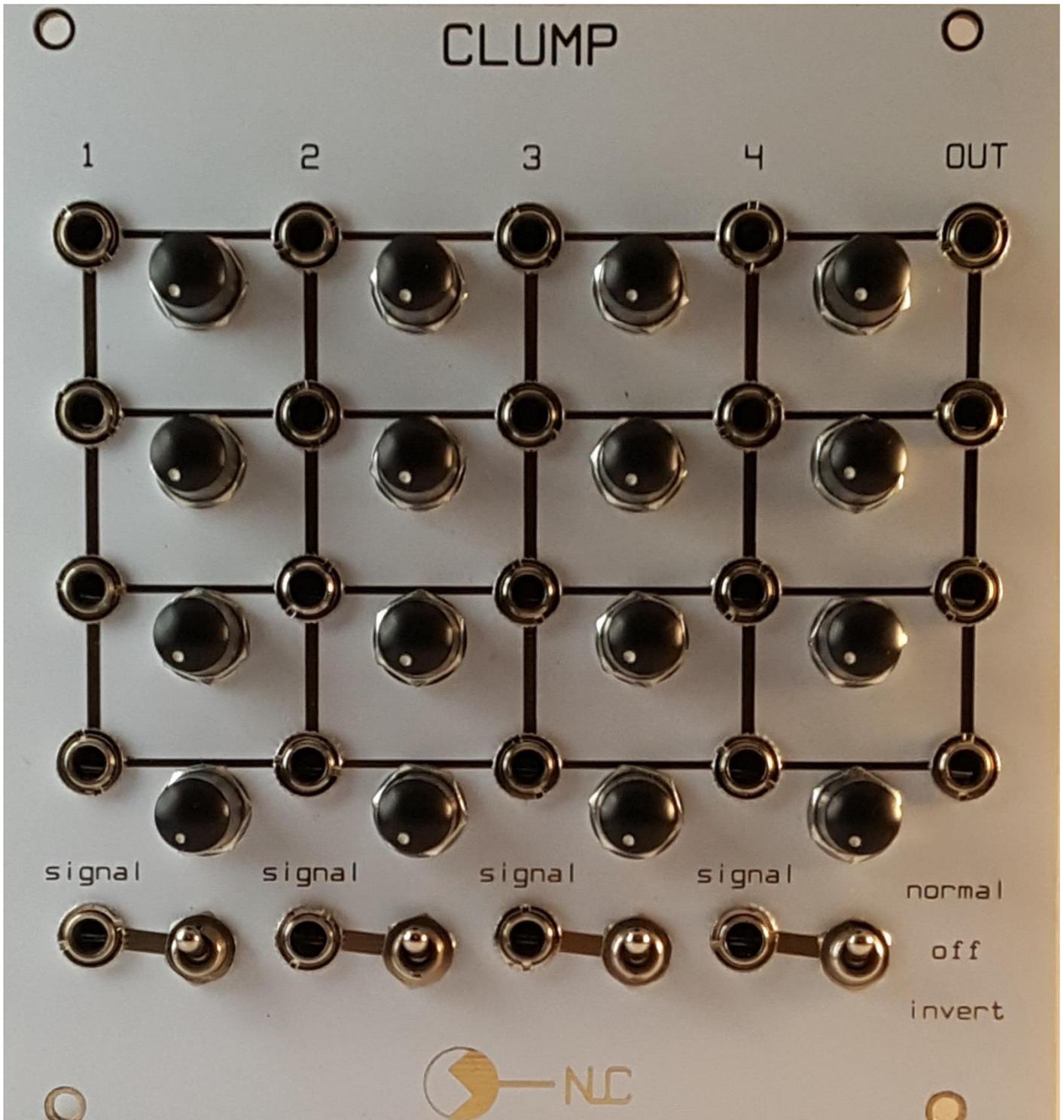


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Clump 4x4 Matrix Mixer build & BOM

Clump is a 4x4 CV controlled matrix mixer (MM). This means there are 16 VCAs on-board along with 4 mixers. It can be used as a regular mixer if you prefer. The gain pots can boost a signal to approx. 2x.

This started out as a half-sized version of the Cluster (8x4 MM), but I changed a few things that oft bugged me on the Cluster and implemented some suggestions. Each VCA gets a 1k trimpot to remove any offset voltages, each input gets a switch to turn off or invert the incoming signal and the pots act as gain pots with no CV patched in and as attenuators when CV is patched.



