

## 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/)

You will be soldering both boards at the same time. Keeping them in the panel together might help you thru the build. We will suggest when to break them apart.

## HAVE FUN!

### BAG A


RESISTORS			
Qty	Value	Code	Name on PCB
13	1k	Brown, black, black, brown, brown	R11, R12, R32, R100, R104, R105, R106, R130, R131, R133, R134, R137, R138
12	10k	Brown, black, black, red, brown	R17, R19, R29, R102, R109, R111, R122, R123, R124, R126, R128, R132
10	100k	Brown, black, black, orange, brown	R18, R103, R107, R110, R114, R116, R118, R127, R129, R136
5	20k	Red, black, black, red, brown	R8, R27, R28, R30, R135
4	1k5	Brown, green, black, brown, brown	R20, R21, R23, R24
3	1M	Brown, black, black, yellow, brown	R108, R119, R121
2	3k3	Orange, orange, black, brown, brown	R4, R15
2	4.7k	Yellow, violet, black, brown, brown	R2, R3
2	6k8	Blue, gray, black, brown, brown	R5, R6
2	8k2	Gray, red, black, brown, brown	R22, R26
1	75 Ohm	Violet, green, black, gold, brown	R25
1	680 Ohm	Blue, gray, black, black, brown	R1
1	820 Ohm	Gray, red, black, black, brown	R16
1	2k	Red, black, black, brown, brown	R125
1	2k7	Red, violet, black, brown, brown	R120
1	3k	Orange, black, black, brown, brown	R13
1	5k6	Green, blue, black, brown, brown	R14
1	6k2	Blue, red, black, brown, brown	R10
1	18k	Brown, gray, black, red, brown	R9
1	68k	Blue, gray, black, red, brown	R101
1	75k	Violet, green, black, red, brown	R7
1	200k	Red, black, black, orange, brown	R112
1	300k	Orange, black, black, orange, brown	R31
1	560k	Green, blue, black, orange, brown	R117
1	820k	Gray, red, black, orange, brown	R115
1	4M7	Yellow, violet, black, yellow, brown	R113



**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
9	1N4148	D1, D100, D101, D102, D103, D104, D105, D106, D107
2	1N5817 (black)	D2, D3
9	1N5400 (black)	D4, D5, D6, D7, D8, D9, D10, D11, D12
4	1N457 (black)	Z1, Z2, Z3, Z4




**FERRITE**

To solder the two ferrite beads use 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	Ferrite

## 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
18	100n	104	C1, C2, C3, C7, C11, C12, C17, C19, C121, C122, C127, C129, C130, C131, C134, C135, C136, C138
6	10pF	10	C10, C118, C124, C128, C132, C137
4	22pF	22	C8, C9, C13, C14
3	1nF	102	C16, C119, C123(Beside 122)
2	1n8 Polyester	1n8	C4, C5
2	10nF Polyester	10nk100	C6, C18
1	15nF Polyester	15nk100	C15
1	560pF	561	C133

## OPEN ICs FOAM




**ICs**

**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.  
Keep ics for later.

Qty	Value	Name on PCB
4	DIP8	IC100, IC101, IC102, IC103
1	DIP8	IC3
1	DIP8	IC1
1	DIP14	IC2
1	DIP8	IC4


This is a good moment to break both boards apart. Do it gently and then remove the little ledges.



**ELECTROLYTIC CAPACITORS**

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

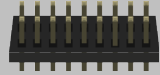
Qty	Value	Code	Name on PCB
3	10uF	10uF	C117, C120, C126
1	1uF	1uF	C125



**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	Value	Name on PCB
1	2n3906	T1
4	2n3904	T100, T101, T102, T103
2	BC546B	T4, T5
2	PN4250A	T2, T3
1	LM317	IC5




**MALE PIN HEADERS**

Place and solder the Male Pin Headers on the silkscreen side of the main board (It is the shorter pins that you are soldering). Double check they all are perfectly straight.

