

THANKS FOR CHOOSING ONE OF OUR KITS!

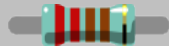
This manual has been written taking into account the common issues that we often find people experience in our workshops. The order in which the components are placed on the board is meant to make assembly as easy as possible.


This is a quite complex build. If you are not an experienced DIYer you might find yourself in trouble. Some steps are not obvious, and some components tricky to solder, so even if you're an experienced DIYer please read the steps thoroughly before starting.

HAVE FUN!

MAIN PCB

OPEN MAIN BOARD BAG A

RESISTORS 			
Qty	Value	Code	Name on PCB
18	100k	Brown, black, black, orange, brown	R34, R35, R36, R37, R38, R39, R40, R41, R63, R64, R65, R66, R67, R68, R69, R70, R101, R104
60	10k	Brown, black, black, red, brown	R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R19, R20, R21, R22, R23, R27, R28, R30, R31, R32, R42, R54, R55, R56, R57, R58, R59, R60, R61, R79, R80, R81, R82, R83, R84, R85, R86, R88, R89, R90, R91, R92, R93, R94, R95, R96, R99, R106, R107, R109, R110, R116, R118, R120, R122
8	150k	Brown, green, black, orange, brown	R71, R72, R73, R74, R75, R76, R77, R78
8	820k	Grey, red, black, orange, brown	R46, R47, R48, R49, R50, R51, R52, R53
6	1k	Brown, black, black, brown, brown	R17, R25, R44, R62, R100, R112
6	330R	Orange, orange, black, black, brown	R18, R24, R33, R43, R97, R111
6	5k6	Green, blue, black, brown, brown	R1, R26, R29, R45, R98, R113
6	12k	Brown, red, black, red, brown	R87, R105, R114, R115, R117, R119
2	470R	Yellow, purple, black, black, brown	R102, R103
2	9k1	White, brown, black, brown, brown	R108, R121

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
16	1N4148 (orange)	D1, D2, D3, D4, D5, D6, D7, D9, D10, D11, D12, D13, D14, D15, D16, D17
2	1N5817 (black)	D8, D18

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+, FERRITE-

OPEN ICs BAG

IC SOCKETS

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

Qty	Value	Name on PCB
5	2x4 pin	IC1, IC2, IC3, IC4, IC5

OPEN MAIN BOARD BAG B (Keep the remaining components from ICs bag for later)

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
11	100nF	104	C3, C10, C23, C24, C25, C26, C27, C28, C29, C30, C31
6	1nF	102	C1, C6, C8, C19, C22, C32
2	10pF	10	C2, C4

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
16	2n3906	T7, T8, T10, T11, T12, T14, T15, T16, T17, T18, T19, T20, T21, T22, T23, T24
8	2N3904	T1, T2, T3, T4, T5, T6, T9, T13

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
10	10uF	10uF	C9, C12, C13, C14, C15, C16, C17, C18, C34, C35
6	47uF	47uF	C5, C7, C11, C20, C21, C33

VACTROLS

Mind polarity when placing the Vactrol. Short leg for negative in silkscreen

VTL5C10	LDR1, LDR2, LDR3, LDR4, LDR5, LDR6
---------	------------------------------------

MALE PIN HEADERS

Place and solder the Male Pin Header on the silkscreen side. It is the shorter pins that you are soldering and long ones will connect the boards. Please make sure **they are straight**.


2	2x5	JP1B, JP2B
4	2x6	JP3B, JP4B, JP5B, JP6B

POWER CONNECTOR

Place the power connector at "POWER" at silkscreen side, ensuring it is facing out from the edge of the PCB.

COMMUNICATION PORTS

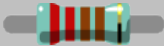
Solder **X1** and **X2** IDC connectors , ensuring the position is correct: they must be soldered at silkscreen side, same side as the rest of components and facing out of the board. Longest connector is in Pots bag.


