

# EGV-3BL\_BPF/LPF

# EGV-3BH\_BPF/LPF

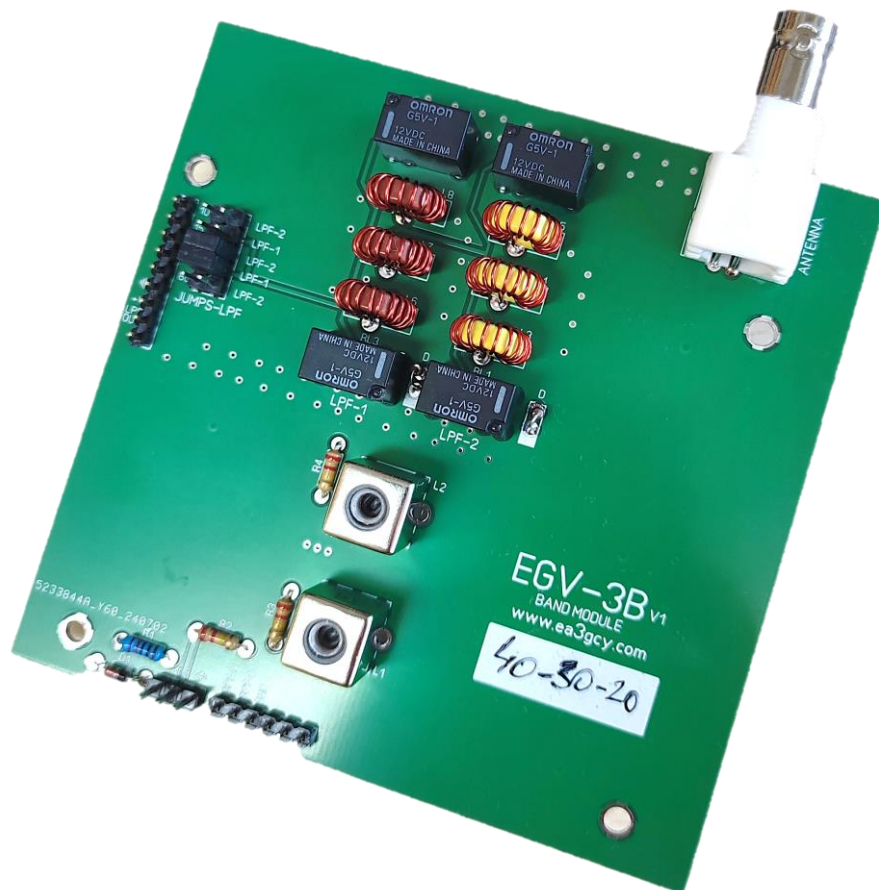
## 3-band BPF/LPF module for EGV-9B main PCB

(Download EGV-9B main PCB manual from [www.ea3gcy.com](http://www.ea3gcy.com))

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Latest updates and news in: [www.ea3gcy.com](http://www.ea3gcy.com)



Thank you for building the **EGV-3B\_BPFLPF** module

Have fun assembling it and enjoy QRP! 73 Javier Solans, ea3gcy

# INTRODUCTION

## EGV-3B\_BPFLPF

The EGV-3B\_BPFLPF is three-band filter plug-in module for the EGV-9Bv2 9-band CW transceiver PCB Main. There are two versions "L" and "H":

- The **EGV-3BL** is for 40-30-20m.
- The **EGV-3BH** for 17-15-12-10m.

This module incorporates two 7-pole low-pass filters and one variable band-pass filter varicap tuned. All the filters are switched by means of relays to avoid their interactions.

