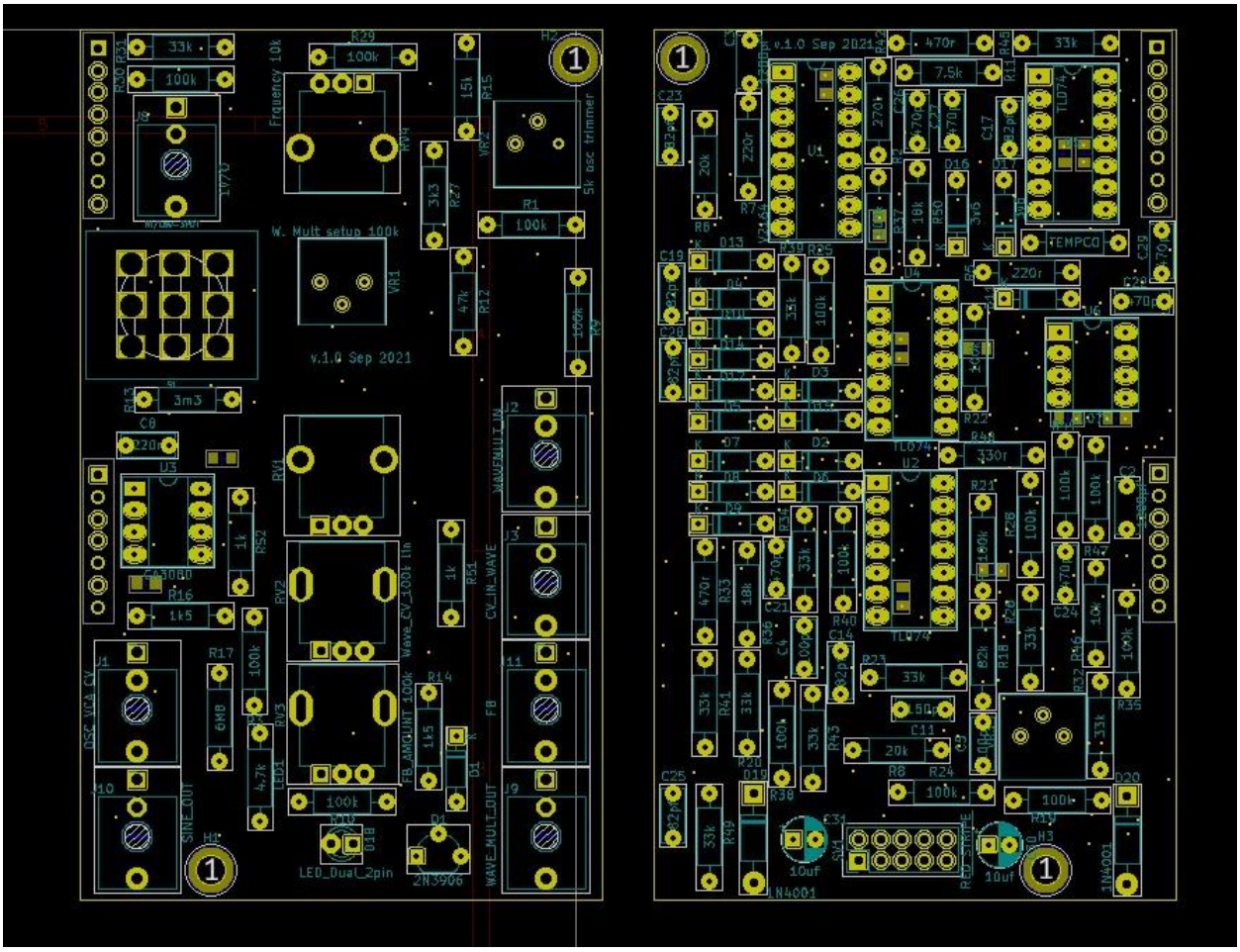
1.1 Overall description

This module came out of a personal need to combine punishing noise modules but making it being able to both track 1v per octave as well as do more traditional musical duties besides just ripping things up. I think that the Bristol Bloodhound (in the right hands) is capable of both. The sine core is my own interpretation on the sine oscillator found in the Dreadbox antiphon[1] (used with permission) using a V2164 for both generating the sine wave as well as the VCA portion of the module. I added a LFO switch which will turn pull the oscillators down deep so serve as a LFO. The wave mult section is derived from the CGS module with the same name (also used with kind permission from Ken Stone) with only minor adjustment most notably a feedback section for creating harsher dynamics and noise. The oscillator is normalled the the wave multiplier via the Wave in jack. Inputting an external signal into the Wave in breaks this connection but the sine is still present at the Sine output (you can then use the sine portion for lfo duties for example). This makes it possible to use the module for processing other sounds than the onboard oscillator (field recordings, drummachines, other oscillators etc). The Feedback input accepts all kinds of signals, both cv, triggers and gates and audiorate (feel free to experiment). There are two attenuators for feedback and wave cv. Tracking when calibrated should be around 4-5 octaves.

