



THONK SYNTH T12 VCA OUT

OUTPUT MODULE

DUAL VCA, HEADPHONE + LINE OUTPUT

Eurorack DIY Kit
Build Instructions



OVERVIEW

For the most recent version of this document please visit

<https://www.thonk.co.uk/shop/thonk-synth-t12-vca-out>

This document should be used in conjunction with the relevant user manual.

All Thonk kits are sold under our standard Terms and Conditions -

<http://www.thonk.co.uk/faq/>

DIY INSTRUCTIONS

This document gives detailed instructions that assume you have purchased a complete kit from www.thonk.co.uk. It also assumes no previous knowledge of electronics. To learn to solder try http://youtu.be/I_NU2ruzyc4 and the **Adafruit guide to excellent soldering** – <http://bit.ly/1l77tF4>

Watch and understand that whole YouTube video! If you're not achieving the results shown in the video then you need to buy new tools or seek advice.

You will not end up with a working module otherwise.

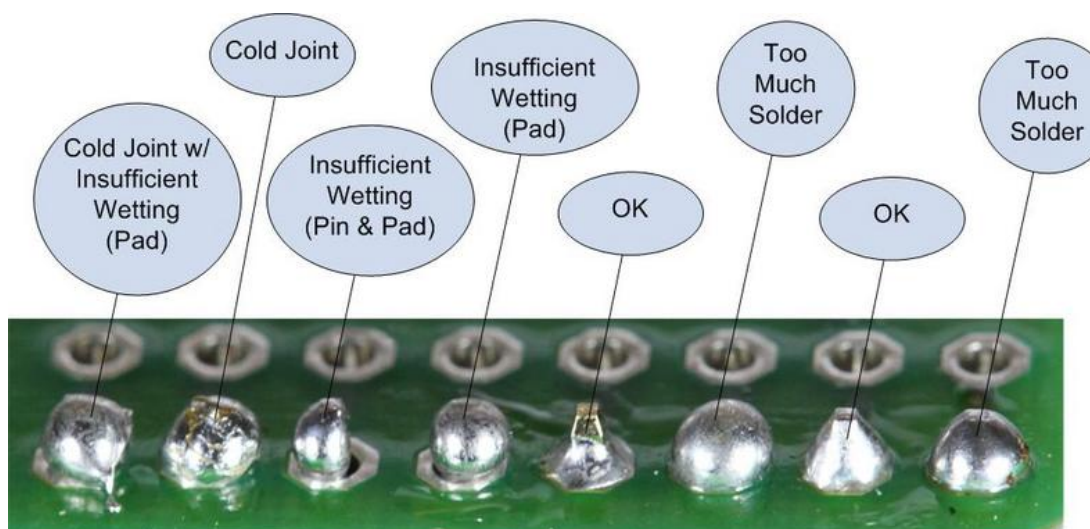
TOOLS REQUIRED

Soldering iron diagonal cutters AKA snips AKA side-cutters. A Digital Multimeter is always helpful for checking for bad solder joints and continuity. Thonk sell a range of inexpensive tools here - <http://bit.ly/1jxqF3n>

SOLDER JOINTS

Your solder joints should look like those shown as 'OK' below, they should have that neat conical shape on **BOTH sides of the PCB**. If they don't look the same on both sides then stop! Work out why from the soldering guides linked and don't continue until you are getting those results.

This isn't just OCD talking, you are very likely to end up with a destroyed, damaged or defective unit if you're not hitting that standard.



This photo is from the [Adafruit guide to excellent soldering](http://adafruit.com/guides/quickstart/soldering) and is reproduced under an Attribution-Sharealike creative commons license - <http://creativecommons.org/licenses/by-sa/3.0/>

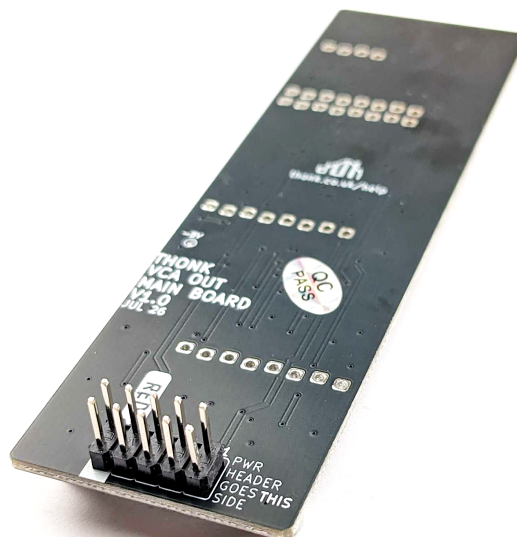


BUILD INSTRUCTIONS

1.

