

nonlinearcircuits

TRACKY DACKS build & BOM

This is another somewhat lazy design, kind of fitting for 2020.

Basically grabbed the NLC Triad and replaced the rise & fall pots with vactrols. It has been named in honour of the pants 90% of us are wearing every day during C-19 iso.

It is a simple circuit and the results are fun; lots of wobbly, evolving envelopes. It also has an end of cycle trigger, so will cycle if nothing is patched into the 'Do it' input. The cycle rates can be controlled by CVs on Up and Down, which makes it a very unusual LFO. The Range switch allows normal (centre), slow (up) and very slow (down) operation.

Please read the notes after the BOM, there are quite a few options to choose when building this circuit or you can build it as per the PCB if you prefer. The short version is build it as per the PCB except install two 10M instead of the 2M2*.



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

VALUE	QUANTITY	DETAILS
100n	3	0805 Tayda: A-3511
1uF	1	0805 Mouser Part Nos: 710-885012207078 OR 80-C0805C105K3R7210
10uF	4	0805 25V or higher voltage rating Mouser Part No: 963-TMK212BBJ106MG-T (or similar, search "10uf 25v 0805")
47R	2	0805
1k	3	0805
4k7	4	0805
10k	5	0805 - see notes
47k	2	0805
100k	4	0805
470k	2	0805 - see notes
1M	1	0805
2M2*	2	0805 - see notes (update - install 10M)
Single vactrol	2	See notes
TL072 or TL082	2	Soic Tayda: A-1139
555 or 7555	1	Soic Tayda: A-074
BC847	1	Sot23-3 Tayda: A-1339
3mm LED	2	See notes
LL4148	2	Tayda: A-1213
Eurorack 10 pin power connector	1	Tayda: A-198 cut to size
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	5	Tayda: A-865 or Thonkiconn Jacks (PJ301M-12) from Thonk, Synthcube or Modular Addict
100k pot	4	Tayda: A-1848
SPDT toggle switch	1	On-off-on. Tayda:A-3187 or A-3670

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. 3mm LEDs: the 1k and 4k7 resistors on the outputs act as voltage dividers to give 5-6V outputs and serve as current limiters for the LEDs. The LED on the DOING (envelope) output also serves to ensure the output returns to 0V. So you want to choose LEDs that have a nice brightness with 5k7Ω (1k + 4k7 = 5k7). Usually most diffused lens

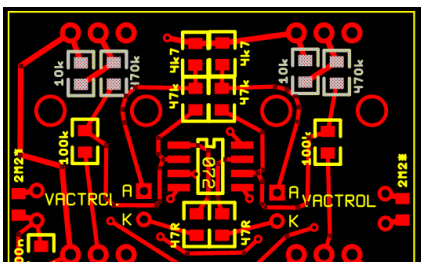
LEDs will be fine. The trigger LED (DONE) only ever flashes very briefly so a very bright LED is ok here. If you need to change the resistors to suit your LEDs, try to keep the approx. 1:5 ratio (1k:4k7).

5. Vactrols – different types will give different results. I used DIY ones with GL5516, get 100 pieces for \$4 with shipping off ebay. It is totally fine to use DIY vactrols for this circuit.

6. 2M2*: these limit the maximum resistance of the LDRs in the vactrols. As mentioned I used GL5516, which are supposed to have an off/dark resistance of 500kΩ, but I rarely measure less than 10MΩ and sometimes double that. The DOWN side doesn't seem to mind but I found the UP side can lock up if the off resistance is too high, so it is good to install a resistor here. 2M2 is a safe value and keeps things ticking over, having built a few of these I now just install 10M for both the UP and DOWN vactrols.

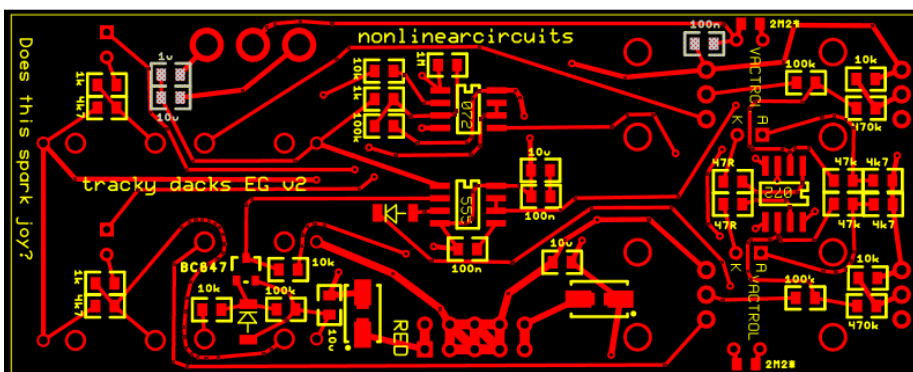
7. 10k resistors on top of the UP & DOWN pots: These can be tweaked to suit your vactrols and your needs. The 10k pots convert the UP & DOWN pots into log pots, see [The Secret Life of Pots](#) to learn more. 10k gives a pretty linear line then a steep curve, 33k-47k give a more conservative arc.

8. 470k resistors on top of the UP & DOWN pots: These control the maximum brightness of the LEDs in the vactrols. If you find a large dead zone maybe increase the value.



10k & 470k

9. Timing caps: When the toggle switch is off the timing cap is 100nF and the circuit oscillates well into the audio range. Toggle up switched in 1uF, down gets 10uF. Feel free to change these, tho remember the 100nF will always be in the circuit, so that is your starting point. For example, to slow things down, you could replace 100nF with 1uF, replace 1uF with 10uF and solder a second 10uF on top of the existing one to get 20uF. The relevant components are highlighted:



Timing caps