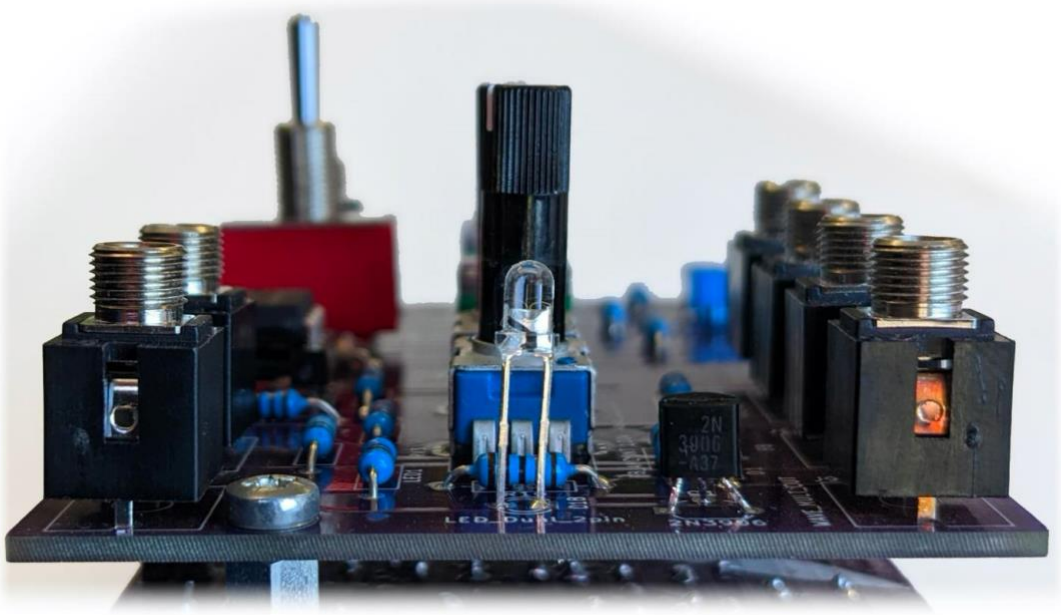
[1] https://www.dreadbox-fx.com/antiphon/