First take the main board and solder the 2x5 power header to the rear of the board (the side without the SMD components).

The header should stay firmly in place but you can check that this is soldered flush to the board by first soldering one joint and reflowing and adjusting where necessary.



2.

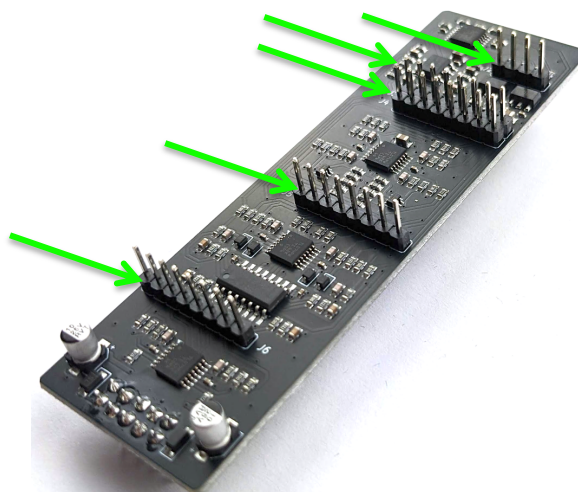
Continuing with the main board, take the single 1x4 pin header and four 1x8 pin headers.

Place these headers on the opposite side of the board to the power header and on the same side as the pre soldered components as pictured.

Note that two of the headers are paired together to make a 2x8 row

Flip the PCB over and solder all five of these headers ensuring they stay flush to the board.

The headers should stay firmly in place but you can check they are flush to the board by first soldering one joint and reflowing and adjusting where necessary.



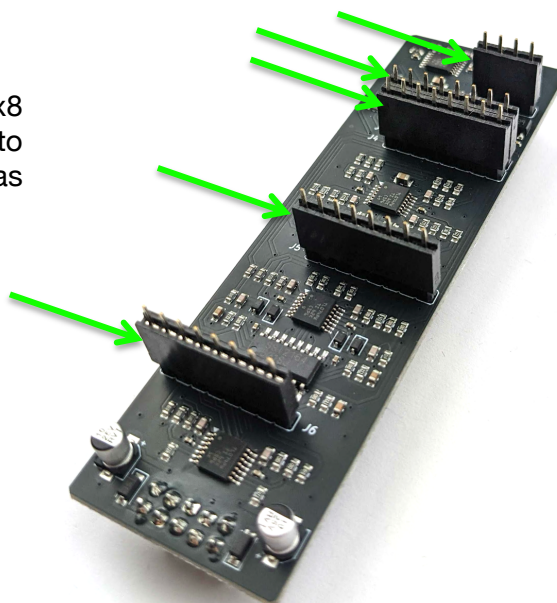


3.

Take the single 1x4 and four 1x8 socket headers and insert them onto the pin headers from step 2 as pictured.

DON'T SOLDER YET

Resume soldering at step 5.



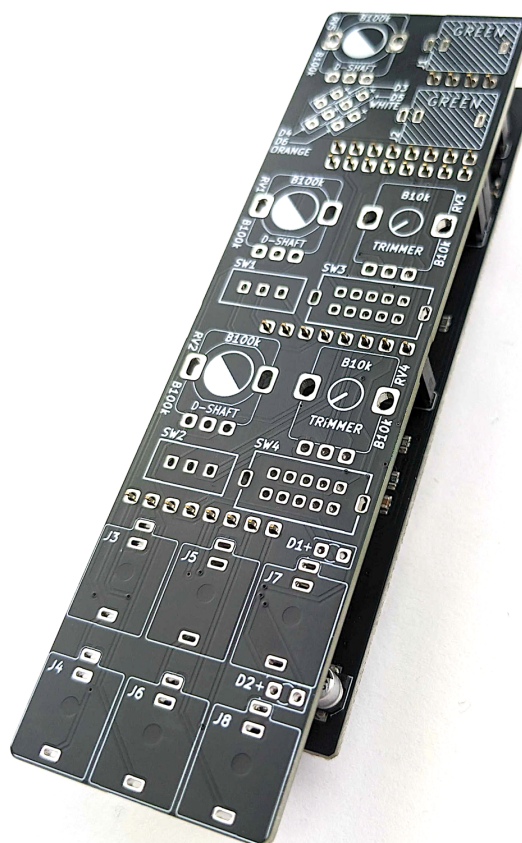
4.

