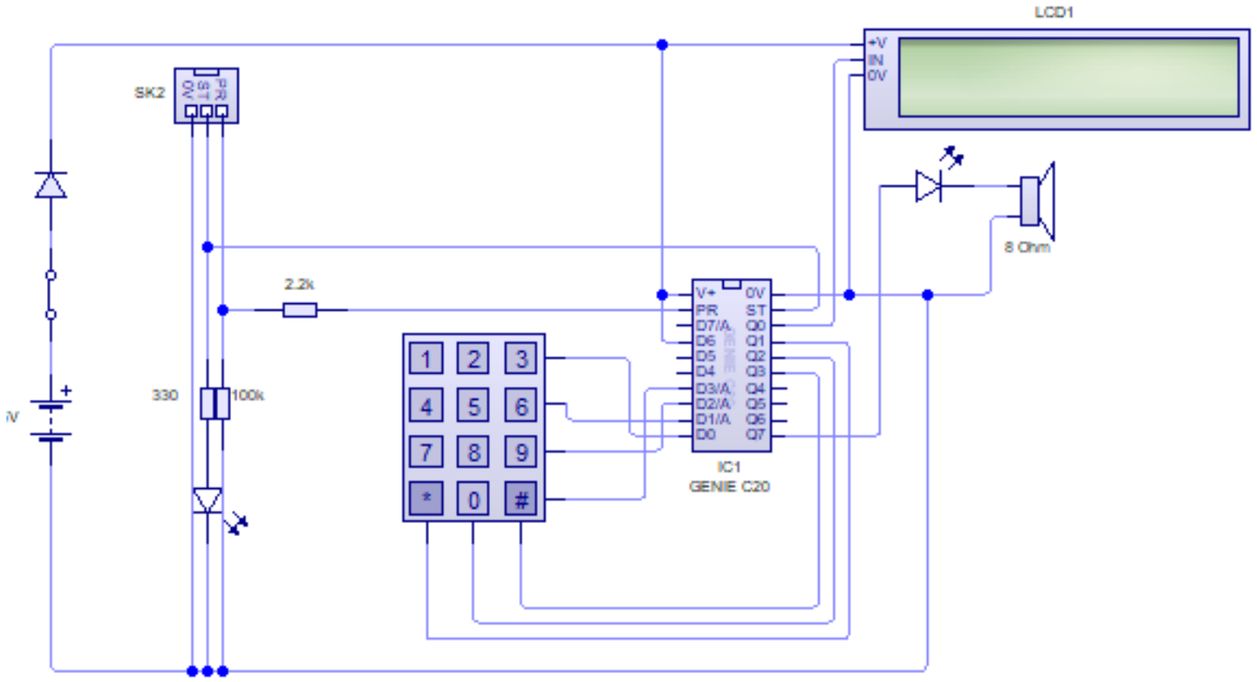


Circuit B

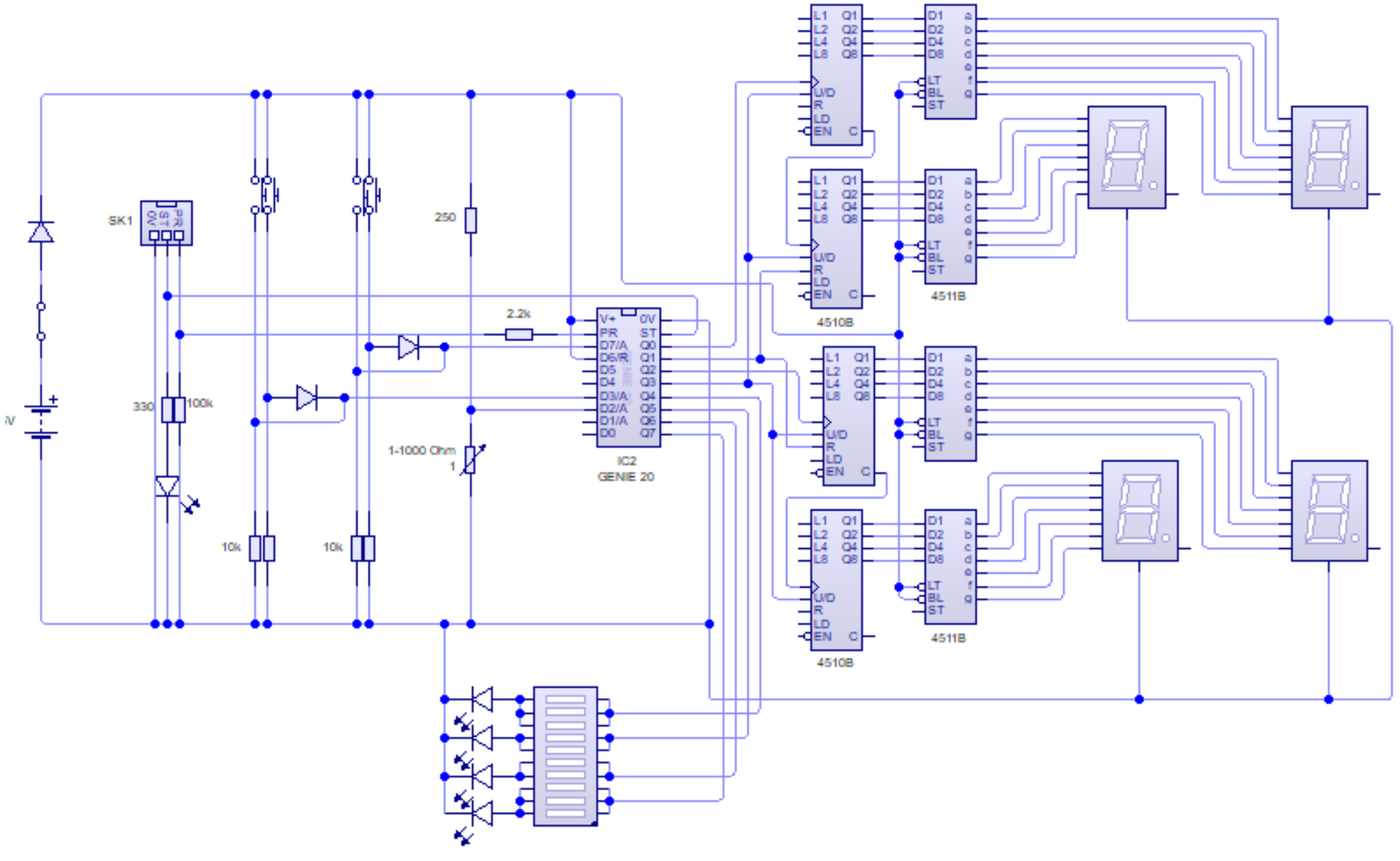
Inputs;
- Keypad

Outputs;
- LCD
- Speaker/LED

Function;

1 – Displays number of COVID cases in the past month

