Smart Bookstand

Project Design

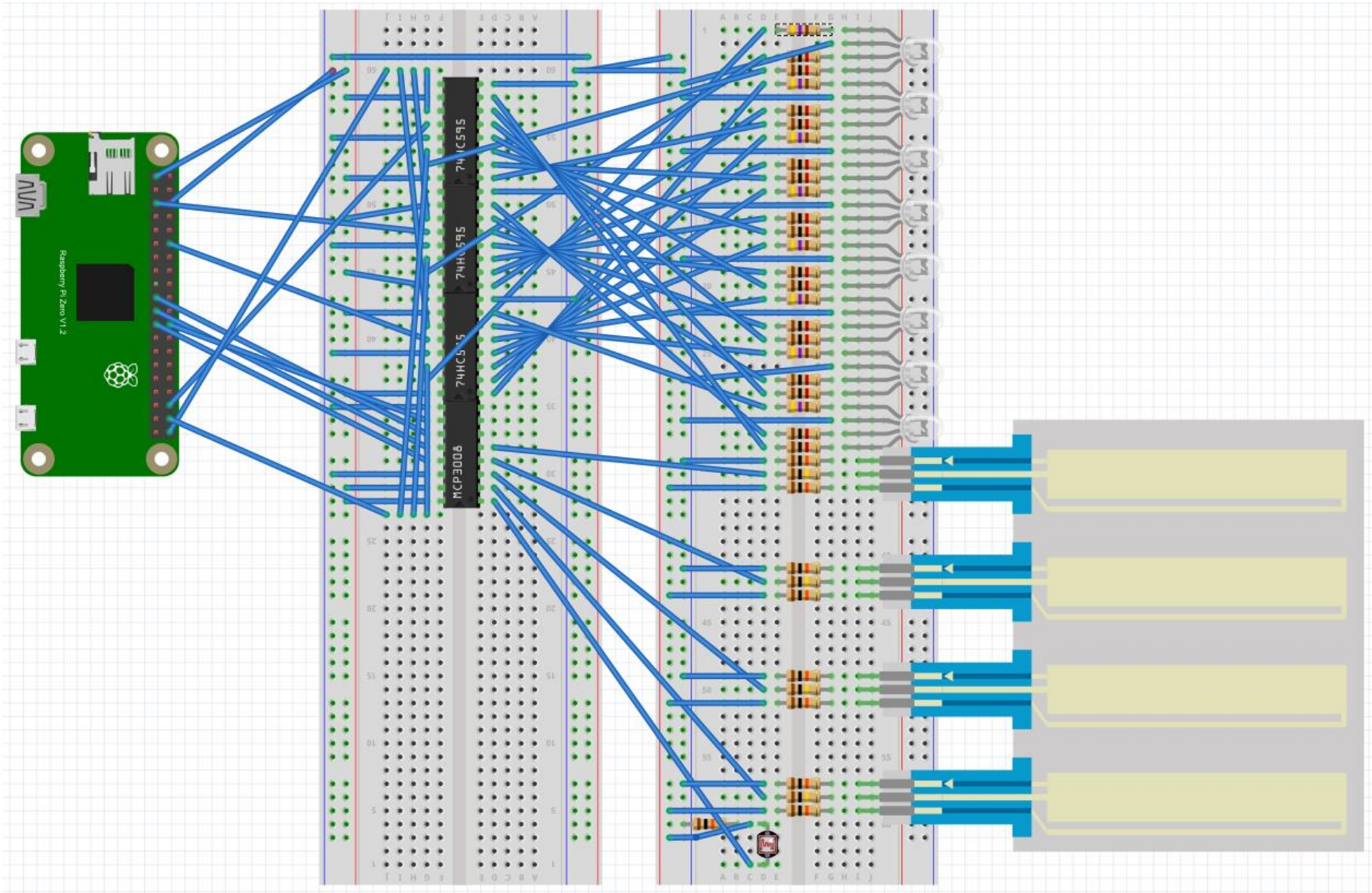
Ideas behind the “Smart Bookstand”

“Your reading experience should be more than a simple woodblock”

