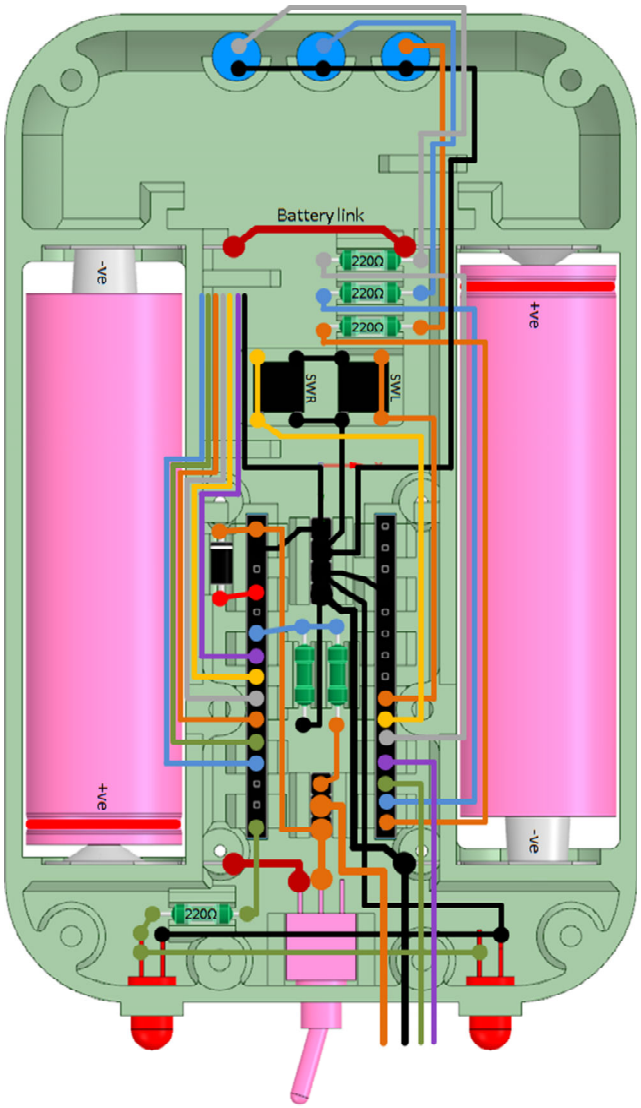
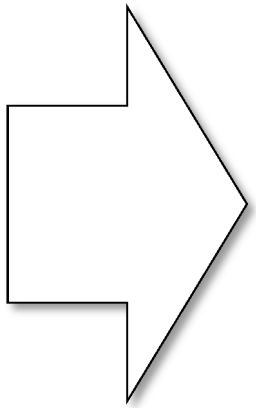
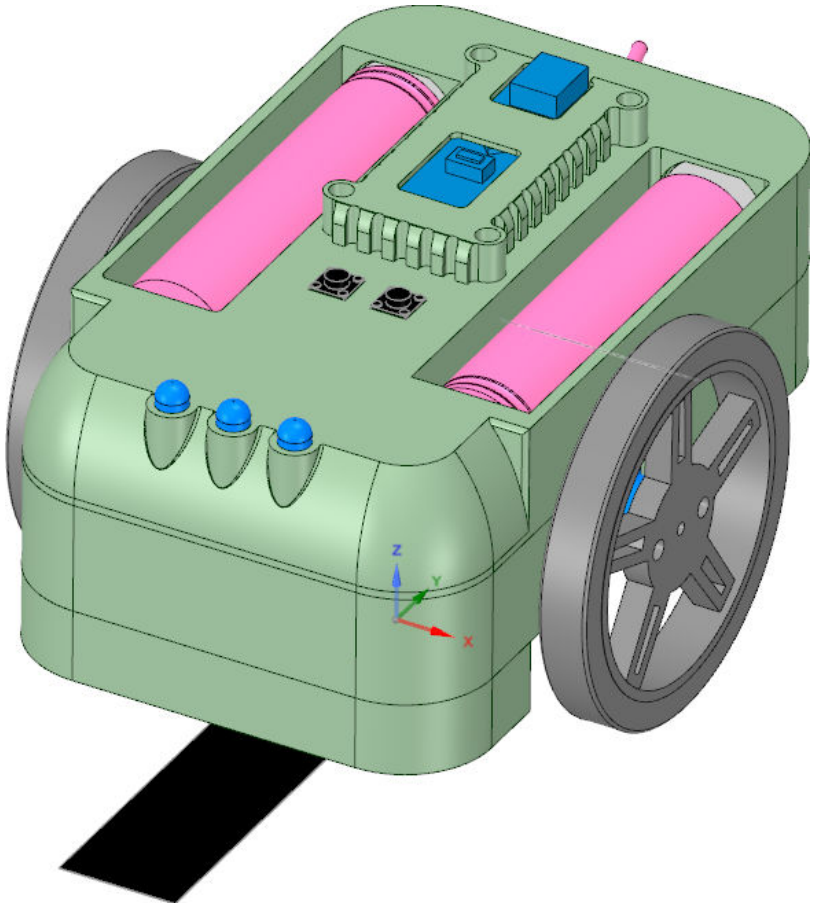
TrackBot v2