2 – Speaker and LED turn on after a set period of time after the keypad has been pressed (reminder to sanitise the device).



Circuit A

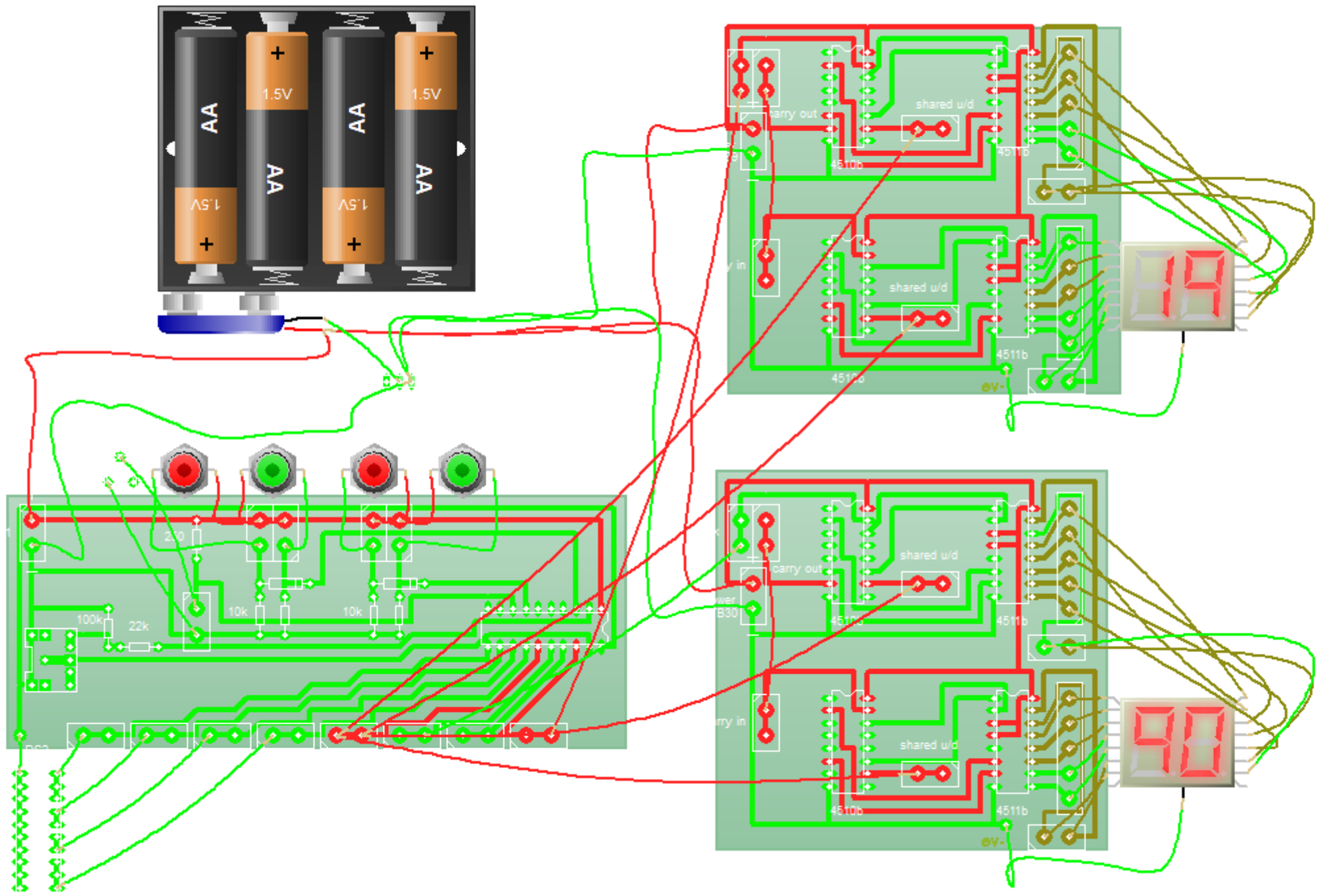
Inputs;
- Push to make switches
- Variable resistor

