BF-22 Sallen Key filter: Assembly Reference

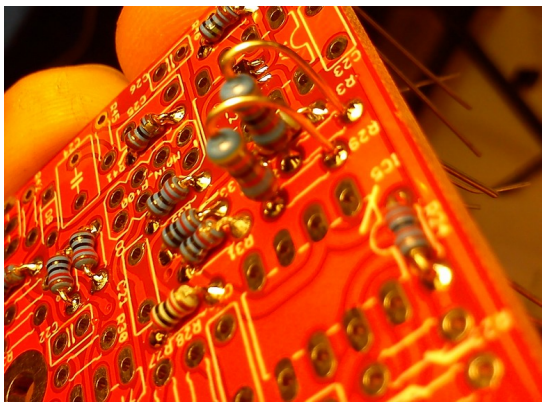
Main PCB

Open "Main Board Bag A"

Resistors:

Qty.	Value	Code	Name on PCB
4	47 Ohm	Yellow, Purple, Black, Gold, brown	R1, R2, R25, R26
4	220 Ohm	Red, Red, black, black, brown	R3, R4, R39, R40
2	470 Ohm	Yellow, Purple, black, black, Brown	R41, R42
2	680 Ohm	Blue, Grey, black, black Brown	R31, R32
2	820 Ohm	Grey, Red, black, Black,Brown	R27, R28
4	3k	Orange, Black, Black, brown, brown	R36, R37, R51, R52
4	4.7k	Yellow, Purple, black, brown, brown	R11, R12, R43, R44
2	5.6k	Green, blue, black, brown, brown	R47, R49
2	7.32k	Purple, Orange, Red, Brown, Brown	R35, R38
10	10k	Brown, Black, Black, Red, Brown	R8, R9, R13, R14, R17, R18, R21, R22, R23, R24
2	15k	Brown, Green, black, red, brown	R33, R34
2	27k	Red, purple, black, red, brown	R48, R50
2	33k	Orange, Orange, black, red, brown	R29, R30
2	47k	Yellow, Purple, black, red, brown	R7, R10
2	82k	Gray, red, black, red, brown	R45, R46
2	270k	Red, Purple, Black, Orange Brown	R19, R20
2	470k	Yellow, Purple, black, orange, brown	R5, R6
2	910k	White, brown, black, orange, brown	R15, R16

If any resistor is bigger than it should for the assigned space put it in vertical, like in this photo:



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*
4	1N4148	D5, D6, D7, D8
2	1N5817	D3, D4

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. The orientation must match the PCB's silkscreen. Save the ICs until the end of assembly.

Capacitors:

Qty.	Value	Code	Name on PCB
4	220p	n22	C19, C20, C23, C26
4	1nF	1nK	C9, C10, C22, C25
2	3.3nF	3n3K	C5, C6
8	100n	104	C1, C2, C15, C16, C17, C18, C21, C24

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	C3, C4, C7, C8
2	33uF	33uF Black-gold	C13, C14
2	220uF	220uF	C11, C12

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

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

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

Qty	*Value*	*Name on PCB*
2	2N3819	Q8, Q7
4	2N3906	T1, T2, Q9, Q10

Control PCB

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

Open “Control Board Bag A”

Resistors:

Qty.	Value	Code	Name on PCB
4	1k	Brown, Black, Black, Brown, Brown	R100, R101, R102, R103
8	10k	Brown, Black, Black, Orange, Brown	R117, R118, R120, R121, R124, R125, R128, R129
2	15k	Brown, Green, Black, red, Brown	R116, R119
2	43k	Yellow, orange, black, red, brown	R106, R107
2	47k	Yellow, purple, black, red, brown	R130, R131
16	100k	Brown, black, black, orange, brown	R104, R105, R108, R109, R110, R111, R112, R113, R114, R115, R122, R123, R126, R127, R132, R133

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*
2	1N4148	D1, D2

Place the sockets taking care of the orientation and solder them on IC100, IC101. The orientation must match the PCB's silkscreen. Save the ICs until the end of assembly.

Capacitors:

Qty.	Value	Code	Name on PCB
2	1nF	1nK	C102, C103
6	100n	104	C100, C101, C104, C105, C106, C107

Solder the Trimmers. Make sure screw is facing out of the board.

Qty.	Value	Code	Name on PCB
2	100k	100k	CUTOFF_INIT_A, CUTOFF_INIT_B

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

Qty	*Value*	*Name on PCB*
2	2N3906	T100, T101

Place the female pin headers and solder them ensuring it is 90º from PCB.

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_A, CUTOFF_ATT_A, CUTOFF_ATT_B, CUTOFF_B, RES_INIT_A, RES_INIT_B, 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 a 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 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 them properly. In this early version the main board exceeds 1mm the control board, you will need to make a bit of extra effort to match them.

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

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

During procedure you will install ICs. See their location:

Qty	*Value*	*Name on PCB*
2	NE5532	IC1, IC2
1	LM13700N	IC3
2	TL074P	IC100, IC101

Calibration procedure.

In order to work properly the filters should be calibrated, to do this we have the adjust potentiometers CUTOFF_INIT_A, CUTOFF_INIT_B.

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_A o CUTOFF_INIT_B (depending on which filter are you adjusting) until you can measure 500Hz at output or B4+20 cents.