

MANIC



DIY BUILD DOCUMENT V1.0

APOLLO VIEW 

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INTRODUCTION

WHAT IS IT?

In collaboration with DivKid, Manic introduces an exploration of dual channel mono, mono to stereo or true stereo modulation and sound shaping within a sleek 8HP module designed for both creative freedom and technical precision. Each Channel offers precision linear VCA functionality with traditional unipolar amplitude control or bipolar behaviour for complex ring modulation effects. While we all need more VCAs! The secret sauce lies in the post VCA shape outputs.

The Shape1 output features TanH soft clipping and Serge-style wavefolding, while Shape2 boasts hard clipping alongside a Buchla-style wavefolder. The contrasting topologies between the Left and Right Channels unlock dynamic stereo-widening effects, making the stereo image both expansive and mesmerising. While the circuits are different, they have been tweaked to provide variance for creating stereo images from mono sources while also working with stereo inputs for a balanced, yet enhanced stereo spread.

Designed to excel with both audio and CV signals, Manic effortlessly processes incoming signals for a wide range of uses. Its intuitive layout ensures immediate hands-on control, making it ideal for live performances and studio experimentation.

SPECIAL THANKS

Ben Wilson

Thomaas Banks

Chris Meyer

Jason Lim

Jimi, Mathew, Tash & Diarmuid

[DivKid](#)

[Thomaas Banks](#)

[Learning Modular](#)

[Instruo](#)

[Glasgow Synth Guild](#)

TOOLS

ESSENTIAL

- Soldering Iron - a solder station with temperature control is best. Some components on this build are connected to the ground plane and require a large amount of heat. A low Wattage soldering iron that plugs directly into the power supply will not be good enough to achieve an effective solder joint. When soldering pots and jacks, 370°C is best; for everything else, 340°C (this is dependent on the solder you use, so check out your solder's data sheet).
- Solder - We find thin is best, around 0.6mm. We use a lead-free rosin core [solder](#).
- [7mm & 10mm Nut drivers](#)
- [Bananut driver](#)
- [Side Cutters](#)
- [Pliers](#)
- [Solder Sucker](#)
- Watchmaker screwdrivers, Phillips $\cong 2.3\text{mm}$ and flathead $\cong 2.3\text{mm}$

CALIBRATION

- No calibration is required!

OPTIONAL

- [Flux Pen](#)
- [Cleaning Brush](#) (an old toothbrush will do)
- Masking Tape (It can help hold components in place when flipping the board over to solder)

CONSTRUCTION GUIDE

There are already excellent soldering guides in existence, so we will refrain from reinventing the wheel here.

If you need some guidance, please check out the Moritz Klein x Erica Synth Build Documents. The soldering appendix is an excellent resource.

Or, if you prefer [videos](#), this is a pretty good guide.

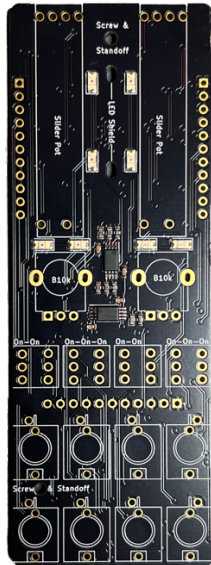
In most cases, components can be placed onto the PCBs, and then the board can be flipped upside down and laid facedown on the soldering mat to solder the legs to the back of the PCB.

PARTS LIST

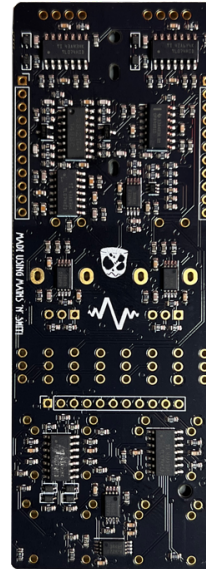
Component	Qty
Front Panel	1
Pot B10k	2
B10k Sliders	2
Thonkiconn jacks	8
DPDT switch On-On	2
DPDT switch On-On-On	2
Bananuts	8
Hex Nut	2
Front PCB	1
Rear PCB	1
Knob	2
Light Pipe	1
Light Pipe Shield	1
1x11p Socket	3
1x11p Pins	3
Power Cable	1
M3 Case Screw	2
M2x5mm Screw	3
M2x8mm Screw	2
M2x8mm Countersunk Screw	1
11mm Brass Standoff	2
90 degree PWR Header	1

ASSEMBLY STEPS

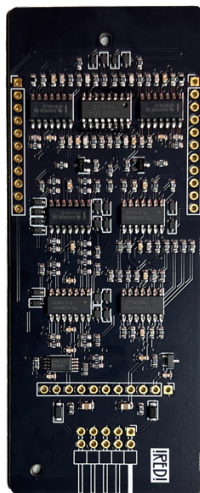
Note: Only when instructed to, solder things in place.



