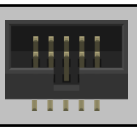
THANKS FOR CHOOSING ONE OF OUR KITS!

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/

HAVE FUN!

POWER CONNECTOR 
Solder the power connector at “POWER” ensuring it is facing out from the edge of the PCB.

FADERs	
Place the faders on the PCB where it is indicated by the silkscreen (on the reverse side to the smaller components). You can solder two of the small pins first to make sure faders are straight. We will solder the rest, when the front panel is assembled.	
Qty	Name on PCB
6	TIMBRE1, TIMBRE2, TIMBRE3, TIMBRE4, TIMBRE5, TIMBRE6

SWITCHES		
The correct placement of those switches is critical so please follow the next steps carefully. - Place the switches **flush** to the PCB and solder just one of the middle points of them. - We will solder the rest, when the front panel is assembled - Attach the front panel with just the pot nut and one jack nut.		
Qty	Type	Name on PCB
1	Mini. Dual circuit 3 position	SW1
1	Mini. One circuit 7 position	Oct1

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.

POTENTIOMETERS

Now place the potentiometer on the PCB but... **don't solder them yet!**

Qty	Type	Name on PCB
2	Single (3pin) B10k	PWM, PWM_ATT
1	Single (3pin) B100k	TUNE

MINI-JACKS

Place the mini-jacks on the PCB ensuring they are on the side with the silkscreen. Some of the minijacks ground legs will share the same solder holes (the 12 at the bottom). **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. 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.

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:

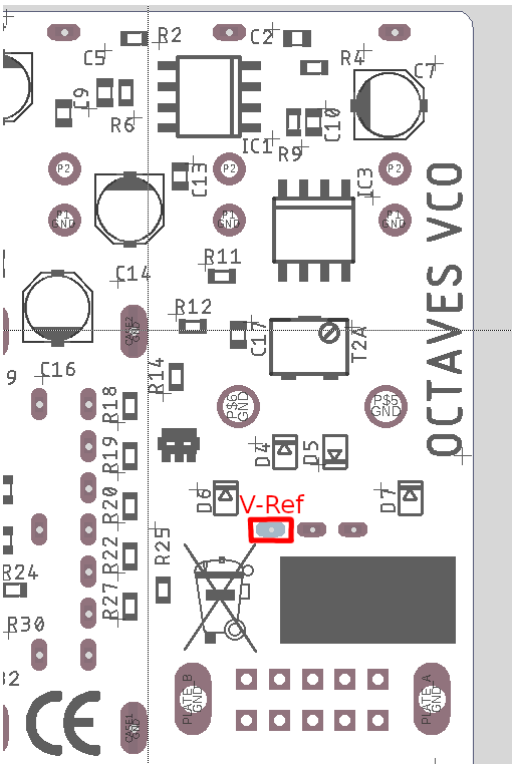
- Screw in the parts in this order: A) **Mini-jacks** B) **Pots.**
- Ensuring all of the above parts are flush with the panel and both PCB and panel are perfectly parallel. Then you can **finally solder** them!
- **Check the correct travel** and height of the switches and fader . If it travels smoothly, solder the rest of the joints and continue with the Front Panel.
- If the travel of the switch is not smooth (i.e: one of the sides touch the edge of the front panel), correct its position by heating the joint and pushing the switch or fader at the same time. Don't heat it without pressing it from the opposite side or the switch will fall against the Front Panel, remember it needs to be **flush** to the PCB.

- Put the **knobs** on the potentiometers and the red caps on the 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.

CALIBRATION

To calibrate the VCO we will need a a 0.5mm Flat Screwdriver, a Digital Multimeter (6000 counts or more would be the ideal for a very precise calibration but is not mandatory) and a Tuner. Any audio interface with a software tuner will do the job. Before start with the calibration process, **power up the module and leave it warming up for 15 minutes.** Once done, we can start with the procedure.

1- Take a look to the back of the module where you should see three Trim-pots. **The one on the right is T2A, WIDTH is near the power connector and INIT below.**



2- Pick your multimeter and select DC Voltage mode (typically marked as V=). Connect the black probe to a Ground point (you can use the sleeve of patch cable connected to any other module) and place the red probe touching the point marked As V-Ref on the image on the side.

You should read a value around 2.5V. Adjust carefully **T2A** trim-pot till you see **2.500V exactly**. If you have a good multimeter (6000 counts or more) that shows you 4 zeros, you will be able to adjust this even more accurately.

3- Place the Freq Pot to middle position, the Octave switch to the second position (C1) and the PWM pot to minimum position. Selectthe Range switch on Semitone Range position. Double check all the controls and if all is on its right spot, go to the next step.

During the next two steps, be sure to not move Freq control. As this control affects the frequency, any move on this will affect to your readings.

4- Connect the **F** output of the module to the input of your Tuner, turn up the fader and check the note that it shows you. Should be close to C1. Adjust the **Init** trim-pot till you get **C1** and 0 cents.

5- Move up the Octave switch to the fifth position (marked with 0 on the front panel) and check the Tuner. The note should be close to C4. Adjust **Width** trim-pot carefully till you get **C4** and 0 cents.

Come back to C1 position on the Octave switch and check the tuner.
If it shows you an accurate C1 (between 0-5 cents), check the rest of the octaves. You should get a C0 to C6 with similar accuracy.
If not (which would be the most regular case), **repeat steps 4 and 5 till you get a good accuracy on every octave.**
This process is based on iterations of steps 4 and 5 so don't worry if takes a bit to get the right tuning. The number of iterations needed to get a good calibration is different on every unit.