BOM – The Tayda & Mouser part numbers are given as examples

VALUE	QUANTITY	DETAILS
22pF	4	0805 Tayda: A-3502 see notes
100nF or 104	36	0805 Tayda: A-3511
10uF	2	0805 25V or higher voltage rating Mouser Part No: 963-TMK212BBJ106MG-T
1k	4	0805
12k	16	0805
20k	32	0805
47k	32	0805
100k	20	0805
220k	16	0805
TL072 or TL082	10	Soic Tayda: A-1139
LM13700M	8	Soic Mouser: 926-LM13700MX/NOPB
BC857	16	Tayda: A-1345
Eurorack 10 pin power connector	1	Tayda: A-198 cut to size
S1JL, Schottky, power rectifier or 10R, optional - for reverse voltage protection...or not	2	SMD SEE NOTES #1. dot on PCB indicates CATHODE (stripe on component). My current fave is BAT54GWX, Mouser: 841-BAT54GWX
3.5MM SOCKET Kobiconn style	24	Tayda: A-865 or Thonkiconn Jacks (PJ301M-12) from Thonk, Synthcube or Modular Addict
10 Pin 2.54mm Single Row Pin Header Strip	6	Tayda: A-197 (cut to size)
10 Pin 2.54mm Single Row Female Pin Header	6	Tayda: A-1306
100k pot	16	See notes
1k trimpot	16	Tayda: A-585
On-off-on toggle SPDT	4	Tayda: A-3670 or A-3187

Additional notes:

1. , Schottky (best option) or standard power rectifier diode 50-600V 1A or more, or use a resettable fuse or just a 10R. Examples: BAT54GWX, PMEG2005EGWX, AEC-Q101, 20V, SOD-123, PMEG2005EH DIODE, SCHOTTKY, 0.5A, 20V, 1N400x or S1JL or similar.

2. The chips, resistors, caps are cheapest from Tayda. Schottky diodes, CMOS & 1uF, 10uF 25V 0805 caps from Mouser/E14/Farnell/etc.

3. Join the Nonlinearcircuits Builders Guild on FB: <https://www.facebook.com/groups/174583056349286/> and ask questions there if you have any. If you prefer not to FB then email is fine.

4. If you don't have 22pF, anything from 10pF to 47pF will do.

5. Due to tight spacing, it is probably best to use T-18 splined shaft pots and micro-knobs.

Modular addict have [9mm T18 Shaft Vertical Potentiometers](#) and [tall trimmer pots](#)

These are similar or the same as the [B100K linear 25mm long shaft](#) at Synthcube.

I prefer the T18 pots as they are bolted to the panel and feel more solid. Also the trimmer pots will leave a bit of a hole at their base as the panel holes are 7mm, guess it might help with cooling? joke

Setup:

Keep in mind - the columns are numbered 1234 and the rows are to be known as a, b, c & d. So looking at the panel; 1a is the top left corner pot and 4d is the bottom right corner pot.