Front PCB Face



Front PCB Rear

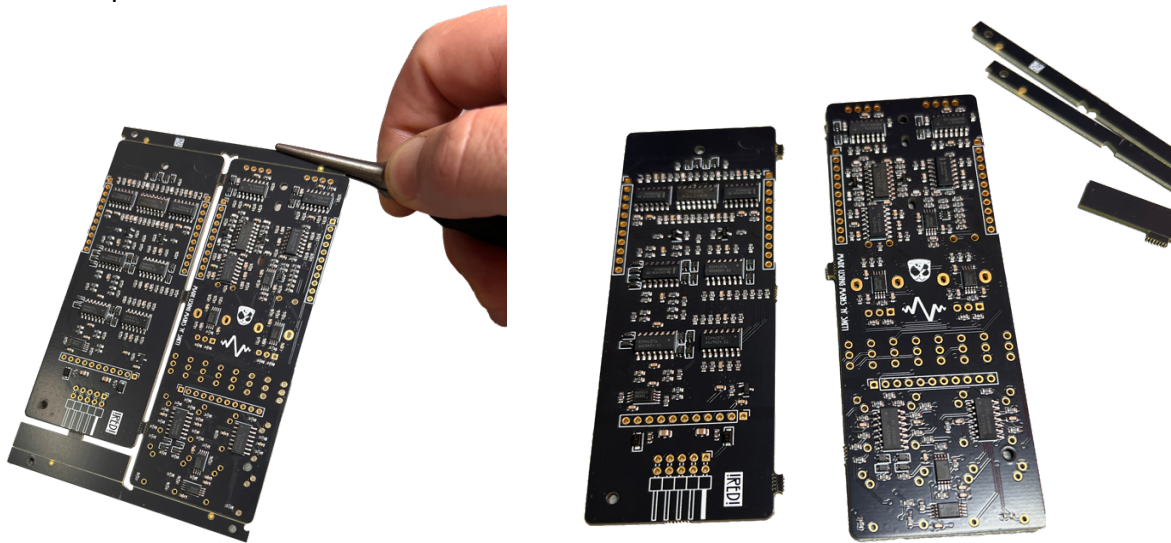


Back PCB Face

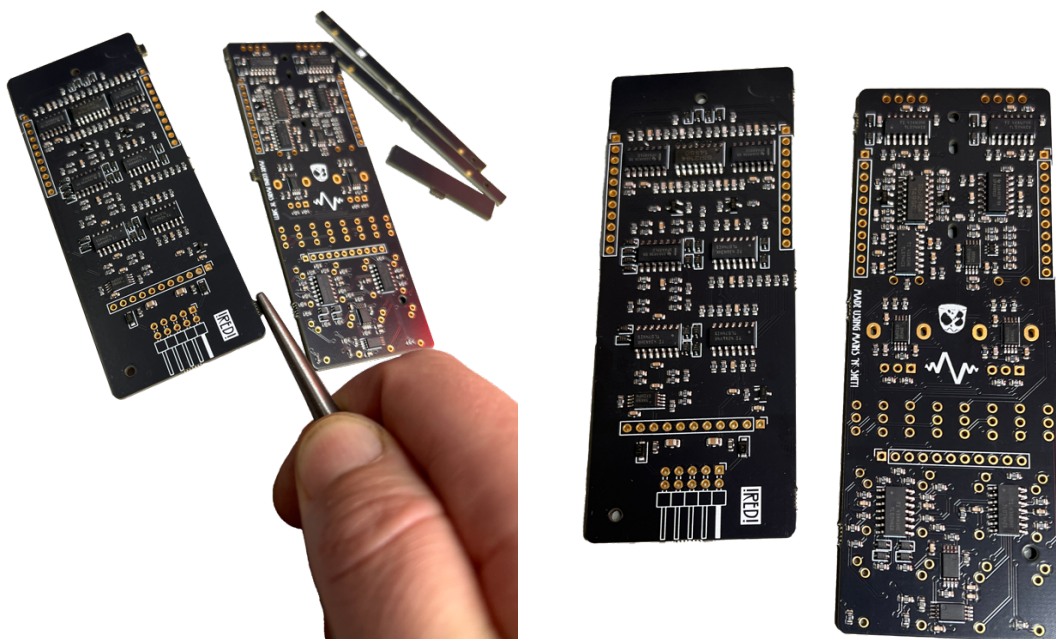


Back PCB Rear

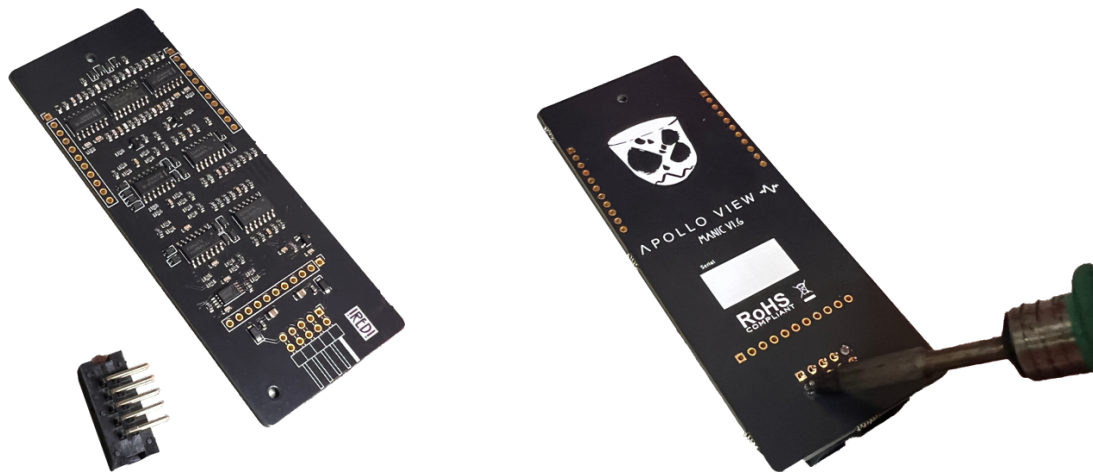
1. Separate boards



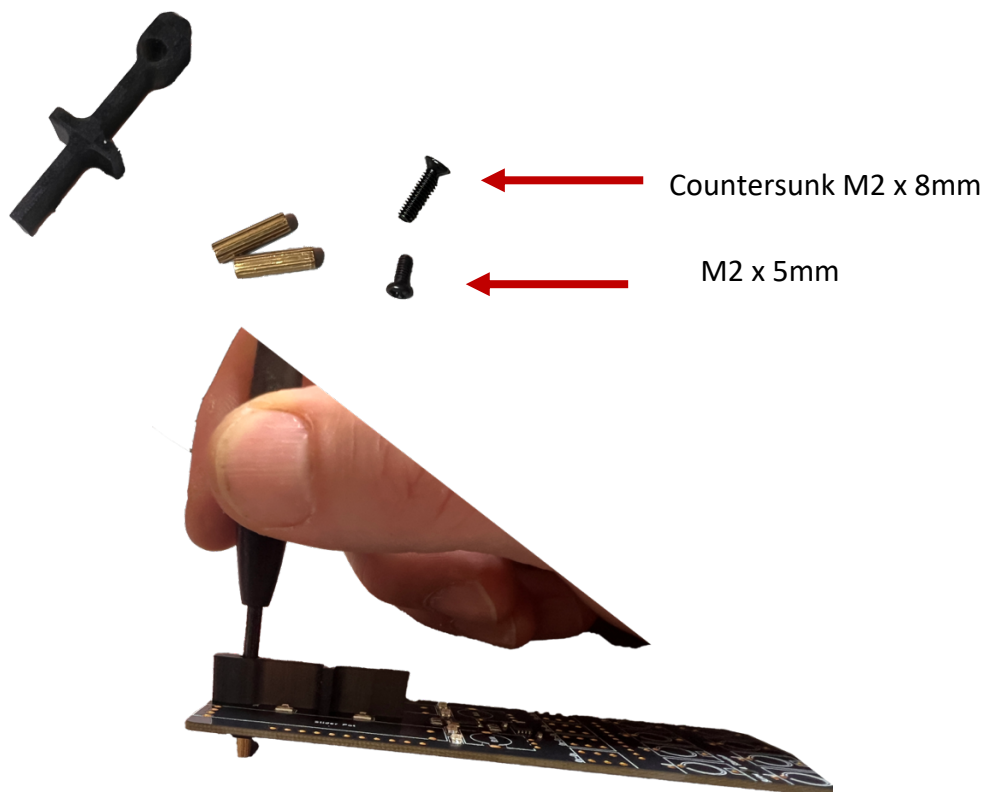
2. Break off the mousebites



- Solder the 90° Power Header to the Face of the Back PCB

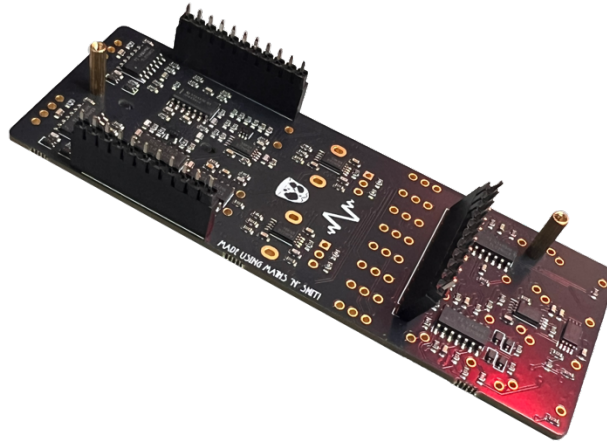