Circuits & Wiring







ARDUINO OPEN-SOURCE COMMUNITY

Hand Tools:

Fine Nosed Pliers
Side Cutters
M3 Tap
M4 Tap
2.5 mm Drill
3.0 mm Drill
3.5mm Drill
6.0 mm Drill
Needle Files
M3 Box Spanner
Screwdriver
Craft Knife

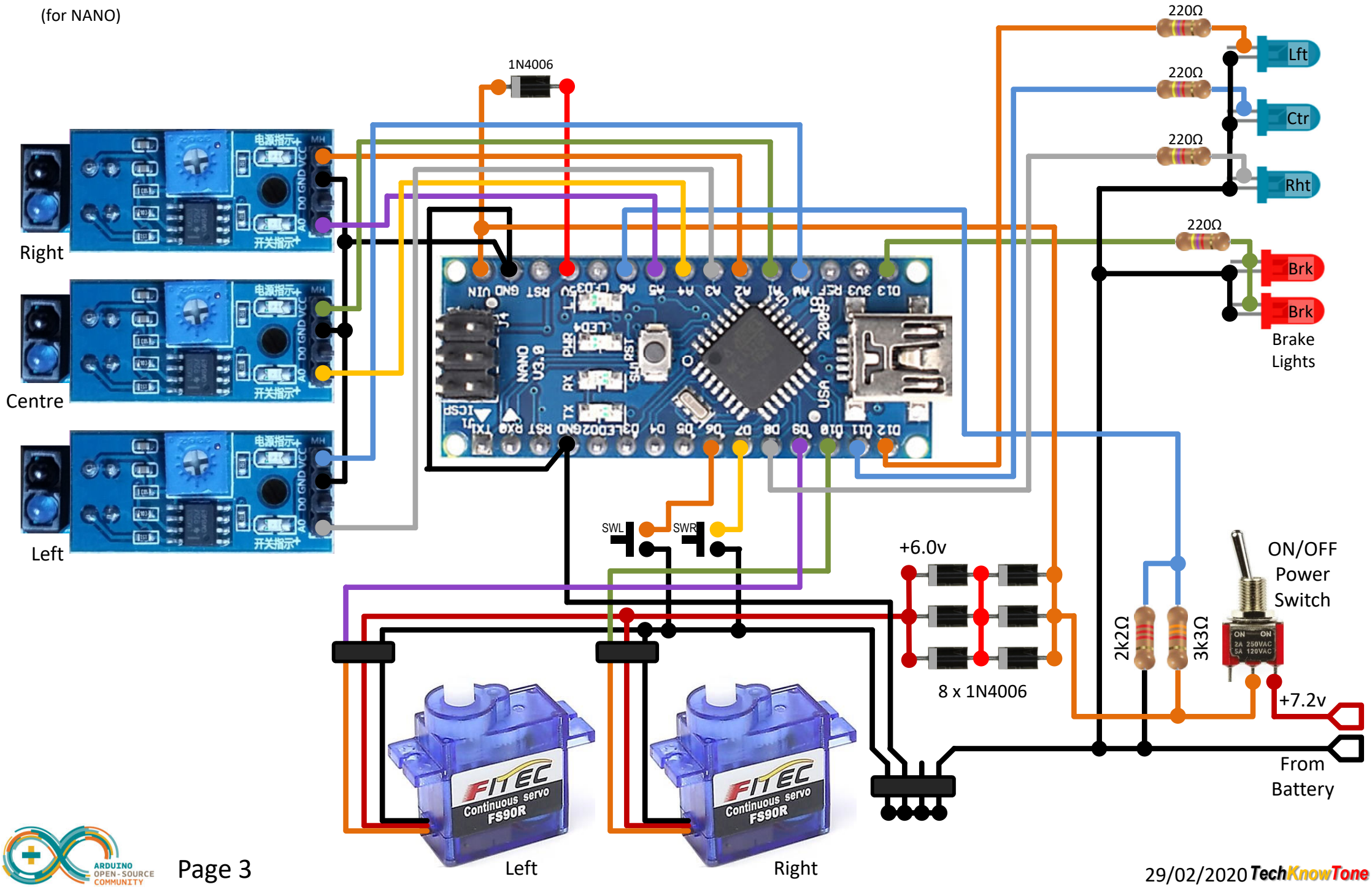
Note: Not all items are shown here.