**Note: good experience on radio assembly is required.  
It shouldn't be your first transceiver to build.**

*All SMD parts soldered at the factory. You don't have to solder anything SMD*

# SPECIFICATIONS

## **RX BAND-PASS FILTER:**

**Power requirements:** 12 – 14VDC

**Antenna impedance:** 50 ohms nominal.

**Frequency:** "L" version 40, 30 and 20m

"H" version 17, 15, 12 and 10m

## **LOW PASS FILTER:**

**Filters:** 40 and 20m ("L" version). 17, 15, 12 and 10m ("H" version).

**Harmonics output:** -45dBc or better below the fundamental frequency (excepted 17m)

**Other spurious signals:** -50dBc or better below the fundamental frequency.

**Switching:** Relays.

**Board dimensions:** 100 x 97 mm.

**PLEASE READ ALL ASSEMBLY INSTRUCTIONS COMPLETELY AT  
LEAST ONCE BEFORE YOU BEGIN.**

# RECOMMENDED ASSEMBLY SEQUENCE

**All SMD parts soldered at the factory. You don't have to solder anything SMD**

Based on your experience you can place the components in the order you are used to.

However I can recommend the following assembly sequence:

- Place and solder D1 10V zener diode.
- Insert and solder all resistors
- Insert and solder two 1N4148 diodes all printed "D" on PCB. They are all placed vertically (see the images).
- Insert and solder all shielded coils (make sure they lie flat on the board). L1 and L2 (see tabla).
- Insert and solder toroids (see section "TOROIDS WINDNG").
- Place and solder all relays. RL1, RL2 RL3 and RL14 have a printed line that has to match the one printed on the board (see the images).
- Place and solder BNC antenna socket.
- To finish, solder the pins strips. This is important work. See the section "wiring and connections".

## COMPONENT LIST

Resistors					
Checked		Ref.	Value	Ident./Comment	Located
		R1	220 Ω		Top layer
		R2	220K		Top layer
		R3	220K		Top layer
		R4	220K		Top layer
Potentiometer					
		P1	50K	50K shaft potentiometer 50K 503	Top layer

Semiconductors					
Checked		Ref.	Type	Ident./Comment	Located
		Printed "D"	2 x diodes printed D are 1N4148 (vertically mounted)		Top layer
		Printed "DV"	All diodes printed DV are BB201 SMD (bottom layer PCB)		Bottom layer
		D1	10V zener diode 0.5W	10V	Top layer

Hardware				
Checked		Qty/Ref.	Type/Comment	Located
		RL1 to RL4 Relays	4 pcs Omron relay G5V-1 12V	Top layer
		1 BNC socket	BNC socket	Top layer
		9 pins strip	9 pins <b>extra long</b> strip	Top layer
		6 pins strip	6 pins <b>extra long</b> strip	Top layer
		13 pins strip	3 "V-TUNE" + 10 Jumps-LPF	Top layer
		2 Jumper	2 Jumper	Top layer
		4 10mm spacers	4 pcs 10mm metal spacers	Top layer
		8 M3 nuts	8 pcs. M3 nuts	Top layer
		4 M3x10	4 pcs. M3 x 10mm screws	Bottom layer
		4 M3x4	4 pcs. M3 x 4 or 5mm screws	Top layer
		Enamelled wire	Enamelled wire 0,4mm	--

## L1, L2 Shielded coils

Version	Band	L1-L2
EGV-3BL	40-30-20	5u3H 3334
EGV-3BH	17-15-12-10	1u2H 3335

## L3 to L8 LPFs TOROID WINDINGS

⇒ The following table shows the type of toroid, the turns it has to wind and the length of wire it will need. All toroids are 9.5mm/0.375in outside diameter. The T37-2 toroid is the red one and the T37-6 is the yellow one. 0.4 mm thick enameled wire is used. Use the data of your chosen version.

