nonlinearcircuits

NOIRO-ZE VCF & VCA build & BOM

This module uses the same blackbox technique as the Shat-noir Phaser.

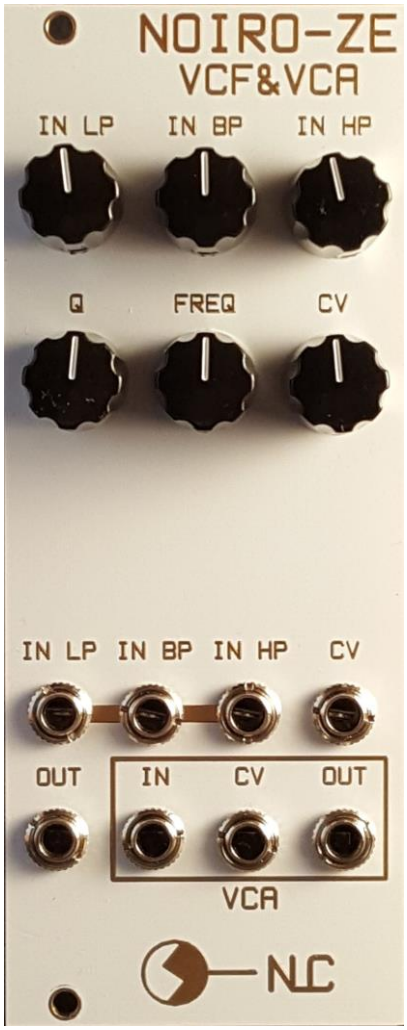
The VCF is based on the Steiner diode VCF but this one uses LDRs rather than diodes and a CV control system to suit. The nice thing about this filter is you can feed different signals to the LP, BP & HP inputs then surf between them with your CV, quite different from regular filters.

The VCA is really there to use up a spare op amp and is based on the Korg PS3100 VCA, works very well for what it is.

Please note the build pictures below when constructing to make the box fairly light-proof. A little bit of leakage does not seem to matter much but you could add a bit of black silastic sealant around the edges if you really want to. When soldering the connector pins, use the SIP connectors, jumped across 1 or 2 pins (see pics) to ensure they are nicely perpendicular to the PCB. When soldering the PCB to PCB connectors, I press lightly on the PCB to help keep the connectors tight against the board.

The PCBs are 2mm thick with black soldermask to prevent light getting in.