Hand Tools:

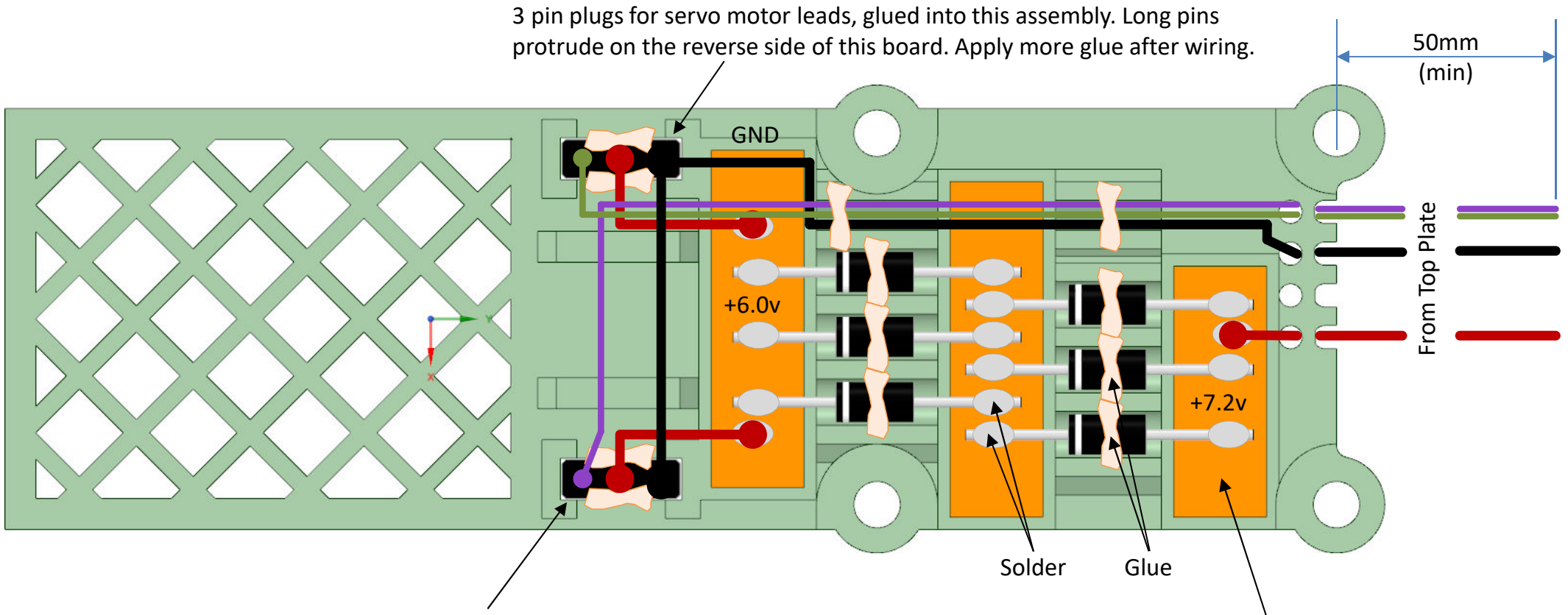
Temperature controlled iron
Heat shrink sleeving gun
Hot melt glue gun
Solder flux
Resin cored solder
6mm adhesive copper tape
Screw drivers
Wire wrapping tool
Wire wrapping wire 30 AWG

TrackBot v2 Circuit

(for NANO)