2.1 The actual build.

PCB's

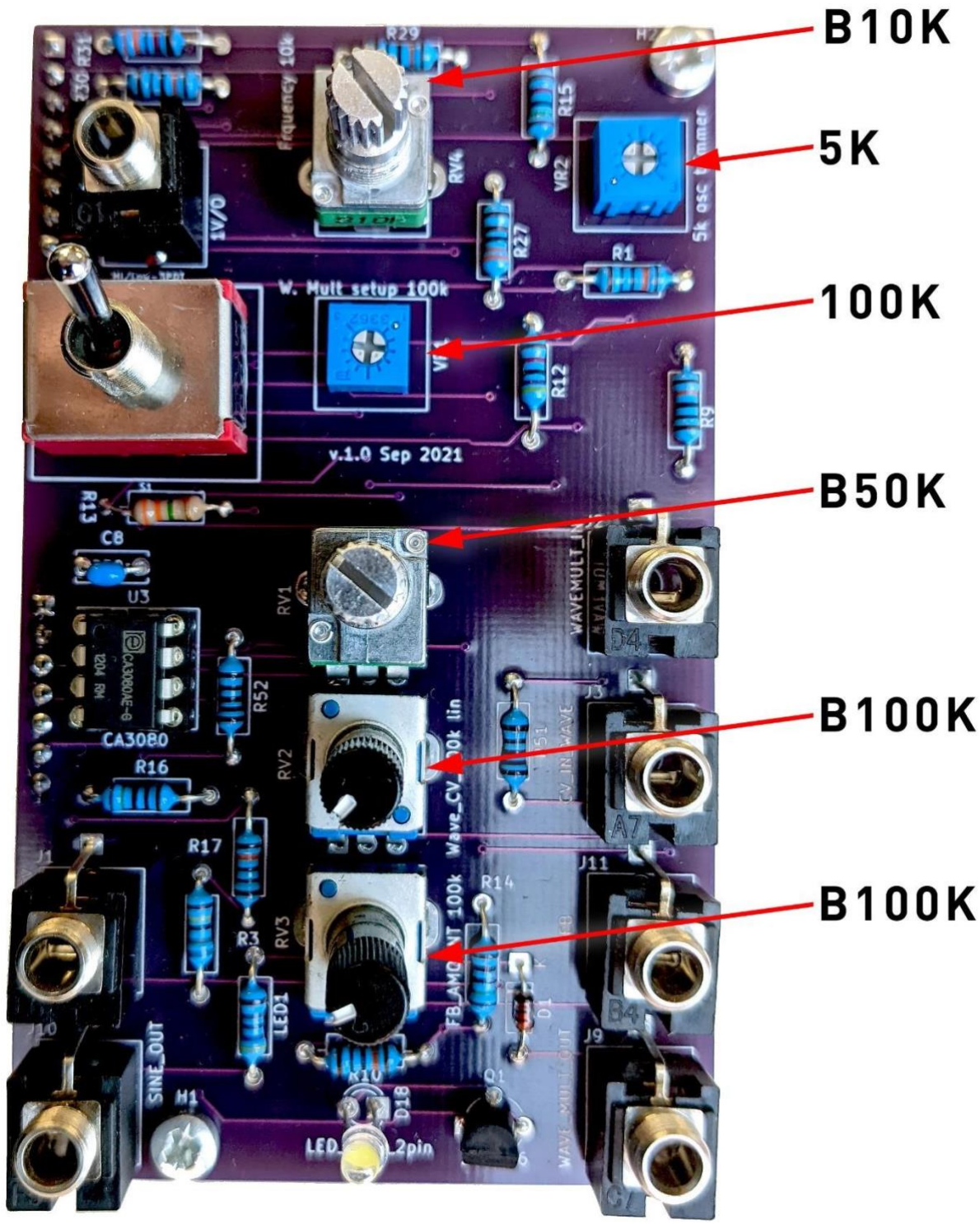


Caps and Diodes