Qty	PINs	Name on PCB
2	2x3	JP1, JP2

## OPEN ICs FOAM




**ICs**

Place the ICs in their respective sockets taking note of their orientation – the notch or dot on the top of the IC must match that of the socket and silkscreen.

Qty	Value	Name on PCB
4	TL072	IC100, IC101, IC102, IC103
1	NE5532	IC3
1	LM393	IC1
1	LM339	IC2
1	NE555	IC4

## BAG C





**ELECTROLYTIC CAPACITORS**

Values are written on the side of the capacitor. Mind their polarity (The long leg of the capacitor is the positive (+)). These capacitors will be mounted on the back of the PCB.

Qty	Value	Code	Name on PCB
10	10uF	10uF/63V	C107, C108, C109, C110, C111, C112, C113, C114, C115, C116
4	10uF	10uF	C102, C104, C105, C106
2	47uF	47uF/63V	C100, C101
1	3300uF	3300	C103

## BAG D

<b>POWER CONNECTOR</b>	
Solder the power connector at "POWER" ensuring it is facing out from the edge of the PCB.	

<b>FEMALE PIN HEADERS</b>		
Place the female pin headers on the control board over the silkscreen markings at positions and solder. Double check they all are perfectly straight.		
Qty	PINs	Name on PCB
2	2x3	JP100, JP101

<b>SPACER</b>
Secure the spacer onto the CONTROL PCB (through the two hole with silver outline) with the main body of the spacer on the component side, and the nut on the opposite.

<b>FADER</b>	
Solder the faders on the PCB where it is indicated by the silkscreen (on the reverse side to the smaller components).	
Qty	Name on PCB
2	ATTACK, DECAY

<b>COMBO CONNECTOR</b>	
Solder the Combo Connector at J1.	

**You're nearly at the end, but the next part is critical and takes a good bit of concentration. If you're feeling a bit strained, a break would definitely help. Reply to those unread messages or prove someone wrong in Internet, for example. Mechanical parts are really delicate and will need your full attention.**

**FRONT PANEL COMPONENTS MOUNTING TIPS:**

Now we will proceed to mount mechanical parts to panel. 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.

MINI-JACKS		
Place the mini-jacks on the PCB ensuring they are on the side with the silkscreen but <b>don't solder them until the front panel is in place with all nuts screwed to it.</b> This way it's easier to solder them in the right position. Keep in mind that the front panel holes are quite narrow and it is almost impossible to place it with all the components already soldered.		

POTENTIOMETERS		
Now place the potentiometer on the PCB but... <b>don't solder it yet!</b>		
Qty	Type	Name on PCB
3	Single (3pin) B100k	THRESHOLD, ENV_GAIN, GAIN

SWITCHES		
Take off all nuts and washers. Place the switches in their right places. <b>But do not solder them yet!</b>		
1	Two circuits Three position	S1
1	Mini. One circuits two position	48V

LEDs		
Place the LEDs onto main PCB minding its polarity, but <b>don't solder them</b> until the front panel is in place. This is the only way to solder them the right position.		
Qty	Type	Name on PCB
4	Red LED 2mm	ENV_LED, GATE_LED, LED_B, TRIG_LED
3	Green LED 3mm	LED4, LED5, LED6
2	Yellow LED 3mm	LED2, LED3
1	Red LED 3mm	LED1

**FRONT PANEL**

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

**To Finish:**

- Screw in the parts in this order: A) **Mini-jacks** B) **Pots**. C) **Switch**
- Ensuring all of the above parts are flush with the panel and both PCB and panel are perfectly parallel. Then you can **finally solder** them
- Fit the LEDs on the panel holes and solder them.
- When placing the main board, carefully hook the Neutrik combo connector through the hole on the front panel, then carefully connect the pin headers between the main board and control board.
- Once the Neutrik combo connector is stable through the hole and the pin headers well connected, Screw the nuts of the connector and now fit the LEDs on the panel holes and solder them.
- Put the **knobs** on the potentiometers and the red caps on the 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.