Next take the control board and place it together with the main board inserting the pins from the socket headers into the pads on the control board.

Ensure the boards are the correct way round with the power header facing the rear of the module and the footprints on the Control PCB facing the front of the module as pictured.

DON'T SOLDER YET

Resume soldering at step 5.



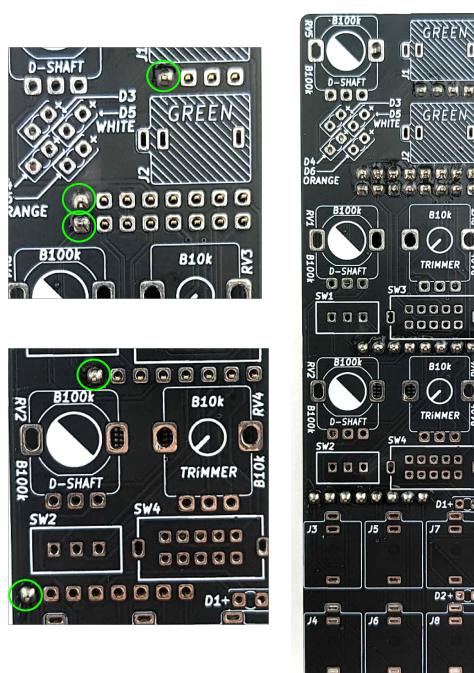


5.

On the control board solder one point of each socket header.

Check the headers are sitting flush and the boards are level with each other.

Reflow and adjust if necessary, before soldering all remaining points.



6.

Carefully detach the two boards and locate the following components for the next steps.

- B10k Tall Trimmers x2
- B100k D-Shaft Potentiometers x3
- Thonkiconn x6
- Stereo Green Thonkiconn x2
- Three Position Slide switches x2
- Red Two Position Slide Switches x2

Remove the nuts from the six black Thonkiconn Jacks.

DON'T SOLDER YET

Resume soldering at step 13.





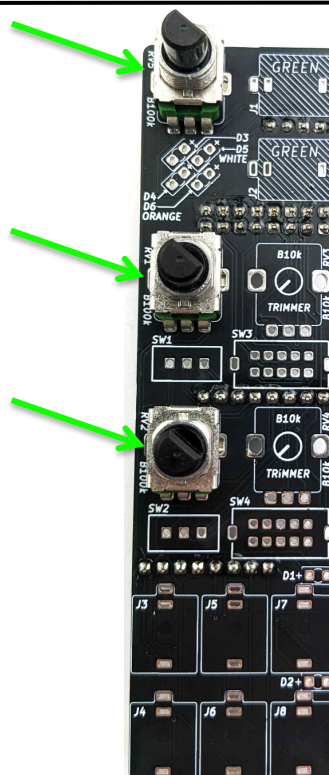
7.

First place the three D-Shaft pots into the positions pictured.

You may have to squeeze the legs to click each pot into place securely.

DON'T SOLDER YET

Resume soldering at step 13.

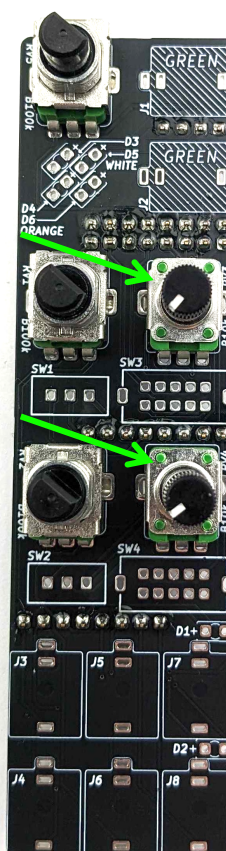


8.