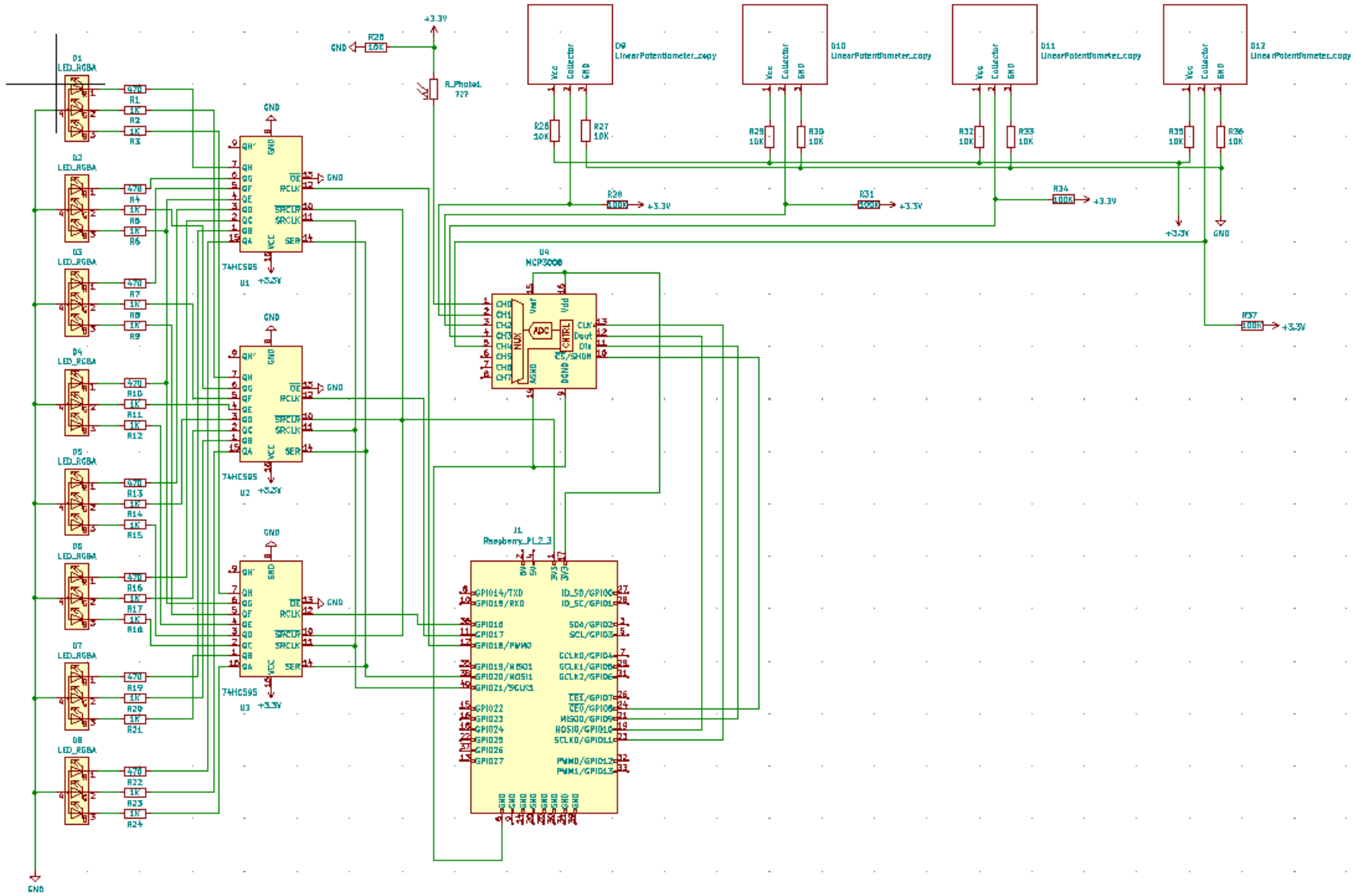
“No bookstand has a decent lighting system embedded within”

“Why can’t bookstands be portable?”