Also, please note the pots go on the side of the PCB that has the pot symbol screenprinted, this is different to previous NLC PCBs……just look at the pictures, if you have time and it isn't too much trouble.



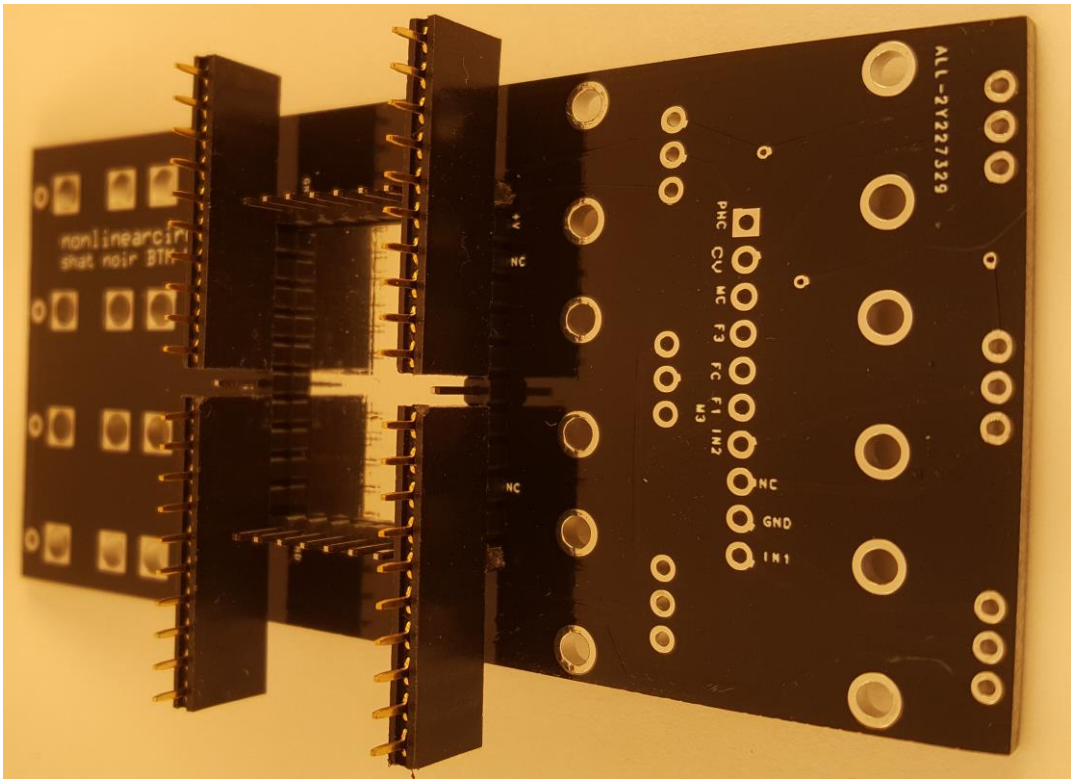
BOM – The Tayda part numbers are given as examples, feel free to buy from your favorite retailer if you prefer.

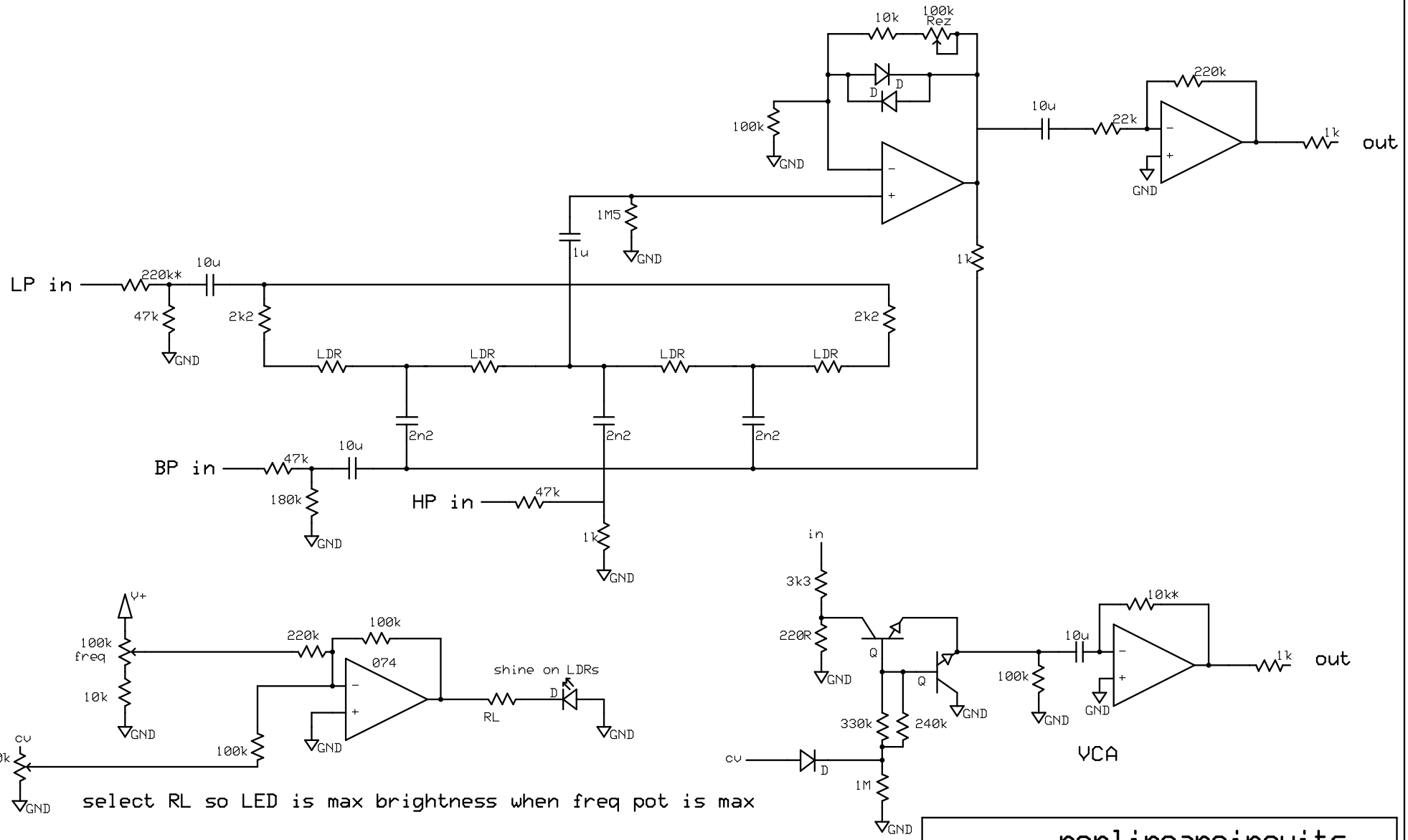
VALUE	QUANTITY	DETAILS
2n2 = 2.2nF	3	**0805 OR 1206 SEE NOTES #1 AND #5**
1µF	1	**0805 OR 1206**
10µF	6	**0805 OR 1206** 25V rating or higher
RL	1	0805 select resistor to suit your LED. If it is a superbright use 4k7-10k
220R	1	0805
1k	4	0805
2k2	2	0805
3k3	1	0805
10k	3	0805
22k	4	0805 SEE NOTES #6
47k	3	0805
100k	4	0805
180k	1	0805
220k	3	0805
240k	1	0805
330k	1	0805
1M	1	0805
1M5	1	0805
LL4148 diodes	3	size: SOD-80, mini MELF, LL34, DO-213AA ……they are all same
BC847	2	NPN SOT-23 Tayda: A-1339
TL074	1	soic
LDR	4	SEE NOTES #5. THESE GO ON THE BOTTOM OF THE UPPER PCB
LED	1	3mm or 5mm, diffused Red, green or yellow. THIS GOES ON THE BOTTOM OF THE UPPER PCB
100k (B) pot	6	Tayda: A-1848 SEE NOTES #6
Eurorack 10 pin power connector	1	Tayda: A-198