Next place the two Tall Trimmer pots into the positions pictured on the right of the board.

DON'T SOLDER YET

Resume soldering at step 13.





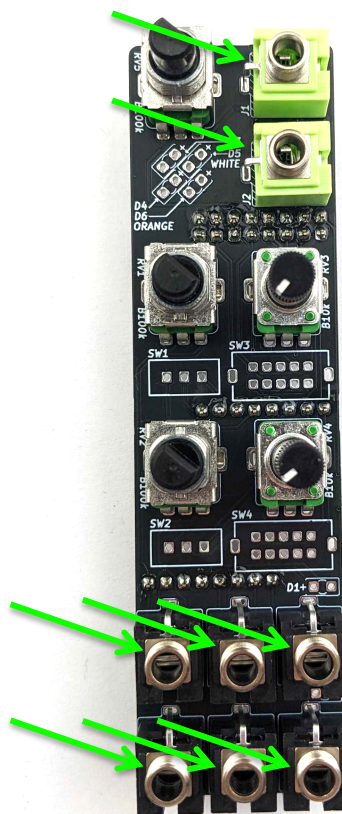
9.

Place the six black Thonkiconn jacks and two green Thonkiconn jacks into the positions pictured.

Ensure that the green jacks are placed at the top of the PCB following the footprint markings.

DON'T SOLDER YET

Resume soldering at step 13.



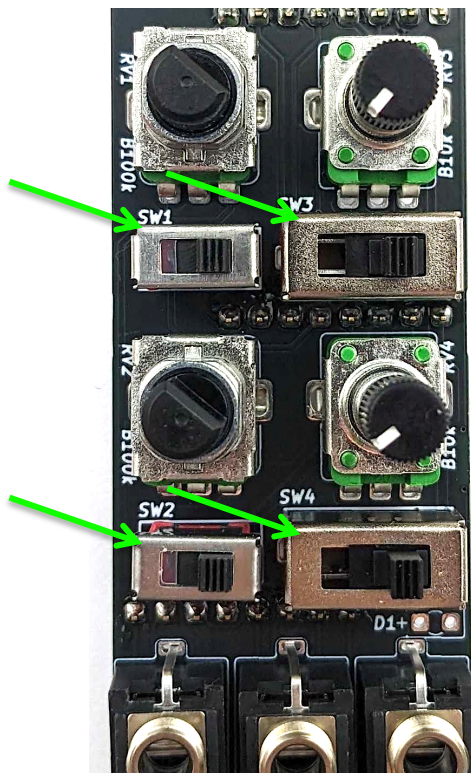
10.

Next place each of the two smaller red switches into positions SW1 and SW2.

Finally place the two larger 3-Position switches into the footprints marked SW3 and SW4 as pictured.

DON'T SOLDER YET

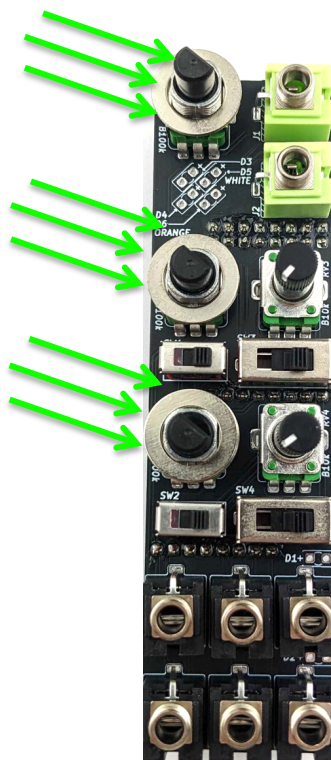
Resume soldering at step 13.



11.

Place three of the provided washers onto each of the D-Shaft pots before positioning the panel over the components.

This ensures the pots will stay level between the panel and PCB when soldering.



Secure the panel with just one of the black pot nuts and three of the knurled jack nuts in the positions pictured.

Tighten securely by hand but don't overtighten the nuts to avoid pulling any components off the board whilst handling.

DON'T SOLDER YET

Resume soldering at step 13.





