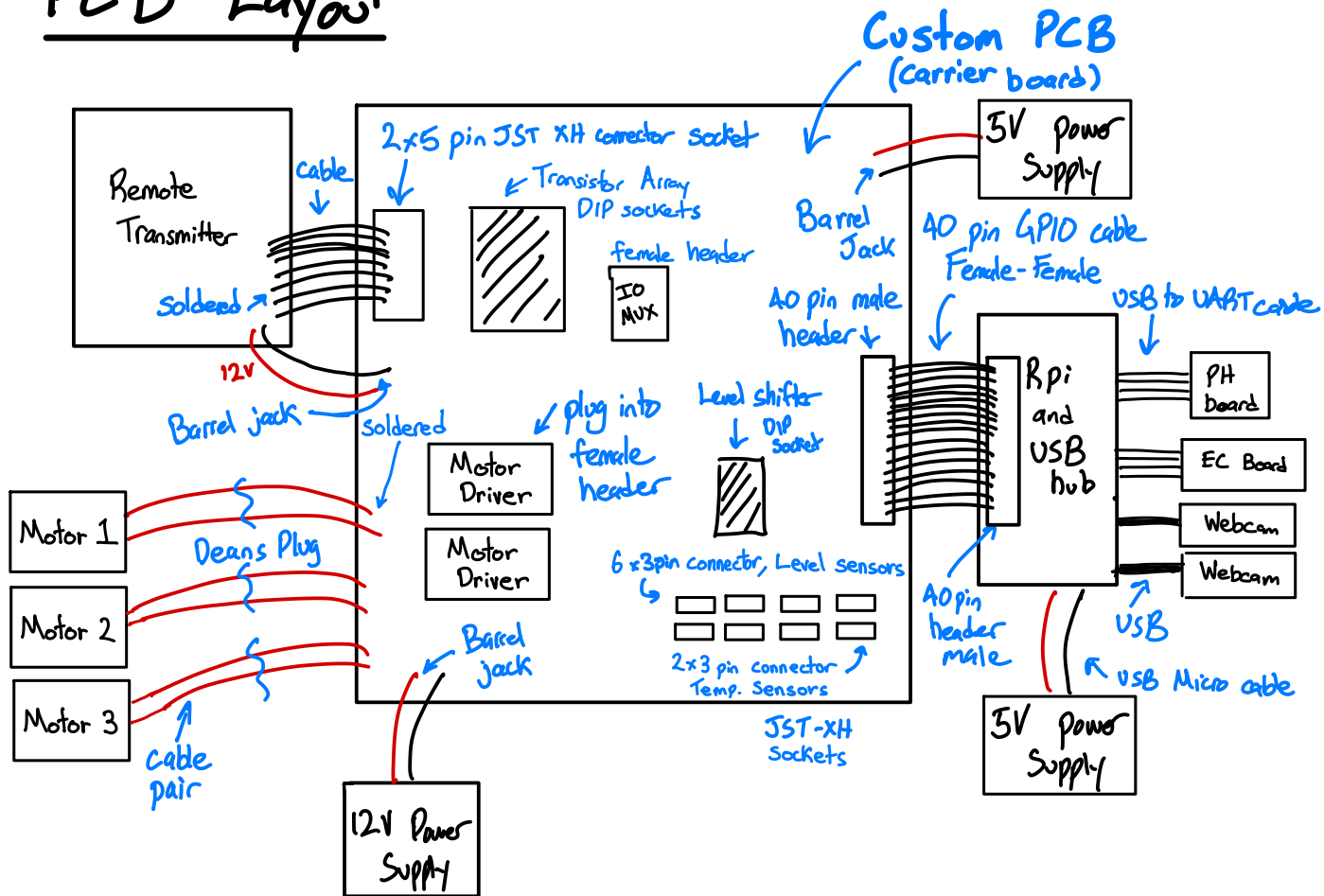


PCB Layout



Connectors

Connectors should aim to be:

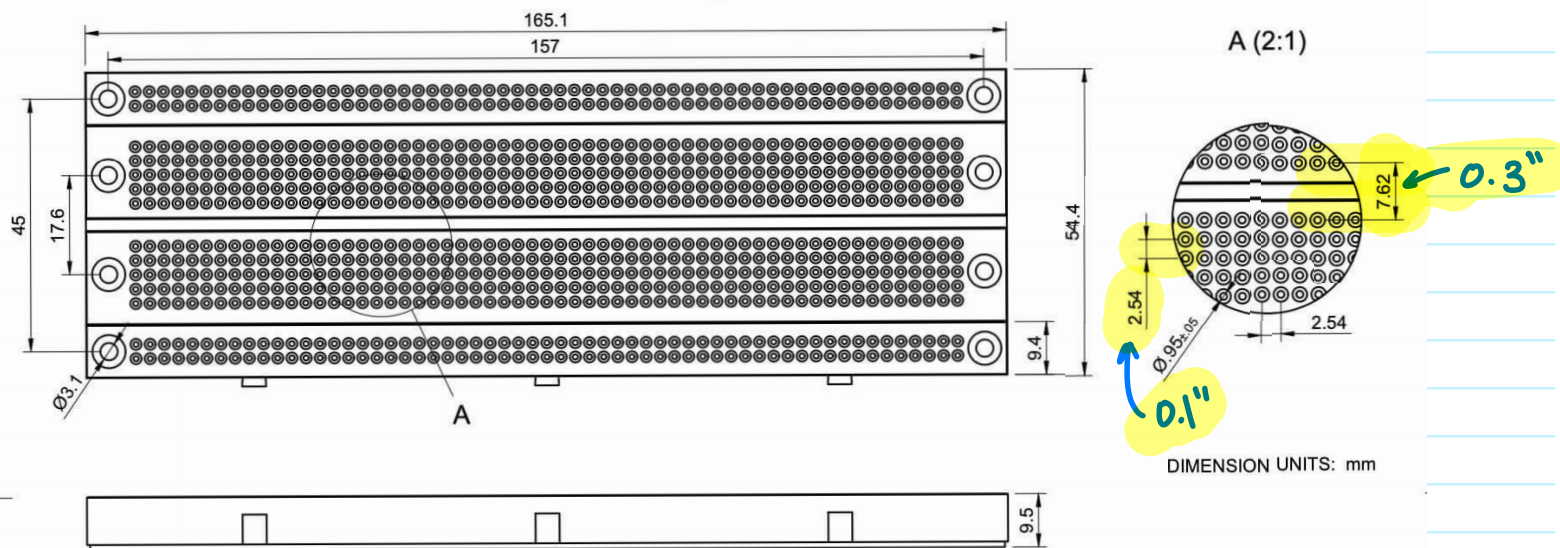
- polarized
- locking
- 0.1" pitch

Selected:

- 3 pin connectors : JST XH, precrimped.
- Dean's Plug
- Barrel plug
- GPIO cable header

Breadboard Dimensions

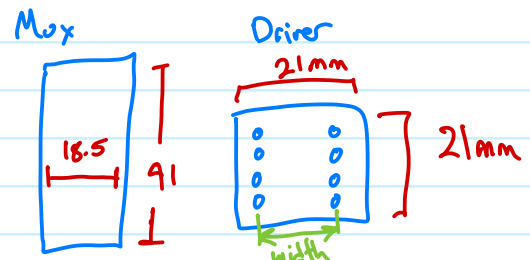
Pitch - all 2.54 mm



Breakout board dimensions (pin separation width)

✓ Mux: $3 \times 2.54 + 7.62 = 15.24 \text{ mm} = 0.6''$

✓ Motor Driver: same as Mux.



✓ DIP Socket IC's: 0.3" (7.62 mm); Rampelt's exact UBMP socket works as level shifter 20 Pin DIP Socket