Schottky, power rectifier or 10R, optional - for reverse voltage protection...or not	2	SMD, Schottky (best option) or standard power rectifier diode 50-600V 1A or more, dot on PCB indicates CATHODE (stripe on component) Or use a resettable fuse or just a 10R. SEE NOTES #2
3.5MM SOCKET Kobiconn style	8	Tayda: A-865 or preferably get Thonkiconn Jacks (PJ301M-12) from Thonk or Modular Addict
10 Pin 2.54mm Single Row Pin Header Strip	5	Tayda: A-197 (cut to size)
10 Pin 2.54mm Single Row Female Pin Header	5	Tayda: A-1306

Additional notes:

1. Capacitors can be 0805 or 1206, whatever is easiest to find.
2. Some power diodes: PMEG2005EGWX SCHOTTKY RECT, AEC-Q101, 20V, SOD-123, PMEG2005EH DIODE, SCHOTTKY, 0.5A, 20V, 1N400x or S1JL or similar
3. The resistors, caps and transistors are cheapest from Tayda. Diodes from Mouser/E14/Farnell/etc.
4. 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.
5. You may need to adjust the 2n2 capacitors to suit your LDRs. For GL5516, 2n2 are fine. For GL5539, which has a higher on-resistance, I found 1n caps worked well. You can find LDRs on ebay; about $4 for 100, search for the GL codes just given.