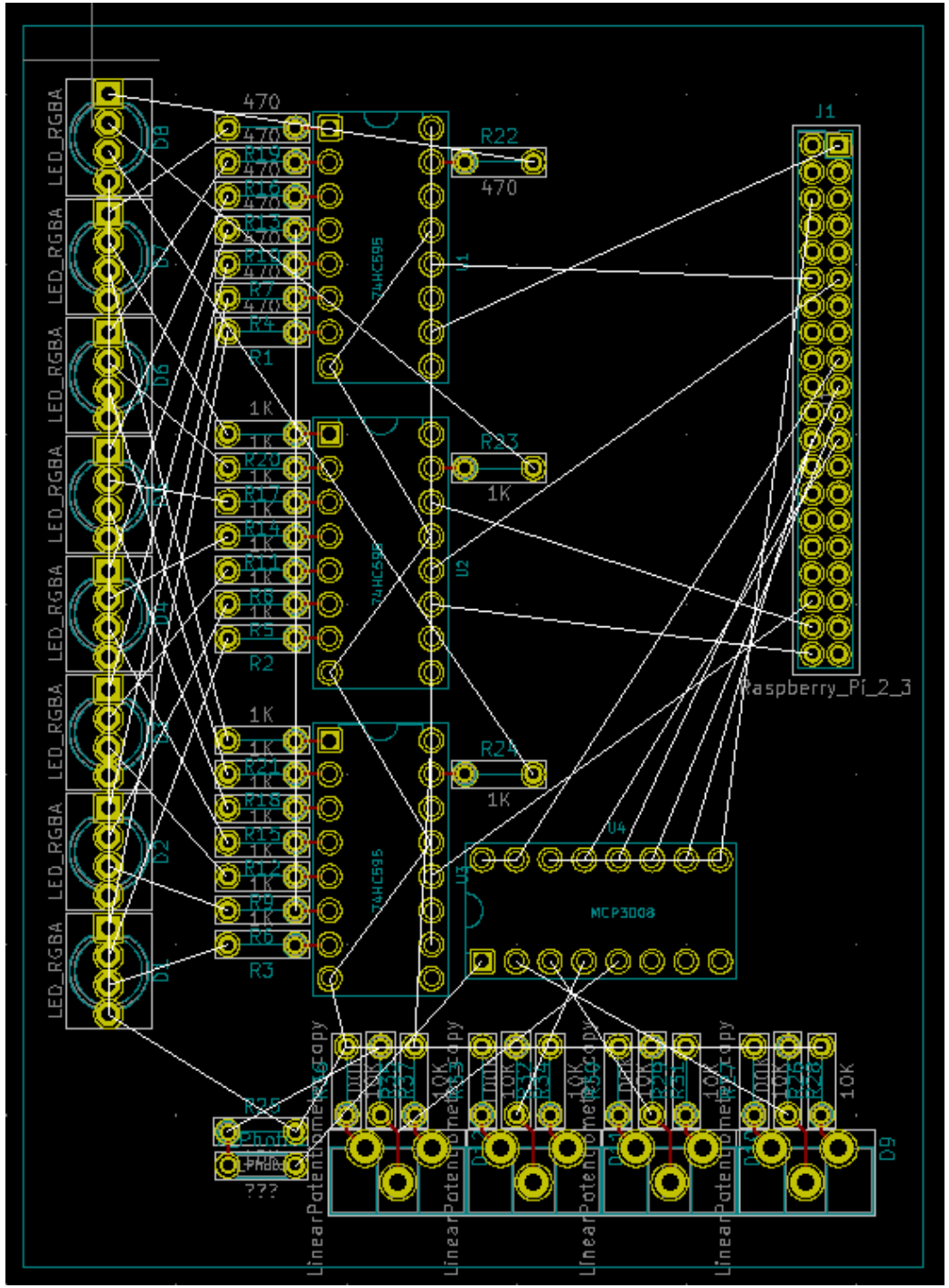
Overview <Fritzing>



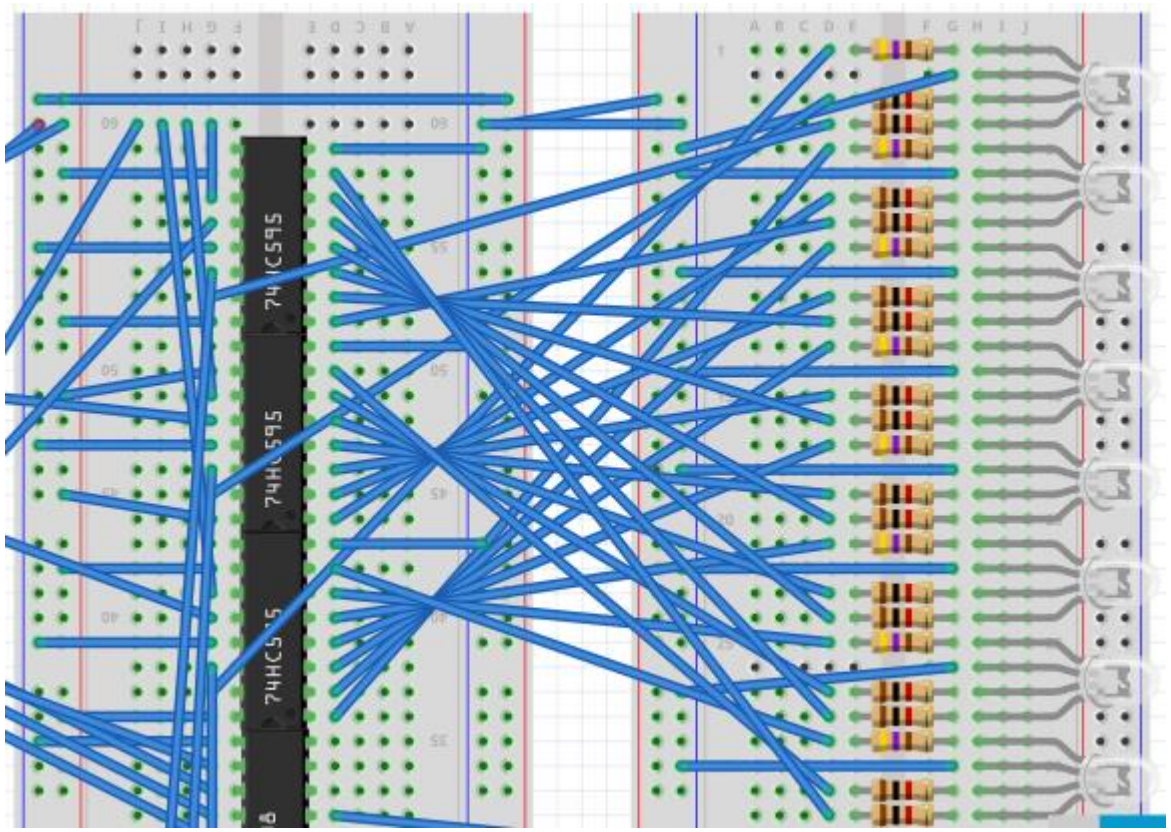
Overview
<KiCAD>



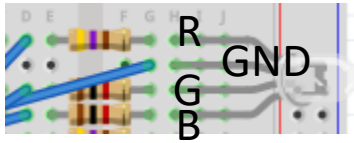
Overview
KiCAD PCB Design



Lighting system - Fritzing

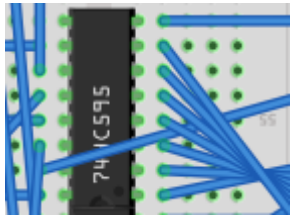


RGB LEDs – 8 of them



- Each with a current limiting resistor
- Red -> connected using 470Ω
- Green / Blue -> 1kΩ