EGV-9BL (40-30-20m)	Type	Turns	Wire length (0.4mm Ø)
<i>Marked on PCB "LPF-1" (40m)</i>			
L6 and L8	T37-2 red toroid	18	28 cm
L7	T37-2 red toroid	20	30 cm
<i>Marked on PCB "LPF-2" (20m)</i>			
L3 and L5	T37-6 yell. toroid	15	23 cm
L4	T37-6 yell. toroid	16	24 cm

EGV-9BH (17-15-12-10)	Type	Turns	Wire length (0.4mm Ø)
<i>Marked on PCB "LPF-1" (15m)</i>			
L6 and L8	T37-6 yell. toroid	12	20 cm
L7	T37-6 yell. toroid	14	23 cm
<i>Marked on PCB "LPF-2" (10m)</i>			
L3 and L5	T37-6 yell. toroid	10	18 cm
L4	T37-6 yell. toroid	11	19 cm

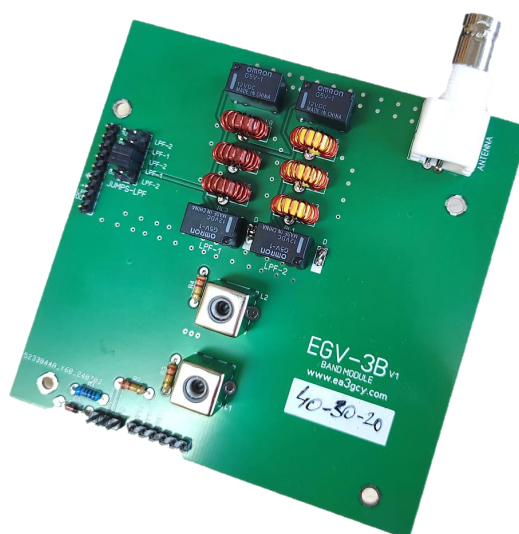
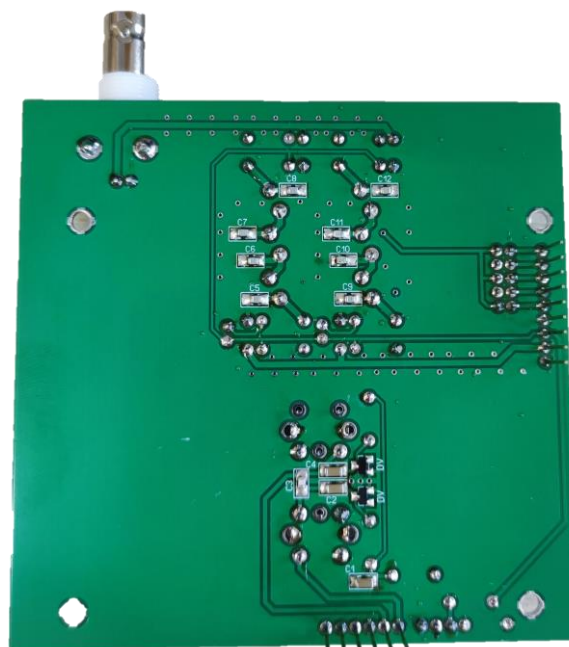
Notes:

- Wire lengths has been calculated so that you will have some wire left over and easy to pull on.
- In the **EGV-9BL**, the 40m LPF affects the 40m band and the 20m LPF affects 30m and 20m bands.
- In the **EGV-9BH**, the 15m LPF affects the 17 and 15m bands and the 10m LPF affects 12 and 15m bands.

## CAPACITORS LIST

			Marked LPF-1 (40m)		Marked LPF-2 (20m)	
<b>EGV-3BL</b> (40-30-30m)	C1-C2-C4 100n	C3 4p7	C9-C12 270pf	C10-C11 680pf	C5-C8 180pf	C6-C7 390pf
			Marked LPF-1 (15m)		Marked LPF-2 (10m)	
<b>EGV-3BH</b> (17-15-12-10m)	C1-C2-C4 100n	C3 2p7	C9-C12 82pf	C10-C11 220pf	C5-C8 56pf	C6-C7 150pf

Notes: All capacitors are SMD 100V NP0 or CG0 type. They are all pre-installed on the bottom PCB  
All SMD places allow 0603, 0805, 1206 or 1210 format.



## TOROIDS ASSEMBLY EXAMPLE:

⇒ The following example is the low pass filter for 40m

40m LPF Toroids L6, L7 and L8.

**L6 and L8** are identical and are wound with **18 turns**.

**L7** is wound with **20 turns**.

They use T37-2 (red toroids 9.5mm/0.375in outer diameter).