- Attach the Light Pipe Shield to the Face of the Front PCB using the countersunk M2 x 8mm screw through the PCB (the longer of the M2 screws with the conical/V-shaped cut) into one of the brass standoffs on the rear of the Front PCB.



- Attach the other brass standoff to the rear of the Front PCB using one of the M2 x 5mm screws (the shorter of the two M2 screws).

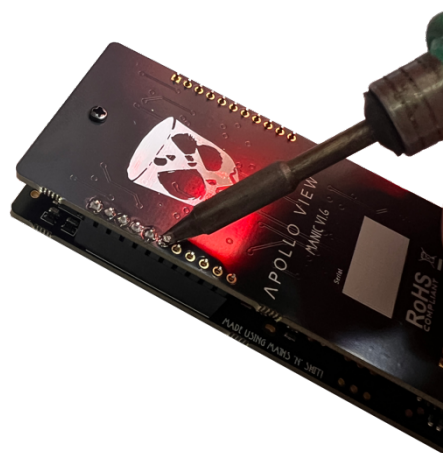
- Place the 11p Sockets (with the matching pins in place) onto the Rear of the Front PCB. It is **important** that the sockets (and not the pins) are connected to the Front PCB—this makes the module compatible if a PCB needs to be replaced.



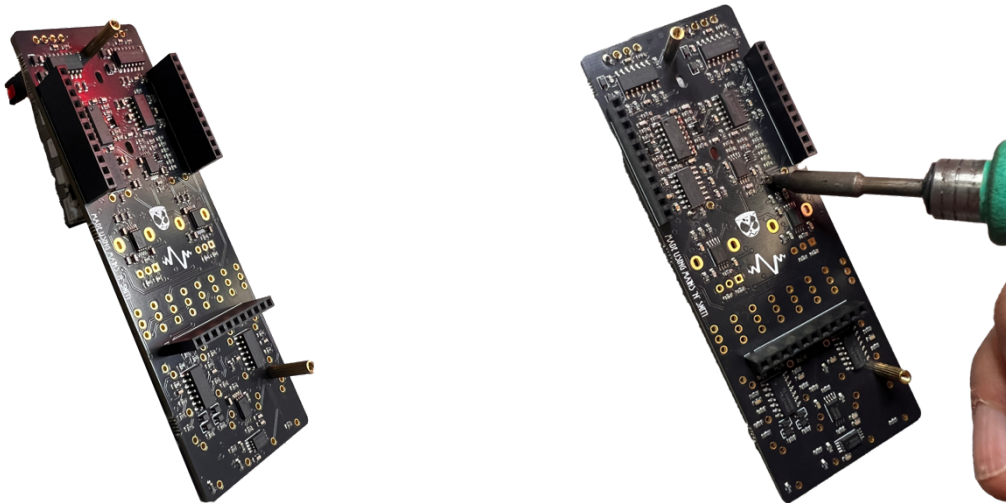
- Lay on the Back PCB, face down and screw in place with two M2x5mm.



