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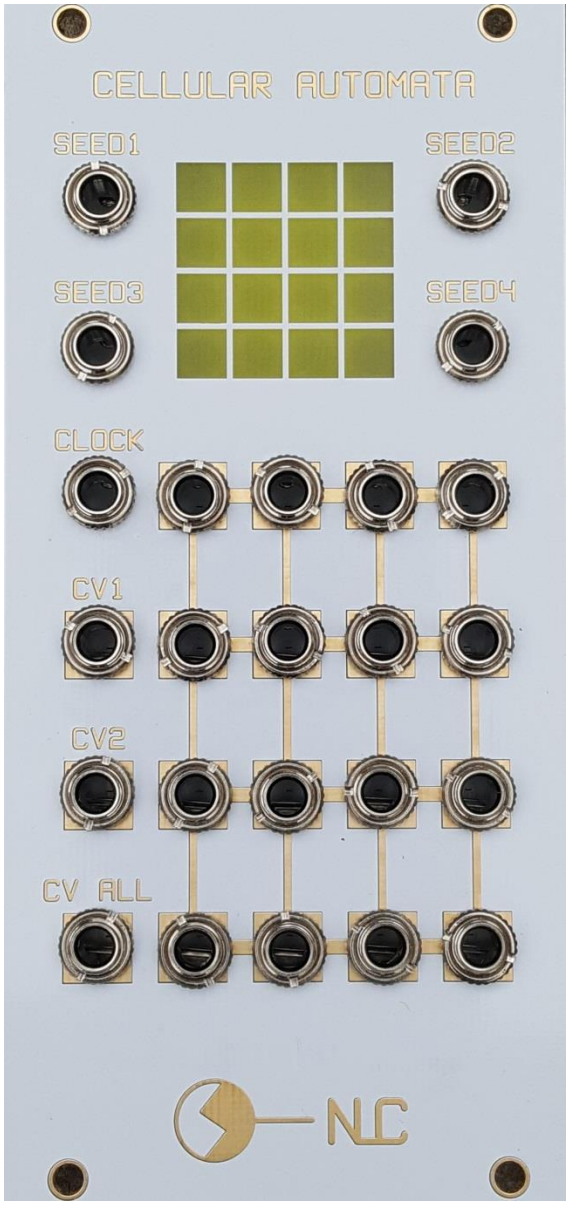
Cellular Automata build & BOM

This is a 16 cell gate and pattern generator using cellular automata rules 90 & 150. It will run thru a process driven by a clock signal and requires a signal on one of the seed inputs (anything crossing 1V) to start a new process or alter the current one. The seed inputs feed external signals into the 4 corner cells.
A process without seeds may run for hours or minutes, depending upon the start point and clock rate.

An early version of this circuit did appear in the NLC 4U panels in sets of 4 cells per PCB. This version is different as the cells are in a grid rather than lines, meaning each cell can be affected by the activity of neighbours on up to 4 sides.

There are 3 CV outputs, two based on what is happening on each half of the circuit, one reflects the pattern created by the active cells. Each cell has a gate output.



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

VALUE	QUANTITY	DETAILS
100pF	1	0805 Tayda: A-3503
100nF or 104	34	0805 Tayda: A-3511 see notes
10uF	3	0805 25V or higher voltage rating Mouser Part No: 963-TMK212BBJ106MG-T
1k	3	0805
2k2	32	0805
10k	24	0805
22k	2	0805
47k	1	0805
100k	22	0805
150k	2	0805
220k	2	0805
330k	2	0805
470k	2	0805
680k	2	0805
820k	2	0805
1M	2	0805
RL	16	0805 select to suit LED brightness
4070	12	Mouser Part No: 595-CD4070BM96 or 771-HEF4070BT653
4042	4	Mouser Part No: 863-MC14042BDG or 863-MC14042BDR2G
BC847	16	Tayda: A-1339
TL072 or TL082	5	Soic Tayda: A-1139
LEDs	16	See notes
LL4148	5	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	24	Tayda: A-865 or Thonkiconn Jacks (PJ301M-12) from Thonk, Synthcube 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:

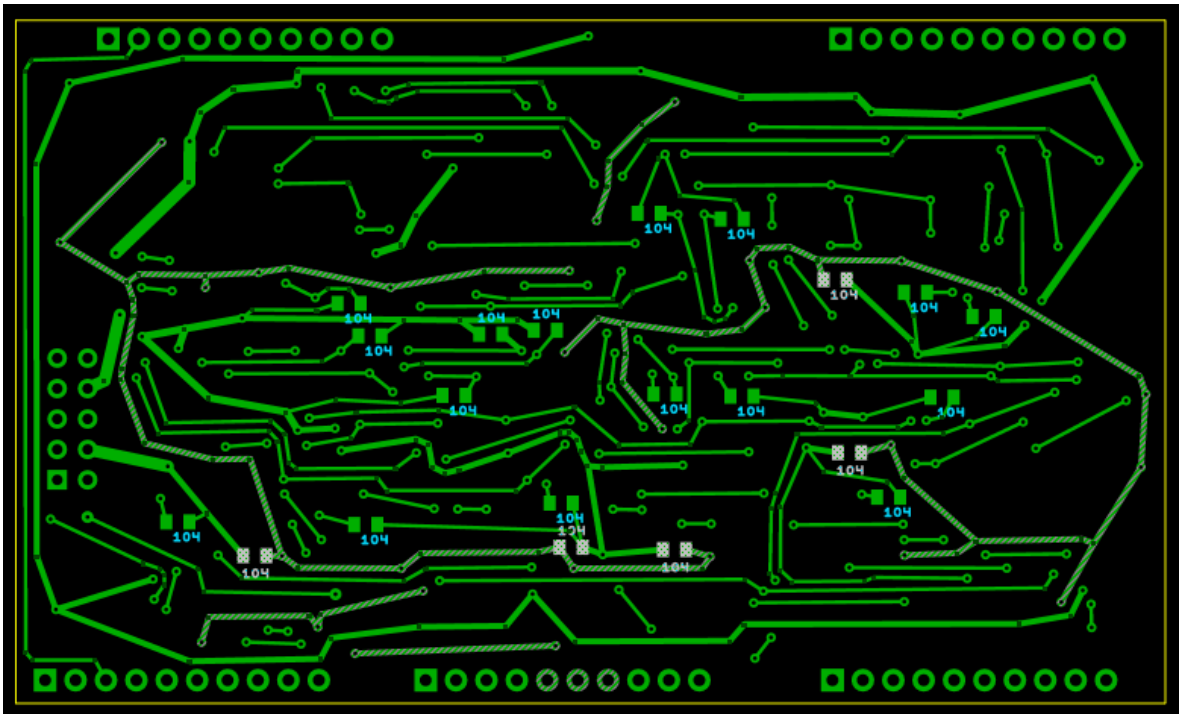
1. , Schottky (best option) **or** standard power rectifier diode 50-600V 1A or more, **or** use a resettable fuse **or** just a 10R. Examples: BAT54GWX, PMEG2005EGWX, AEC-Q101, 20V, SOD-123, PMEG2005EH DIODE, SCHOTTKY, 0.5A, 20V, 1N400x or S1JL or similar.