Cut about 28cm (10.3") of 0.4mm diameter enameled wire and wind the **L6 and L8** toroids with eighteen (18) turns. Spread the turns evenly around the toroid and wind them tightly so that they follow the contour of the toroid and are as tight against the toroid as possible. The turns should be evenly distributed around the circumference of the toroid.

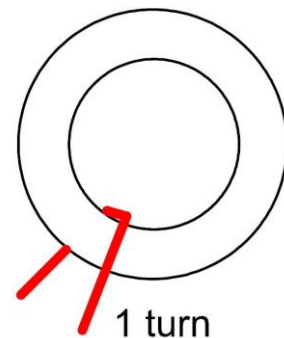
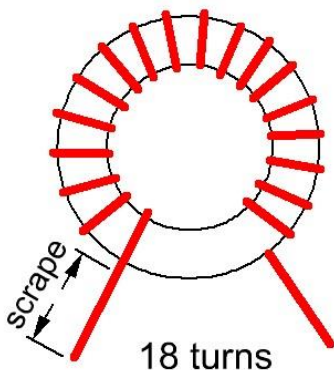
Leave pigtails of about 10-12mm (0.70"). Scrape off the enamel with a knife from the ends of the wire, in order to solder the toroid onto the board.

For **L7** cut about 30cm (12") of 0.5mm diameter enameled wire and wind twenty (20) turns.

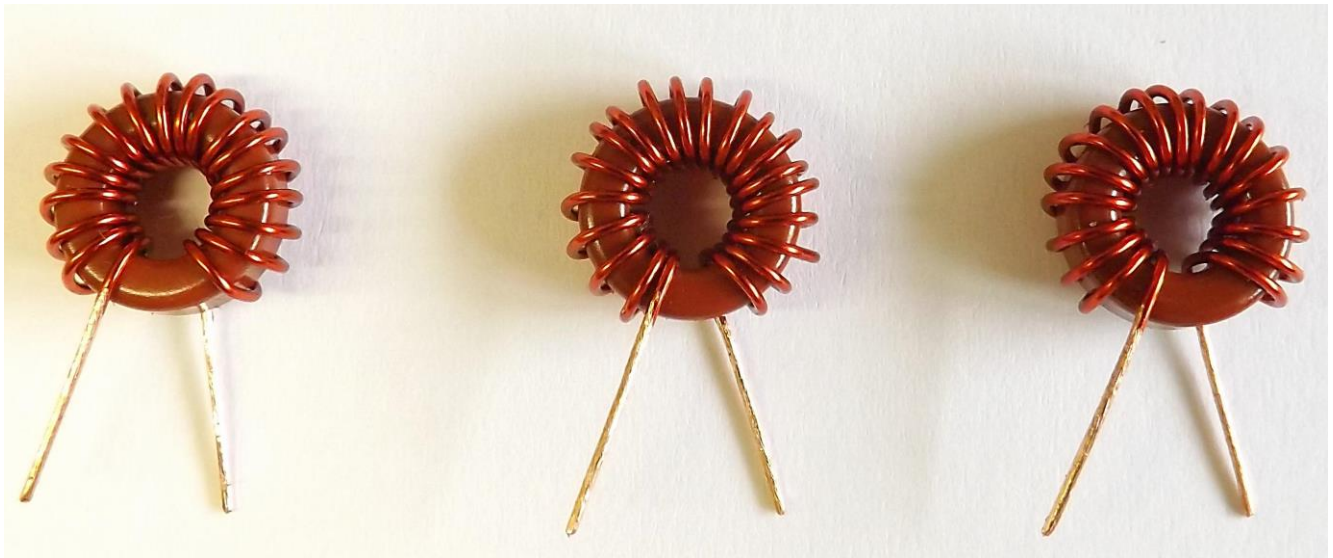
Mount and solder the three toroids in place.

*Counting the turns: Count one turn for each pass of the wire through the center of the toroid.*

Important: Wind the toroid exactly as shown in the images. One turn more or less will affect the transmitter spectrum and the output power.