- Solder all the pins and sockets.



9. Separate boards by unscrewing the two M2 x 5mm screws from the Back PCB. Put them somewhere safe, we will screw the boards back together in the final step.
10. Populate the Front PCB with the Sliders. Solder a few pins to hold it in place, ensuring the slider is flush with the PCB.

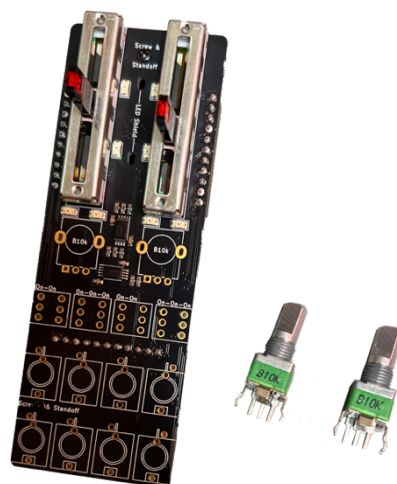


11. Place LED Lightpipe in position on Front Panel.

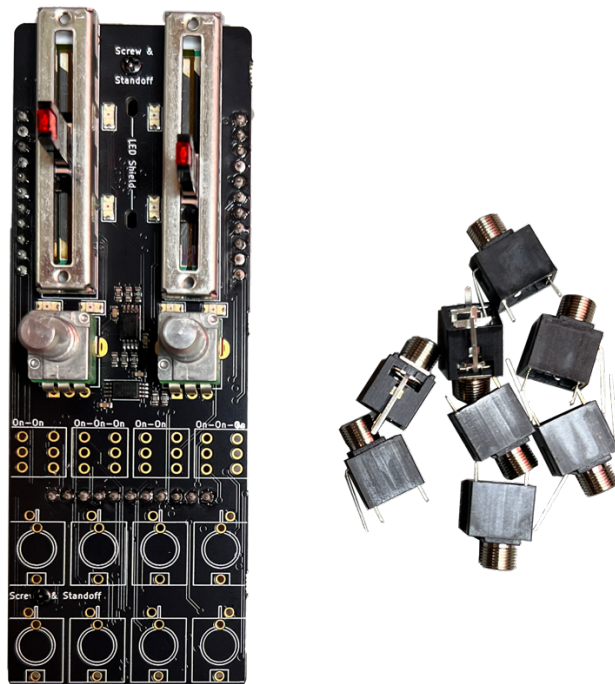


12. Populate the Front PCB. Start with the B10k D shaft pots.

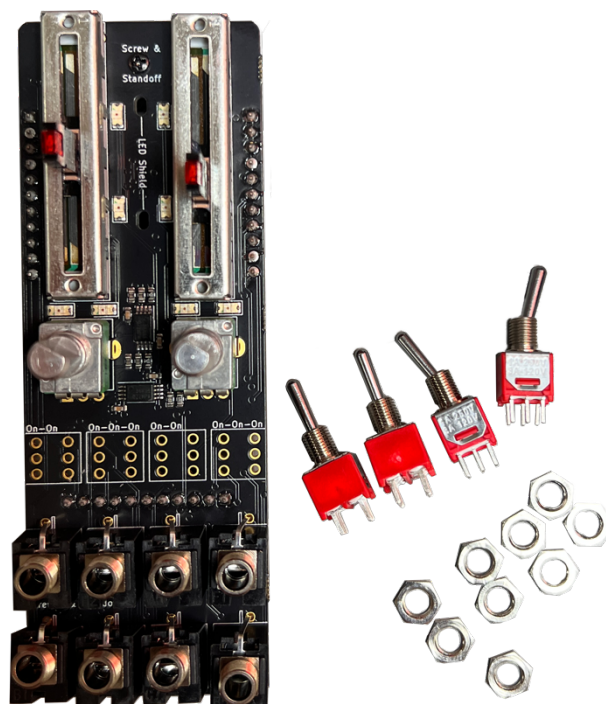
DO NOT SOLDER ANY OF THESE PARTS YET!