Outputs;
- 7 Segment displays
- Bargraph LED

Function;

Showcases number of cases for each category of people (pupils, staff etc) and its able to store and load this number even after the circuit has been turned off.

Bargraph LED turns on based on how high the number is.



Close

00 = 040	08 = 000
01 = 070	09 = 000
02 = 000	10 = 000
03 = 000	11 = 000
04 = 000	12 = 000
05 = 000	13 = 000
06 = 000	14 = 000
07 = 000	15 = 001

EEPROM memory

The contents of the microcontroller EEPROM memory is shown above.

EEPROM is memory that persists even when the power is turned off.

Click on the **Close** button to go back.

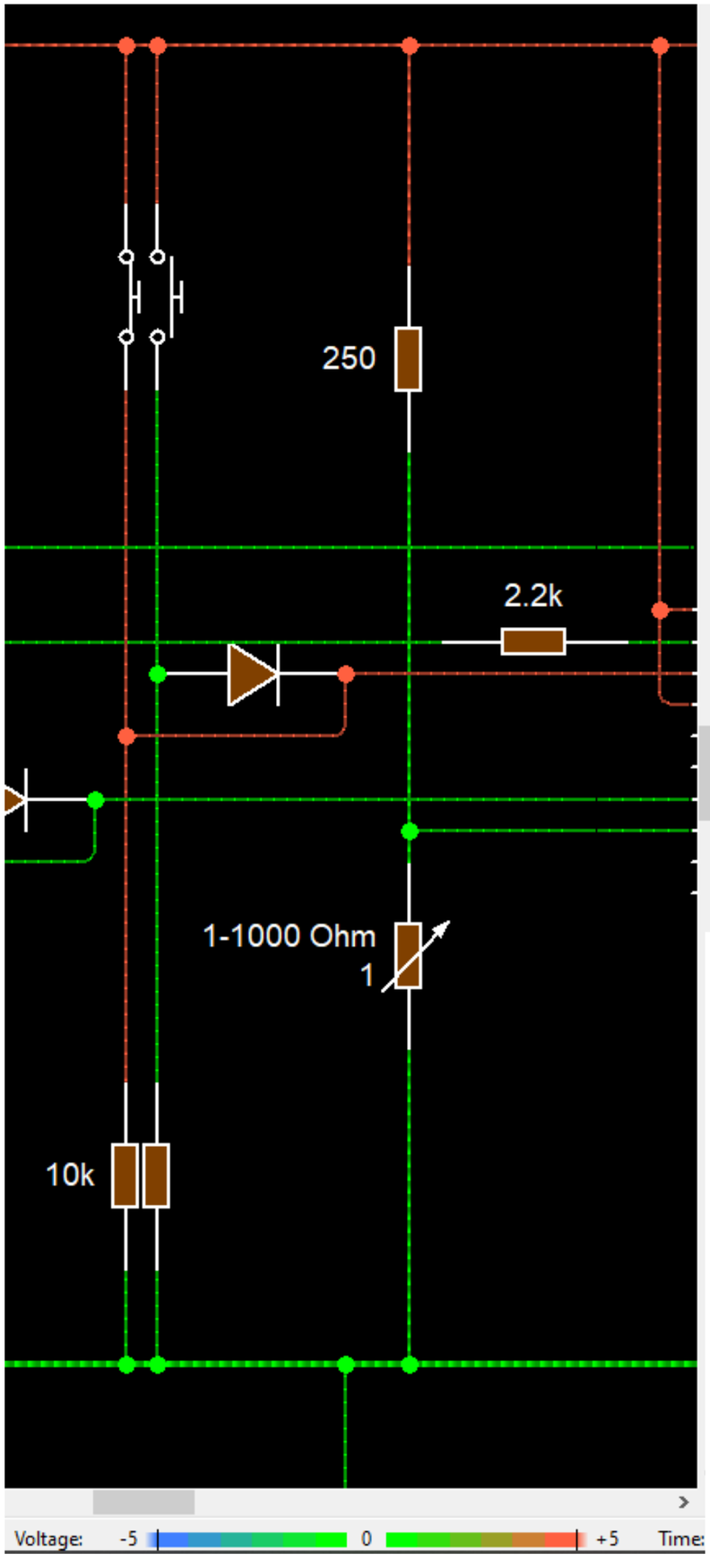
Circuit A

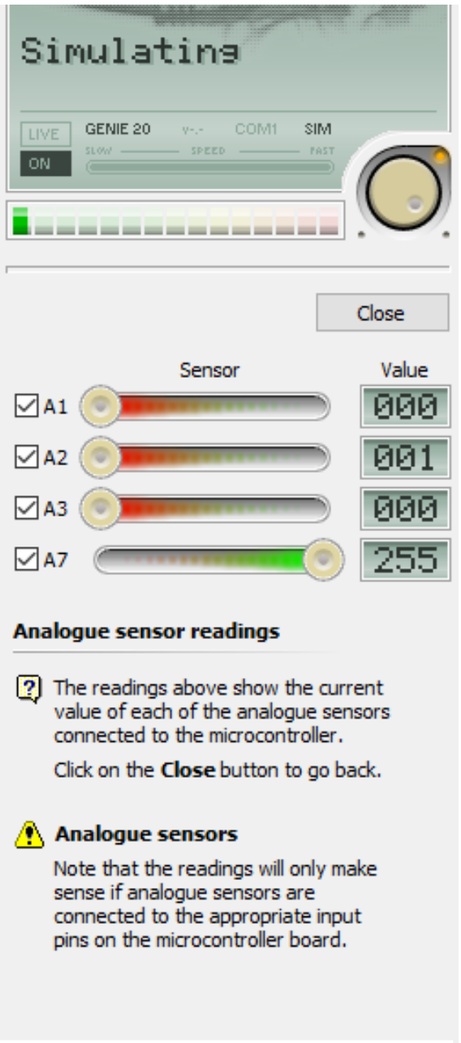
The startup sequence loads up the saved numbers and displays them on the 7 segs.

It does this by sending x number of pulses to the decade counter, in this case 40 pulses for variable 00.

This is done since this decade counter can only directly load 4 bit numbers (up 15) via its pins.