L6 (18 turns)

L7 (20 turns)

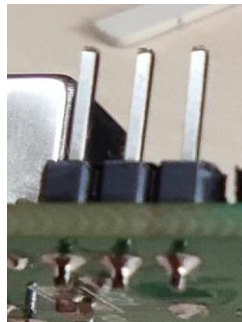
L8 (18 turns)

## PLUG IN MODULE - WIRING AND CONNECTIONS

⇒ The EGV-3B2\_BPFLPF PCB is a plug-in module that sits on top of the EGV-9Bv2's main board.

***The connection is simple, but requires special attention so that errors do not arise.***

1.- The three-pin “V-TUNE” strip goes up and is soldered to the bottom side of the board.

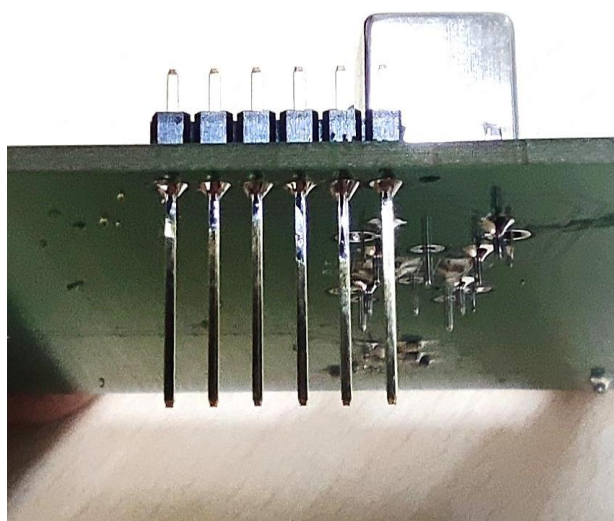


2.- The other two strips of pins go down (to connect to the main board) and are **soldered to the top side of the board**. Extra-long strips of pins are used. 8 extra-long pins strip for LPF switching and 6 extra-long pins strip for BPF switching.

Before soldering you should pay close attention to how tall the pins should be to accommodate the position of the plug-in board.

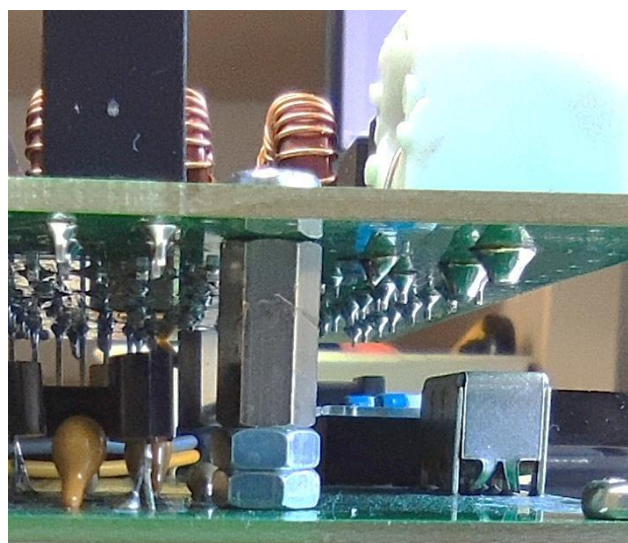
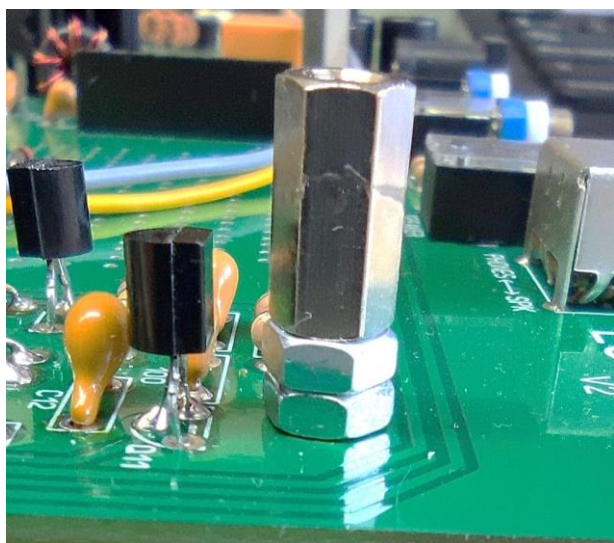
- Insert the pins from above the board (Top)
- Next put the board in place no solder the pins.
- Insert the pins into the female sockets of the main board all the way down.
- With a fine soldering iron tip, **solder the pins on the top of the board**.
- Although it is not necessary, you can later tear off the plastic strip