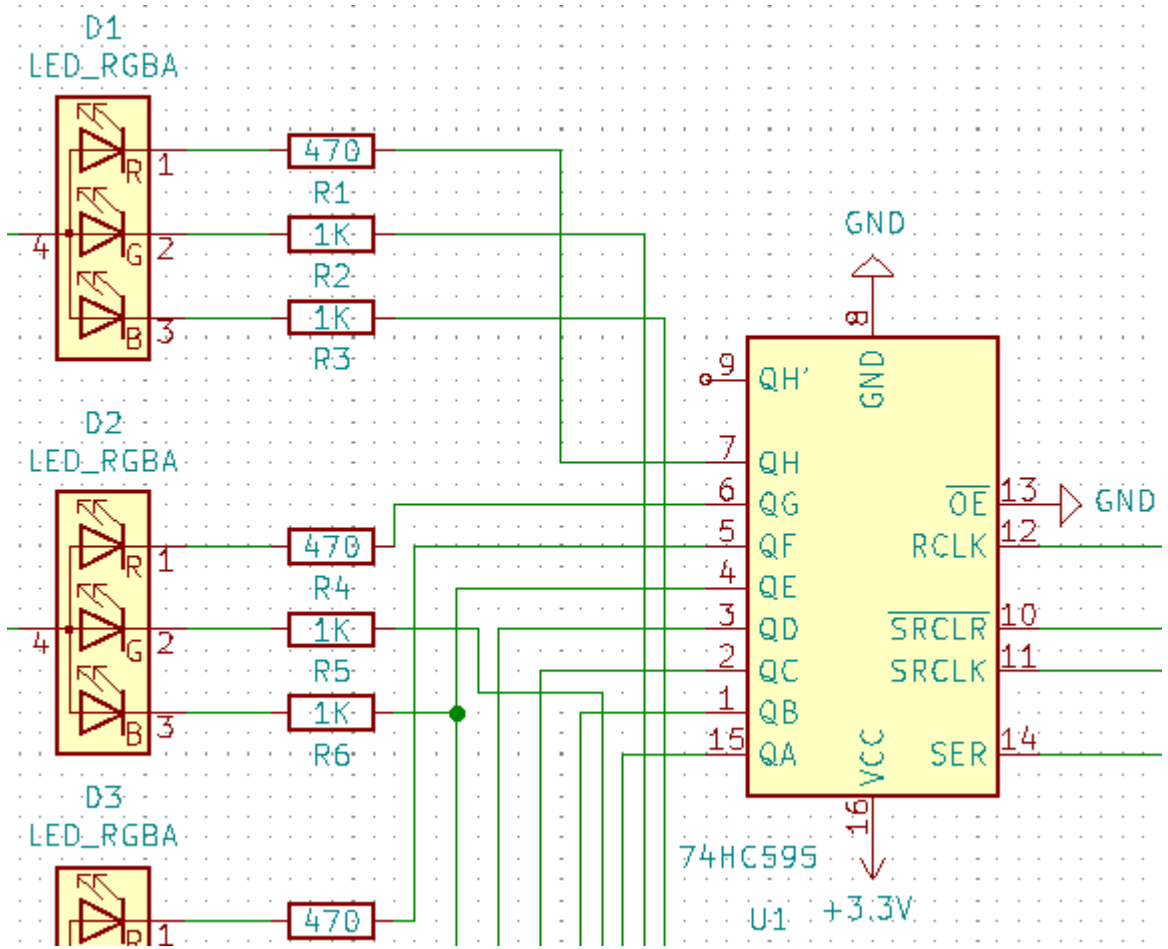
74HC595 Shift Register



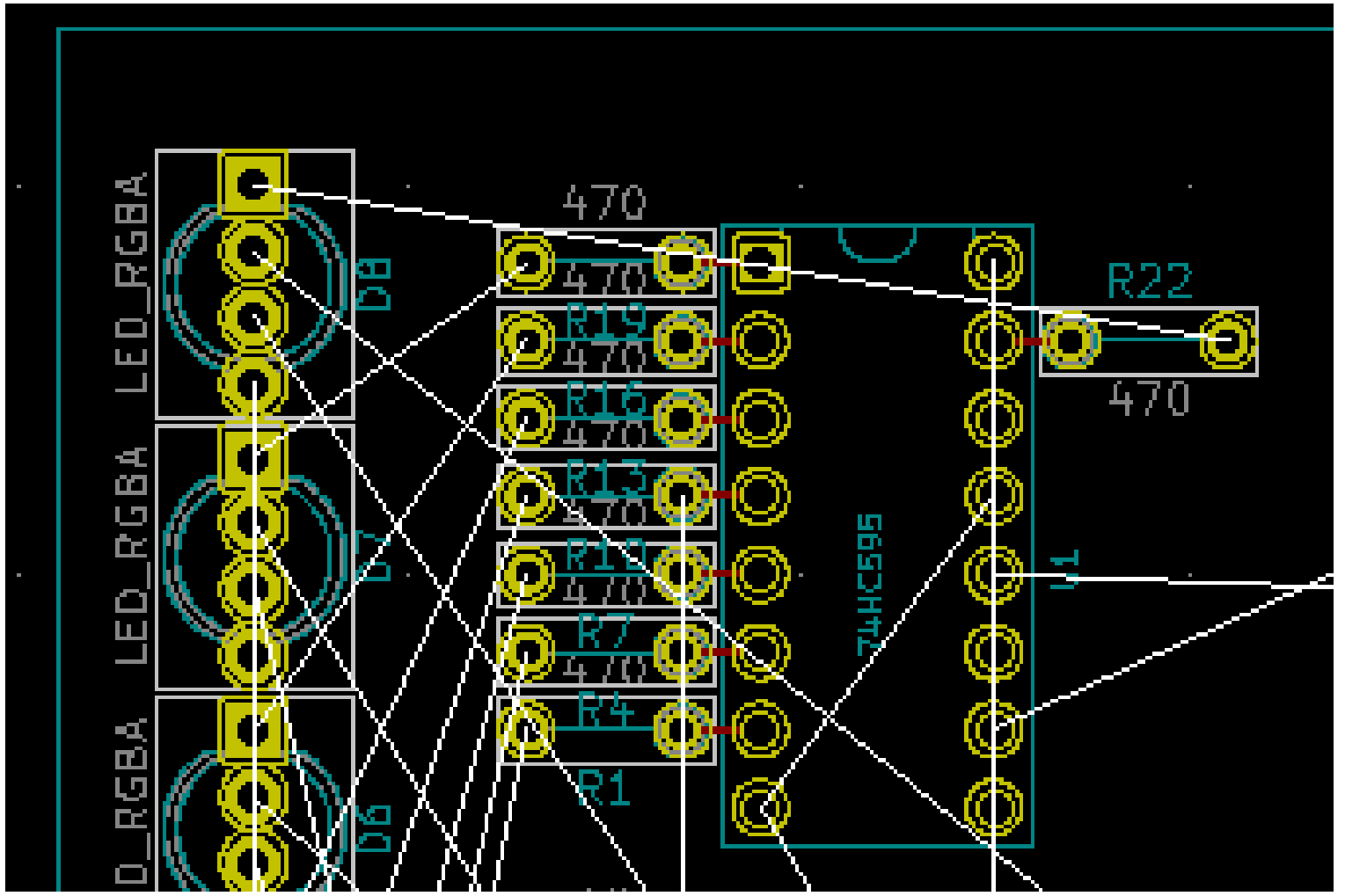
- One for each color – 3 total
- 8 outputs connected to each LED
- Will be connected to SPI1, 3CEs