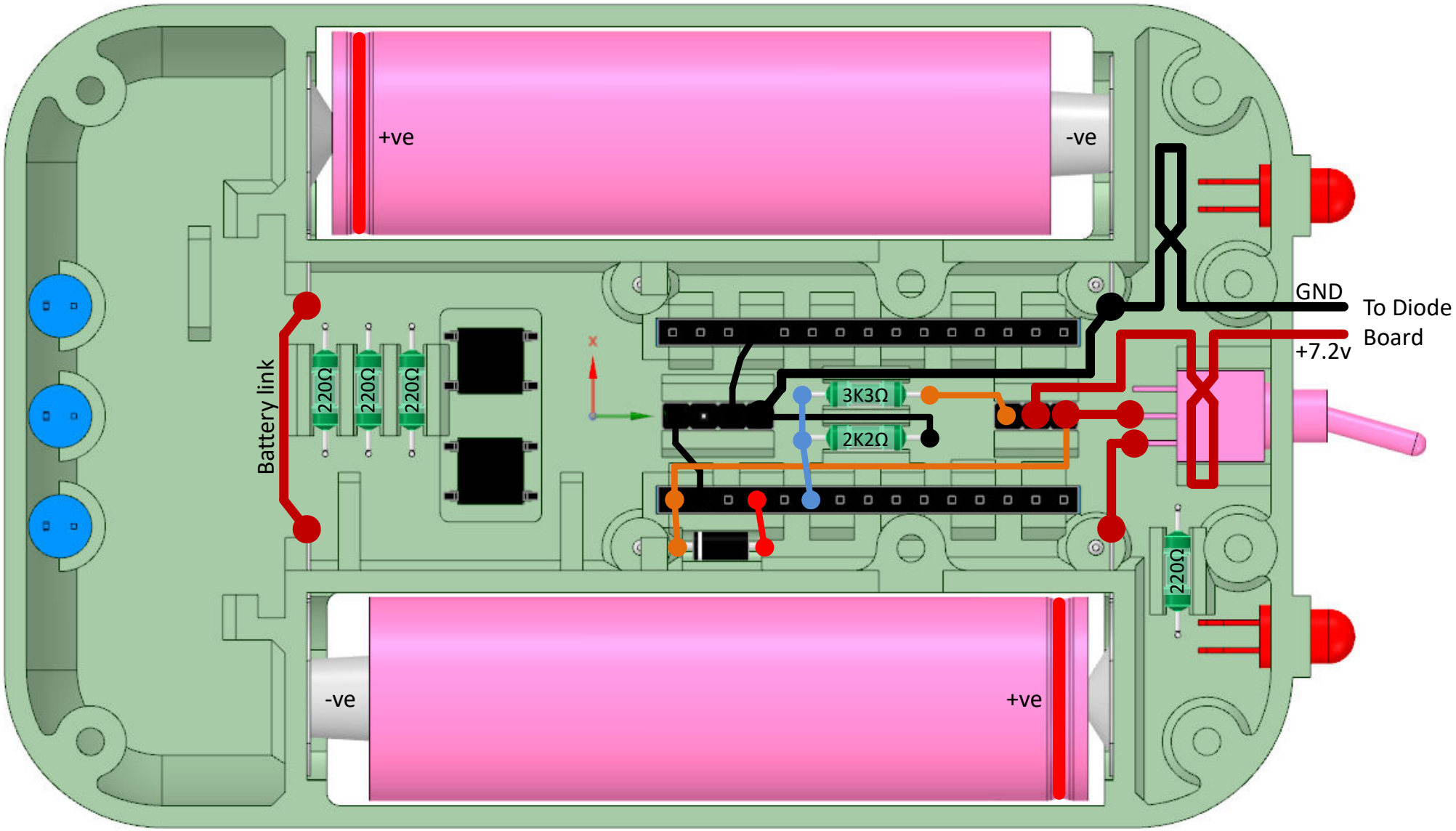


TrackBot v2 – Diode Board Wiring

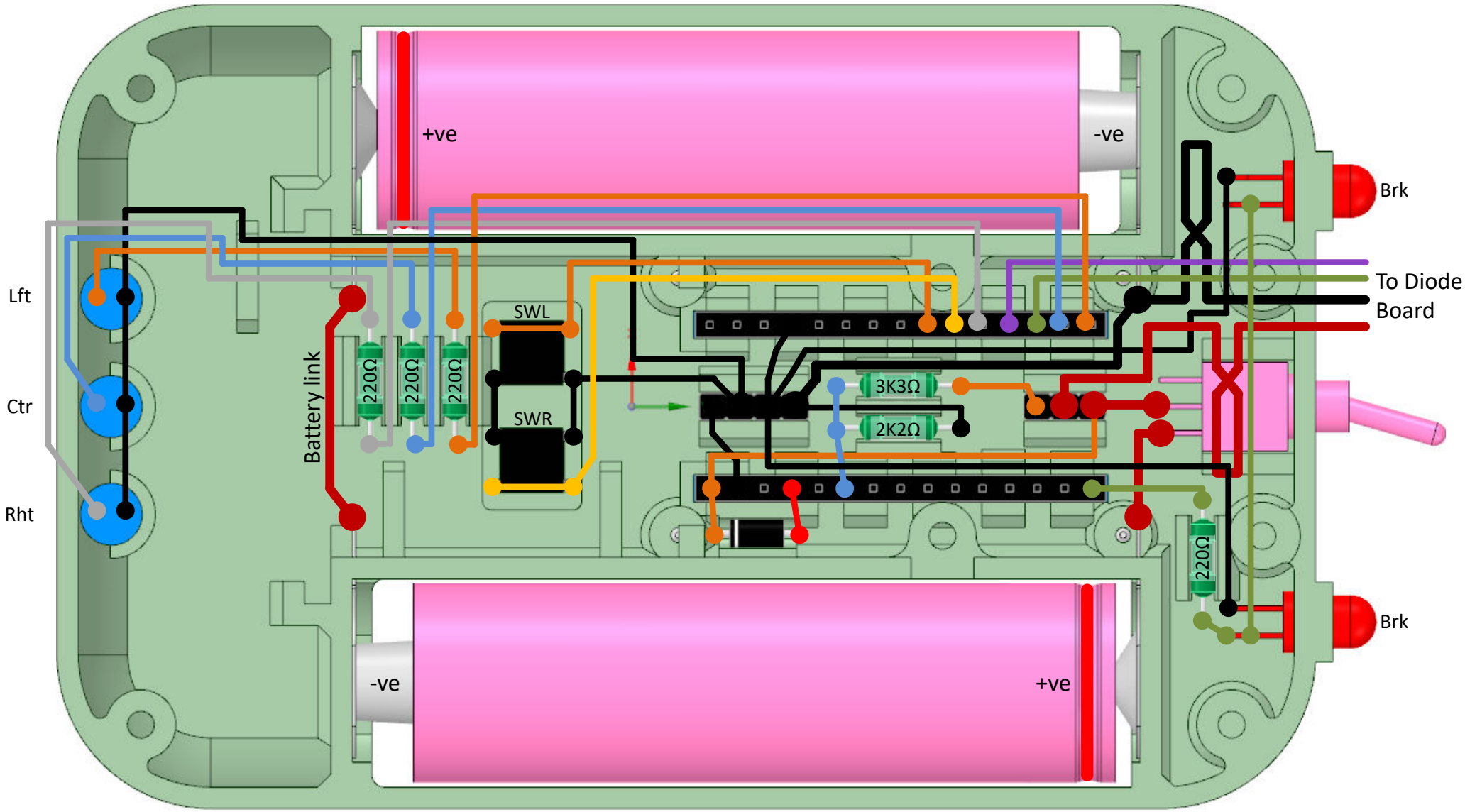


Note:
PWM connections are wire-wrapped, then tested, then soldered if successful.
4 layers of copper foil tape improves thermal conduction during soldering of IN4006 diodes.