See the following pictures:



The spacers to screw the board are 10mm and you have to add two nuts to gain about 4mm in height. To fasten to the main board, 10mm (M3x10) screws are used and to fasten the plug-in filter module, 4 or 5mm (M3x4) screws are used.

See the images.

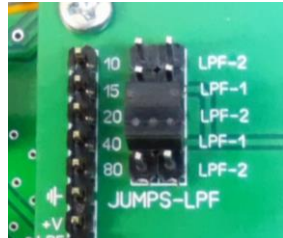




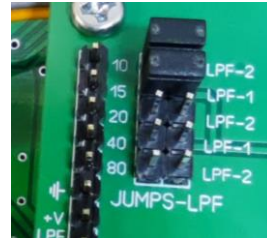
## JUMPERS-LPF

- For **EGV-3BL** place **20 to LPF-2** jumper and **40 to LPF-1** jumper.
- For **EGV-3BH** place **10 to LPF-2** jumper and **15 to LPF-1** jumper.

Note: You can directly solder a piece of wire to make the jumpers.



EGV-9BL jumpers



EGV-9BH jumpers

## SETTINGS

### EGV-3BL

Adjust the “Band Tune” control knob pointing fully to the left (at the beginning of the potentiometer travel).

Switch to the 40m band and adjust L1 and L2 alternately until you get the maximum reception signal.

You can make a small re-adjustment on the other bands. There will always be a band that benefits the most. You can look for a compromise. In practice this is not decisive.

The printed scale settings are indicative and will not match exactly.

No further adjustments required. TX has no settings.



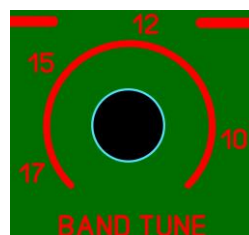
### EGV-3BH

Adjust the “Band Tune” control knob pointing to “10” (near the end of the potentiometer travel).

Switch to the 10m band and alternately adjust L1 and L2 until you obtain the maximum reception signal.

The printed scale settings are indicative and will not match exactly.

No further adjustments required. TX has no settings.



IMPORTANT: For the other settings on the EGV-9B motherboard (TX-RX delay, side-tone level, etc.) and for the instructions for use of the transceiver and the K2 keyer, download all the manuals from [www.ea3gcy.com](http://www.ea3gcy.com).

# LIMITED WARRANTY

**Please read carefully BEFORE building your kit**

All electronic components and hardware supplied with the kit are under warranty in case of any manufacturing defect for the period of one year after purchase. The warranty does not include the transmitter final amplifier transistor.

The original purchaser has the option of examining the kit and manual for 10 days. If, within this period, the buyer decides not to build the kit, he/she may return the entire unassembled kit at their own expense for the shipping expenses. The shipping expenses and sales commissions (i.e. bank, Ebay, and PayPal commissions) included in the purchase price will not be returned.

Please, BEFORE returning a product, request instructions by email at: [ea3gcy@gmail.com](mailto:ea3gcy@gmail.com)

Javier Solans, EA3GCV, warrants this device to function according to the specifications, provided that it is assembled and adjusted as described in this documentation, and used correctly according to all provided instructions.

It is your responsibility to follow all the instructions in the manual, to identify all the components correctly, and to use good workmanship and proper tools and instruments in the construction and adjustment of this kit.