I know its dizzy – Let’s go into the details

Lighting system - KiCAD



Lighting System KiCAD PCB Design



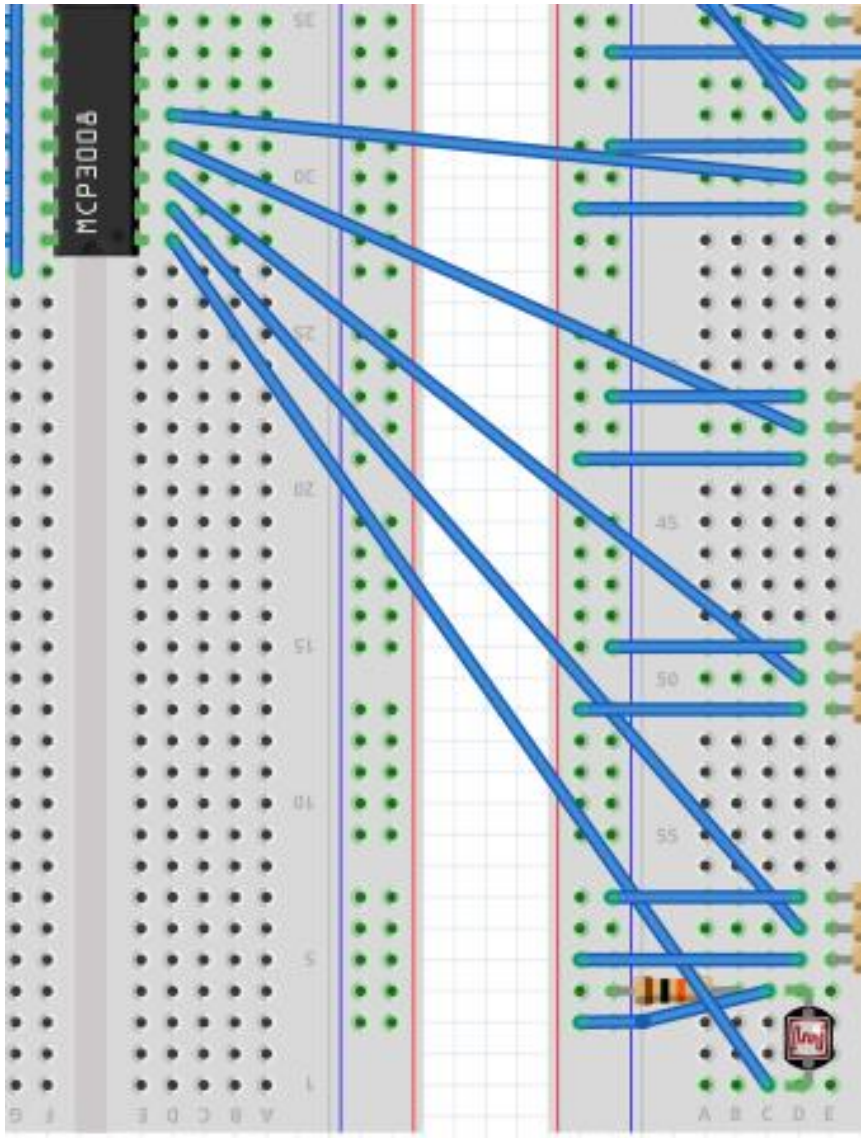
Photoresistor - Fritzing

Resistor value changes as the incoming light level varies.