6. Three 22K resistors go on the bottom PCB. These are optional and are to convert the linear pots to log pots. If you want....or you could use 100kA (log pots for the top row instead and leave out the 22k. I prefer to use linear (B) pots and add resistors to convert to log, this way you select resistors to suit the log curve you desire.
7. The 10k* next to pin 1 of the TL074 sets the gain of the VCA. 10k should give approx. unity gain for a 5V CV signal. This might vary a little, so if gain is too low, increase the value of this resistor, to say 15k or even 22k if you like it hot.
8. The 220k* controls the maximum level of the Low pass input signal. If it is too hot and dominating, try a larger value, say 330k. In use, 220k should be fine as you can always attenuate the signal with the low pass input pot.
9. When soldering on the pins, use the SIP connectors to hold them on straight. This pic below is of the Shat-noir but the method is the same.




10k
100k
Rez
D
D
100k
GND
10u
22k
220k
1k
out
GND
1M5
1u
GND
1k
LP in
220k*
10u
47k
GND
2k2
2k2
LDR
LDR
LDR
LDR
2n2
2n2
2n2
BP in
47k
10u
180k
GND
HP in
47k
1k
GND
V+
100k
freq
10k
GND
220k
100k
074
shine on LDRs
D
RL
GND
cv
100k
GND
100k
GND
in
3k3
220R
GND
Q
Q
GND
330k
240k
cv
D
1M
GND
100k
10u
10k*
1k
out
GND
GND
VCA
select RL so LED is max brightness when freq pot is max
nonlinearcircuits
NOIR-ZE VCF & VCA