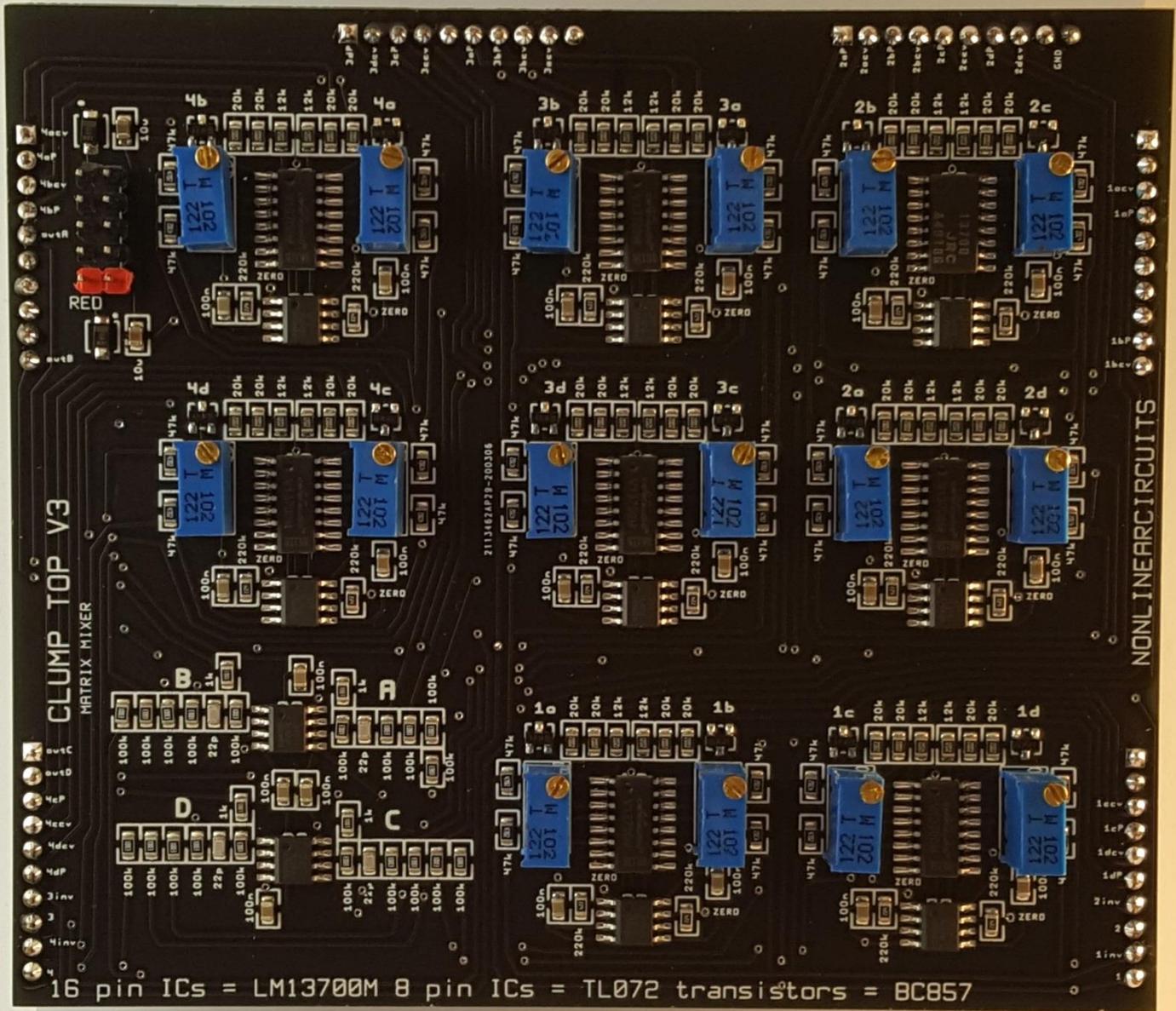
Turn all pots to zero except 1a. Turn 1a to maximum. Measure the voltage on output a (the top most output) with a multimeter set to DCV or an oscilloscope.

Locate the VCA labelled 1a on the PCB and tweak the 1k trimpot until the output measures 0V.