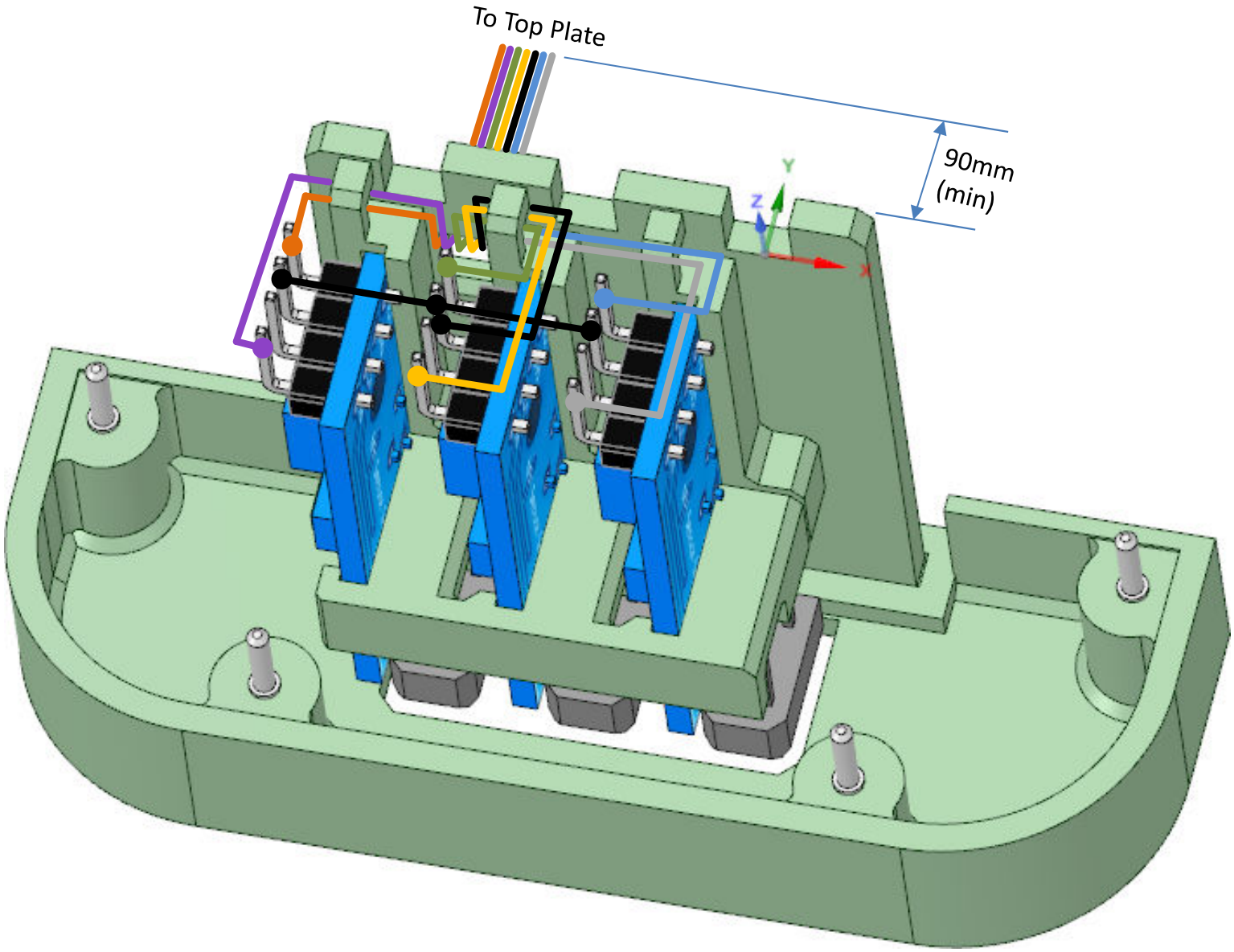
TrackBot v2 – Top Plate ‘Power’ Wiring

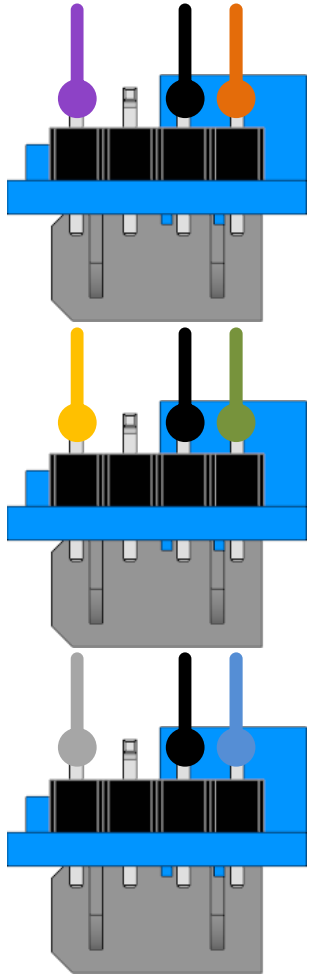


TrackBot v2 – Top Plate ‘LED & Switches’ Wiring

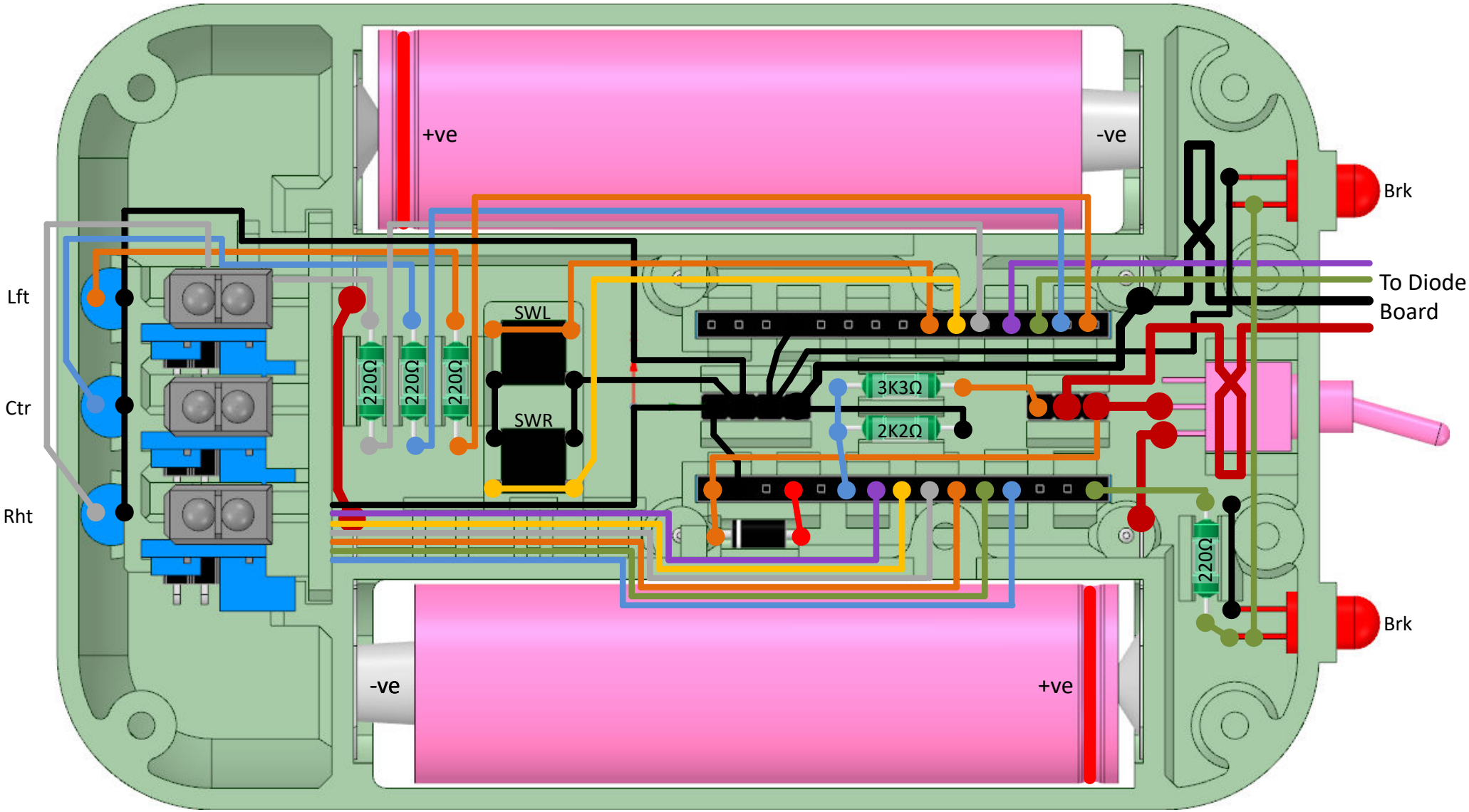


TrackBot v2 – Sensor Plate Wiring

