the most suitable frequency close to the center frequency of the filter (real frequency not nominal). One tip: the sound should be heard in a fairly low pitch.

Note: Some hams use an audio spectrum analyzer software "spectrogram to help with adjustments. You should try to get closer to an audio bandwidth of 700-800Hz.
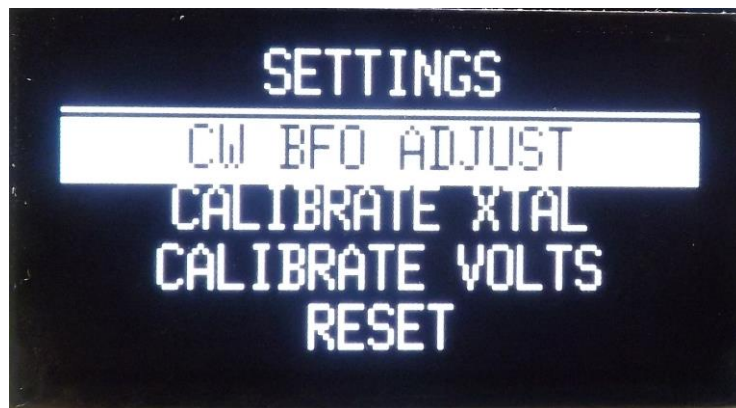
- "CW-LSB" it is by default 4,913,200. This may be the correct frequency. If desired, you vary slightly. To finish, hold > 1sec pressed and "SAVE / CANCEL" will appear, you can change it or leave it as it was before.
- "CW-USB" it is by default 4,914,200. This may be the correct frequency. If desired, you vary slightly. To finish, hold > 1sec pressed and "SAVE / CANCEL" will appear, you can change it or leave it as it was before.

Note: A quick push on the encoder will change the step (all steps available from 1Hz to 1MHz). The 100 HZ step is best suited for these settings. Usually you can work with 100Hz.

This screen always appears after making a value or frequency adjustment. You can record the changes or no "OK" or "CANCEL" them.

⇨ CALIBRATE VOLTS:

Press the push-button to enter "CALIBRATE VOLTS" sub-menu. You can calibrate the dial display voltmeter. Use a quality multimeter in the volts function. Measure the input voltage of the EGV+.
Turn the encoder until the same reading is displayed as on the multimeter.
The measurement resolution is 0.1V.

⇨ RESET:

If necessary, you can perform a RESET to the factory default values.
Choose the RESET line and then choose "OK" or "CANCEL".

Important note: When you do a RESET, then you have to redo all the settings.

⇨ EXIT:

Returns to the previous menu screen.