✓ DIP Socket: 0.3" / 7.62 mm

✓ female header pins Rampelt ✓

✓ Wire pad size: $\hookrightarrow 5 \times 5 \text{ mm}$

✓ Test point flat pad for Oscilloscope probe on non-BPi signals: 1.5 mm

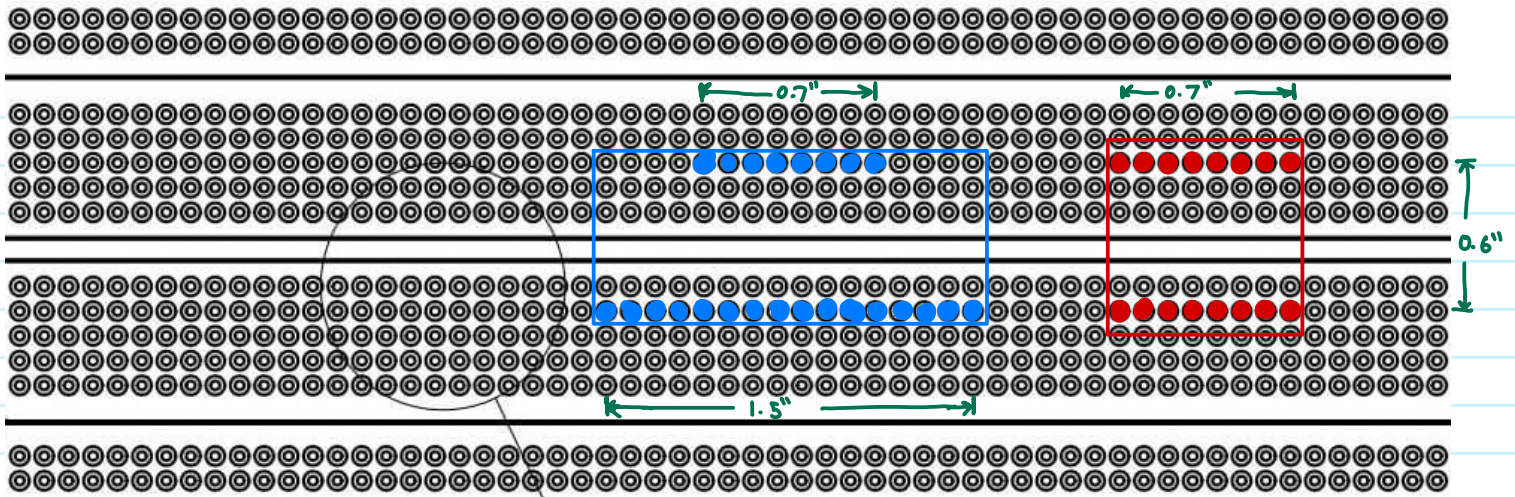
✓ JST Footprint: fake JSTs fit into Rampelt's DIP socket footprint pitch: 2.54 mm

Other Footprints

✓ Resistors ✓ Matches Rampelt's

✓ Capacitors Use the 2 outer pads of Rampelt's 3 pin header





Mox

Motor Driver.

Adafruit Cabling

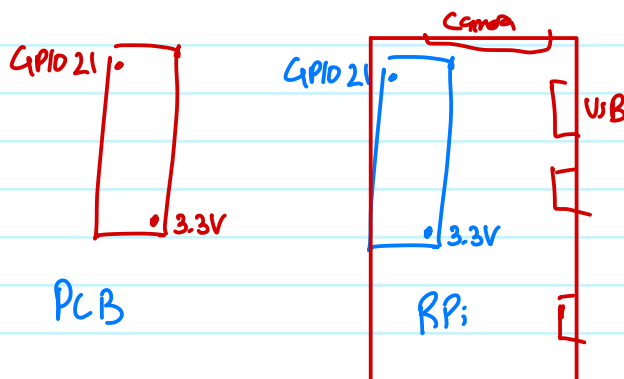
if cable has no kinks, then pinout is exact same as pi

- using cable vs. directly.

↳ this doesn't matter. can be decided later.

Whether I use a cable or not, pinout/orientation of header on PCB is the same

- orientation of 40 pin header on PCB needs to be flipped like this:



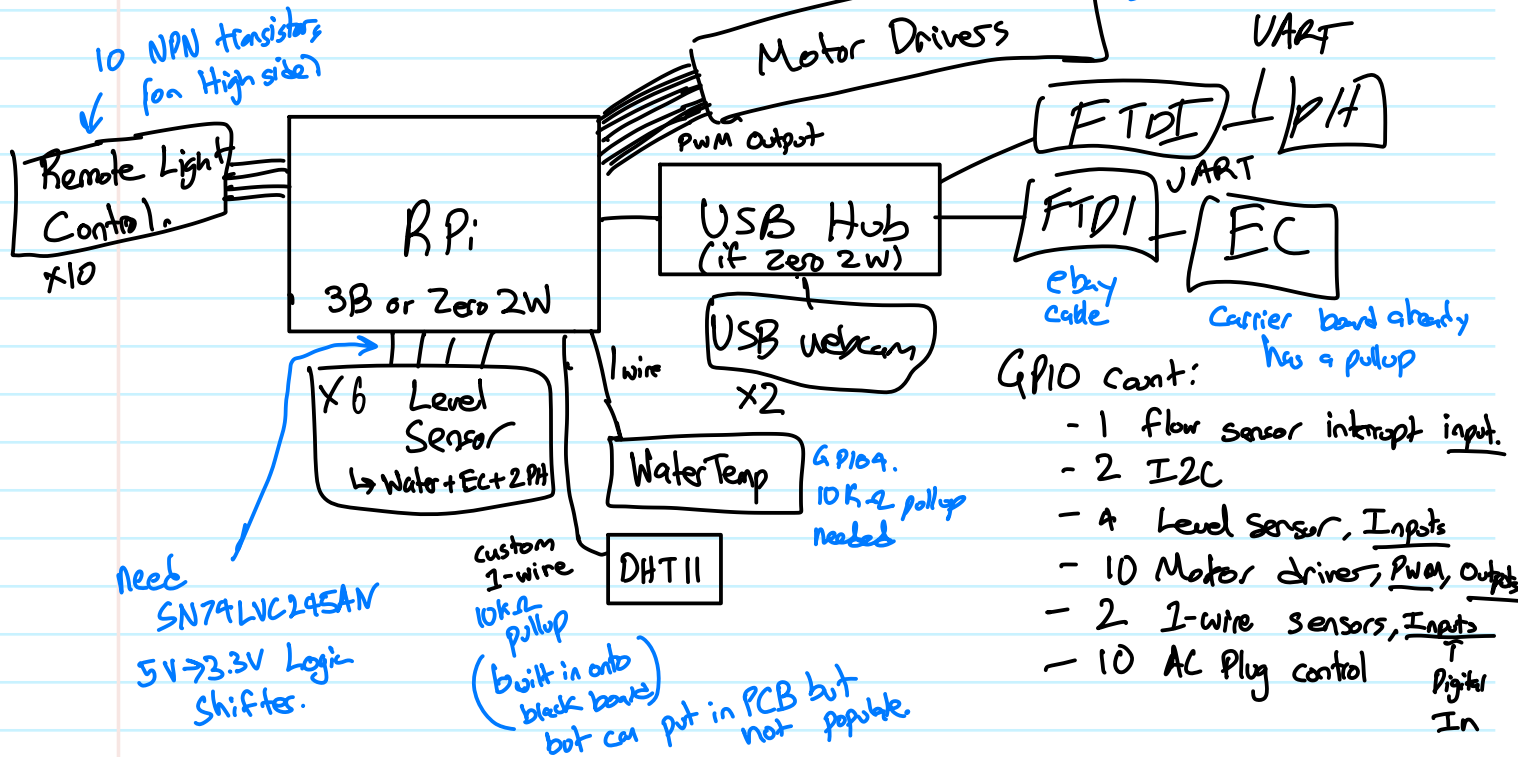
5V, 3.3V Power

• if Rpi is not able to supply enough current from its 5V; 3V3 header, can attach an external DC supply to breadboard and possible LDO regulator and solder to 5V, 3V3 pads

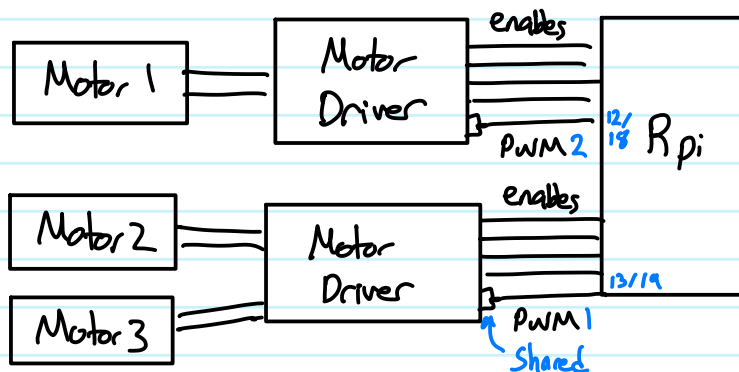
Rough Block Diagrams. - Initial Planning

Rpi has only 2 Hardware PWM outputs!!

- will need to use ENable lines
See below.



Motor Controls



Pin restrictions

| | |
|------------|------------|
| PWM0 | GPIO 12/18 |
| PWM1 | GPIO 13/19 |
| Water Temp | GPIO 4 |
| I2C | GPIO 2/3 |

Remote Control transistor requirements. from testing.

44mA on button

33mA off.

12.6 V.
connection

The remote control transmitter is in a pulled down config.