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

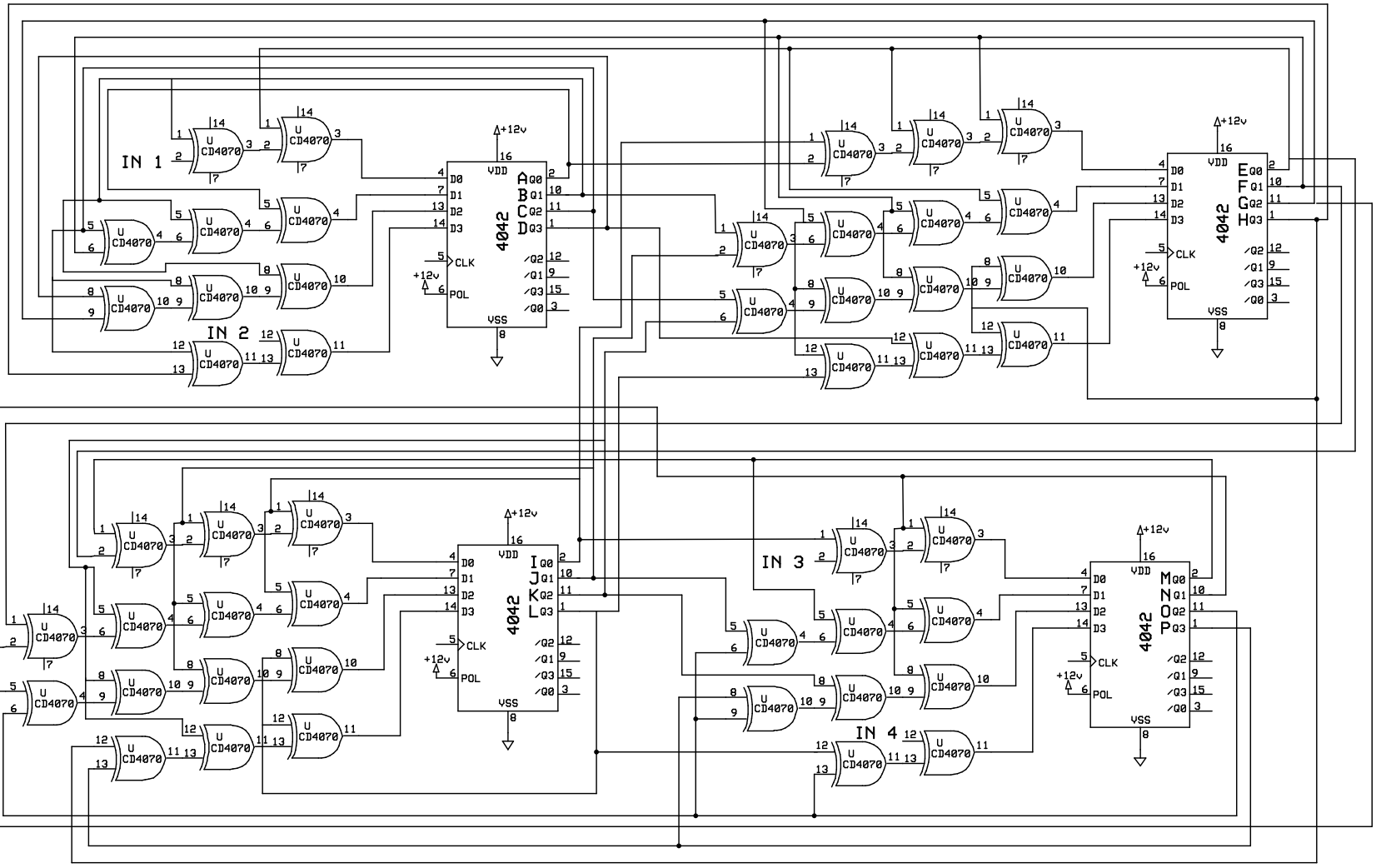
3. Join the Nonlinearcircuits Builders Guild on FB: https://www.facebook.com/groups/174583056349286/ and ask questions there if you have any. If you prefer not to FB then email is fine.

4. The LEDs chosen make a big difference to how the module will look. I have tested with 5mm diffused LEDs and 3mm clear. All are good but I liked the 3mm clear best (the green ones in the pictures), the light does leak to neighbour cells, which is good, but not as much as the diffuse LEDs. Also the LEDs are mounted so they are sitting on the PCB rather than pressed against the panel. Feel free to make your own choices about how to do this.

5. 21 of the 100nF capacitors are soldered to the bottom of the upper PCB. Five of these are for decoupling (highlighted in pic below). The others are a mod suggested by builder Andy B. who found the CA puts out spurious triggers on every clock pulse. These triggers are very short and sharp, which do not affect other NLC modules but don't play nicely with Befaco modules. So, installing them is optional but probably a good idea if you have Befaco in your system.



IGNORE THE PIN NUMBERS ON THE 4070s



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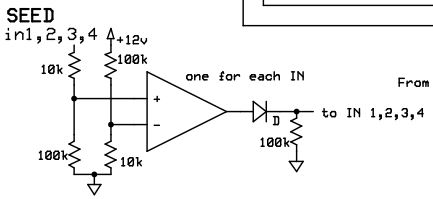
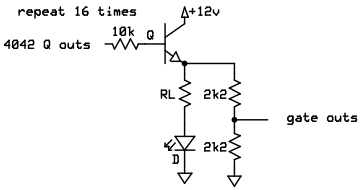
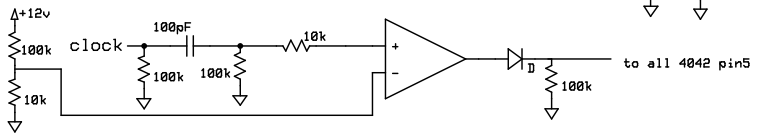
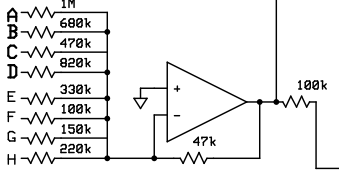
cellular automata 16 cells
Rev 1.2
11May2019
Page # or name
andrewF

