

nonlinearcircuits

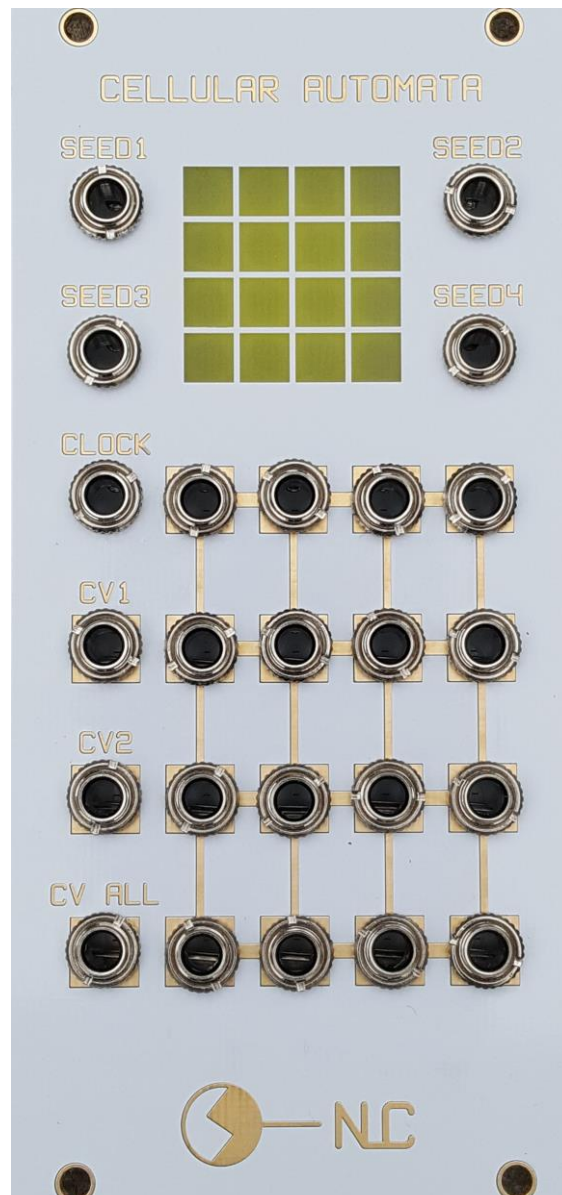
Cellular Automata build & BOM

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 | 18 | 0805 Tayda: A-3511 |
| 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.