ICs		
		
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). Like this it will be easier to place the rest of components.		
Qty	Value	Name on PCB
5	TL072	IC1, IC2, IC3, IC4, IC5

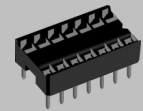
Good one! Main board is finished. Please take a 15 minute break, as it will prepare you for the rest of the build (this is a big one!)

CONTROL PCB

OPEN CONTROL BOARD BAG A

RESISTORS			
			
Qty	Value	Code	Name on PCB
36	10k	Brown, black, black, red, brown	R209, R210, R215, R219, R220, R221, R222, R223, R224, R225, R226, R227, R229, R237, R238, R239, R240, R242, R243, R250, R251, R253, R254, R255, R256, R257, R258, R259, R260, R261, R262, R263, R264, R272, R278, R286
16	1M	Brown, black, black, yellow, brown	R216, R217, R230, R231, R232, R233, R234, R235, R236, R241, R244, R245, R246, R247, R248, R249
12	6k8	Blue, grey, black, brown, brown	R273, R274, R275, R276, R277, R281, R282, R283, R284, R285, R287, R288
10	100k	Brown, black, black, orange, brown	R202, R203, R204, R205, R207, R208, R265, R280, R290, R291
8	47k	Yellow, purple, black, red, brown	R228, R252, R266, R267, R268, R269, R270, R271
6	39k	Orange, white, black, red, brown	R206, R211, R212, R213, R214, R218
4	15k	Brown, green, black, red, brown	R295, R296, R298, R299
2	91k	White, brown, black, red, brown	R294, R297
2	220k	Red, red, black, orange, brown	R292, R293
2	1k	Brown, black, black, brown, brown	R200, R201
2	36k	Orange, blue, black, red, brown	R279, R289

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	D200, D201, D202, D203



IC SOCKETS

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.

Qty	Value	Name on PCB
16	2x4 pin	IC200, IC201, IC202, IC203, IC204, IC205, IC206, IC207, IC208, IC209, IC210, IC211, IC212, IC213, IC214, IC215

OPEN CONTROL BOARD BAG B



DIP SWITCH

Solder the DIP switch at S200. This switch will set levels for both channels of output.



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
32	100nF	104	C200, C201, C202, C203, C204, C205, C206, C208, C209, C210, C212, C213, C220, C221, C223, C224, C225, C226, C227, C228, C230, C232, C233, C234, C235, C236, C237, C244, C254, C264, C274, C277
8	470pF	470	C207, C214, C215, C217, C219, C229, C216, C218* (WIMA)
8	4.7nF	4.7nF	C211, C231, C247, C248, C249, C250, C251, C252
8	47nF	47nF	C246, C256, C258, C259, C260, C261, C262, C263
8	560pF	561	C222, C238, C239, C240, C241, C242, C243, C245
4	10pF	10	C253, C265, C275, C276


* These two capacitors are a tight in space. **Leave some slack** for **JP1A** and **JP2A** to fit.



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
10	10uF	10uF	C255, C257, C266, C267, C268, C269, C270, C271, C272, C273




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
4	2N3904	T200, T201, T202, T203


OPEN CONTROL BOARD BAG C



FEMALE HEADER


Place the female pin headers on the silkscreen side. Please make sure **they are straight.**

2	2x5	JP1A, JP2A
4	2x6	JP3A, JP4A, JP5A, JP6A



VCA EXTENSION CONNECTOR

Solder the VCA expander connector at VCA_CON. Ensuring that its position is following the orientation of the silkscreen.



ICs

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).

Qty	Value	Name on PCB
16	TL072	IC200, IC201, IC202, IC203, IC204, IC205, IC206, IC207, IC208, IC209, IC210, IC211, IC212, IC213, IC214, IC215

SPACERS

Secure the two 12 mm male/female spacers onto the CONTROL PCB (through the holes with silver outlines) with the main body of the spacer on the component side, and the nut on the opposite.

WARNING: *If you don't screw them now, you won't be able to do it later!!!* Make sure they are tightly fastened, use a tool for this purpose.