REMEMBER: This kit will not work as a commercially manufactured product; however, it can often give similar results. Do not expect great performance, BUT YOU ARE SURE TO HAVE LOTS OF FUN!

If you believe that there is a missing kit component, please do a thorough inventory of all parts using the parts list in the manual. Check all bags, envelopes and boxes carefully. If needed, you may email me and I will replace any component that you are missing. Even if you can find the exact part locally, please let me know so that we are aware of the problem to help other customers.

I can also supply any part that you have lost, damaged or broken accidentally.

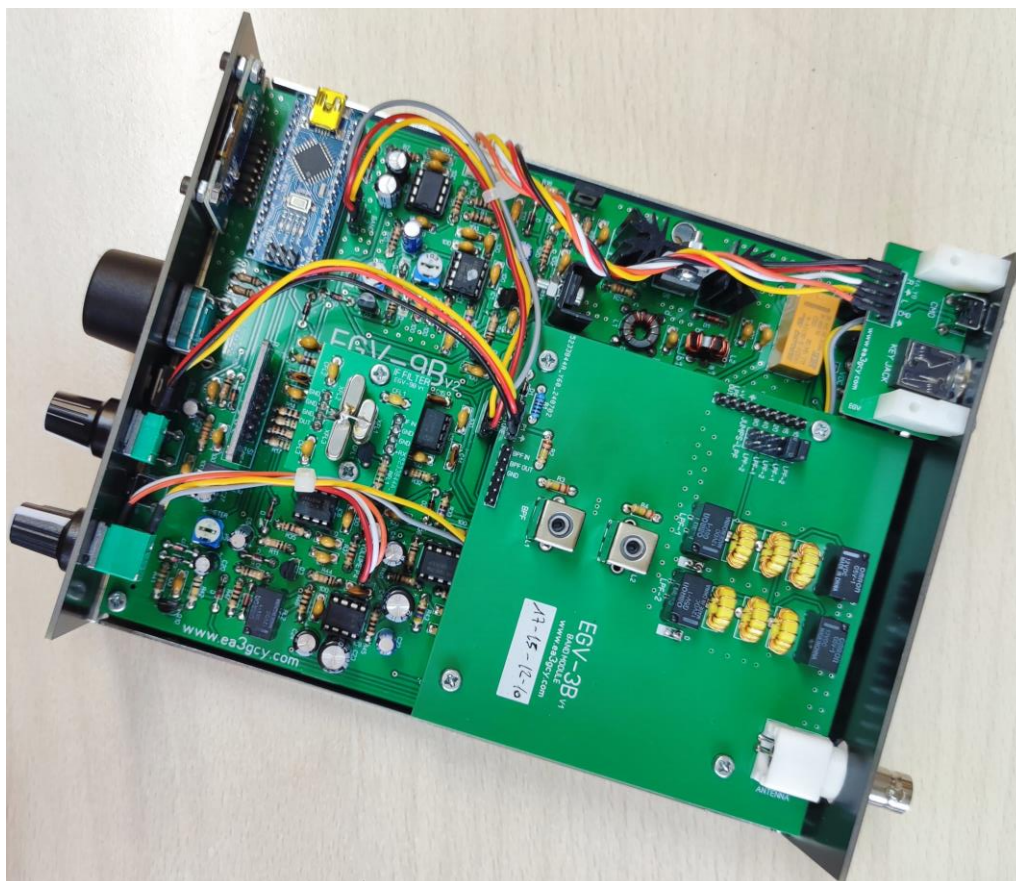
If you find any errors in this manual or would like to make a comment, please do not hesitate to contact me at [ea3gcy@gmail.com](mailto:ea3gcy@gmail.com)

THANK YOU for building the

**EGV-9B\_BPFLPF** module kit.

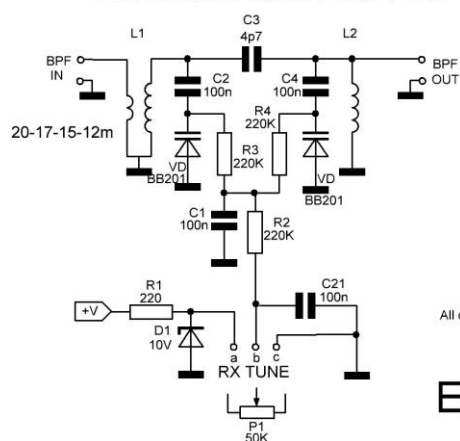
Enjoy QRP!