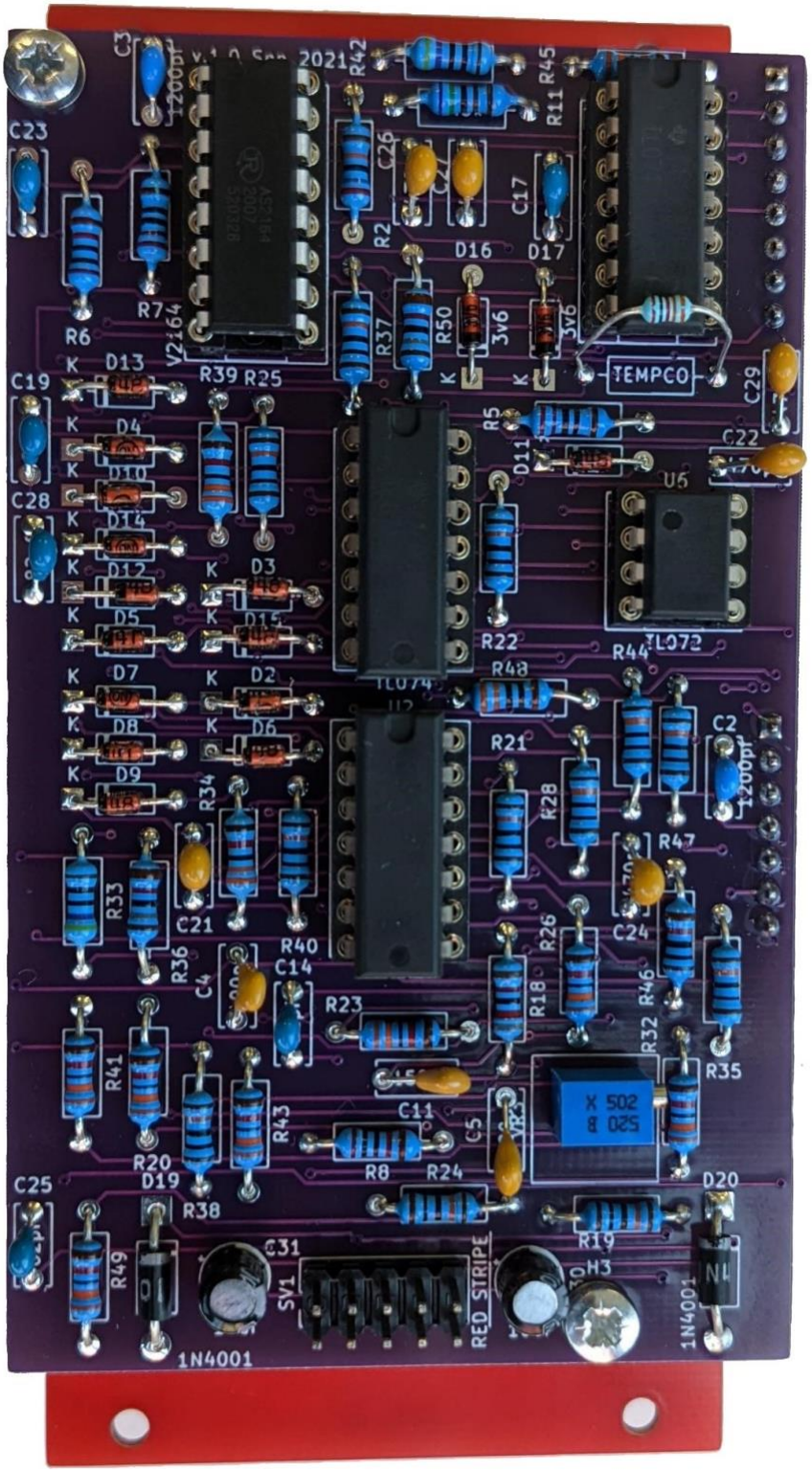


LED

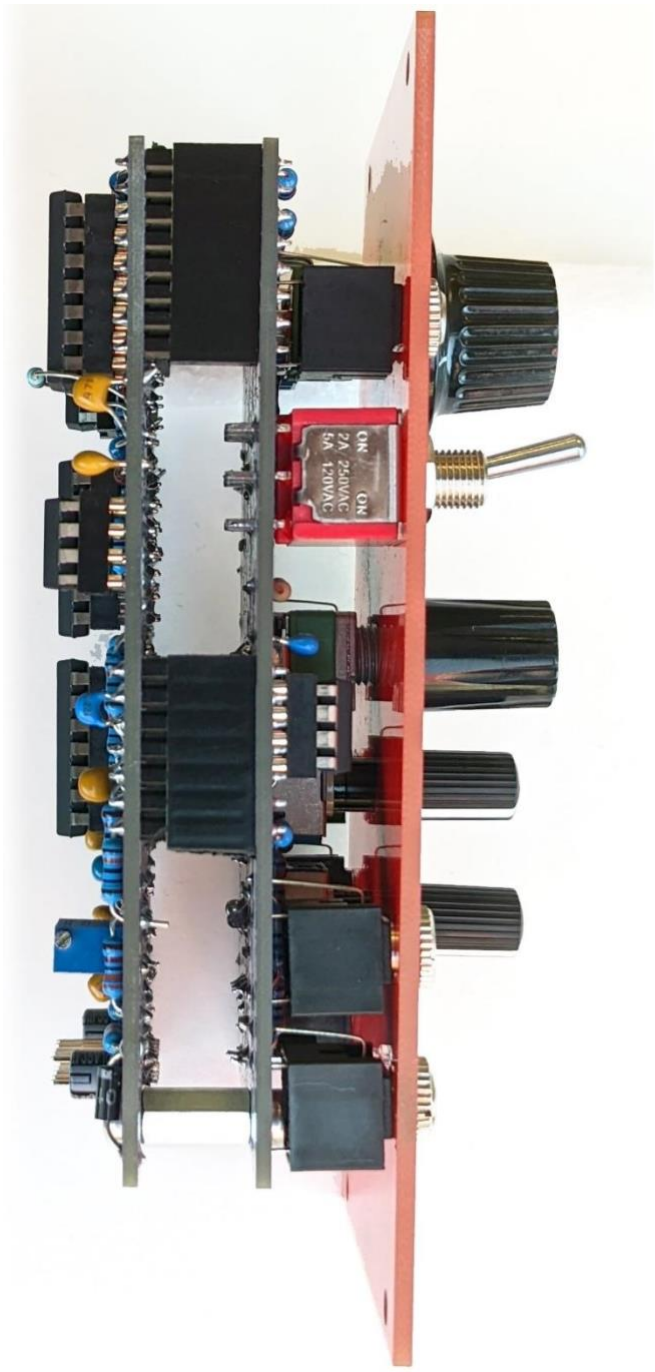
pots

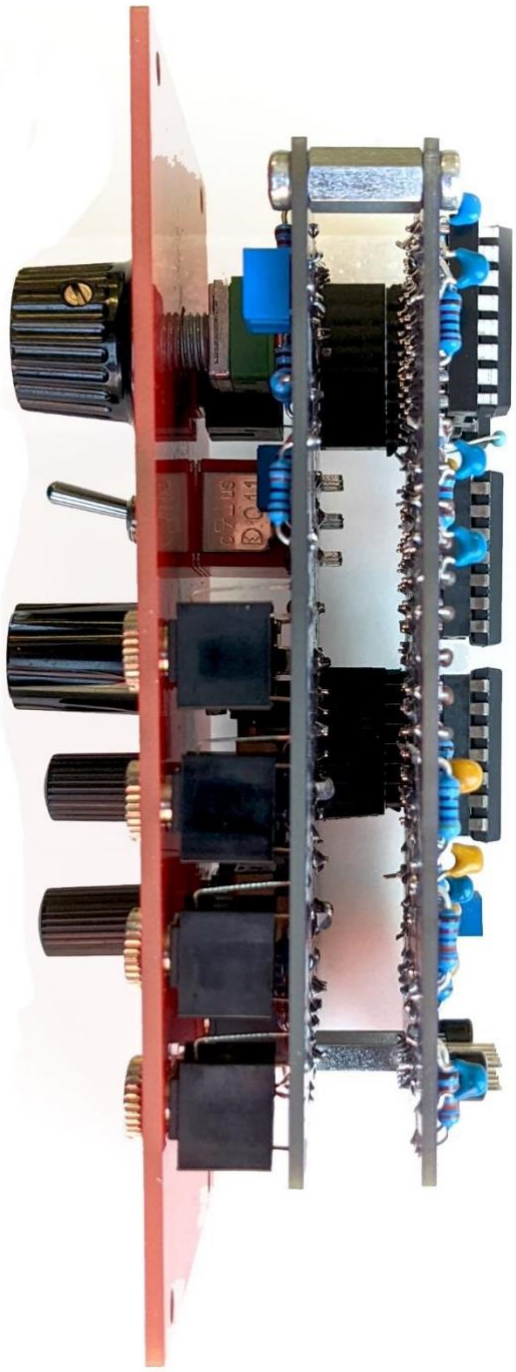

B10K
5K
100K
B50K
B100K
B100K
W. Mult setup 100k
v.1.0 Sep 2021
CA3080
SINE_OUT
WAVEMULT_IN