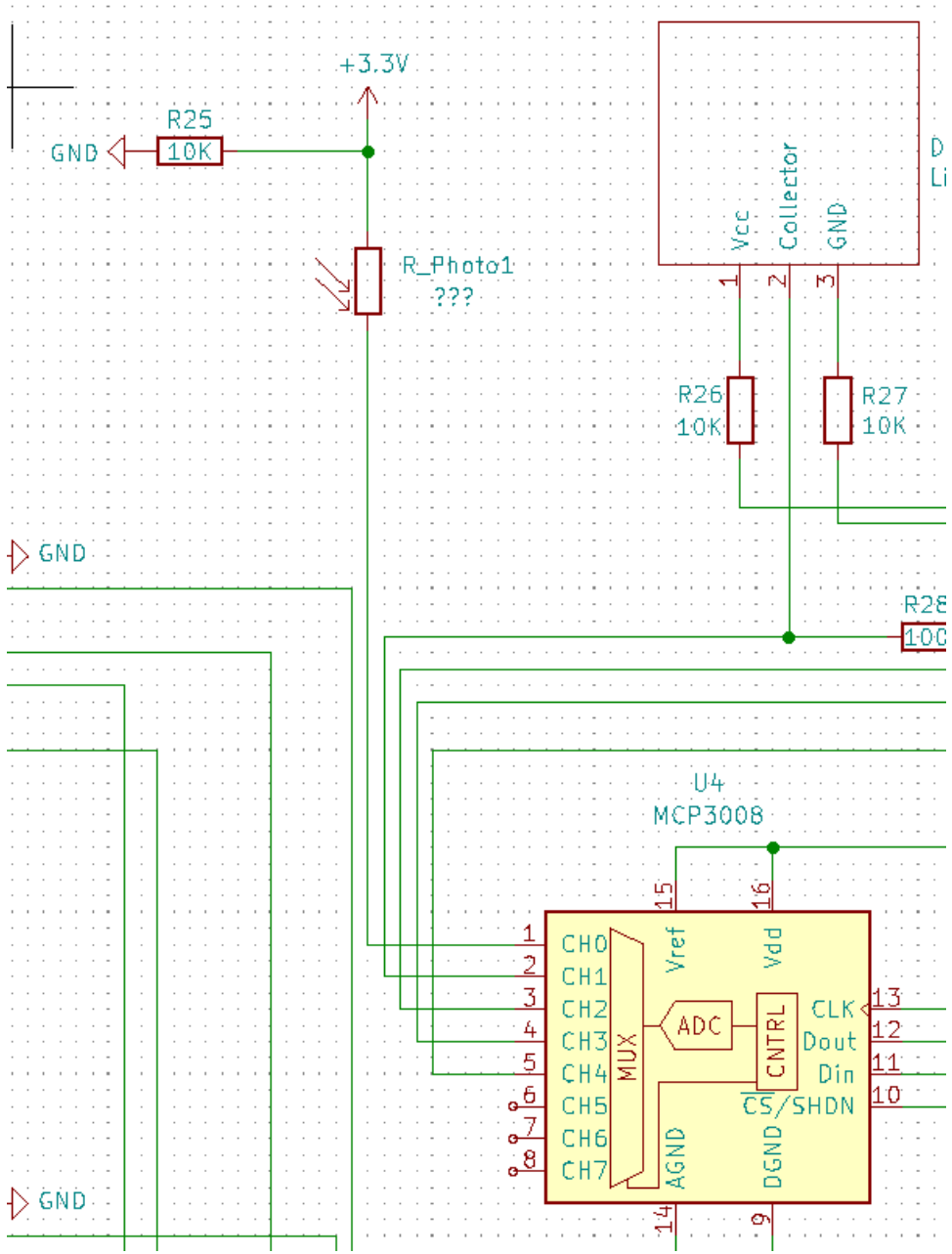
Pull down resistor of 10kΩ

Connected to channel 0 of MCP3008

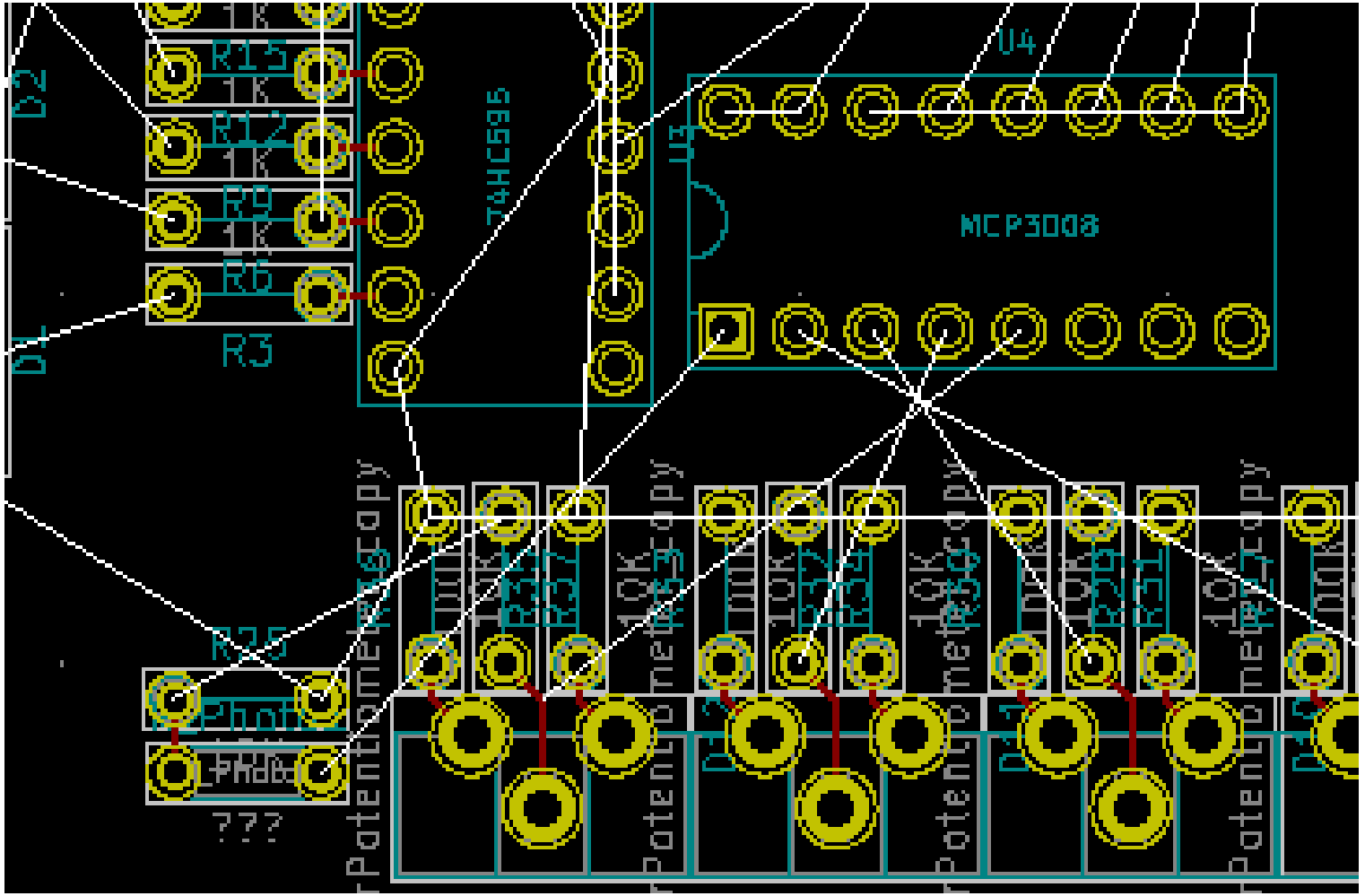
- MCP3008 operates through SPI0



Photoresistor - KiCAD



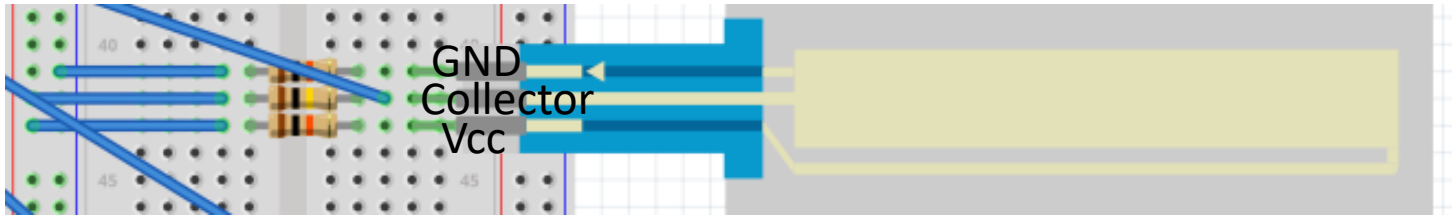
Photoresistor KiCAD PDB Design



Linear Potentiometer - Fritzing