73 Javier Solans, EA3GCV

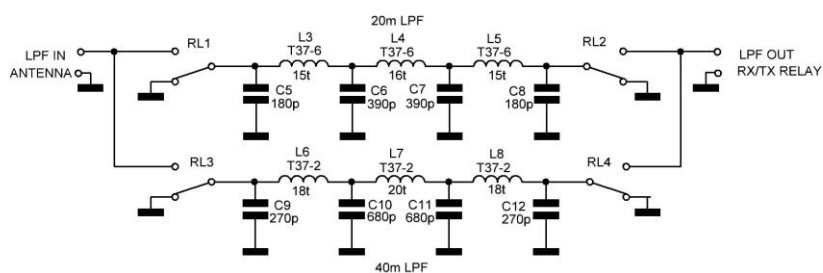


## SCHEMATICS

RX Tunable Band Pass Filter



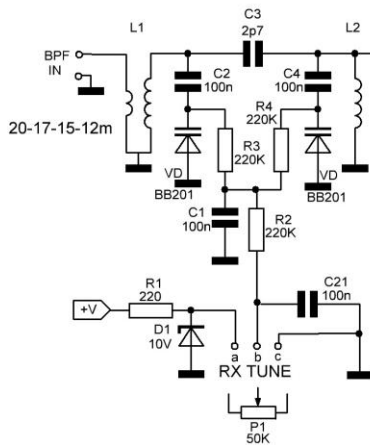
RX Tunable Band Pass Filters



All diodes unmarked are 1N4148

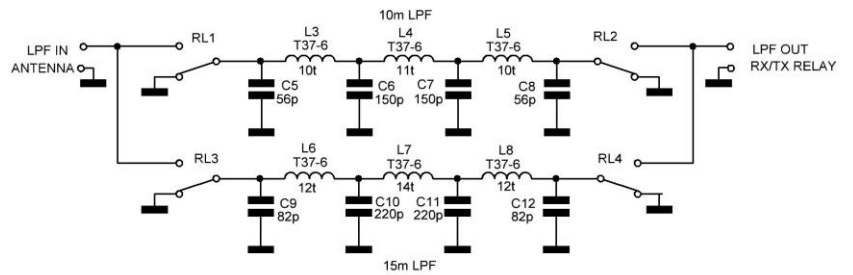
EGV-3B-L 40-30-20m BPF/LPF module

RX Tunable Band Pass Filter

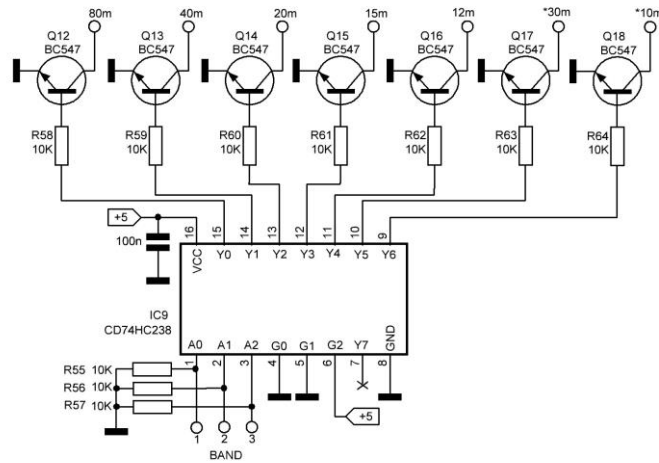


All diodes unmarked are 1N4148

RX Tunable Band Pass Filters



## EGV-3B-H 17-15-12-10m BPF/LPF module



Switching circuit on main PCB