BF-22 Sallen Key filter: Assembly Reference v1.3

Main PCB

Open "Main Board Bag A"

Resistors:

Qty.	Value	Code	Name on PCB
22	10k	Brown, Black, Black, Red, Brown	R3, R6, R14, R17, R18, R23, R43, R44, R46, R52, R55, R68, R70, R75, R79, R84, R85, R88, R90, R92, R93, R94
20	100k	Brown, Black, Black, Orange, Brown	R12, R16, R25, R28, R34, R41, R42, R47, R69, R72, R77, R78, R80, R81, R82, R83, R86, R87, R89, R91
4	47 Ohm	Yellow, Purple, Black, Gold, brown	R1, R10, R48, R53
4	220 Ohm	Red, Red, black, black, brown	R4, R40, R61, R65
4	470k	Yellow, Purple, black, orange, brown	R8, R56, R57, R66
2	470 Ohm	Yellow, Purple, black, black, Brown	R30, R62
2	680 Ohm	Blue, Grey, black, black Brown	R20, R60
2	820 Ohm	Grey, Red, black, Black,Brown	R21, R49
2	1k	Brown, Black, black, brown, brown	R9, R19,
2	2K	Red, Black, black, brown, brown	R45, R76
2	3k	Orange, Black, Black, brown, brown	R50, R71
2	4.7k	Yellow, Purple, black, brown, brown	R13, R35
2	5.6k	Green, blue, black, brown, brown	R54, R59
2	7.32k	Purple, Orange, Red, Brown, Brown	R37, R74
2	15k	Brown, Green, black, red, brown	R36, R58
2	30k	Orange, Black, black, red, brown	R26, R31
2	33k	Orange, Orange, black, red, brown	R51, R67
2	43k	Yellow, Orange, black, red, brown	R63, R73
2	47k	Yellow, Purple, black, red, brown	R24, R64
2	56k	Green, Blue, black, red, brown	R7, R11
2	270k	Red, Purple, Black, Orange Brown	R15, R27

Solder the diodes respecting the polarity. Black line on the diode must be in the same place as white line on the diode PCB silkscreen.

Qty	*Value*	*Name on PCB*
6	1N4148	D1, D2, D3, D4, D5, D6

Solder the two ferrite beads (FERRITE+, FERRITE-) passing trough a recycled resistor leg and proceed as if it were a resistor.

Open “Main Board Bag B”

Place the sockets taking care of the orientation and solder them on IC1, IC2, IC3, IC4, IC5 and IC6. The orientation must match the PCB's silkscreen.

Place ICs on the sockets taking care of polarity. To do that the mark on front must match the mark on the socket and the PCB's silkscreen. Some ICs might have a dot instead of the rounded mark.

Qty	*Value*	*Name on PCB*
1	TL072	IC1
2	NE5532	IC2, IC3
1	LM13700N	IC4
2	TL074P	IC5, IC6

Solder the Capacitors:

Qty.	Value	Code	Name on PCB
4	47p	47	C3, C7, C17, C21
2	560p	561	C24, C31
4	1nF (Poliester)	1n	C2, C25, C23, C29
2	1nF	102	C38, C39
2	3.3nF	3n3	C4, C28
14	100n	104	C1, C9, C12, C14, C16, C20, C26, C27, C30, C32, C33, C34, C37, C40

Solder electrolytic Capacitors:

Values written at the side of the capacitor. Mind polarity. Check positive terminal on board and make it match with long leg.

Qty.	Value	Code	Name on PCB
4	10uF	10uF	C35, C36, C6, C18
2	33uF	33uF Black-gold	C10, C11
2	220uF	220uF	C19, C22

Transistors: (place them matching the shape draw on the silkscreen)

Qty	*Value*	*Name on PCB*
2	2N3819	Q5, Q7
4	2N3906	T1, T2, Q4, Q6

Place and solder the Male Pin Header at the top side of the silkscreen, ensuring it is 90º from PCB.

Solder the Trimmers. Place they **from the back** of the PCB (Same side as power connector), not from silkscreen side.

Qty.	Value	Code	Name on PCB
2	100k	104	CUTOFF_INIT_1, CUTOFF_INIT_2

Solder the power connector ensuring the position is correct: it must be on the silkscreen side with the pins facing out.

Control PCB

This board will mount components in both sides. Mind the silkscreen.

Open "Control Board Bag A"

Solder following components:

Qty.	Value	Code	Name on PCB
2	1k	Brown, Black, Black, Brown, Brown	R32, R33
2	10k	Brown, Black, Black, Orange, Brown	R2,R5
2	15k	Brown, Green, Black, red, Brown	R38, R39
2	2N3906	2N3906	T3, T4

Place the female pin header (PCB_INTERCONN_POTS) and solder them ensuring it is 90º from PCB.

Open "Control Board Bag C"

Place the minijacks ensuring they are by the silkscreen side **but don't solder** them until the front panel is on place and with all nuts screwed to it.
This way it's easier to solder them on the right position. Keep in mind that the front panel holes are quite narrow and is almost impossible to place it with all the components already soldered. **Caution:** the switch nuts and the jack nuts looks the same but they are not...so don't mix them!

Open "Control Board Bag B"

Cut the little ledge on all pots with cutting pliers as pictured:

Place potentiometers ... but don't solder them.

Qty.	Value	Name on PCB
8	Single (3pin)	Cutoff_1, Cutoff_2, Res_init_1, Res_init_2, Cutoff_att_1, Cutoff_att_2, Vol_in_1, Vol_in_2

Place the switches but don't solder them until they are screw to the front panel. This way it's easier to solder them on the right position.

Qty.	Value	Name on PCB
3	Single two position	LINK, LO-HI_SELECT_1, LO-HI_SELECT_2

Put LEDs on place taking care of the polarity. **but don't solder** them until the front panel is on place. This is the only way to solder them on the right position.

Long Leg is the + . In the PCB the square hole is the minus and there is a + symbol to indicate you the right position.

QTY	*Name on PCB*
2	LED1, LED2

Place the front panel moving a little the parts one by one if necessary until you fit them to the top. At this point a sharp tweezers can be helpful.
Screw in this order: minijacks, switches and then pots until all of them are flat and touching completely the panel. Then solder all of them.

Place the LEDs in the panel holes making sure they are on the right level and proceed to solder.

Place the spacers on the holes using their male side and facing to the resistor's side of the PCB. Then fix with the 3mm nuts (Nuts will be placed from potentiometers/jacks side)

Put the two boards together aligning the connector properly.

Please check this checklist to ensure that your module has been properly assembled:

http://www.befaco.org/en/trubleshooting-questions/

Calibration procedure.

In order to set to the correct freq. Range he filters should be calibrated. Wi will do this with the adjust potentiometers CUTOFF_INIT_1, CUTOFF_INIT_2.

The procedure is the same for both:

- Connect the system to the power supply.
- Turn the resonance pot to max and the Cutoff to the middle.
- Connect a frequency counter, tuner or oscilloscope to the output of the filter.
- Move the CUTOFF_INIT_1 o CUTOFF_INIT_2 (depending on which filter are you adjusting) until you can measure 500Hz at output or B4+20 cents.