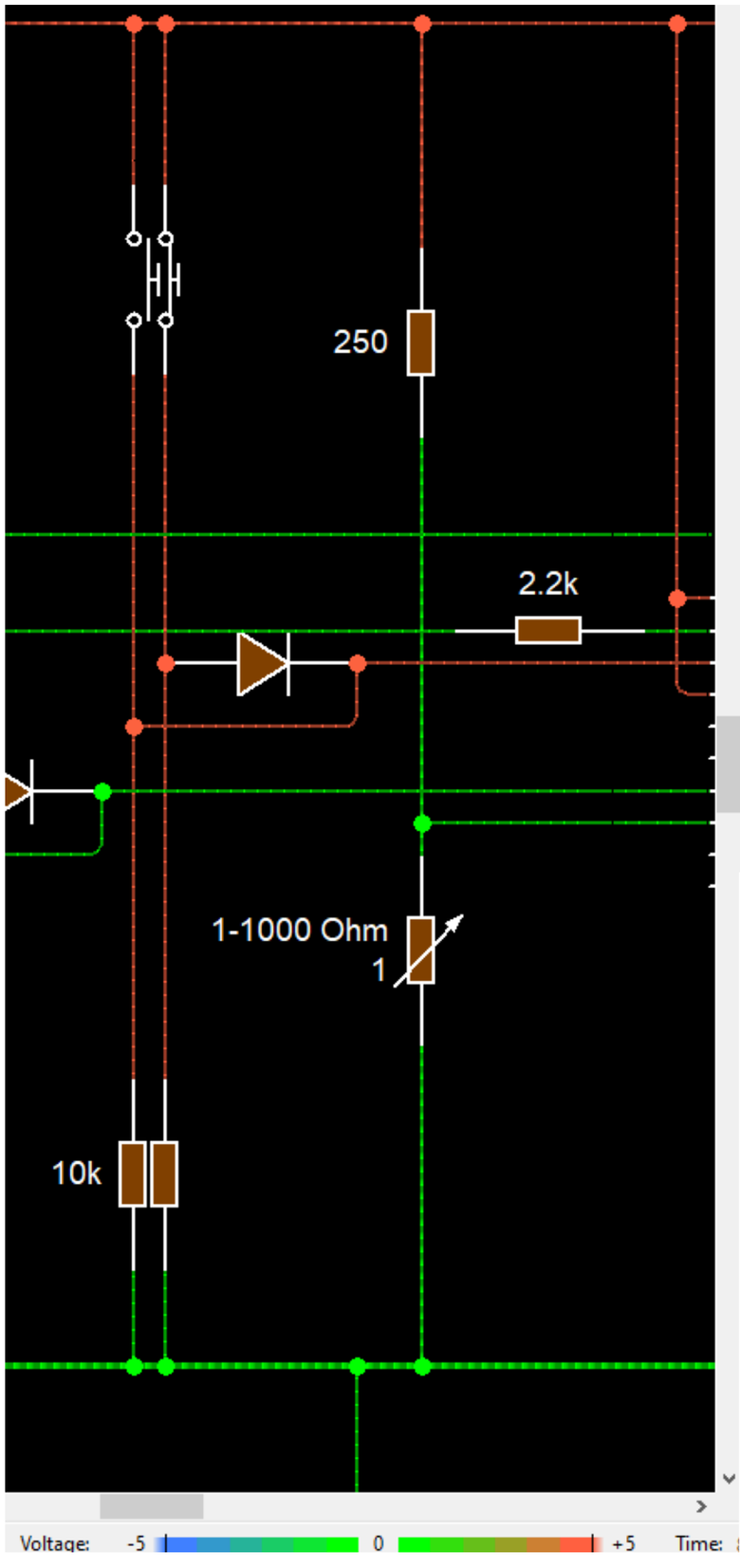
Every time a variable is changed (increased or decreased in increments of 1) via the PTM switches, the new value is stored into the EEPROM memory so its able to be loaded up next time the circuit is rebooted.

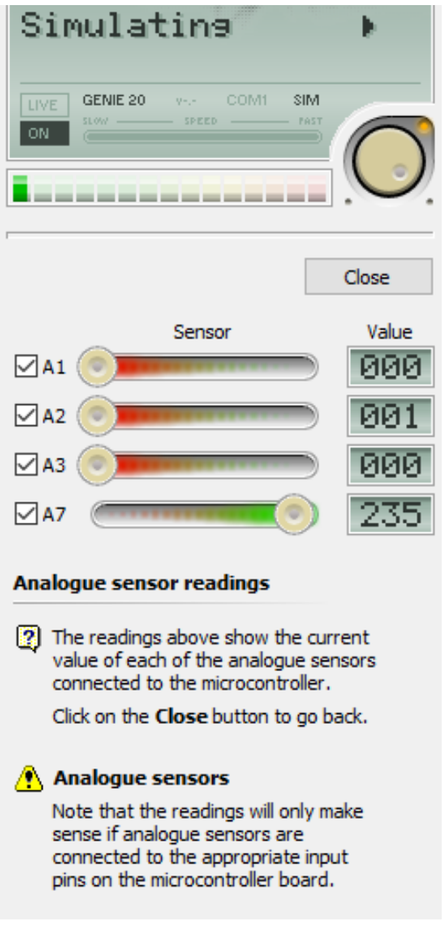




Another feature of this circuit is the use of the analogue input pins for use of multiple digital inputs.

