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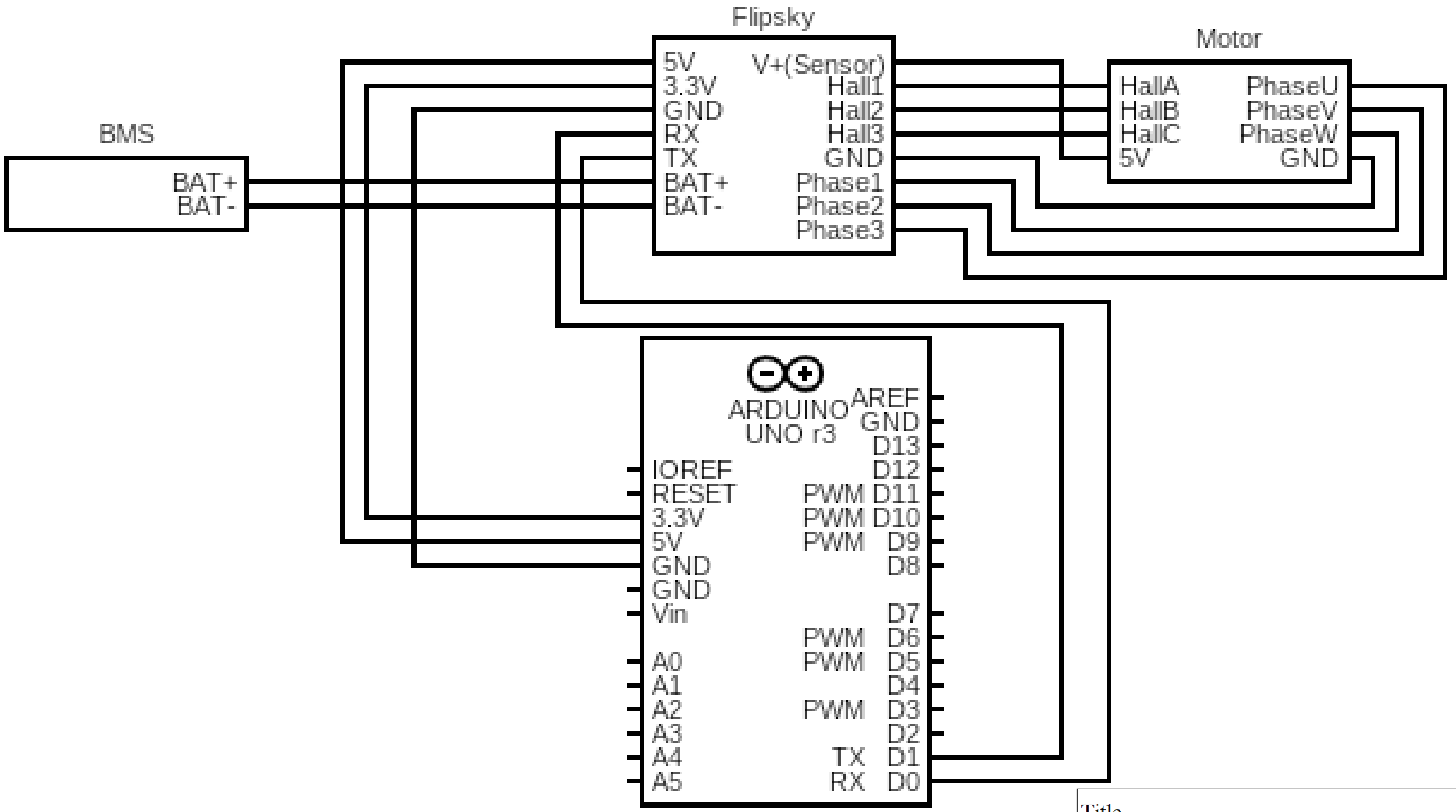
TranzVolt