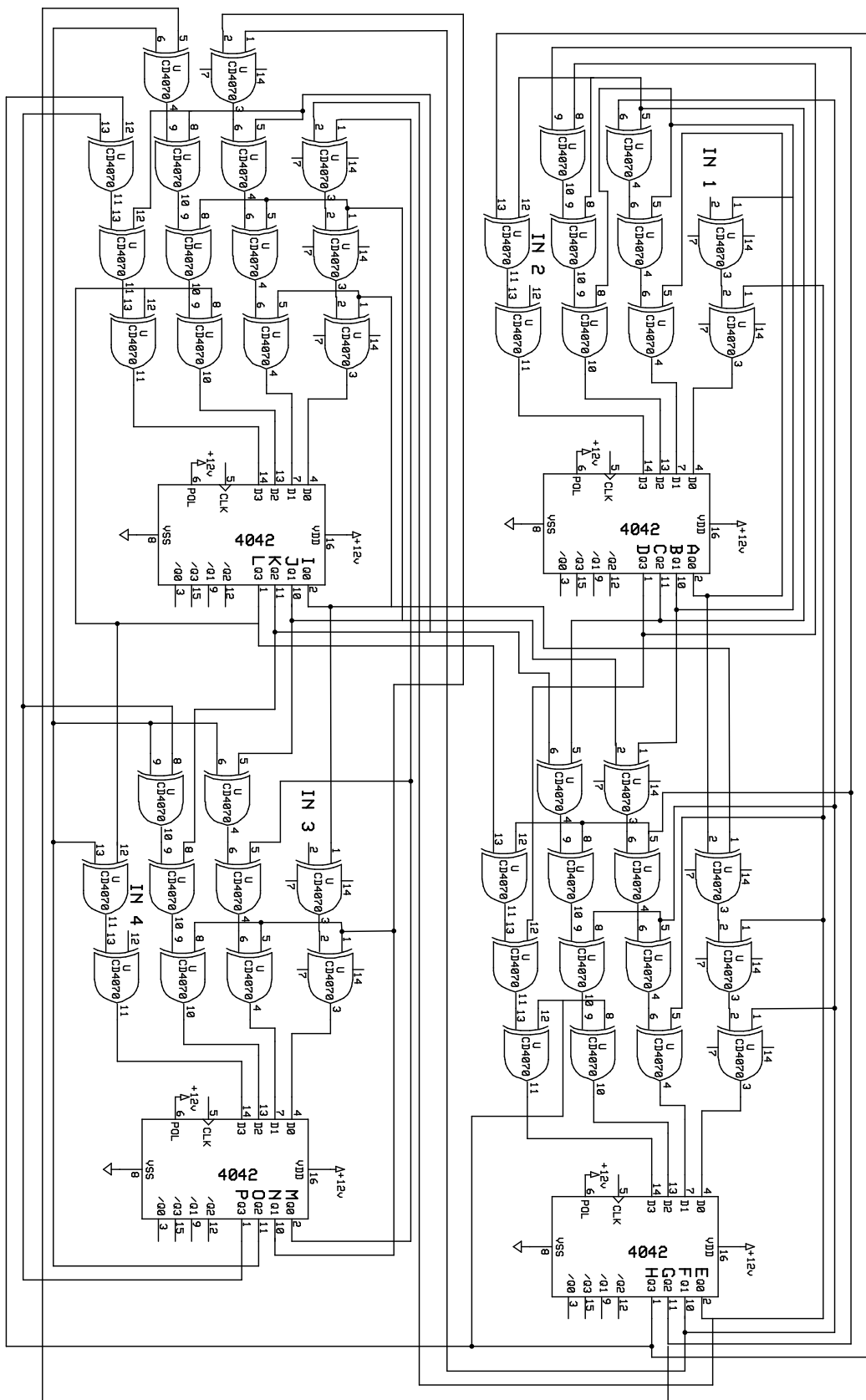
2. The chips, resistors, caps are cheapest from Tayda. Schottky diodes, CMOS & 10uF 25V 0805 caps from Mouser/E14/Farnell/etc.

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.

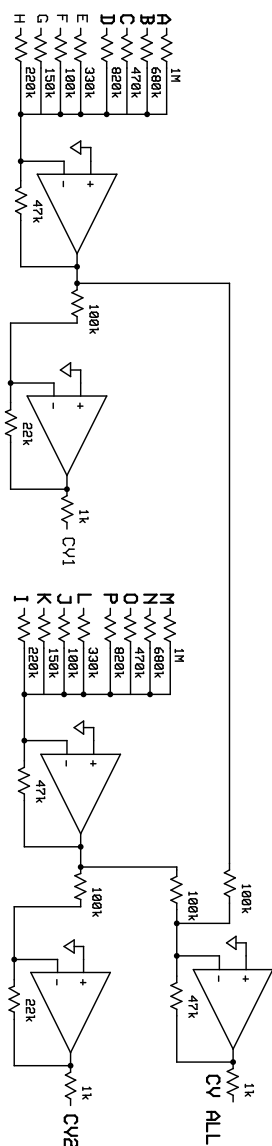
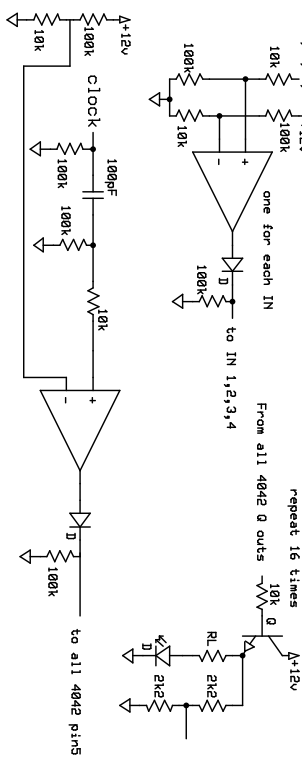
4. The LEDs chosen make a big difference to how the module will look. I have tested with 5mm diffused LEDs and 3mm clear. All are good but I liked the 3mm clear best (the green ones in the pictures), the light does leak to neighbour cells, which is good, but not as much as the diffuse LEDs. Also the 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. Six of the 100nF capacitors are soldered to the bottom of the upper PCB