As shown on the simulation panel, one switch corresponds to a certain analogue value and the other switch gives a different value.





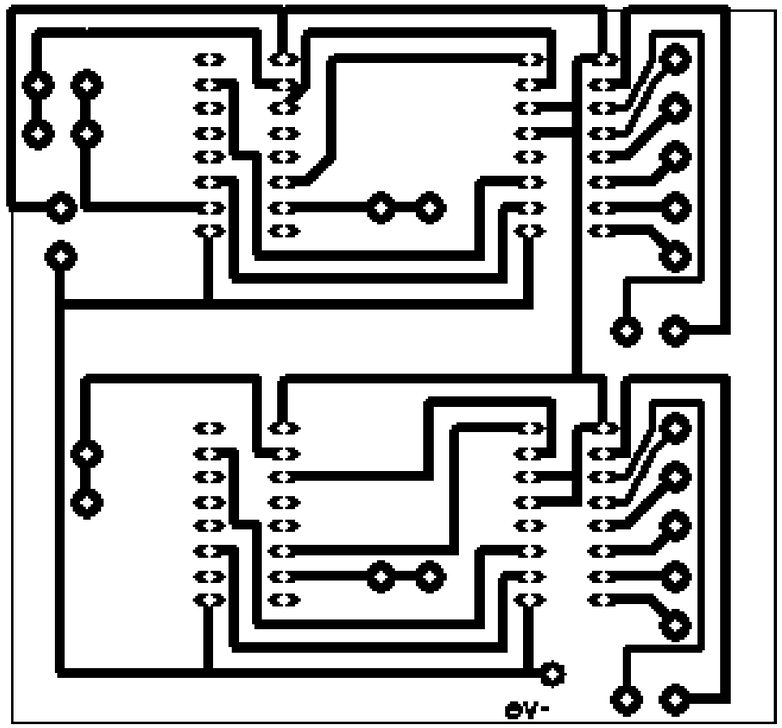
This is done via use of a diode. One switch is hence connected to 2 ground rails and the other to only one – so this voltage difference can be detected as different analogue signals.

