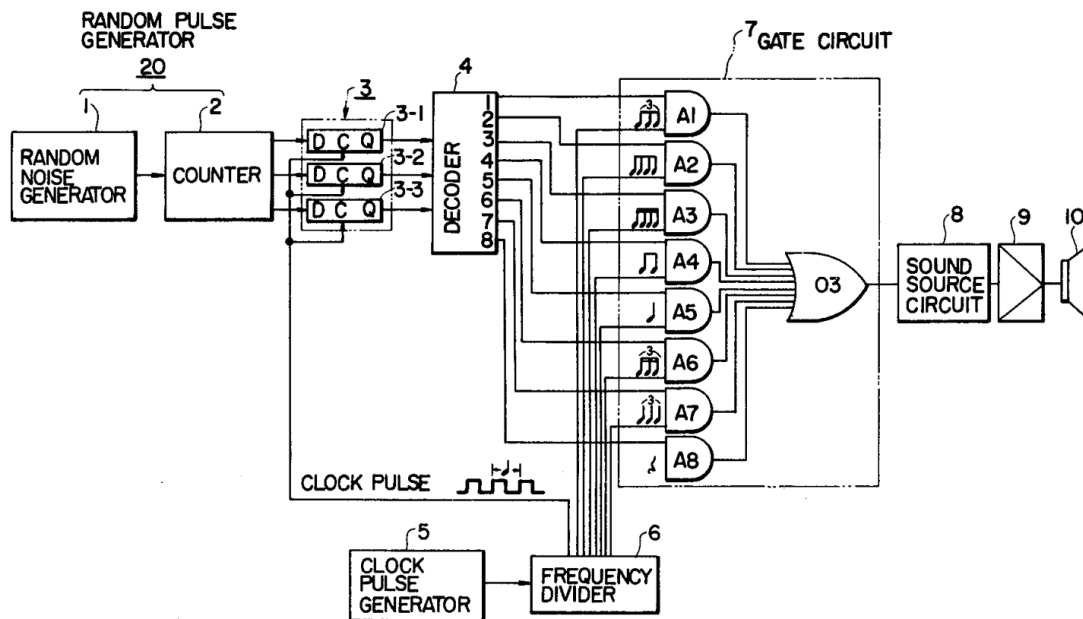


nonlinearcircuits

STOCHAOS build & BOM

This module generates gates and control voltages based on pink noise or chaos or pink noise vs chaos. You can use a switch to select which variation. It uses a lot of cmos but I was careful to select chips that are still in stock at most retailers.

The base idea for the circuit came from a 1980 patent: US4208938 Random Rhythm Pattern Generator. The block diagram from the patent is shown below -



Stochaos retains sections 1, 2, 3, 4 & 6.

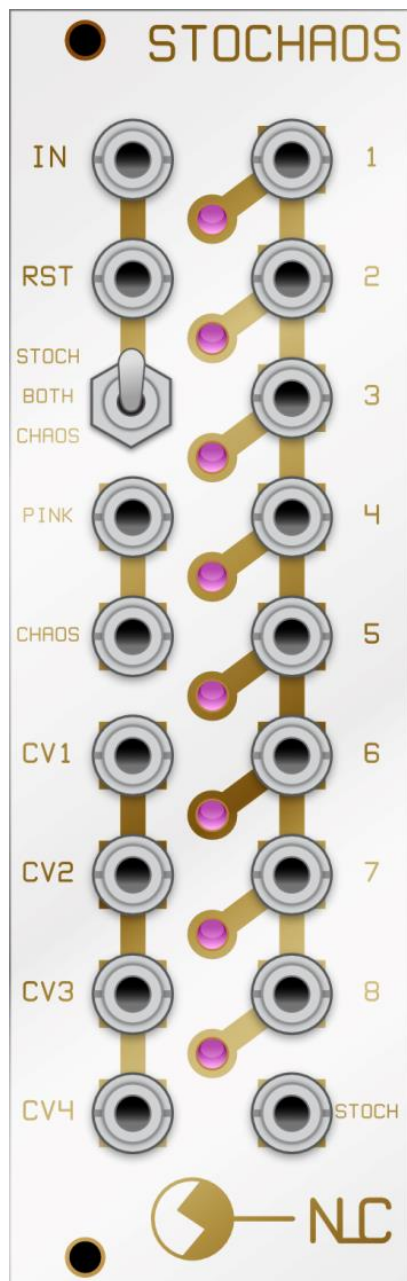
Section 1 consists of a pink noise circuit, a chaos circuit operating at approx. 1.5KHZ and a comparator.

Section 5 has been replaced with clock and reset input circuits.

Section 7 does not have the 8 input OR gate and the 8 AND gates have been replaced with XOR gates so that multiple gates can be active at the same time. If using AND gates, only one of the 8 gate outputs will be available at a time, this is not a bad thing.