12V



Remote Control (2 button remote)

- must have internal pull down resistor

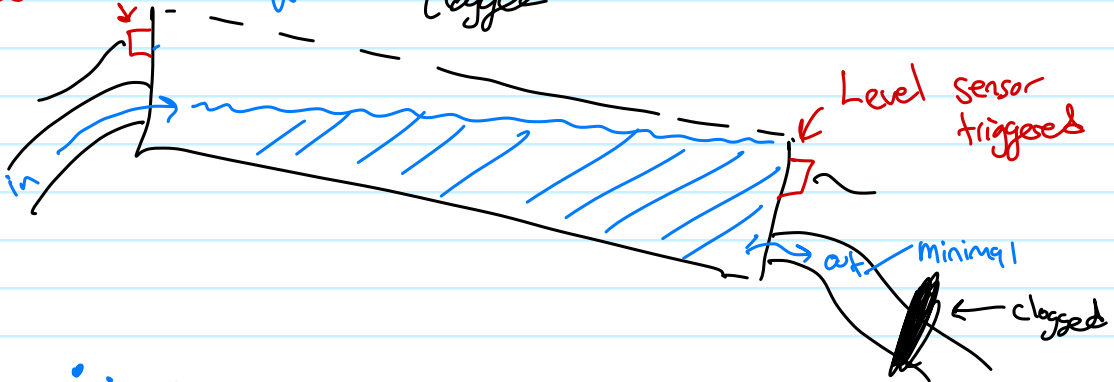
sig

Return Line Blockage

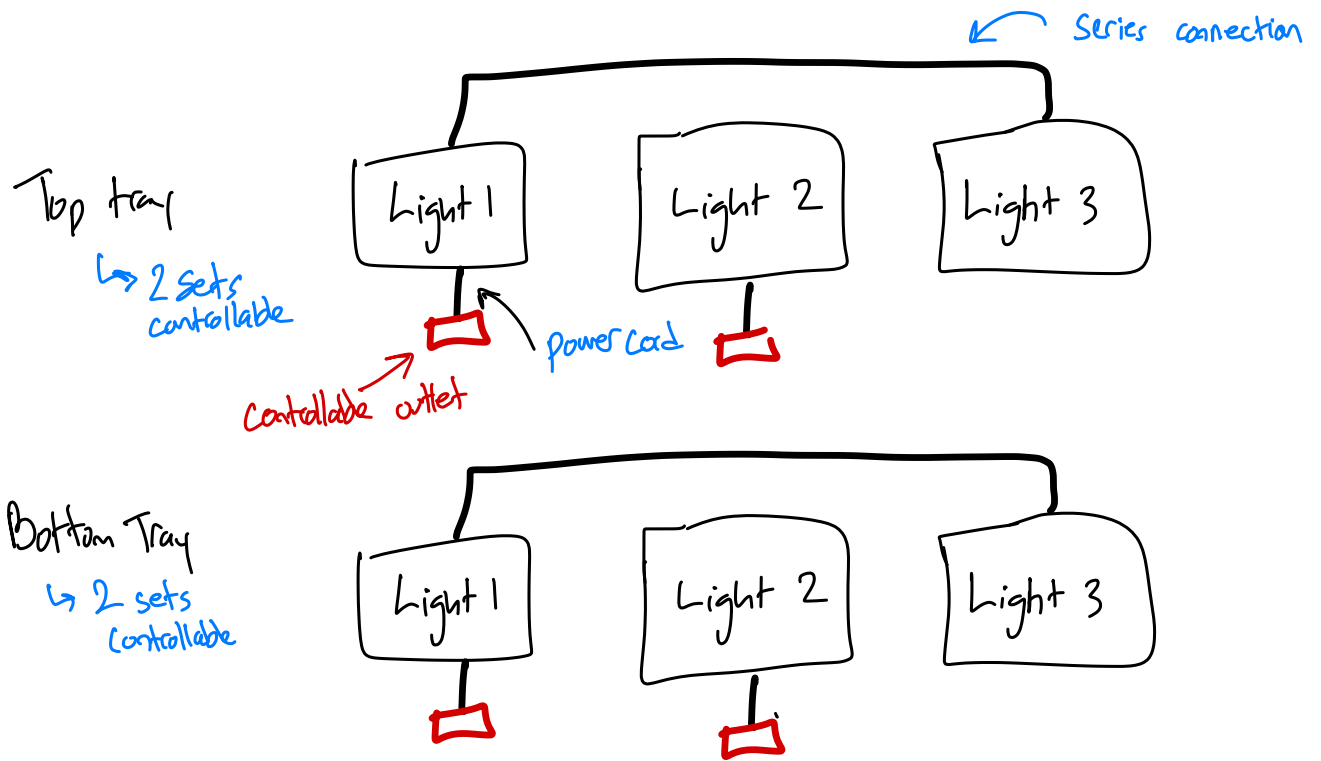
Level sensor not triggered

water

clogged



$in > out$



⇒ 4 remote socket plugs + 1 water pump remote socket.