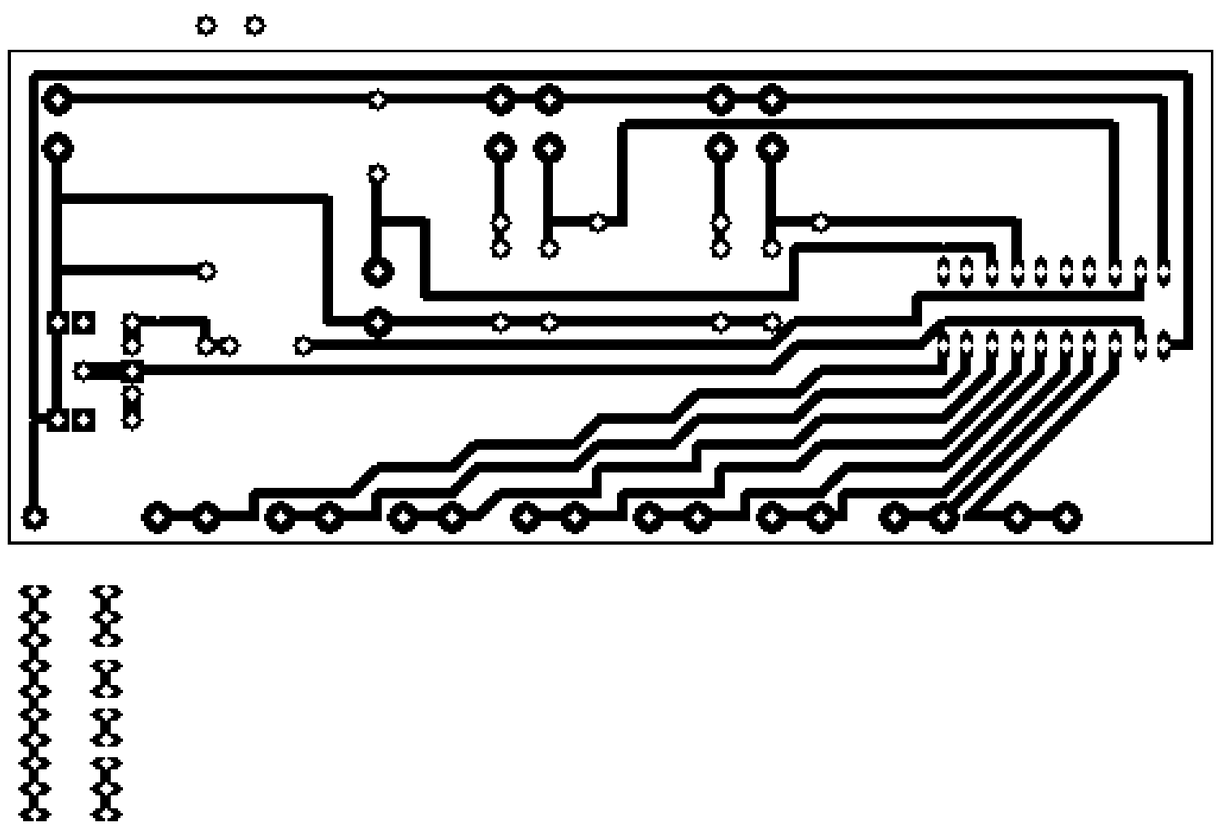
This in turn helps condense the circuit since less input pins need to be traced to the Genie on the PCB.