A varying resistor:

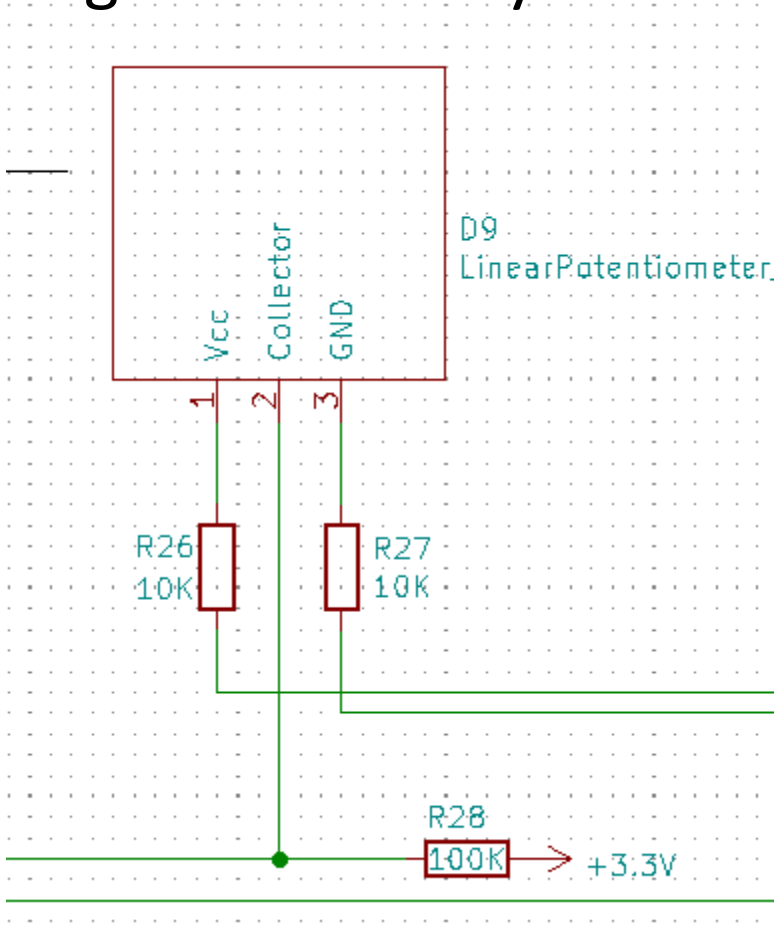
- Depending on where you touch
- Using current limiting resistors – 10k on Vcc and GND
- 100k as a pullup resistor on Collector
- Closer to the collector, the smaller the resistor value
- 4 in total - Connected to channel 1-4 of MCP3008