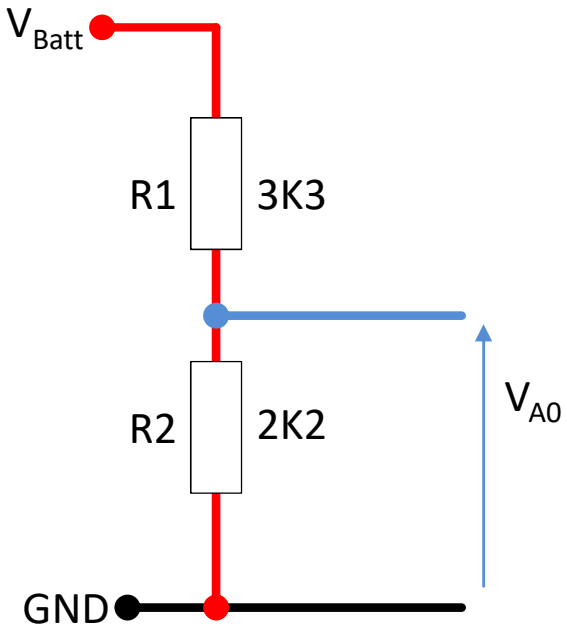




TrackBot v2 – Top Plate ‘Sensor’ Wiring



Battery Monitor (Protection)



$$V_{A0} = \frac{V_{Batt} \times R2}{R1 + R2}$$

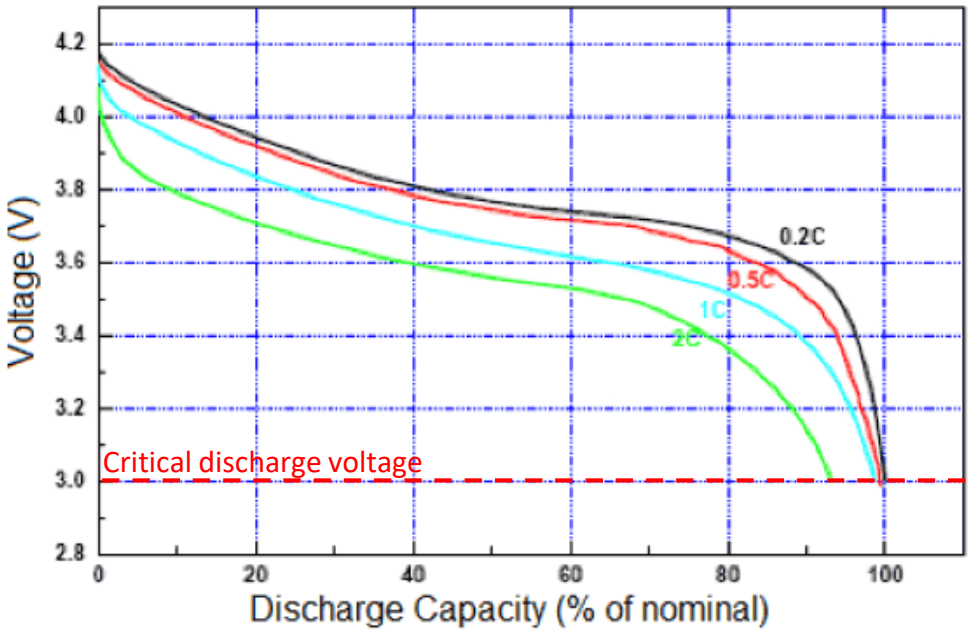
$$V_{A0} = \frac{V_{Batt} \times 2K2}{5K5}$$