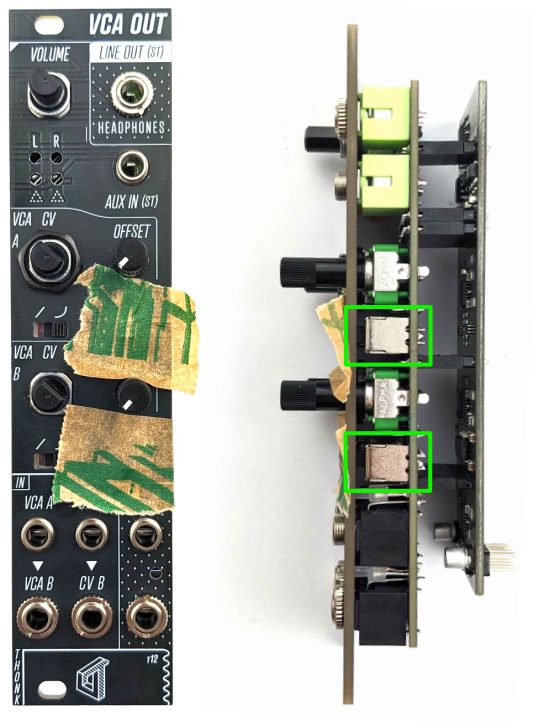
12.

Before soldering use small strips of masking tape to hold the two larger 3-Position switches against the PCB.

Ensure that these switches sit flush to the PCB as pictured before proceeding.

DON'T SOLDER YET

Resume soldering at step 13.

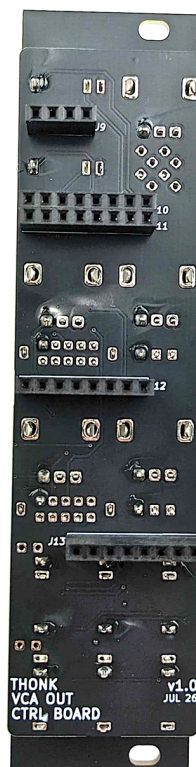


13.

When you are satisfied with the alignment between the PCB and panel proceed to solder just one point of each component.

Check all components are level between the panel and PCB and that all switches and pots function smoothly as expected.

Reflow and readjust any components as necessary before proceeding to solder all remaining points.





14.

Remove the panel once more before locating the two clear Orange/White LED's from the yellow labelled bag as pictured.

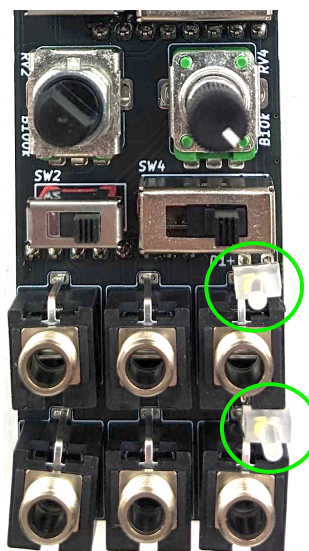


DON'T SOLDER YET

Resume soldering at step 20.

15.

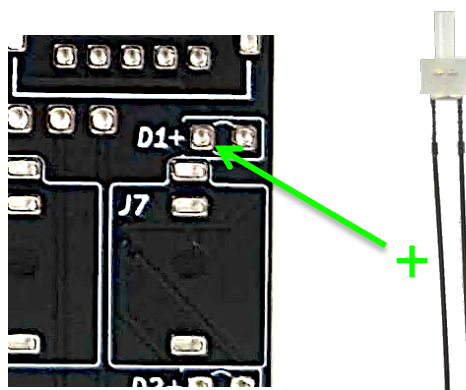
Place the two clear Orange/White LED's into the positions marked D1 and D2 at the bottom of the board as pictured.



CHECK ORIENTATION – these components are polarized and must be placed as pictured with the long leg inserted into the pad marked with '+'.

DON'T SOLDER YET

Resume soldering at step 20.