andrewF
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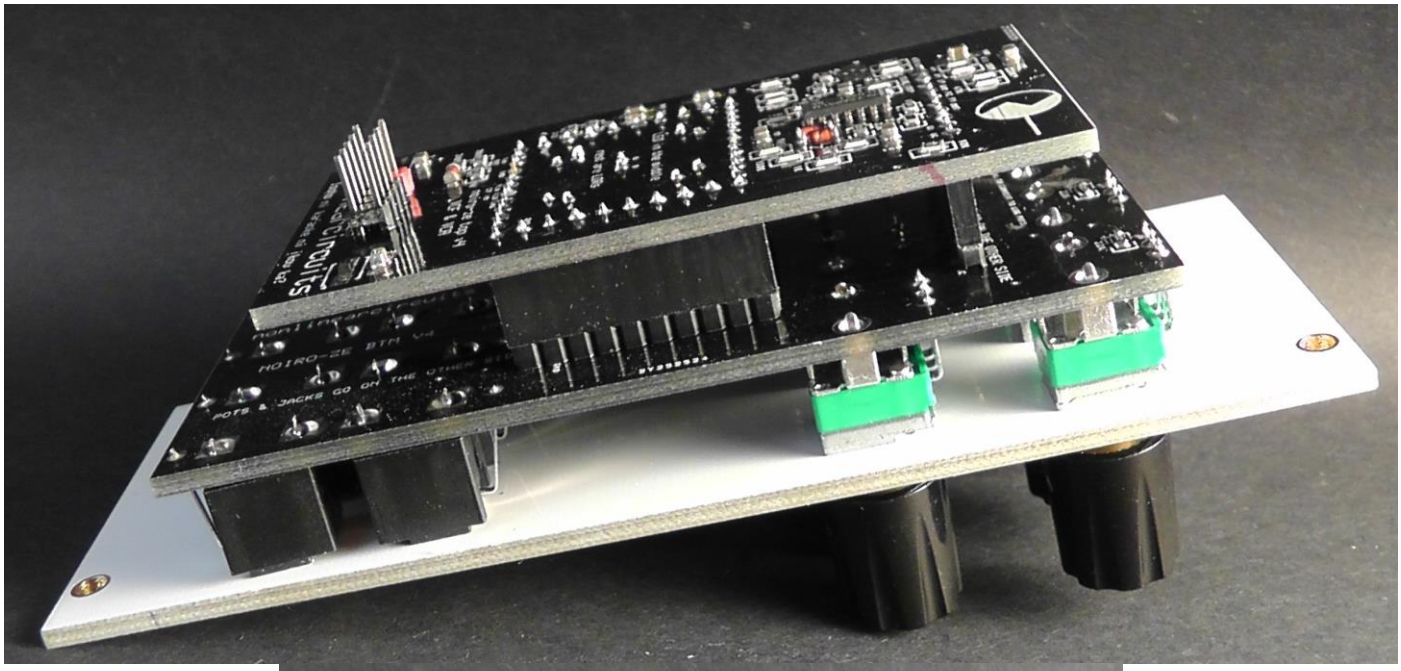
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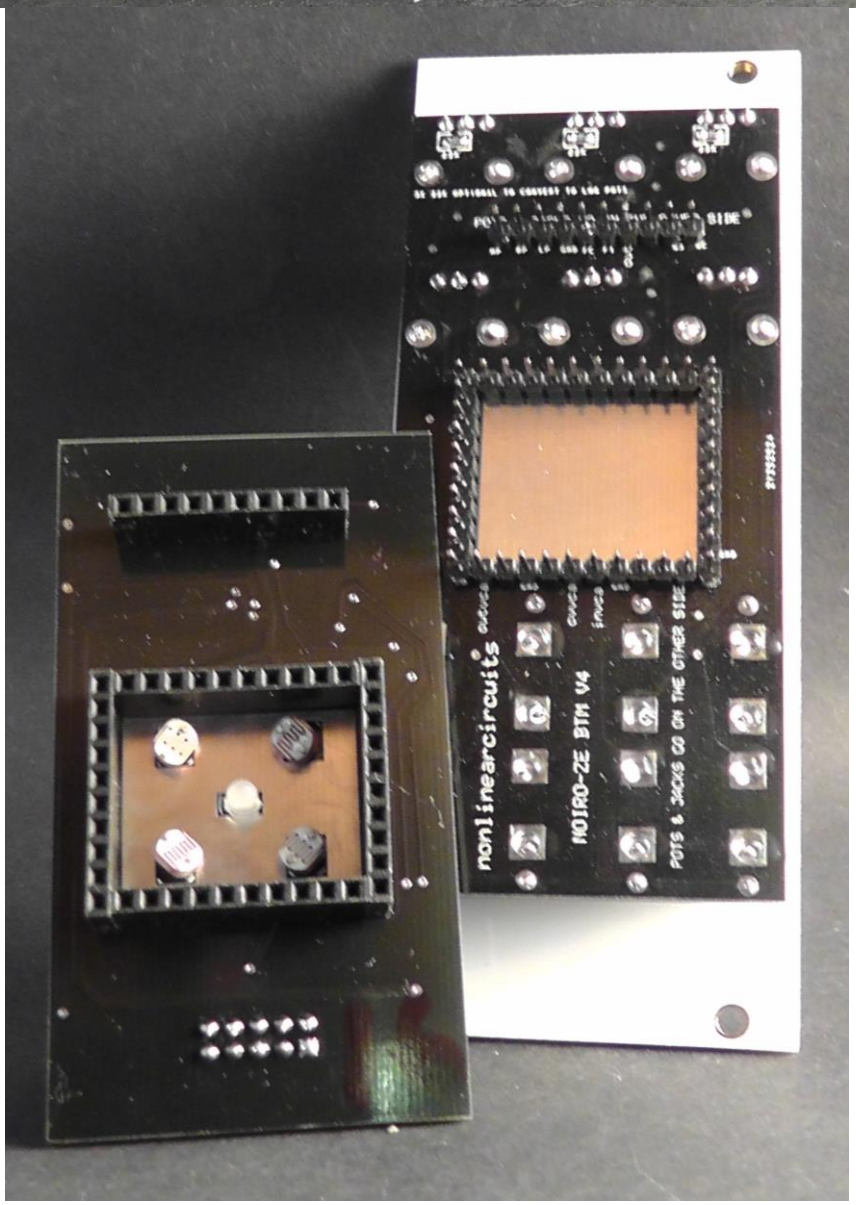
NOIRO-2E BTM V4
POTS & JACKS GO ON THE OTHER SIDE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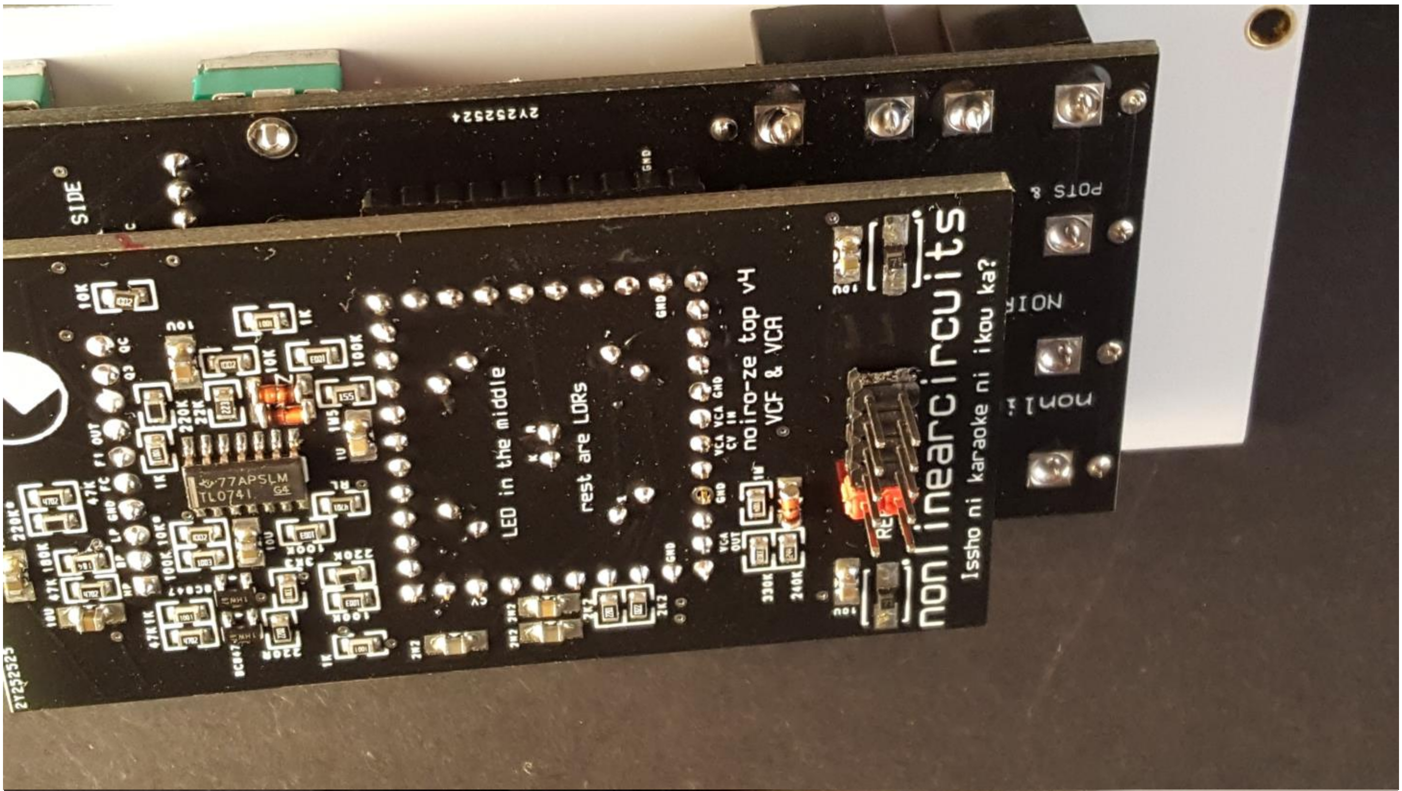
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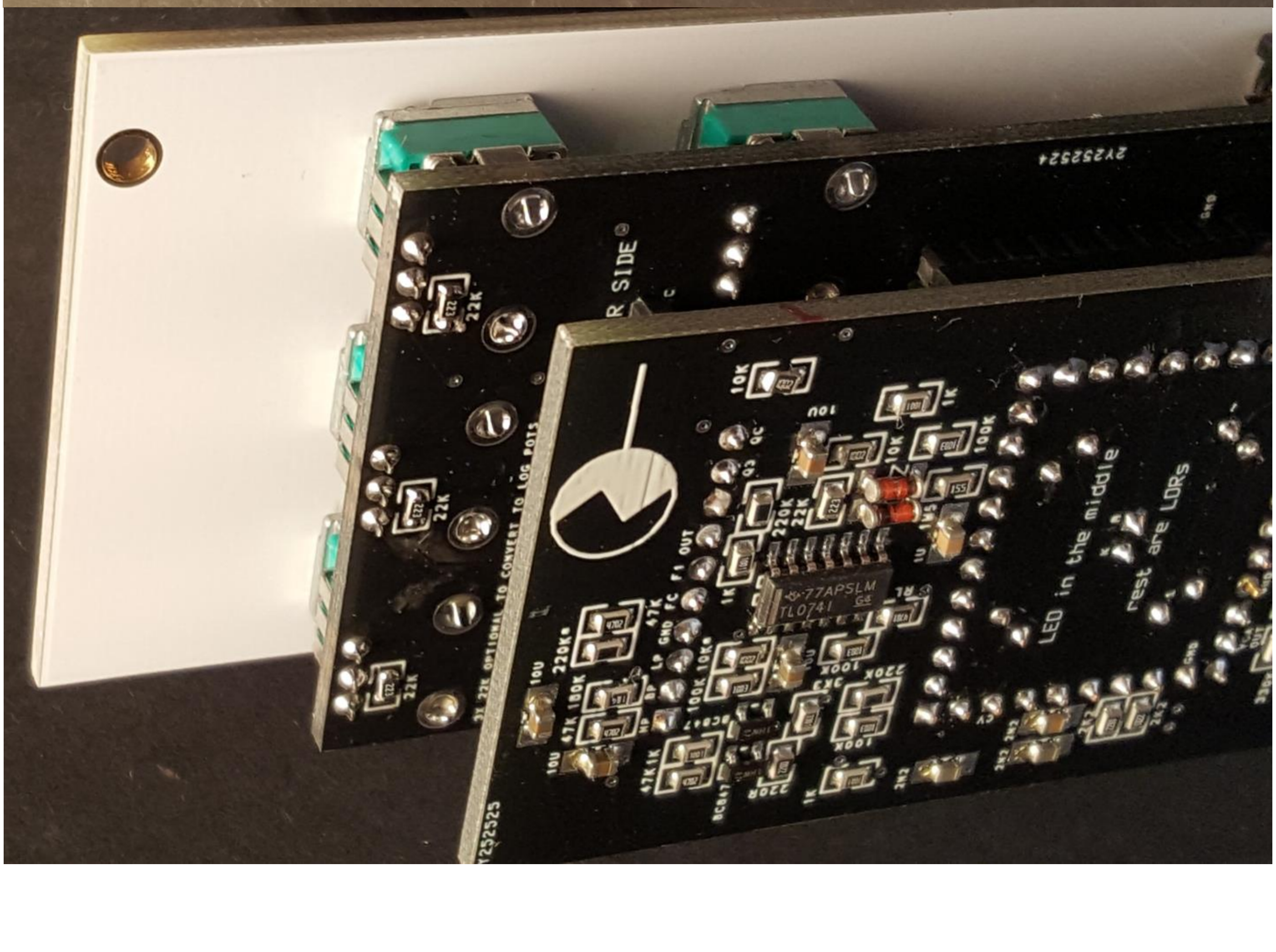
Issho ni karaoke ni ikou ka?