V_{FSD} = 12.5v @ V_{A0} = 5v

$$V_{A0D} = \frac{V_{A0} \times 1023}{5}$$ voltage read by 10-bit ADC

$$V_{A0D} = \frac{V_{Batt} \times 0.4 \times 1023}{5}$$

18650 Lithium Battery
Discharge Profile



Discharge: 3.0V cutoff at room temperature.

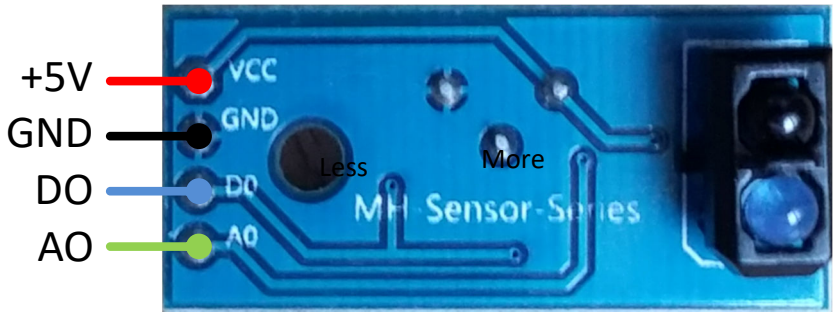
Two cells in series gives a nominal 7.4v constant discharge voltage. To prevent damage, stop using once the following conditions are reached:

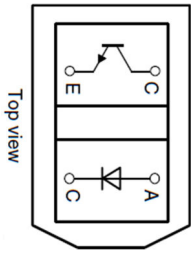
3.60 + 3.00 = 6.60v (one battery fades early)
3.30 + 3.30 = 6.60v (both batteries fade together)

Hence V_{A0D} = 540 @ V_{Batt} = 6.60v

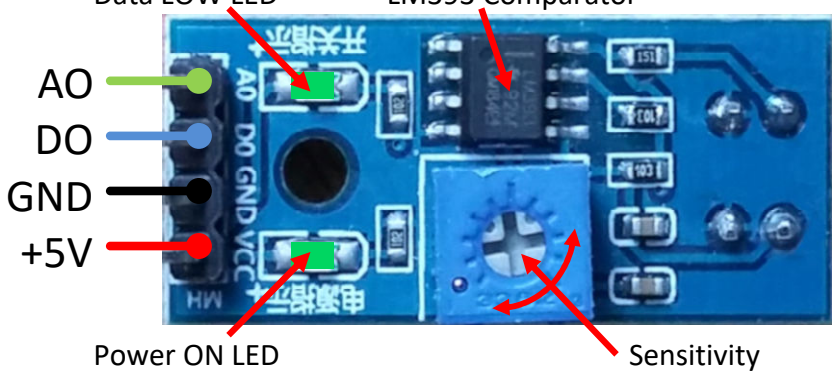
The code will shut down when the value drops to 540.

IR Obstacle Sensor

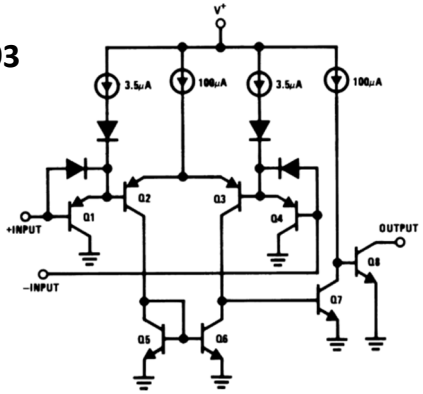




Proximity	LED	Output
Close	ON	LOW
Far	OFF	HIGH



LM393



LM393 is open collector output, therefore several devices can be connected to a common active LOW data line.
LM393 has a minimum sink current of 6mA, typical 16mA. As each 'Data' LED draws ~2.5mA, you could connect between 2 and 6 circuits together.

Pcb current = 30mA with both LEDs ON.