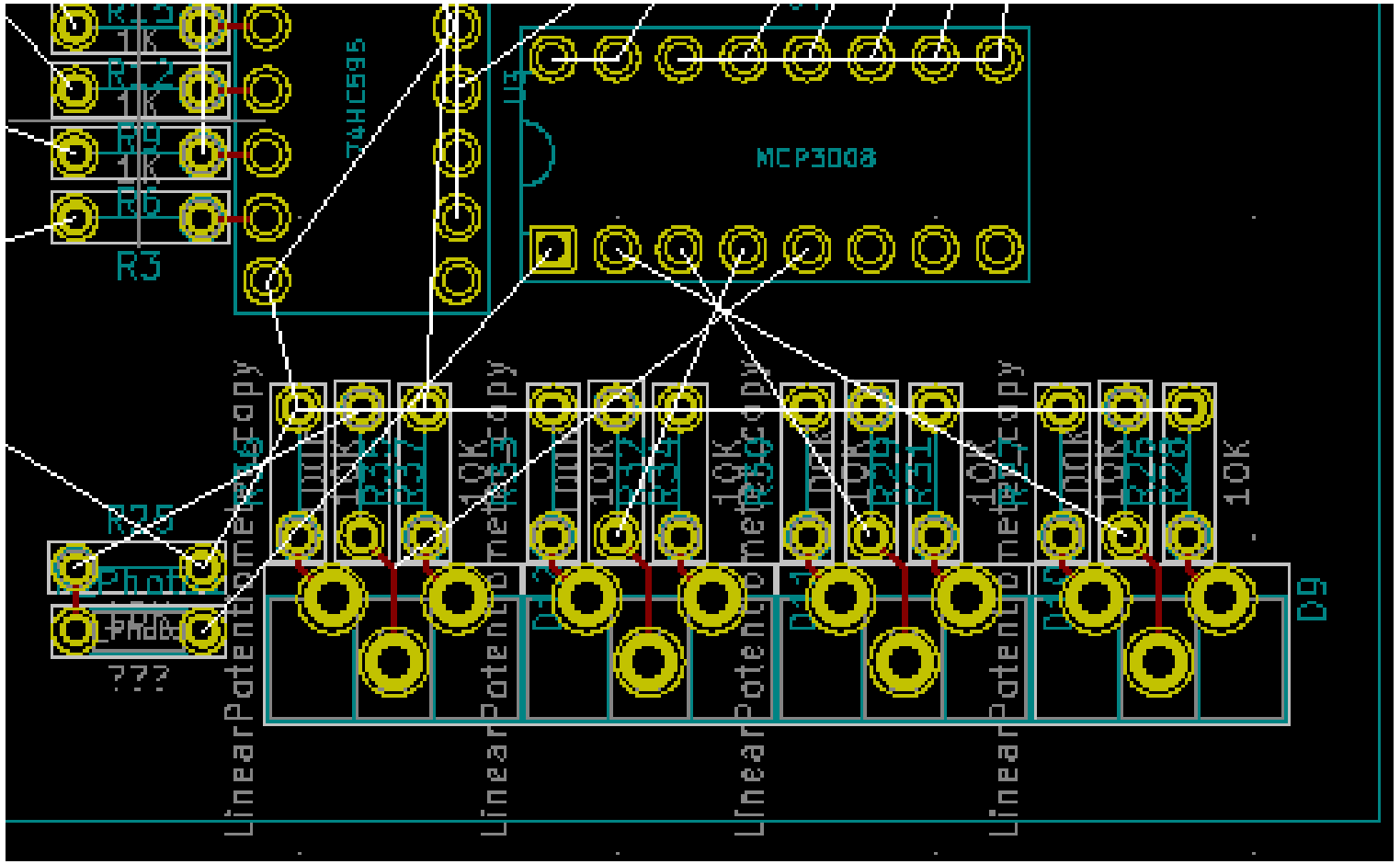
Fritzing diagram taken from following:
https://github.com/sparkfun/Fritzing_Parts/blob/master/products/08680_softpot_membrane_potentiometer_50mm.fzpz

Linear Potentiometer - KiCAD

Diagram Manually Created



Linear Potentiometer KiCAD PCB Design



Thank you

End of Document