noiro-ze top v4
VCF & VCA
LED in the middle
rest are LDRs
TL074I


LED in the middle
rest are LDRs
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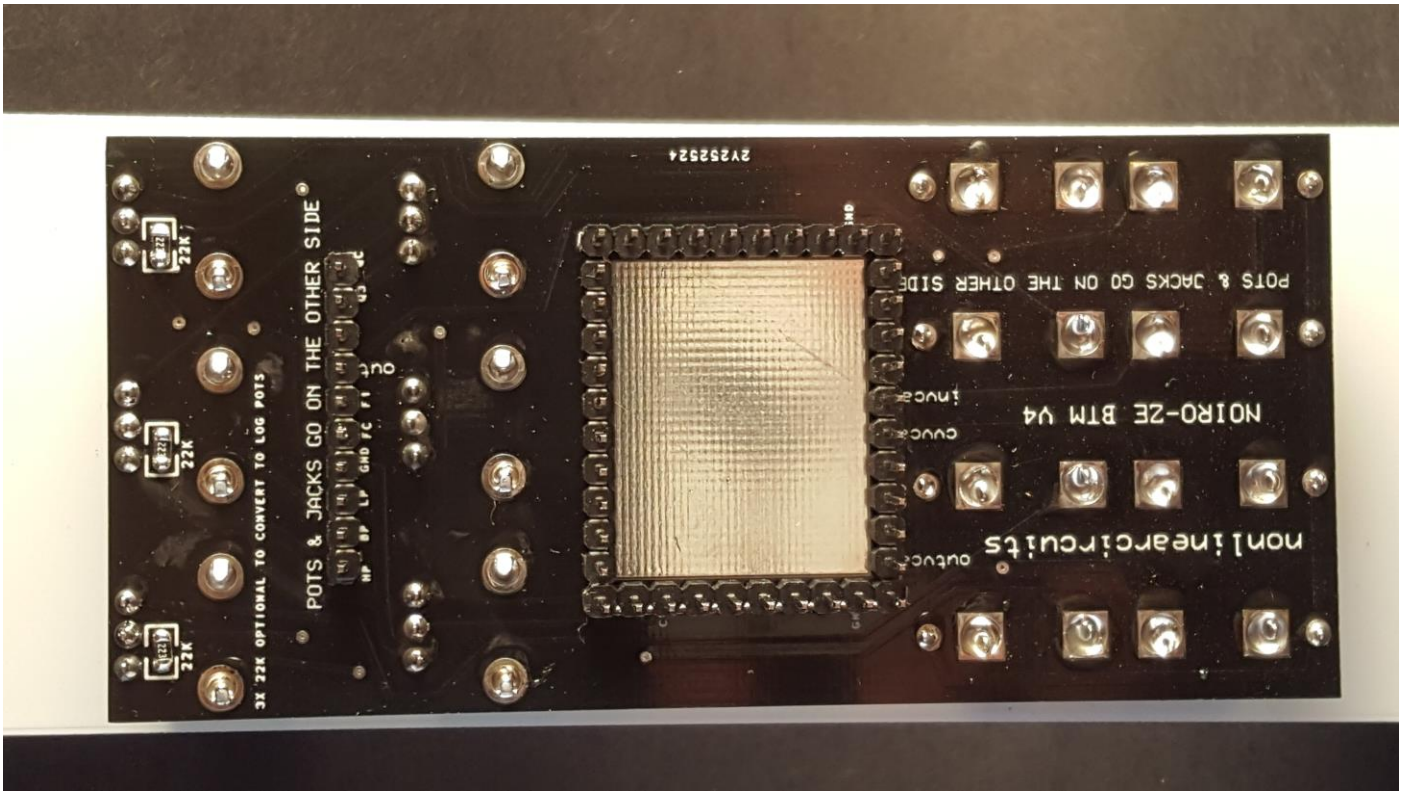
POTS & JACKS GO ON THE OTHER SIDE
3X 22K OPTIONAL TO CONVERT TO LOG POTS
22K
22K
22K
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NOIRO-2E BTM V4
POTS & JACKS GO ON THE OTHER SIDE