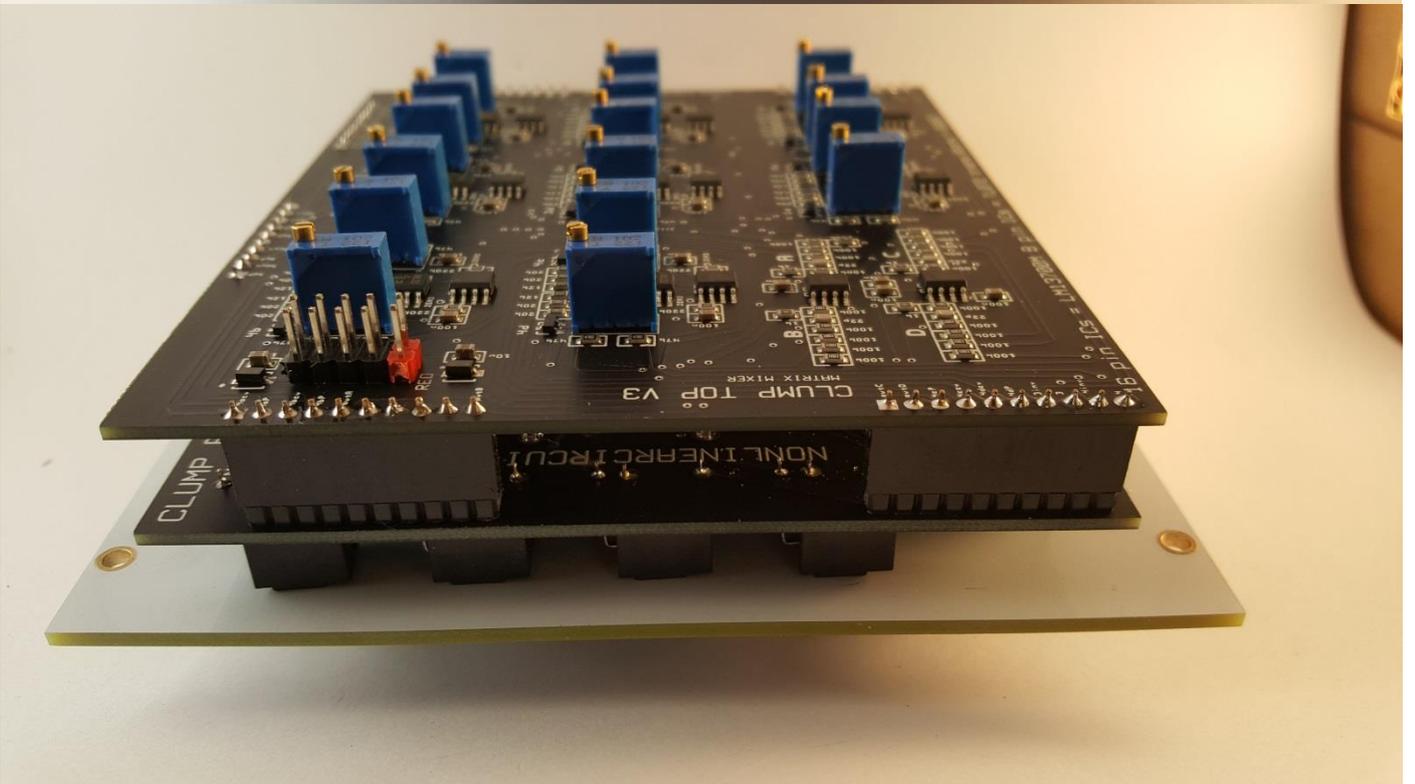
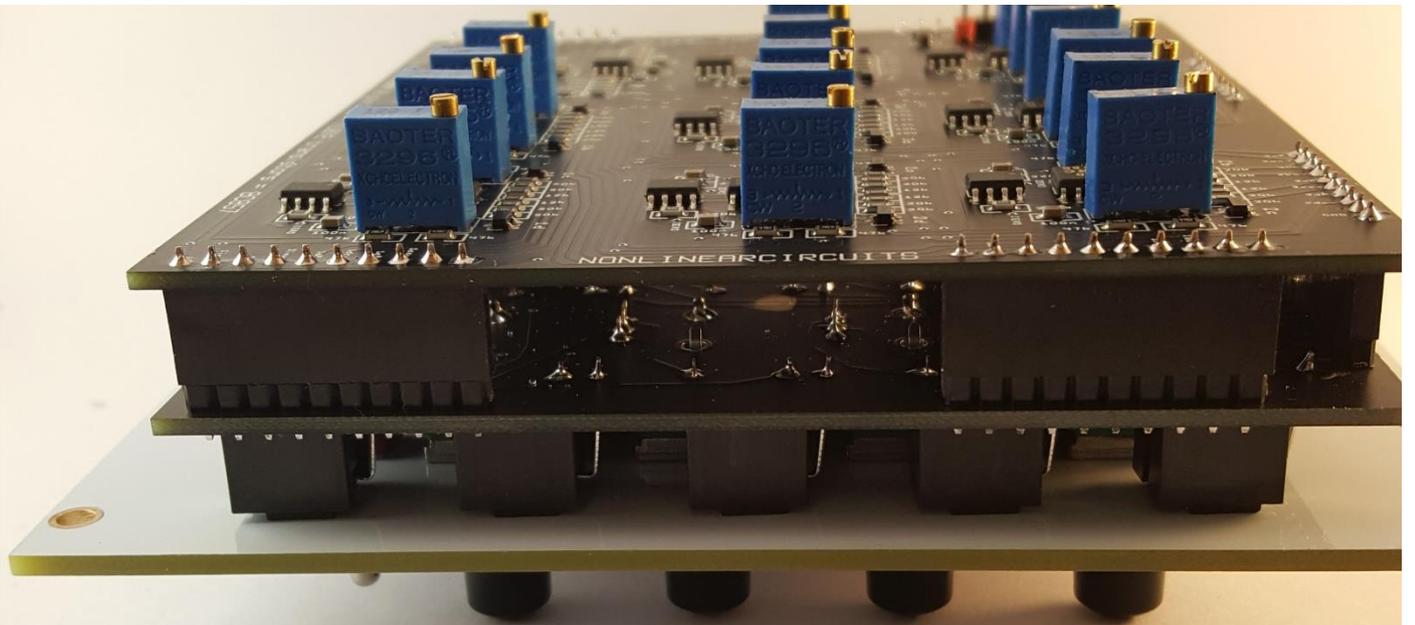
Turn 1a pot to zero, turn 2a pot to max, find VCA 2a on PCB, tweak trimpot until output measures 0V

And so on!