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. Mechanical parts are really delicate and will need your full attention. Please read all steps carefully: A MISTAKE FROM HERE WILL UNLEASH A DESOLDERING MAYHEM

ON YOU. YOU ARE WARNED.

FRONT PANEL COMPONENTS MOUNTING TIPS:

Now we will proceed to mount the jacks, potentiometer, 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.

In order to avoid problems with potentiometers we need to make sure the right height is set. Please remind to use the washers and follow soldering procedure. We need to have all pots at same height as minijacks, so the easiest way to do so is to set Master volume pot as your reference and solder it at the same time as minijacks.

MINI-JACKS

Place the mini-jacks on the PCB ensuring they are on the side with the silkscreen but **don't solder them until the front panel is in place with all nuts screwed to it**. This way it's easier to solder them in the right position.

POTENTIOMETERS


Now place the potentiometer on the PCB. Do not place them all the way down, leave them loose and... **don't solder them yet!**
Do not forget to use the washers under the panel, as they will help getting the right height.

Qty	Type	Name on PCB
24	Single (3pin) B100k	HPF1, HPF2, HPF3, HPF4, HPF5, HPF6, LPF1, LPF2, LPF3, LPF4, LPF5, LPF6, MPF1, MPF2, MPF3, MPF4, MPF5, MPF6, GAIN_1, GAIN_2, GAIN_3, GAIN_4, GAIN_5, GAIN6
10	Dual (6pin) B10k	PAN1, PAN2, PAN3, PAN4, PAN5, PAN6, GAIN_M, HPF_M, LPF_M, MPF_M

SWITCHES

Remove washers and nuts from the switches.
Place them at **MUTE1, MUTE2, MUTE3, MUTE4, MUTE5, MUTE6**. These switches have orientation, make sure the momentary action is facing down. **But do not solder them yet!**

LEDs



Place the LED onto the PCB (the opposite side to the transistors, resistors etc...) minding its polarity (see next paragraph), but **don't solder them** until the front panel is in place. This is the only way to solder them the right position.
On the silkscreen and the image you will see the letters L and S to show right orientation.

Qty	Type	Name on PCB
-----	------	-------------

8	Duo_LED	LED1, LED2, LED3, LED4, LED5, LED6, LED7, LED8
---	---------	--

FRONT PANEL

At this point we have all mechanical components in place and ready to attach front panel. Before doing so, fill this check list (DO IT! We are watching you):

X	
	Are all LEDs properly oriented? (flat side facing left)
	Did you removed nuts and washers from the switches?
	Do all switches have momentary action facing down? (slot in neck, facing down)
	Did you placed washers on the pots?
	Are all pot legs straight and properly in place? (no legs bent or whatsoever)
	Are you sure no pot have been placed all the way down so they are touching the board?

If all check items have been marked, attach the **front panel** adjusting the parts one by one until it fits. At this point a pair of fine tweezers can be helpful. Be patient and extra careful, fitting all those components is hard and need your full attention.

To Finish:

- Screw in the parts in this order: A) **Mini-jacks** B) **Pots** C) **Switches**
- Make sure everything is flush against the panel and all pots end up all aligned (It's easy to spot like this pots not screwed flat against the panel)
- Solder all components **except potentiometer's location lugs**. This will allow you to debug easier if you made any mistake. Solder them only when module is finished and working.
- Place the LEDs at their right height and **solder them**.
- Doublecheck your soldering. Just in case.
- Connect the **Main PCB** to the **Control PCB** **by threading the M3 screws through the Main PCB** and securing them to the spacers. The main PCB should be orientated so that the component side is facing towards the front panel.
- Put the **knobs** on the potentiometers.
- Trim bottom row of potentiometers standoffs (GAIN pots) and IN5 jack. If they are too long, they might touch and damage expansion and power cable.
- **Please read user manual carefully before connecting your module.**

ENJOY YOUR NEW BEFACO MODULE!