LIFT HOIST

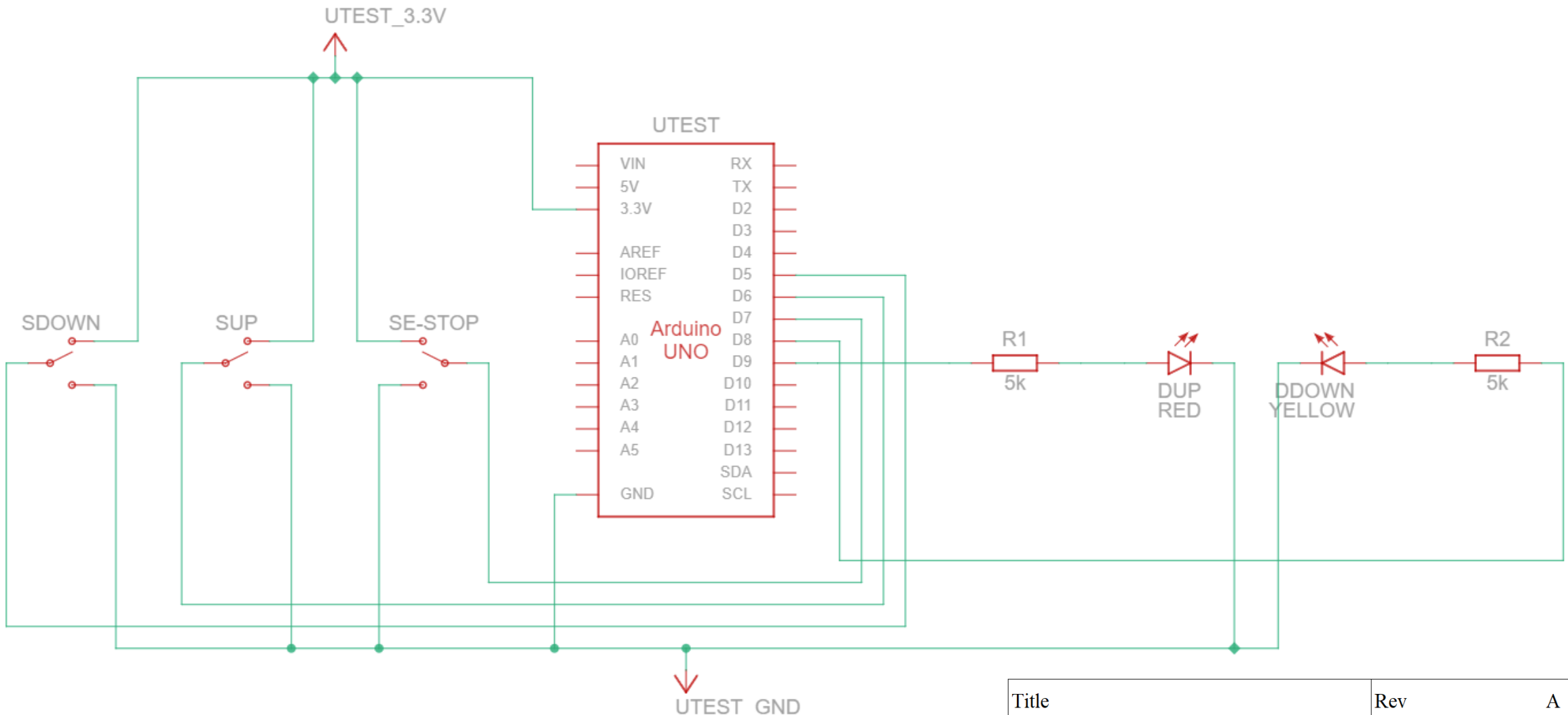
CORDLESS POWER

Item	Supplier	Part #	Description	Quantity	Price
BG Brushless 40V DC Motor	Alibaba	86BL130-430-01	Brushless 40V DC Motor 1050W	1	$80
Uxcell Push Button	Amazon	N/A	50x50mm Colored Pushbuttons	1	$17.49
10ft 18 Gauge Wire	McMaster-Carr	8157K62	10ft, 18 Gauge copper wires	2	$24.60
20V MAX XR Lithium Ion Battery	Home Depot	N/A	20V, 5.0Ah Lithium Ion Battery Pack	2	$318
BQ7790400PW BATTERY PROTECTOR	Digikey	296-45190-5-ND	Battery Pack Protectors	1	$2.17
MOSFET N-CH 40V 80A DPAK	Digikey	STD95N4LF3	N-Channel 40 V 80A 110W Surface Mount DPAK	8	$14.08
Thermister	Digikey	B57330V2103F260	THERMISTOR NTC 10KOHM 3380K 0603	8	$2.16
MOSFET N-CH 200V 1A SOT-233	Digikey	STN1NF20	MOSFET N-CH 200V 1A Surface Mount SOT-233	8	$5.60
LowOn MOSFET	Mouser	SSM6J214FETE85LF	MOSFET LowON Res ID=-3.6A VDSS=-30V	8	$3.20
Total					**$467.30**