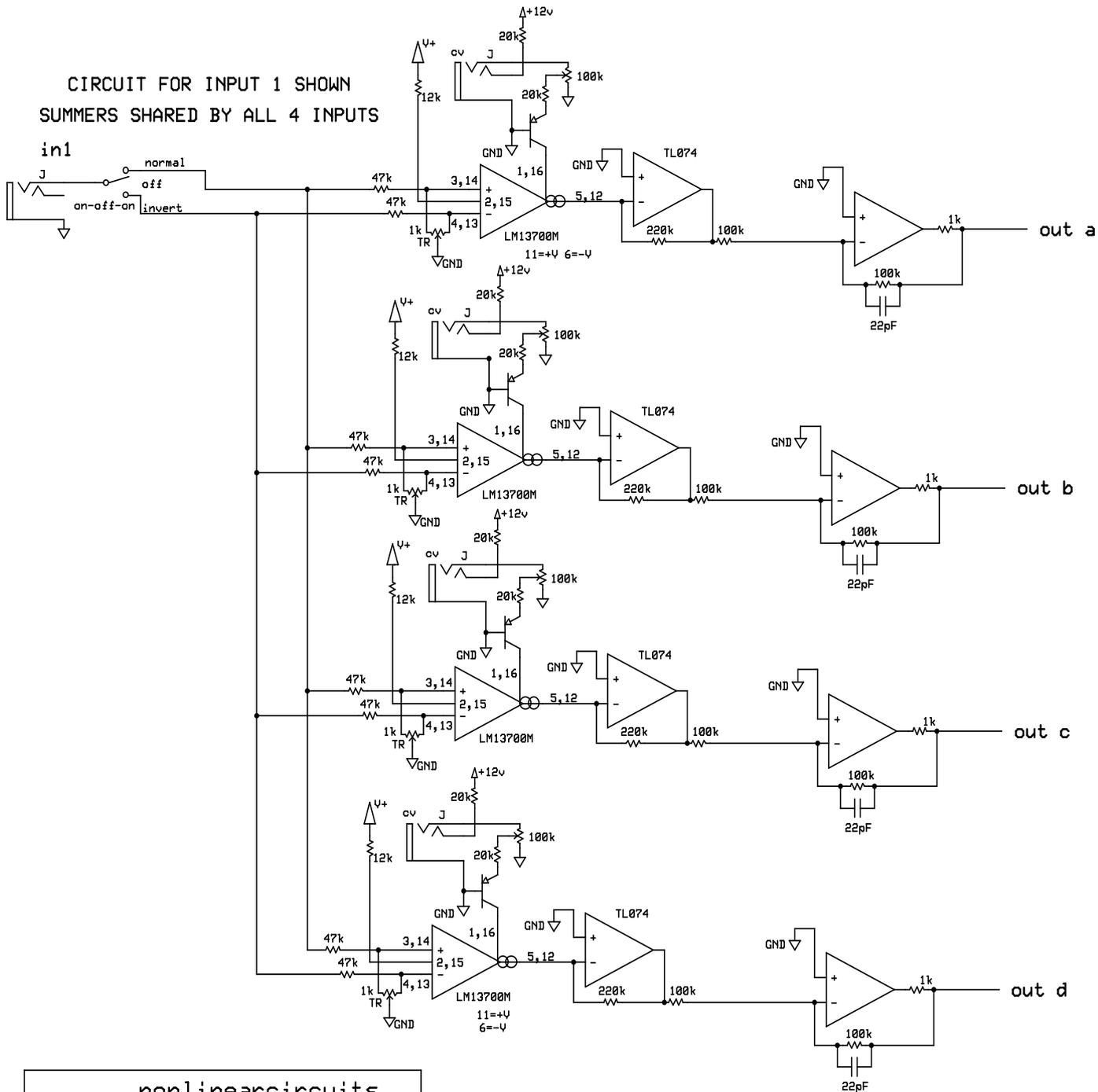
Once done, all outputs should measure 0V no matter what position any of the pots are.



16 pin ICs = LM13700M 8 pin ICs = TL072 transistors = BC857



CIRCUIT FOR INPUT 1 SHOWN
SUMMERS SHARED BY ALL 4 INPUTS



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