13. Then populate the Front PCB with the Thonkiconn Jack Sockets.



14. Identify the On-On switches and the On-On-On switches. The On-On have two possible positions. The On-On-On have 3 possible positions.

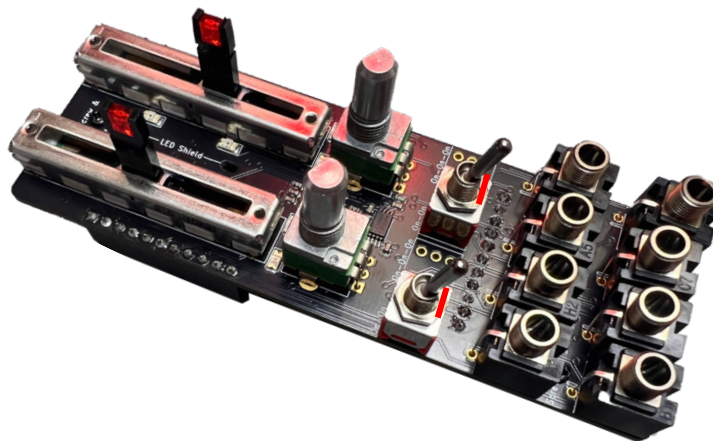


15. Tighten one nut onto the barrel of each of the switches.

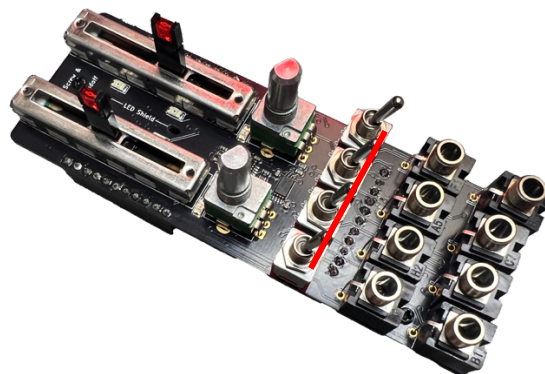


16. Place the On-On switches in the correct footprint, match with the text on the PCB.

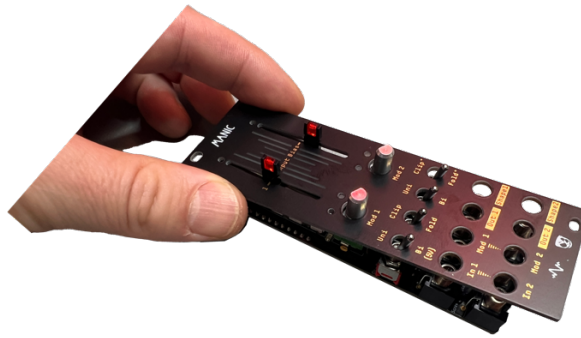
NOTE: Ensure the flat key (on the thread/barrel of the switch) at the bottom. The red line on the graphic indicates where the flat part of the barrel should be.



17. Place the On-On-On switches into their footprints. When this step is done, the Front PCB should look as follows (the red line indicates the flat thread/barrel of the switch).



18. Place the Front Panel on. Take care not to dislodge the LED Lightpipes.



19. Now we will secure the Front Panel to the parts.

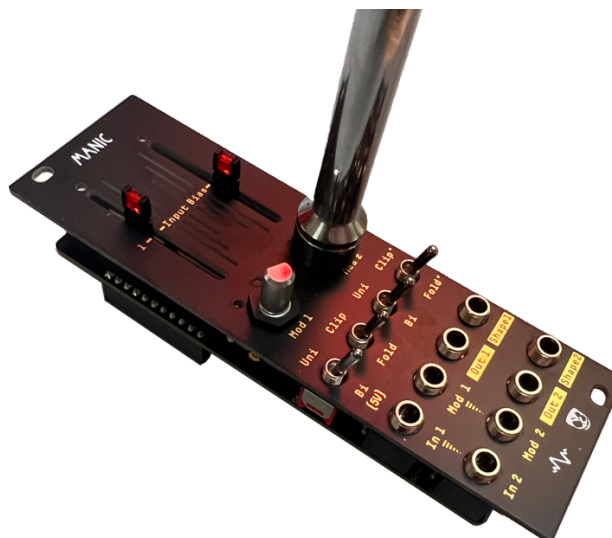
20. First, put on the black hex nuts. Finger-tighten the black hex nuts before tightening them with the 10mm hex driver.