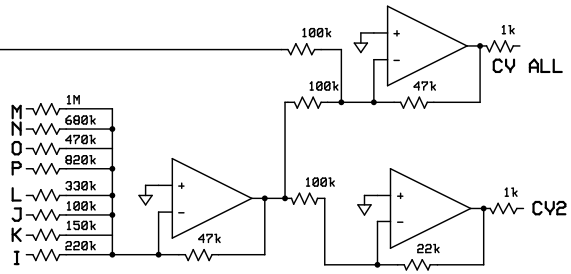
SEED
in1,2,3,4











Left – 3mm narrow beam green LEDs

Right – 5mm diffused red LEDs

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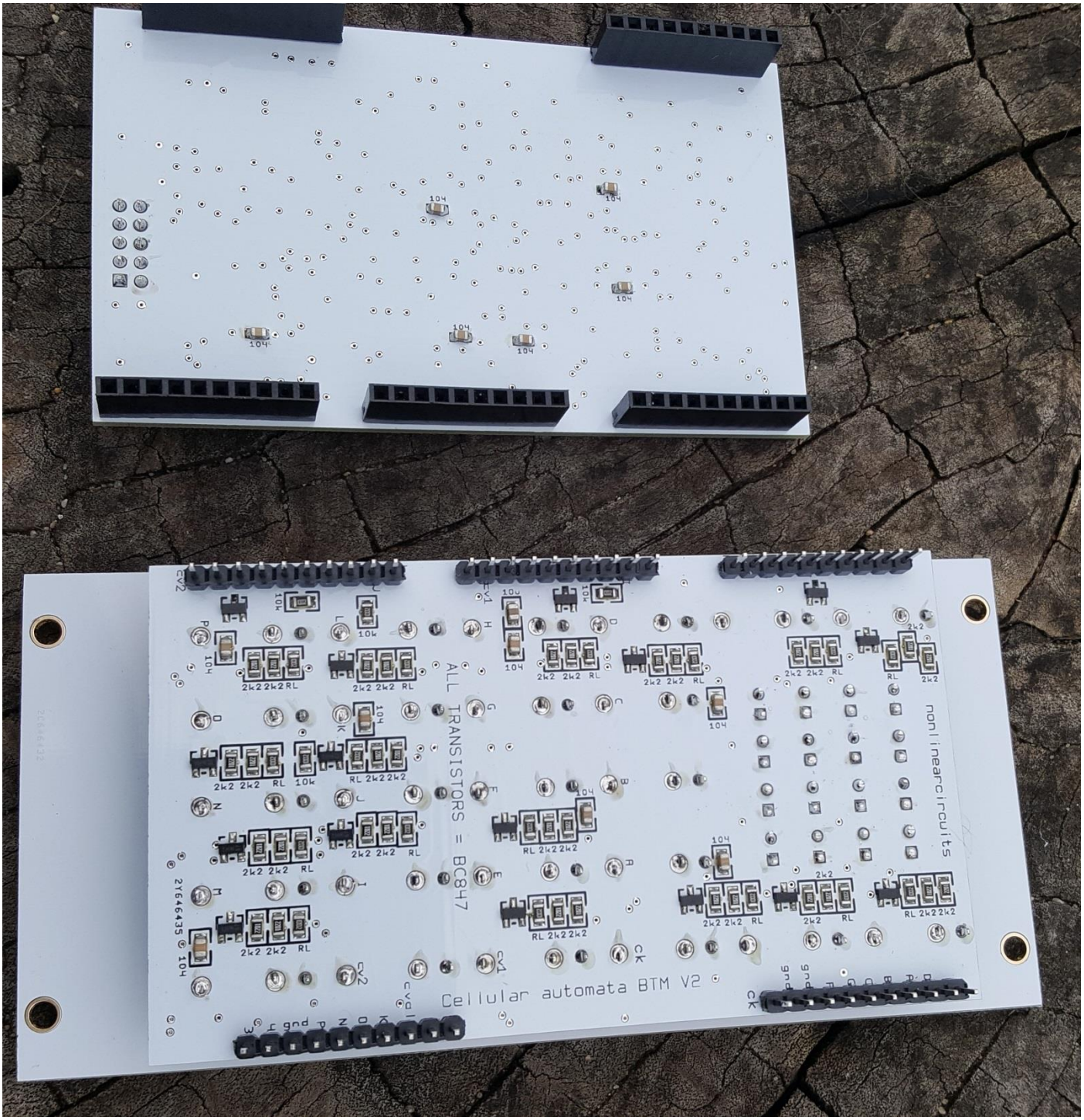
CA TOP vers2
CV1
CV2
10U
2Y646445



Note – 6 100nF capacitors are placed on the bottom of the upper PCB