The circuit can be easily modified to perform in this way by replacing the two 4070 XOR chips with two 4081 AND chips (or any other 4 channel two input logic chip - OR, NAND, XNOR, NOR). I have both versions and like them both, the one-gate-at-a-time version tends to get a much faster clock signal.

Section 3 is used to generate the CV signals.



To operate, just feed a gate to IN, add a reset if you like. Select if you want full random (STOCH), chaos or random vs chaos (BOTH).

Everything else is an output. PINK and CHAOS are drawn off the internal random and chaotic sub-circuits.

CV1 And CV2 are fed to a difference rectifier to get CV3 and CV4, so CV3 will be mainly negative voltage.

1-8 are gate outs, so is STOCH. I had a spare jack so just routed an output from one of the earlier stages in the circuit, it tends to give longer gates than the other stages.

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

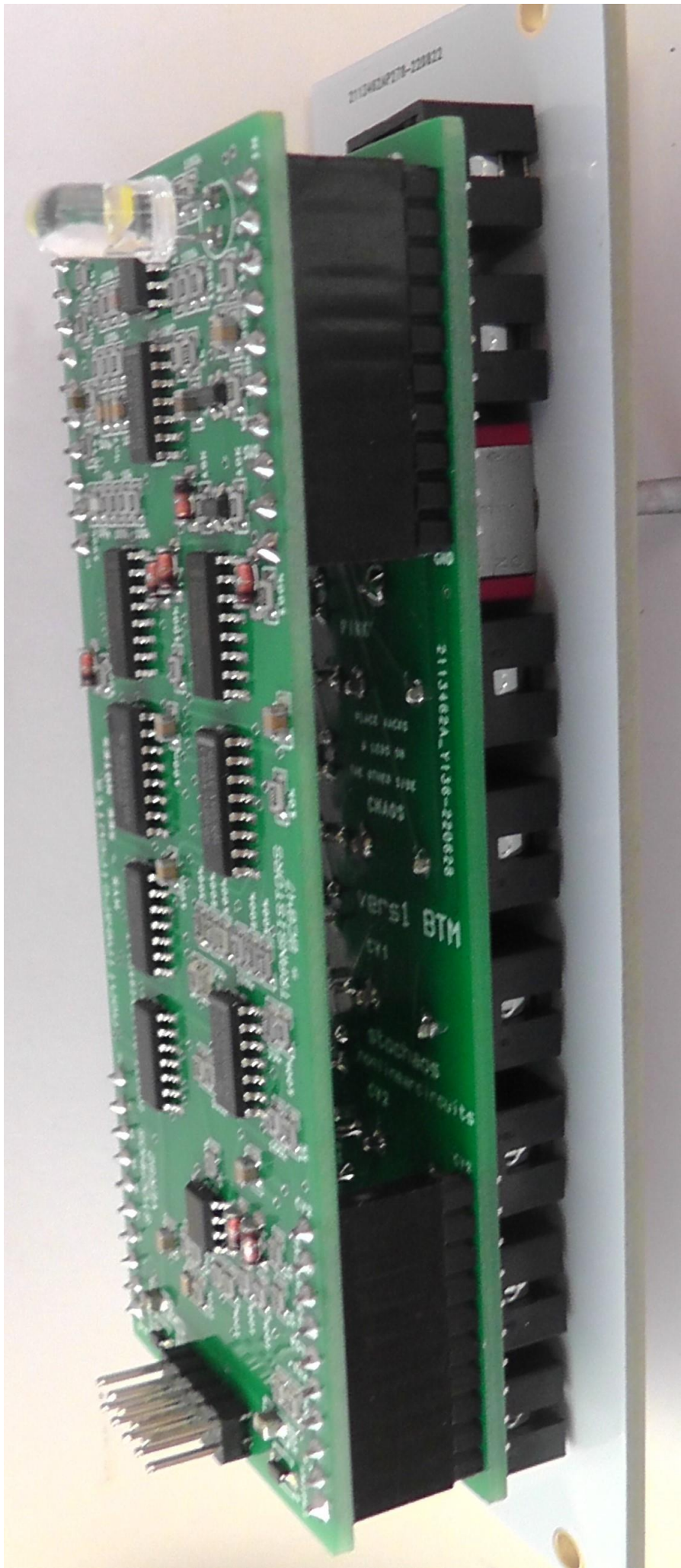
VALUE	QUANTITY	DETAILS
100p	1	08050
560p	1	0805
1n	3	0805
4n7	1	0805
10n	2	0805
100n	8	0805
10uF	4	0805 25v or higher voltage rating Mouser:963-TMK212BBJ106MG-T or similar
1k	8	0805
2k2	18	0805
4k7	2	0805
10k	16	0805
22k	1	0805
33k	2	0805
100k	27	0805
200k	3	0805
220k	1	0805
300k	2	0805
1M	1	0805
1M-10M?	1	0805 select for pink noise level (I tend to use 10M but it depends how noisy your transistor is)
RL	9	0805 select resistor to suit LED brightness (prob 4k7 to 10k)
TL072 or TL082	1	Soic Tayda: A-1139
TL074 or TL084	3	Soic Tayda: A-1140 or A-1137
CD4070 or HEF4070	2	soic Mouser Part No: 863-MC14070BDG or 863-MC14070BDR2G or 595-CD4070BMT
CD4028 or HEF4028	1	Mouser: 595-CD4028BM96 or 595-CD4028BNSR (wide soic but just fits) or 771-HEF4028BTD-T
CD40175	1	soic Mouser part No: 595-CD40175BM96
CD4040 or MC14040	2	soic Mouser Part No: 595-CD4040BM96 or 595-CD4040BM or 863-MC14040BDG
3mm or 5mm LED	1	for chaos circuit on top PCB, any crappy LED is fine but high V-on is good so a blue one if you have it.
LL4148	7	sod-80 Tayda: A-1213
BC847	11	SOT23-3 Tayda: A-1339
3mm LEDs	8	Up to you, diffused lens are easier on the eyes. Square hole = anode / long lead
Eurorack 10 pin power connector	1	Tayda: A-198 cut to size
S1JL, Schottky, power rectifier or 10R	2	SMD SEE NOTES #1. dot on PCB indicates CATHODE (stripe on component).
3.5MM SOCKET	17	Tayda: A-865 or Thonkiconn Jacks (PJ301M-12) from Thonk, Synthcube or Modular Addict
on-off-on toggle switch	1	Tayda: A-2559 or similar
10 pin header	4	get two 40 pin strips and cut off as needed Tayda: A-197
10 Pin 2.54mm Single Row Female Pin Header	4	Tayda: A-1306