POTS



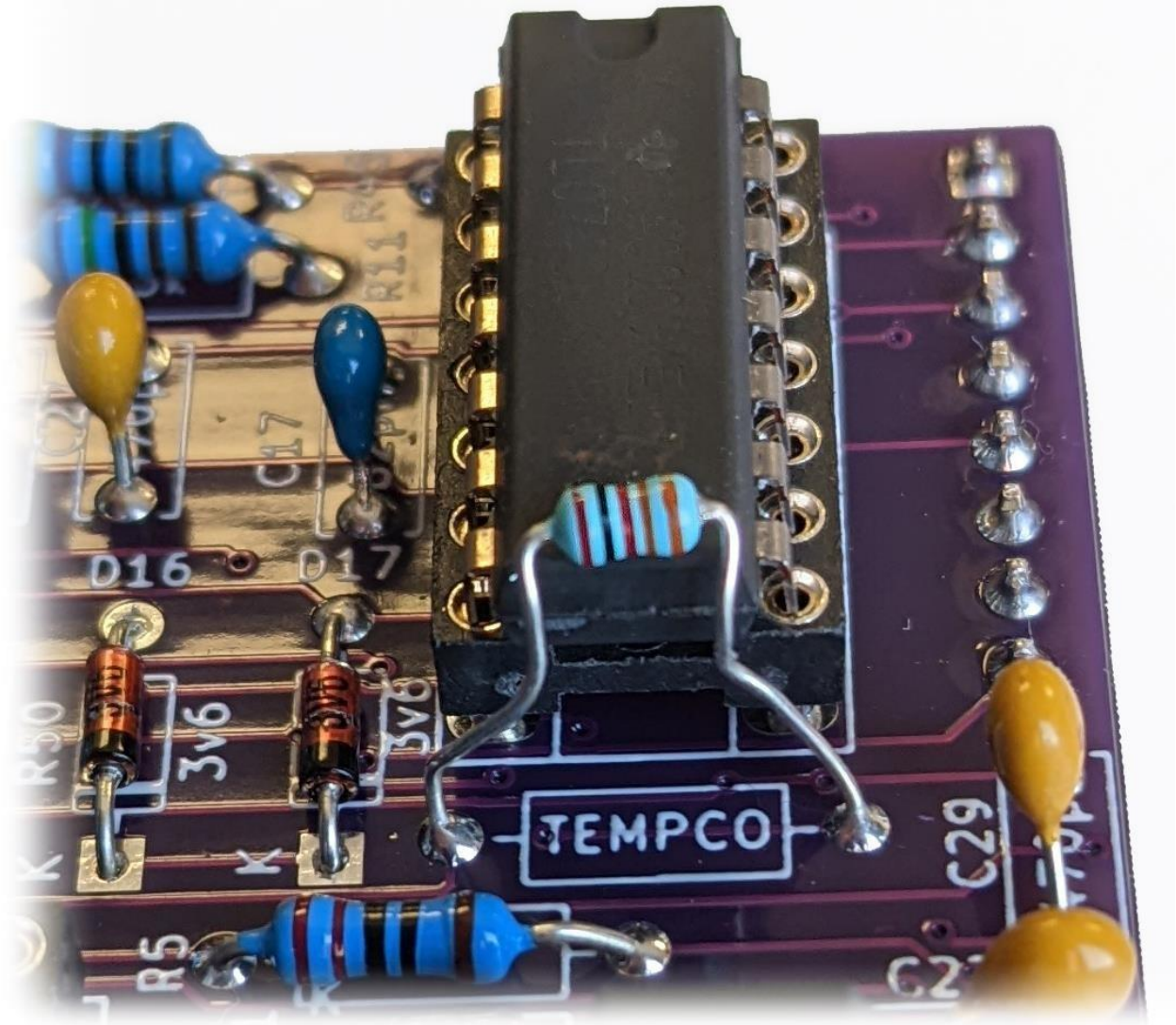
Rear with components





Side with components

Tempco



Tempco placement

Building this is quite straight forward. I usually start with the 100nf 0805 smd caps located on the backside of both PCB's. There are 10 on the component board and 2 on the jack board. Please not that these are NOT optional. In order for this module to work you need to solder them in. I usually start with adding a tiny bit of solder to one pad, heat it up, drop the cap in in and do the other side. There are tons of great videos on smd soldering on youtube if you need help.

After that I do the resistors on both PCB's, then the diodes and then IC holders, caps and the rest. Carefully placing the IC's in there holders, make sure no legs are bent or folded.

There are two trimmers, one on each board (Labeled VR2 and VR3). VR2 sets the initial frequency and VR3 the tracking intervals when calibrating (make sure VR3 gets the 5k multiturn trimmer, you'll need it). There is also a Tempco just beneath U5 (a TL074 located in top right corner of the component pcb). Make the tempco rest on the 4 bottom legs of the IC (see picture above). When applied right this will prevent the oscillators from drifting.

For the jack board mechanical parts - please pay attention: Don't solder anything yet

First place the led – the short leg goes to the square pad. Then fit all the jacks, pots and the switch, the 2 x metals pots have different values - make sure they are placed correctly (refer to pot image above). Next place the panel and then screw on a nut on all jacks and on both alpha pots before soldering anything. The jacks should be hanging slightly off the PCB due to the size of the switch (like they are someway floating: See pictures above). Don't screw the jack nuts on too far - they should sit flush with the top of the barrel of the jack socket. If you screw them on too tight before soldering then they will pull the jacks too far away from the PCB. Turn it all upside down, make sure the LED is peaking out behind the panel in the right spot and make sure everything is aligned, that the jacks are "floating". We recommend soldering the frequency jack first, as it is in most danger of being pulled to far from the pcb. Then solder the rest of the parts. For the 2 headers that connect the PCBs - solder one pad put the boards together and then solder the rest.

Check both boards for bad solder joints or other anomalies.