IGNORE THE PIN NUMBERS ON THE 4070S



SEED
in1,2,3,4 $\Delta_{+12\mu}$

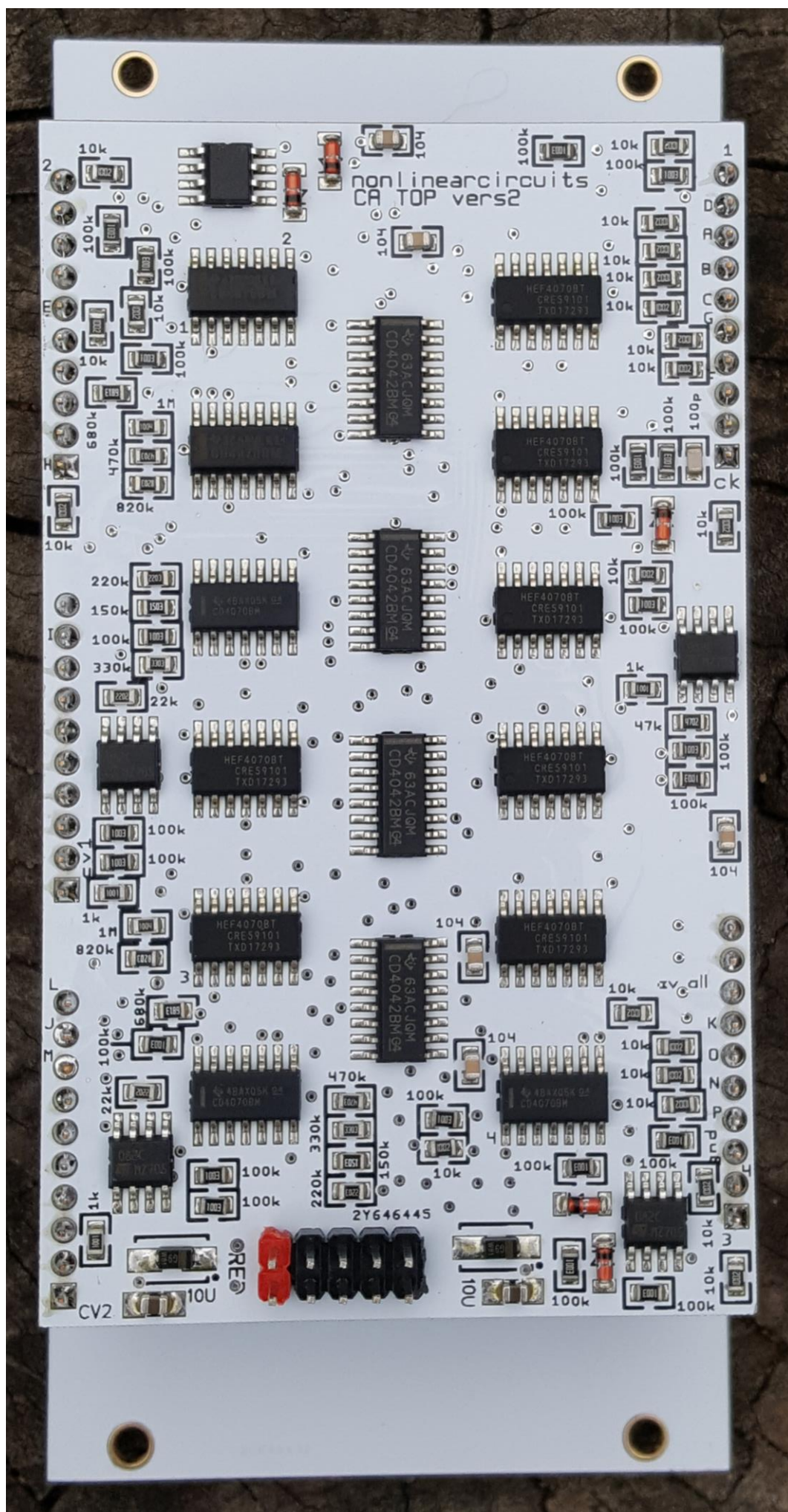


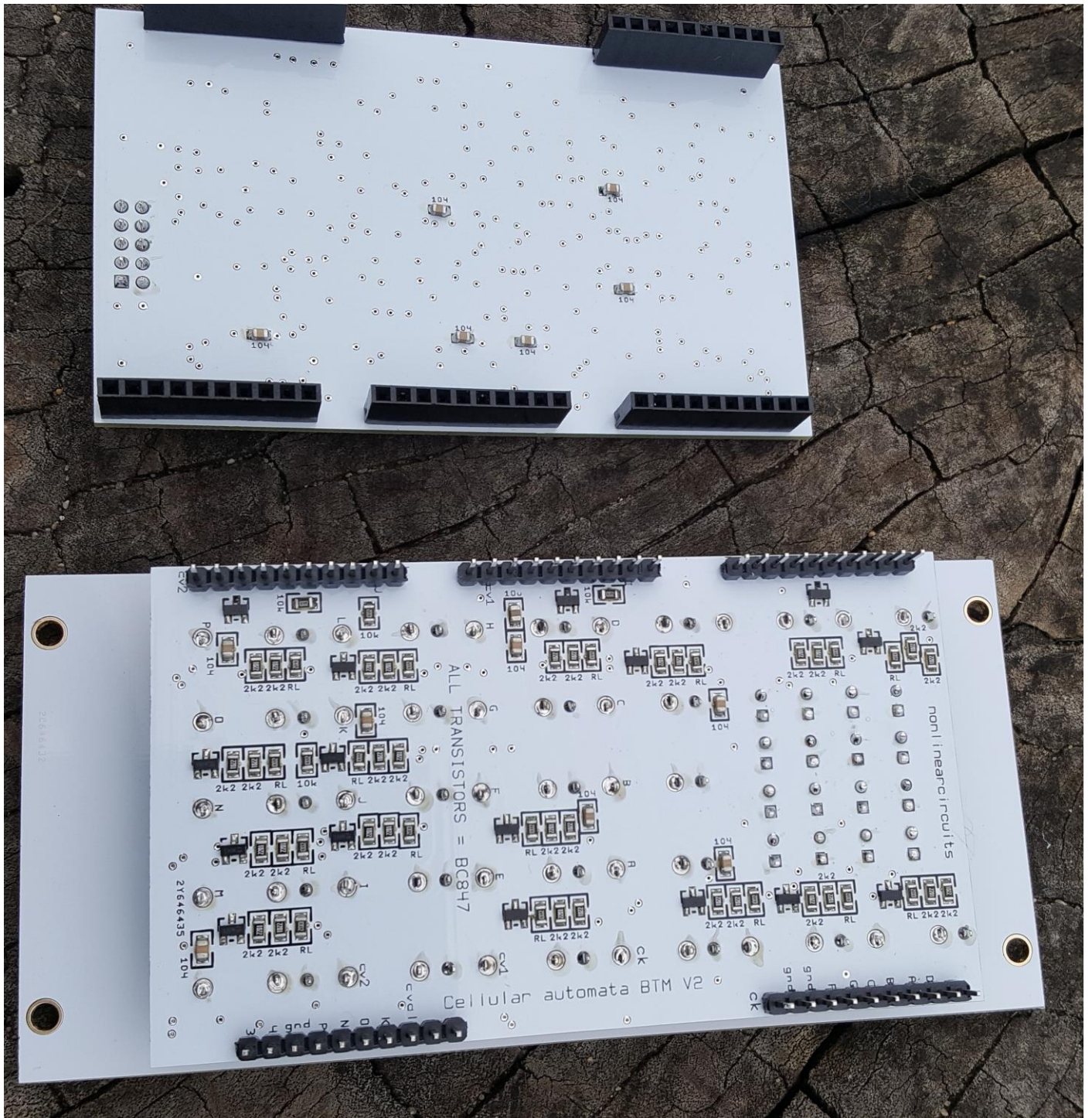
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|----------------------------|-------------|----------------|
| nonlinearcircuits | | |
| cellular automata 16 cells | | |
| andrewF | Rev 1.2 | Page # or name |
| | 11 May 2019 | |



Left - 3mm narrow beam green LEDs

Right - 5mm diffused red LEDs





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