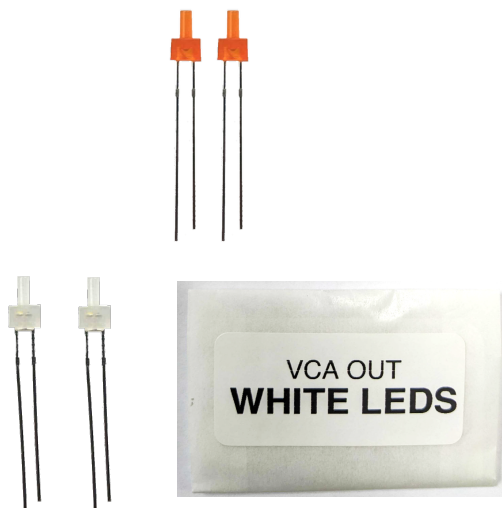


16.

Locate the two orange LED's from the remaining components and two white LED's from their individual labelled bag as pictured.

DON'T SOLDER YET

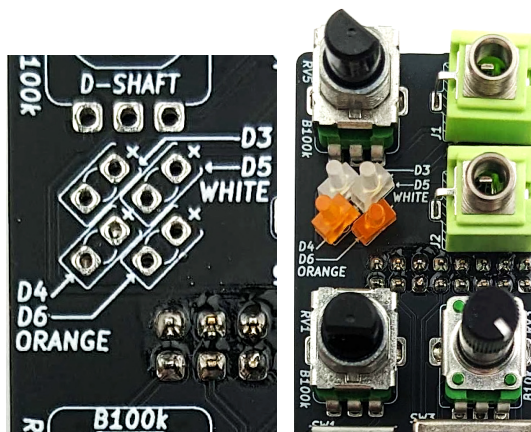
Resume soldering at step 20.



17.

Paying close attention to the PCB footprint place the two orange LED's into positions marked D4 and D6 and the two white LED's into position marked D3 and D5.

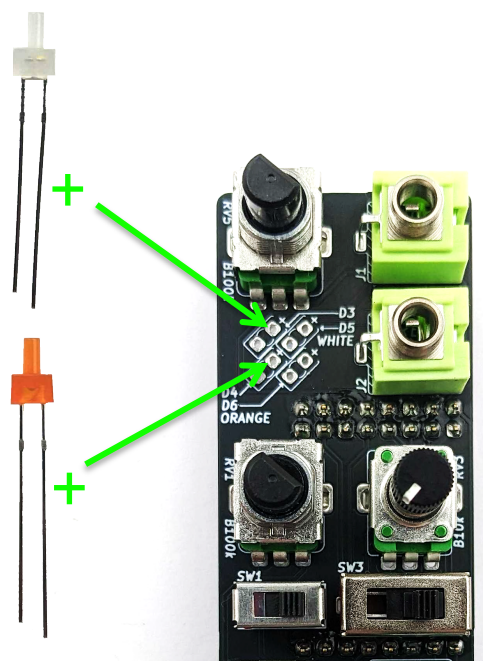
The orange LED's are placed in the lower two positions. The white LED's in the two positions above.



CHECK ORIENTATION – these components are polarized and must be placed as pictured with the long leg inserted into the pad marked with '+'.
Ensure all four LED's are placed correctly inside the PCB footprints before proceeding.

DON'T SOLDER YET

Resume soldering at step 20.



18.

With all six LED's in position and the washers in place on the D-Shaft pots replace the panel.

Secure the panel once more this time with the three black pot nuts and all eight jack nuts.

DON'T SOLDER YET

Resume soldering at step 20.



19.

Once the panel is secured use small strips of masking tape or similar to hold the LED's flush against the panel.

Check the tops of all six LED's stay flush to the top of the panel before proceeding.

DON'T SOLDER YET

Resume soldering at step 20.

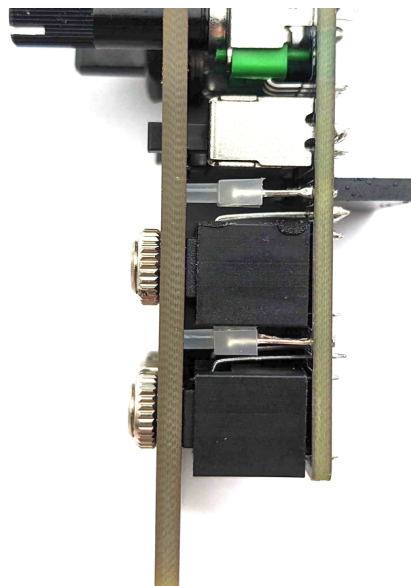


20.