There will be a build thread available here through Modwiggler: https://modwiggler.com/forum/viewtopic.php?p=3612944&hilit=bristol+bloodhound#p3612944)

2.2 Calibration

Is quite easy but takes some time and patience, there are several videos up on youtube how to calibrate a VCO (uset this:

https://www.youtube.com/watch?v=Dt2iaX98wcU&ab_channel=Dreadbox). First leave the oscillator running in a stable temperature room for at least 15-20 minutes before calibration. Make sure you do all the calibration before adding the panel, you need to be able to turn the trimmer on the jack board which you can't get to if you already mounted the panel. It should be able to track 4 octaves (perhaps even 5 if you are lucky), YMMV.

2.3 Acknowledgments

- Dreadbox
- Ken Stone
- Steven and Thonk
- Jon The Human Comparator

3. BOM

Quantity	Value	Source (mouser # unless listed)
12	100n	581-08053C104J
1	150p	810-FA24NP2W151JNU06
6	82pf	810-FG28C0G1H820JNT6
2	1200pf	810-FG28C0G1H122JNT6
6	470p	810-FG28C0G1H471JNT6
2	10uf	80-ESK106M025AC3AA
2	100pf	810-FG28C0G1H101JNT0
1	220n	810-FG24X7R1H224KNT6
15	1N4148	78-1N4148
2	3v6 Zener	78-BZX55C3V6-TAP
1	LED_Dual_2pin	www.ebay.com/itm/190894964341
2	1N4001	750-1N4001T-G
1	OSC_VCA_CV	Thonkiconn
1	SINE_OUT	Thonkiconn
1	FB	Thonkiconn
1	WAVEMULT_IN	Thonkiconn
1	CV_IN_WAVE	Thonkiconn
1	Jack Board 1	Tayda A-197 (cut to lenght)
1	JACK BOARD 2	Tayda A-197 (cut to lenght) 1
	Comp Board 1	Tayda A-196 (cut to lenght)
1	COMP BOARD 2	Tayda A-196 (cut to lenght)
1	1V/O	Thonkiconn
1	WAVE_MULT_OUT	Thonkiconn
1	2N3906	833-2N3906-AP
18	100k	1% Resistor 1/4W
1	7.5k	1% Resistor 1/4W
1	47k	1% Resistor 1/4W
1	3m3	1% Resistor 1/4W
2	1k5	1% Resistor 1/4W
1	15k	1% Resistor 1/4W
1	6M8	1% Resistor 1/4W
1	82k	1% Resistor 1/4W
1	270k	1% Resistor 1/4W
11	33k	1% Resistor 1/4W
1	3k3	1% Resistor 1/4W
2	470r	1% Resistor 1/4W

2	18k	1% Resistor 1/4W
1	10k	1% Resistor 1/4W
1	330r	1% Resistor 1/4W
2	220r	1% Resistor 1/4W
2	1k	1% Resistor 1/4W
2	20k	1% Resistor 1/4W
1	RV1 B50K	Alpha 9mm pot 50k Lin (thonk)
1	Wave_CV_100k lin	Tall trimmer top 100k Lin https://www.thonk.co.uk/shop/ttpots/
1	FB_AMOUNT 100k lin	Tall trimmer top 100k Lin https://www.thonk.co.uk/shop/ttpots/
1	Frequency B10k	Alpha 9mm pot 10k Lin (thonk) https://www.thonk.co.uk/shop/alpha-9mm-pots/
1	Hi/Low-3PDT Switch	108-1M31T1B1M2QE-EVX
1	10_PIN_HEADER	Standard eurorack pin connector 10pin without box
1	TEMPCO	2k tempco Thonk: https://www.thonk.co.uk/shop/tempco-resistor-akaneohm/
1	V2164/AS2164	Thonk: https://www.thonk.co.uk/shop/as2164/
3	TL074	595-TL074ACNE4
1	CA3080	Thonk: https://www.thonk.co.uk/shop/ca3080/
1	TL072	595-TL072IP
1	W. Mult setup 100k trimmer	652-3386P-1-104LF
1	5k osc trimmer (single turn)	652-3386P-1-502LF
1	5k trimmer Tracking (multiturn)	652-3266Y-1-502LF
2	hex standoffs	11mm: www.thonk.co.uk/shop/standoffs/
8	M3 Screws	for panel and standoffs
1	Eurack power cable	www.thonk.co.uk/shop/eurorack-power-cables/