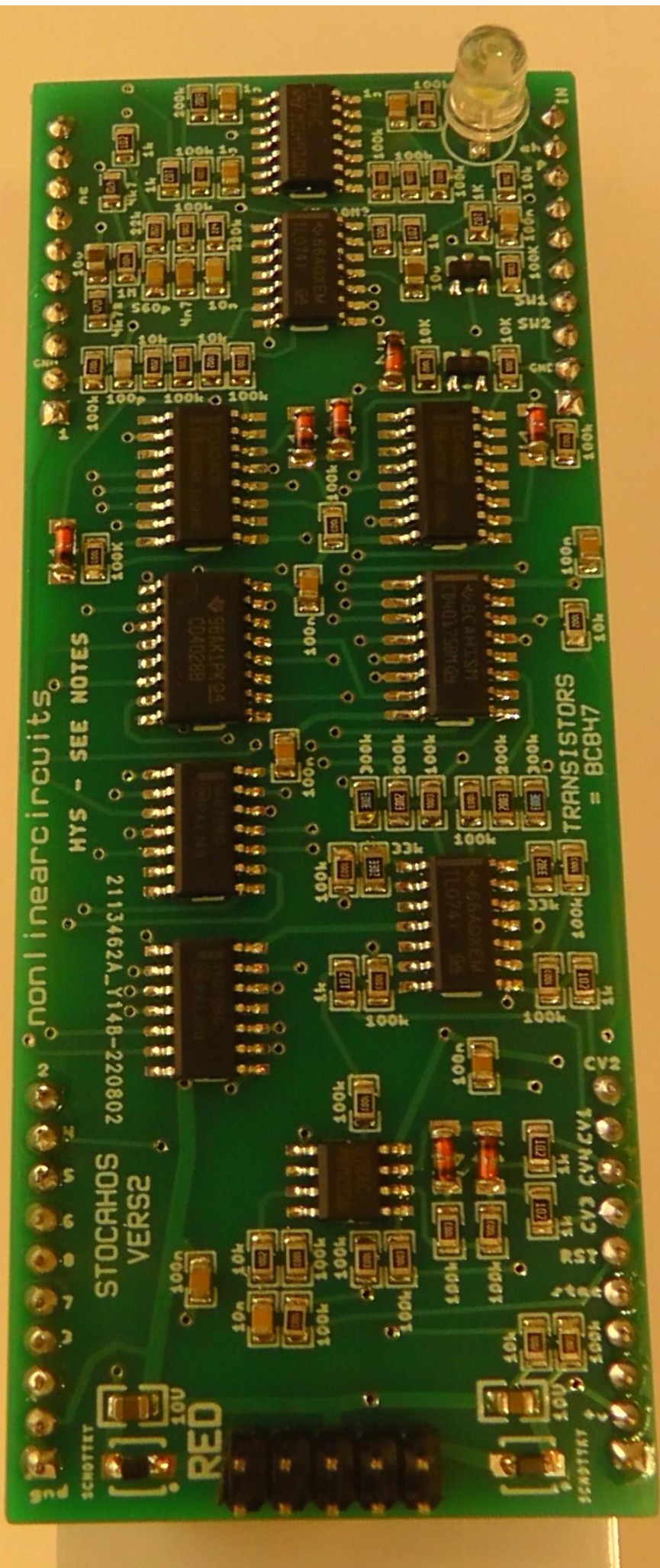
Additional notes:

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.





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