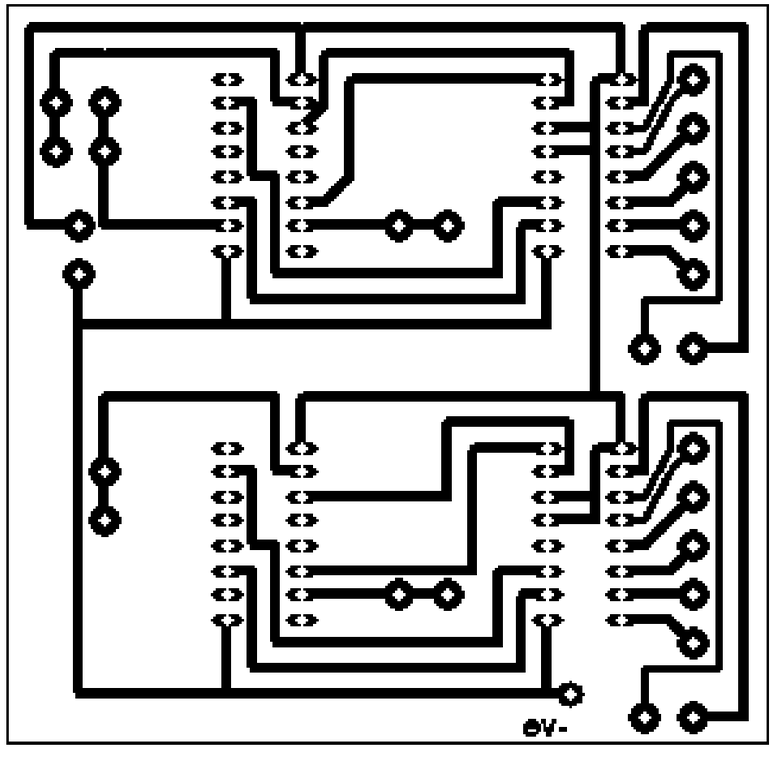
PCB traces

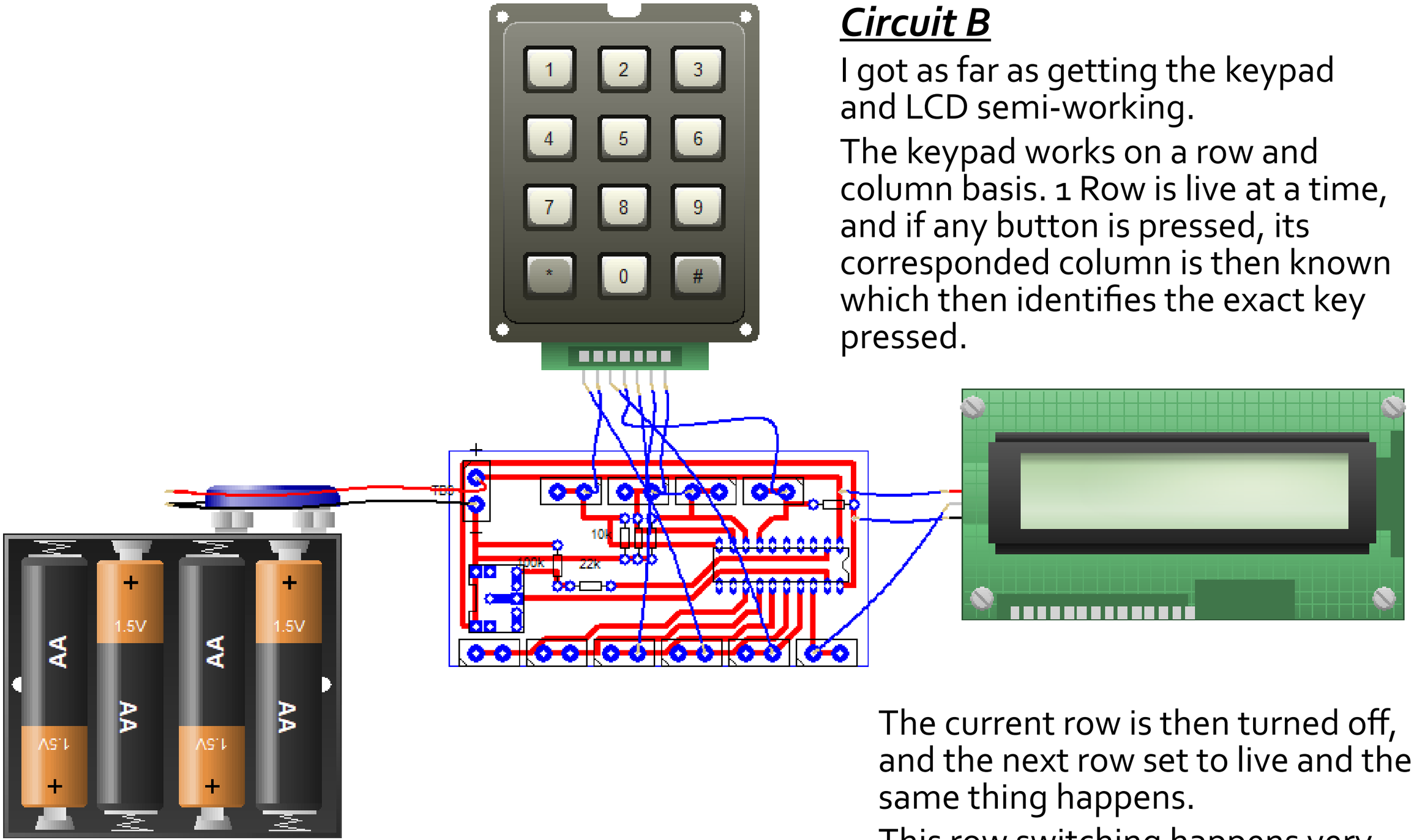
The two boards on the right house the decade counter 4510+4511 combination.

