

nonlinearcircuits

VC ADSR build & BOM

This is a somewhat lazy design.

Basically grabbed the classic Jacky/Kirschman 555 ADSR circuit from 1980 and replaced the pots for Attack, Decay and Release with LDRs inside black boxes (BBX).

Not sure why it hasn't been done before, it is a simple circuit and the results are fun; lots of wobbly, evolving envelopes.

I used GL5516 LDRs with clear lens red 3mm LEDs. GL5516 are supposed to have a dark resistance of 500k but I have regularly measured them at over 1M Ω and sometimes over 15M Ω . This means the maximum attack and release times may be quite varied. I have measured 11 minute Attack times and 12 minute release times, but don't be surprised if yours is different.



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

VALUE	QUANTITY	DETAILS
10n	2	0805 Tayda: A-948
100n	3	0805 Tayda: A-3511
10uF	4	0805 25V or higher voltage rating Mouser Part No: 963-TMK212BBJ106MG-T (or similar)
100R	3	0805
1k	2	0805
4k7	1	0805
10k	5	0805
47k	9	0805
100k	13	0805
2M2	2	0805
RL	4	0805 - see notes
GL5516 LDR	3	See notes
TL072 or TL082	5	Soic Tayda: A-1139
555 or 7555	1	Soic Tayda: A-074
BC847	1	Sot23-3 Tayda: A-1339
3mm LED	4	See notes
LL4148	5	Tayda: A-1213
100k trimpot	1	Tayda: A-2506
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	7	Tayda: A-865 or Thonkiconn Jacks (PJ301M-12) from Thonk, Synthcube or Modular Addict
10 Pin 2.54mm Single Row Pin Header Strip	8	Tayda: A-197 (cut to size)
10 Pin 2.54mm Single Row Female Pin Header	8	Tayda: A-1306
10k pot	1	Tayda: A-1847
100k pot	6	Tayda: A-1848

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. Use 3mm LEDs, for the black box, best are red or green LEDs. For the panel LED use a superbright, any colour is ok, also a 5mm LED for the panel is fine too.

5. LDRs (light dependent resistors) - different types will give different results. I used GL5516, get 100 pieces for \$4 with shipping off ebay. Feel free to try whatever types you like ☺ One builder reported that for the NLC black box LPGs it is best to install the LDRs flat, do not bend them towards the LEDs. This way you get a better range over the control pots. See pics following as an example.

6. RL - select resistors to suit the LEDs you have. For the ones in the black box, I tend to choose a lower value for RL than usual as you want these LEDs to shine very brightly. So if you normally choose 10k to suit the LED, maybe try 2k2.

Setting up

With nothing on the inputs, use a multimeter to measure the voltage of the output. Adjust the trimpot so the output is 0V.

Use

The envelope will start with a signal on the gate or trigger inputs, tho best to send a gate to the gate input and another signal to the trigger input to re-trigger the envelope.

The CVs work to increase the brightness of the LED, which reduces the resistance of the LDRs making the function times shorter. For example; the higher the voltage of a CV on the attack CV input, the shorter the attack time. How effective this is also depends on the setting of the preset pots.