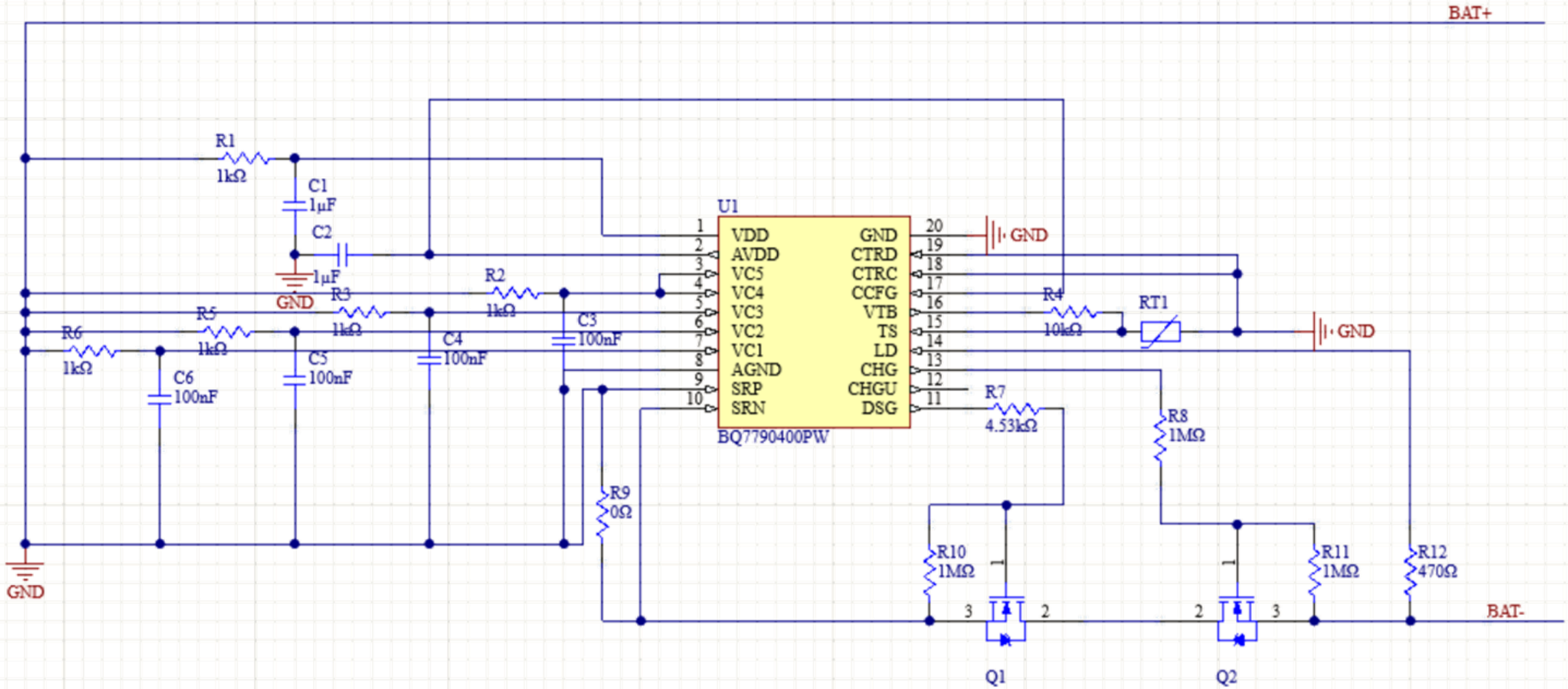
Title	Bill Of Materials	Rev	A
		Date	3/16/2022
Authors	Oliver	ID	1
		Group #	6



Title	Motor Schematic	Rev	A
		Date	3/16/2022
Authors	Oliver, Dakota, Raymond	ID	2
		Group #	6



Title	UI Schematic	Rev	A
		Date	3/16/2022
Authors	Sri, Solomon	ID	3
		Group #	6



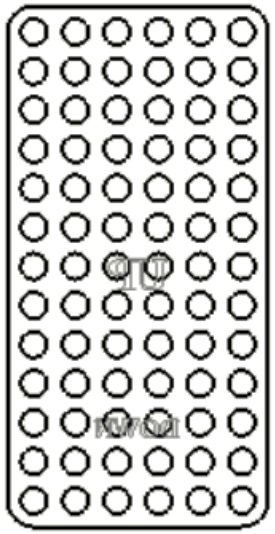
Title	BMS Schematic	Rev	A
		Date	3/16/2022
Authors	Su	ID	4
		Group #	6

