

## THANKS FOR CHOOSING ONE OF OUR KITS!

This manual has been written taking into account the common issues that we often find people experience in our workshops. The order in which the components are placed on the board is meant to make assembly as easy as possible.

Some steps are not obvious, so even if you're an experienced DIYer please read the steps thoroughly before starting.

If this is your first project, please read this article before you start assembling the kit:

[www.befaco.org/howto/](http://www.befaco.org/howto/)

**GOOD LUCK!**

## MAIN PCB (The small one)

### OPEN MAIN BOARD BAG A

#### RESISTORS

Qty	Value	Code	Name on PCB
6	100k	Brown, black, black, orange, brown	R4, R8, R9, R12, R13, R18
4	4K7	Yellow, violet, black, brown, brown	R1, R2, R11, R17
4	10k	Brown, black, black, red, brown	R10, R16, R19, R22
1	1k	Brown, black, black, brown, brown	R21
3	2k2	Red, red, black, brown, brown	R3, R7, R20
1	330k	Orange, orange, black, orange, brown	R5
1	56k	Green, blue, black, red, brown	R15
1	3k3	Orange, orange, black, brown, brown	R14
1	1M	Brown, black, black, yellow, brown	R6

#### DIODES

Solder the diodes **observing their polarity**. The black or white line on the diode must match with the white line on the diode symbol on the PCB silkscreen.

Qty	Value	Name on PCB
4	1N4148 (orange color)	D1, D2, D3, D4
2	1N5817 (black color)	D5, D6

#### FERRITES

Solder the two ferrite beads by using a recycled resistor leg passed through each ferrite and proceed as if it were a resistor. Ferrite beads don't have polarity.

Qty	Name on PCB
2	FER_1, FER_2

## OPEN MAIN BOARD BAG B

### CAPACITORS

Identifying capacitors can be quite tricky. Codes stated are indicative, please take a look at this guide for help identifying capacitors: <http://www.wikihow.com/Read-a-Capacitor>

Qty	Value	Code	Name on PCB
10	100n	104	C1, C2, C4, C8, C9, C10, C11, C13, C14, C16, C17
2	1n	102	C7, C12
1	100p	101	C5
1	10n	103	C3
1	470n	.47 (or 473)	C15
1	2n2	2200 (red color)	C6

### REGULATOR

Make sure the voltage regulator is positioned correctly with reference to the silkscreen outline on the PCB

Qty	Code	Name on PCB
1	78L05	IC2

### ELECTROLYTIC CAPACITORS

Values are written on the side of the capacitor. Mind their polarity (The long leg of the capacitor is the positive (+)).

Qty	Value	Code	Name on PCB
2	10uf	10uf	C18, C19

### TRANSISTORS

Be sure they are orientated correctly. The curved and flat sides of the silkscreen outline of the transistor on the PCB must match that of the transistor's body.

Qty	Code	Name on PCB
4	2N3904	T2, T3, T5, T6
2	2N3906	T1, T4

### MALE PIN HEADERS

Place and solder the male pin headers (CON\_1 and CON\_2) where the silkscreen indicates (it is the shorter pins that you are soldering).



**POWER CONNECTOR**

Solder the power connector at “POWER1”, ensuring it is facing out from the edge of the PCB. The small arrow on the connectors must be on the side with the thick white line.

**OPEN THE ICS BAG**



**ICs**

First **place the sockets** (taking care to orientate them properly - the notch or dot on one end of the IC should match the image on the silkscreen) and solder them into their correct positions.

Next place the ICs in their respective sockets (again taking note of their orientation - the notch or dot on the top of the IC must match that of the socket and silkscreen).

**CONTROL PCB**

Qty	Value	Name on PCB
1	TL074	TL074/84
1	CD4013	CD4013
1	CD4052	CD4052
1	CD4073	CD4073
1	TL072	TL072/82

**MAIN PCB**

1	TL074	TL074/84
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**Buen trabajo! You’ve already made it quite far through the build. How are your focus and energy levels? Do you think a 15 minute break would better prepare you for the rest of the build (this is a big one!)? Maybe you could call someone you haven’t talked to in a while or do something useful like debate politics on facebook or look at videos of cats being jerks?**

**[CONTINUED ON NEXT PAGE]**

## CONTROL PCB

### OPEN CONTROL BOARD BAG A

**RESISTORS**

Qty	Value	Code	Name on PCB
13	100k	Brown, black, black, orange, brown	R102 R113, R114, R115, R116, R118, R119, R121, R122, R125, R126, R128, R129
7	1k	Brown, black, black, brown, brown	R100, R101, R117, R120, R123, R124, R127
3	3M	Orange, black, black, yellow, brown	R109, R110, R111
3	47k	Yellow, violet, black, red, brown	R106, R108, R112
1	4k7	Yellow, violet, black, brown, brown	R105
1	2k2	Red, red, black, brown, brown	R107
1	10k	Brown, black, black, red, brown	R104
1	56k	Green, blue, black, red, brown	R103

**DIODES**

Solder the diode **observing its polarity**. The black or white line on the diode (which indicates the cathode - the negative side) must match the white line on the diode symbol on the PCB silkscreen.