First solder only the x2 Bi Colour LED's positioned at the bottom of the PCB.

Solder just one pin of each LED before double checking it is flush to the panel. Reflow and adjust if necessary before soldering the remaining two pins

Using side cutters clip the 4 legs so the solder points are small peaks like other components.



21.

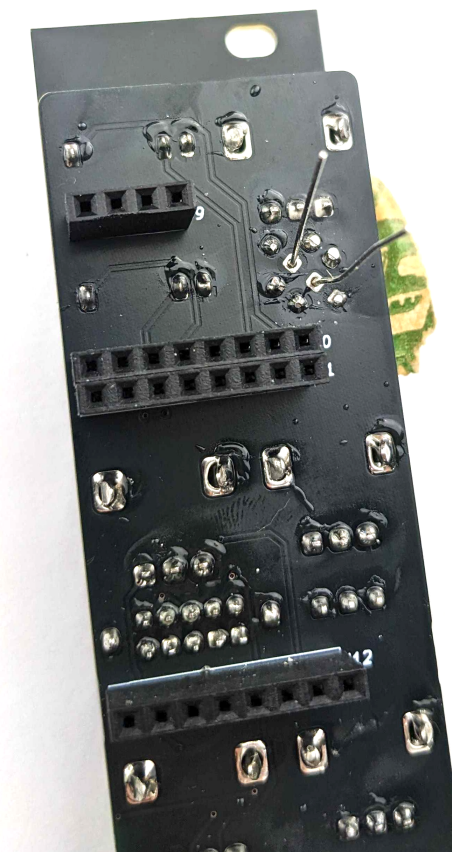
Proceed to the four LED's placed at the top of the PCB.

First solder just the 6 outer points as pictured.

Check once more that all LED's are flush with the panel. When you are satisfied with the positioning clip the x6 soldered legs with the side cutters.

This should now make it easier to access the remaining two points left to solder.

Clip the remaining legs when all points are soldered.





22.

Next locate the three D-Shaft knobs and caps.

You will have two black caps and one grey cap included in the kit.

The grey cap is used for the volume knob at the very top of the module.



23.

To position the caps correctly first place a knob onto each pot, with the pot turned fully counter clockwise.

This is your 'zero' point for the knob.

From here you can clip on the cap – lining up the pointer and indent on the knob at the zero point.

Repeat for all 3 knobs.





24.

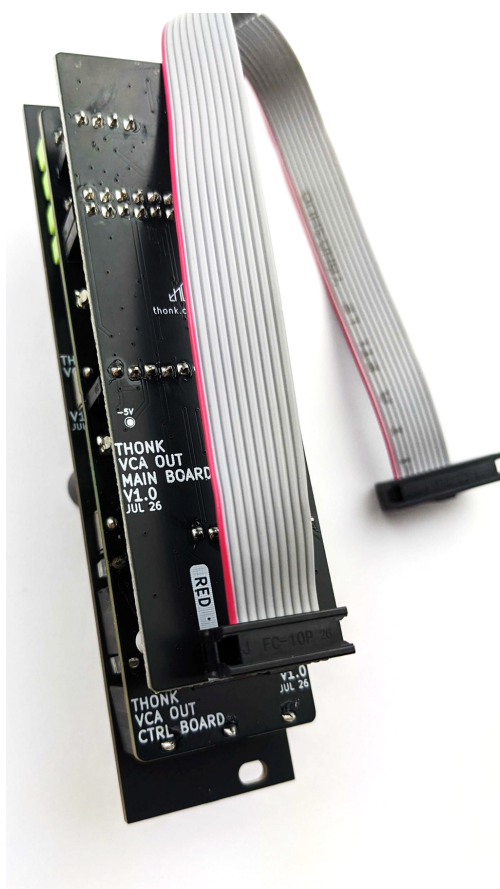
Place the two PCB assemblies back together as pictured ensuring all 5 headers are firmly seated together.



25.

Finally attach the power cable.

Be sure to follow the polarity by lining the red stripe on the cable up with the text on the PCB. Picture shown for reference.





Your Thonk Synth VCA OUT is now complete.

Find the manual and other product info on the Thonk website through the link below.

<https://www.thonk.co.uk/shop/thonk-synth-t12-vca-out>