The board below is for the Genie 20.









Circuit B

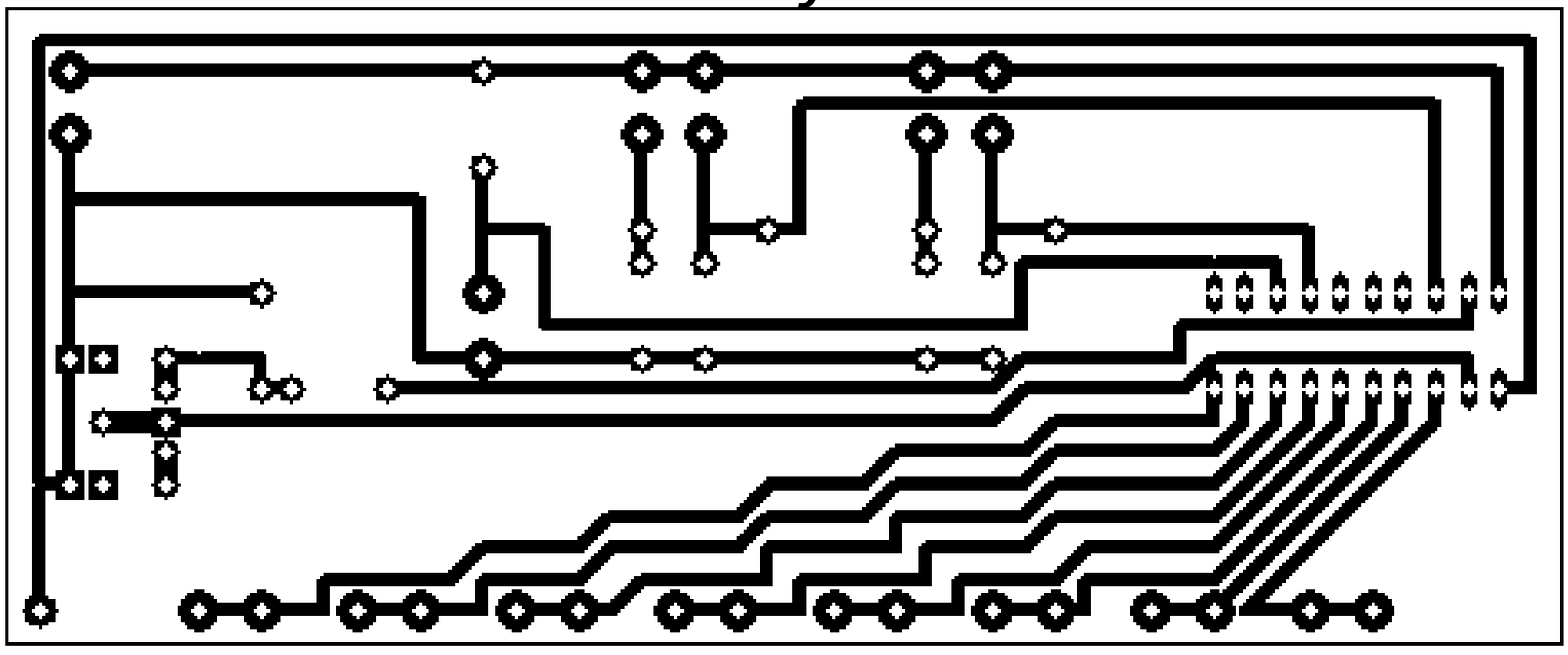
I got as far as getting the keypad and LCD semi-working.

The keypad works on a row and column basis. 1 Row is live at a time, and if any button is pressed, its corresponded column is then known which then identifies the exact key pressed.

The current row is then turned off, and the next row set to live and the same thing happens.

This row switching happens very quickly so the user doesn't have to hold down a key for it to be identified by the Genie.

Circuit A Primary PCB



The design for PCB B was derived from the first one – hence their similar component layout.

Less I/O pins are needed so its size is even smaller.

Circuit B PCB