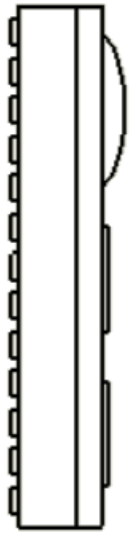
```
#include <VescUart.h>

#define DOWN 0
#define STOP 1
#define UP 2
#define STOP_FREEZE 3

#define DOWN_PIN 5
#define UP_PIN 6
#define ESTOP_PIN 7

int motorStatus = STOP;
void motorCommand(int comm);
int startCurrent = 0;
int Current = 0;
long startRevs = 0;
long endRevs = 0;

VescUart UART;

void setup()
{
  // Set switch input pins
  pinMode(DOWN_PIN, INPUT); // Down
  pinMode(UP_PIN, INPUT); // Up
  pinMode(ESTOP_PIN, INPUT);  // E Stop

  // Set output testing pins
  pinMode(8, OUTPUT); // Down Signal
  pinMode(9, OUTPUT); // Up Signal
  pinMode(LED_BUILTIN, OUTPUT); // E Stop Signal

  Serial.begin(115200);

  UART.setSerialPort(&Serial);
  // put auto homing stuff here
  UART.getVescValues()
  startRevs = UART.data.tachometer;
  UART.nunchuck.valueY = 200;
  UART.setNunchuckValues();
  delay(1000);
  UART.getVescValues()
  startCurrent = UART.data.avgMotorCurrent;
  while (Current <= startCurrent) {
    UART.getVescValues()
    Current = UART.data.avgMotorCurrent;
  }

  UART.nunchuck.valueY = 127;
  UART.setNunchuckValues();
  endRevs = UART.data.tachometer - startRevs;

  UART.nunchuck.valueY = 50;
  UART.setNunchuckValues();
  UART.getVescValues()
  while (UART.data.tachometer > startRevs){
    UART.getVescValues()
  }
  UART.nunchuck.valueY = 127;
  UART.setNunchuckValues();
}

void loop()
{
  // Check switches for inputs

  // E-Stop has top priority
  if (digitalRead(ESTOP_PIN) == HIGH) {
    motorCommand(STOP);
  motorStatus = STOP_FREEZE;
  } else {
    // Check other pins (Give down priority for safety reasons)
    int downStat = digitalRead(DOWN_PIN);
    int upStat = digitalRead(UP_PIN);
    if (motorStatus == STOP_FREEZE && downStat == LOW && upStat == LOW) {
      motorStatus = STOP;
    }

    if (motorStatus == STOP) {
      // Static to Movement
      if (downStat == HIGH) {
    motorCommand(DOWN);
        motorStatus = DOWN;
        return;
      }
      if (upStat == HIGH) {
        motorCommand(UP);
        motorStatus = UP;
        return;
      }
    } else {
      // Movement to Static
      if (motorStatus == DOWN && downStat == LOW) {
        motorCommand(STOP);
        motorStatus = STOP_FREEZE;
        return;
      }
      if (motorStatus == UP && upStat == LOW) {
        motorCommand(STOP);
        motorStatus = STOP_FREEZE;
        return;
      }
    }
  }
}
```

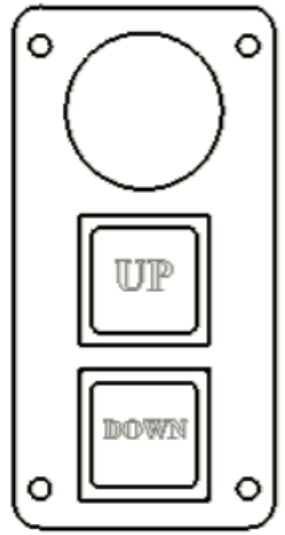
Title	Main Code	Rev	A
		Date	3/16/2022
Authors	Raymond, Dakota	ID	5
		Group #	6