Qty	Value	Name on PCB
1	1N4148	D100

**CAPACITOR**

Qty	Value	Code	Name on PCB
2	100n	104	C100, C101

**TRANSISTORS**

Be sure they are orientated correctly. The curved and flat sides of the silkscreen outline of the transistor on the PCB must match that of the transistor's body.

Qty	Code	Name on PCB
1	2N3906	T100



**FEMALE PIN HEADERS**

Place the female pin headers over the silkscreen markings at positions “TO\_100” & “TO\_101” and solder.

**OPEN CONTROL BOARD BAG B**

**SPACER**

Secure the spacers onto Control PCB (through the three holes with silver outlines) with the main body of the spacer on the component side, and the nut on the opposite.

**FADERS**

Solder the faders on the PCB where it is indicated by the silkscreen.

Qty	Name on PCB
4	A_POT, D_POT, R_POT, S_POT

**FRONT PANEL COMPONENTS MOUNTING TIPS:**

Now we will proceed to mount the jacks, potentiometers, switches and LEDs. This part of the assembly is CRITICAL. Please take your time and read the following instructions carefully.

These components must **NOT** be soldered until they are placed on the PCB and fully attached to the front panel.

There are two reasons for this:

- The height of the panel components are not all the same. Because of this, if not attached properly before soldering, they will not stay properly seated against the panel. This might cause mechanical stress reducing their life expectancy and in the worst case cause them to break.
- The second reason is that it is very difficult to align the components to the holes if the panel is not positioned prior to soldering. In the case of the LEDs, they are almost impossible to set to the correct height without reference to the front panel.



**LEDs**

Place the LEDs onto the PCB minding, their polarity, but **don't solder them** until the front panel is in place. This is the only way to solder them in the right position.

The long leg is the positive and the short the negative. On the PCB the square pad indicates the negative side and there is a + symbol to indicate the positive.

Qty	Name on PCB
5	L_0, L_A, L_D, L_R, L_S

**[CONTINUED ON NEXT PAGE]**

**POTENTIOMETER**



Cut the locating lug on the pot with snips as pictured. Now place the potentiometer on the PCB but... **don't solder it yet!**

Qty	Type	Name on PCB
1	Dual (6pin) B100K	SHAPE

**TOGGLE SWITCH**

Remove the two nuts and the tabbed washer from the toggle switches (if they are still present). Discard one nut and the tabbed washer, but keep one nut for securing to the front panel later. Place the toggle switches on the PCB but **don't solder them** yet.

Qty	Type	Name on PCB
1	SPDT ON-ON Toggle	MODE

**PUSH BUTTON**

Remove the nut from the push button but leave the washer in place. Now fit the push button onto the PCB but again...**don't solder it yet.**

Qty	Type	Name on PCB
1	Red Cap OFF/ON Push-Button	M_TRIG

**OPEN MINI-JACKS BAG**

**MINI-JACKS**

Place all the mini-jacks onto the PCB ensuring they are on the silkscreen side, but **don't solder yet.**

**Note:** The two rows of 4x mini-jacks at the bottom of the control PCB will be orientated such that they face each other with each opposite pair of mini-jacks sharing a solder point for their 3<sup>rd</sup> (outer) legs.

**Caution:** the switch nut and the jack nuts look the same, but they are not equally sized and will not fit in each others' thread, so make sure to keep them separate!

**[CONTINUED ON NEXT PAGE]**

**FRONT PANEL**

Attach the **front panel** adjusting the parts one by one if necessary until they fit. At this point a pair of fine tweezers can be helpful.

To finish:

- Secure the parts to the panel in this order: A) **Mini-jacks** B) **Switch** C) **Pot** D) **Push button**.
- Ensuring all of the above parts are flush with the panel then you can finally **solder** them!
- Next, adjust the **LEDs** so that they are flush with the panel and solder them.
- Connect the **main PCB** to the **control PCB** by threading the 3x M3 screws through the main PCB and securing them to the 3 spacers. The main PCB should be orientated so that the component side is facing towards the front panel.
- Put the **knob** on the potentiometer and the red end-**caps** on any switches/faders.
- Connect the **power ribbon cable**: The red wire (-12V) on the power ribbon cable corresponds to pin number one on the male power connector. The number one pin is indicated with a small triangle on the male power connector and a white line on the main PCB. A white or black line (or “-12v”) marked on your power bus normally indicates the corresponding pin.

**ENJOY YOUR NEW BEFACO MODULE!**