NOTE: Place them with the smooth/rounded side down. If you position them with the flatter side down, they scratch the Faceplate while tightening.

Flat side up



Rounded side up



- Then position and finger tighten the switch nuts. Do the final tightening with the 7mm hex driver.



- Then position and finger tighten the Bananuts onto the jacks. Do the final tightening with the Bananut driver.



- Screw the remaining two M2x8mm screws through the PCB into the holes on the sliders.

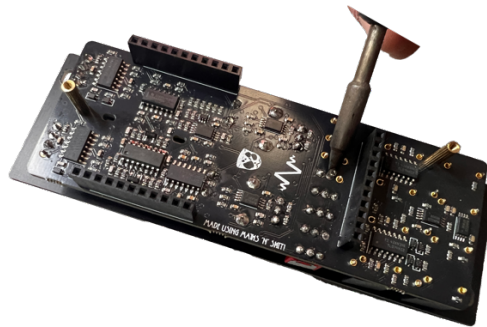
NOTE: Careful not to over tighten these screws, the front panel should gently rest on the LED Shield.



24. Push on the Knobs. Considerable force is required to get them on, this is normal.



25. Flip the whole assembly over and **NOW SOLDER EVERYTHING.**



26. Now everything is soldered, reattach the back PCB and screw the boards together with the two M2 x 5mm screws.



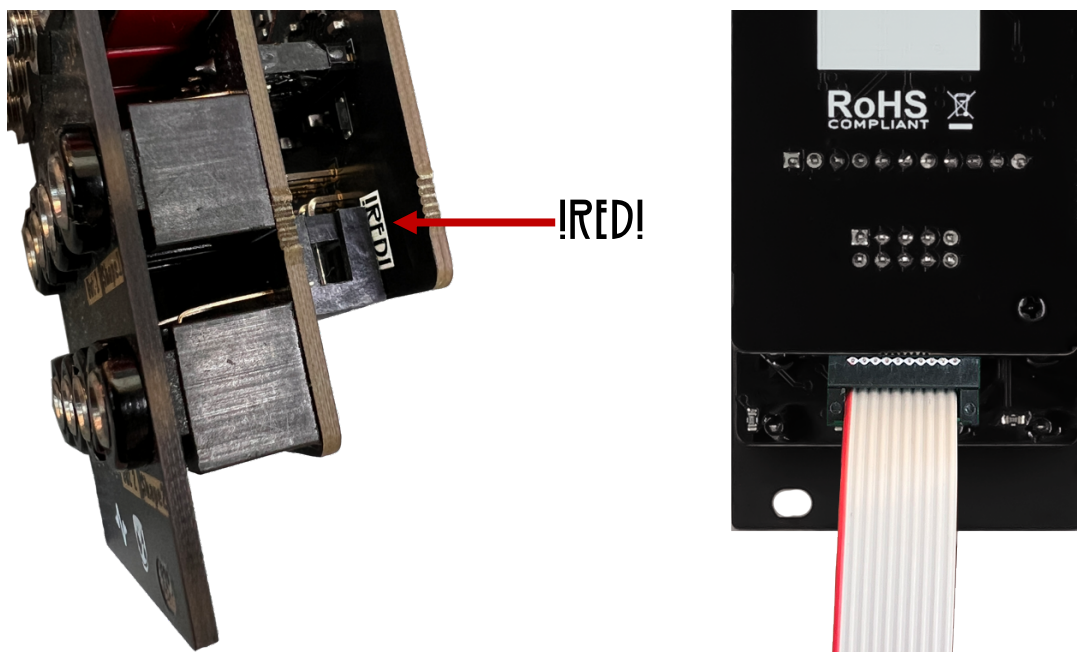
CONGRATLATIONS YOUR DONE!



INSTALLATION MANIC

POWER

Before installing Manic, ensure your Eurorack system is powered off. Manic is supplied with a 10-pin to 16-pin power cable. Carefully align the 10-pin end with the 2x5 pin header on the module. The shrouded power header is on the inside of the bottom of the rear PCB, for space saving making the module skiff friendly.



Align the power cable such that it fits into the shrouded header with the key fitting the lock. When looking at the module from the rear, the red stripe of the power cable should be on the left.

Next, find an 8 HP slot in your Eurorack case for Manic. Connect the other end of the power cable to your Eurorack power supply, ensuring the red stripe aligns with the -12V rail. With the power connection established, mount the module into your case using the appropriate screws and power on your Eurorack system.

The module has reverse protection diodes, which will divert the reverse current to ground in case of incorrect installation.

TESTING

Some basic testing should be done to ensure good functionality across all of Manic's circuits. To complete the tests, you will require:

- A couple of simple audio input waveforms, such as a Triangle or Sine
- A triggered envelope or a controllable DC voltage offset
- An oscilloscope to visualise the outputs (Optional)

Direct Unipolar VCA Tests

1. Start by patching the audio waveform into the Audio In on Channel 1 (Left). This signal gets normalised from Channel 1 to Channel 2. If you have an oscilloscope visualise this input signal.
2. Ensure both VCA are set to Uni(polar).
3. Visualise the Direct Out for both Channel 1 and Channel 2. (If you don't have an Oscilloscope, use your ears)
4. Push the Slider up on Channel 1 and verify a linear gain on the scope. When the slider is at its maximum travel, the Output signal should closely match the Input signal.
5. Repeat for Channel 2.
6. Move both sliders to the bottom to ensure the VCA are closed
7. Patch an envelope of a controllable DC offset (initially set to 0V) into Channel 1 Mod Input
8. Ensure the Mod Attenuverters are turned Fully Clockwise (CW).
9. Trigger the envelope or increase the DC offset. 5V should achieve unity Output compared to the Input Signal
10. You can also test the action of the Mod Attenuverters. Turning the Mod Attenuverters Fully Counter Clockwise (CCW) will invert the incoming modulation signal.
e.g. you can push the slider to the top, and Mod Attenuverters CCW, send a positive modulation signal, and watch (hear) the Audio be ducked.

Direct Bipolar VCA Tests

1. Switch the VCAs modes from Uni to Bi(polar).
2. Disconnect the envelope, or DC offset from the Mod Input.
3. Move the sliders to the middle (centre) of their travel. This should reduce the Output to 0V. It is possible to null the signal fully, but it takes some fiddling to get exactly 0V, which is normal.
4. Moving a slider up from the centre position should pass the Audio signal through with the polarity unchanged.
5. Moving a slider down from the centre position will invert the Audio signal.
6. Put the envelope or DC offset back in the Mod 1 Input.
7. Verify control over the Gains of each VCA using a modulation source.
8. You can repeat the Mod Attenuverters test if you wish. See step 10 above.

Shape Out Tests

1. Switch the VCAs to Unipolar Mode.
2. Remove the patch cables from the Direct VCA Outs
3. Visualise or listen to both the Shape Outs
4. Start with the Clip/Fold switches in the centre position. This just inverts the polarity of the input Signal.
5. Push the sliders up and observe the Shape Output waveforms. The expected behaviour should be the same as the Direct Out, but the waveform should be polarity-flipped.
6. Switch the Clip/Fold switches up to Clip.
7. Push the sliders up to clip the signals. Channel 1 (Left), will produce a Tanh style Soft Clipping. Channel 2 (Right) will produce Hard clipping (see the Full Manual for more details).
8. Switch the Clip/Fold switches down to Fold.
9. Push the sliders up on each Channel and observe the awesomeness of wavefolding.

If any of these tests did not produce the expected results, please check all of your soldering for cold solder joints and solder bridges. Reflow any solder joints that require it. Sometimes, tiny balls of solder can be made when soldering, and these can find their way around the PCB and get stuck between the legs/pins of a chip. It's a good idea to have an old toothbrush or similar and give everything a really good brush to clear all the solder debris.

If everything is working correctly, congratulations!

Go read the Full Manual to get the most for your new Manic module!

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