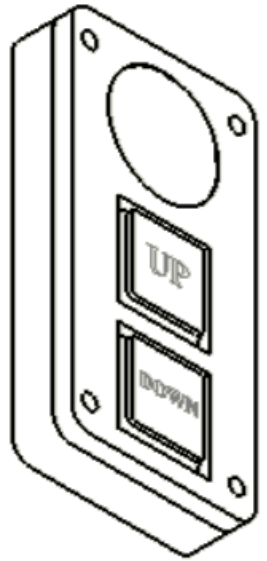
```
void motorCommand(int comm){
  // Replace with UART commands
  if (comm != STOP) {
    digitalWrite(LED_BUILTIN, LOW);
  }
  switch (comm) {
    case UP:
      // Motor UP
      UART.nunchuck.valueY = 200;
      UART.setNunchuckValues();
      digitalWrite(8, LOW);
      digitalWrite(9, HIGH);
      UART.getVescValues()
      while (UART.data.tachometer < endRevs){
        UART.getVescValues()
      }
      UART.nunchuck.valueY = 127;
      UART.setNunchuckValues();
      break;
    case DOWN:
      // Motor DOWN
      UART.nunchuck.valueY = 50;
      UART.setNunchuckValues();
      digitalWrite(8, HIGH);
      digitalWrite(9, LOW);
      UART.getVescValues()
      while (UART.data.tachometer > startRevs){
        UART.getVescValues()
      }
      UART.nunchuck.valueY = 127;
      UART.setNunchuckValues();
      break;
    default:
      // Motor STOP
      UART.nunchuck.valueY = 127;
      UART.setNunchuckValues();
      digitalWrite(LED_BUILTIN, HIGH);
      digitalWrite(8, LOW);
      digitalWrite(9, LOW);
      break;
  }
}
```

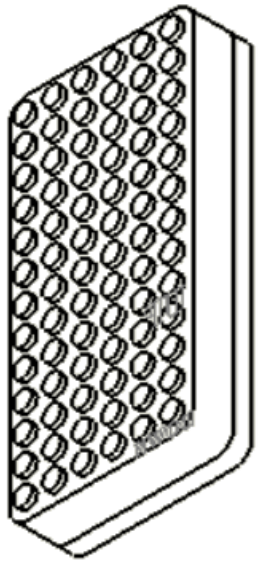
Title motorCommand Function	Rev	A
	Date	3/16/2022
Authors Raymond, Dakota	ID	6
	Group #	6



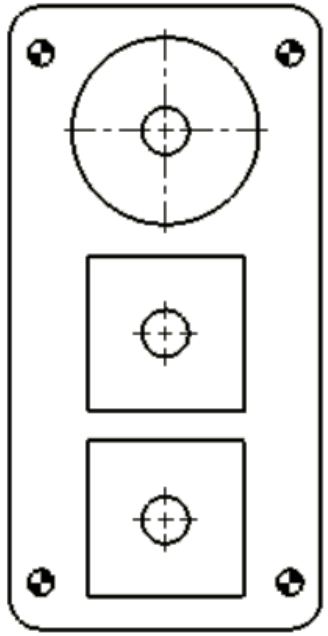


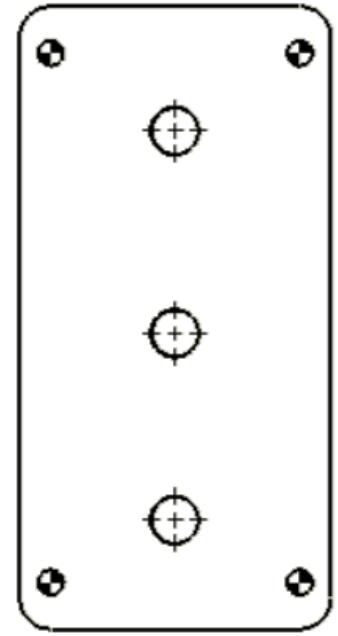


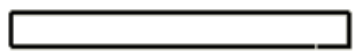


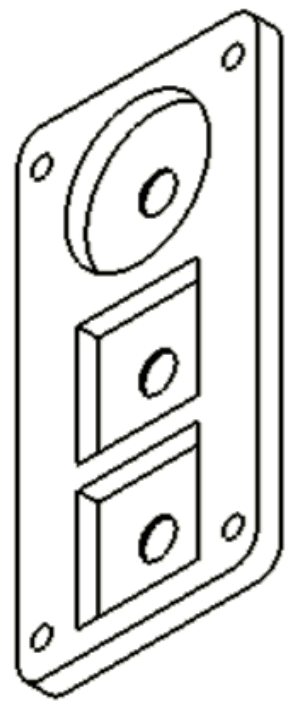


Title	UI Controller	Rev	A
		Date	3/16/2022
Authors	Sri	ID	7
		Group #	6

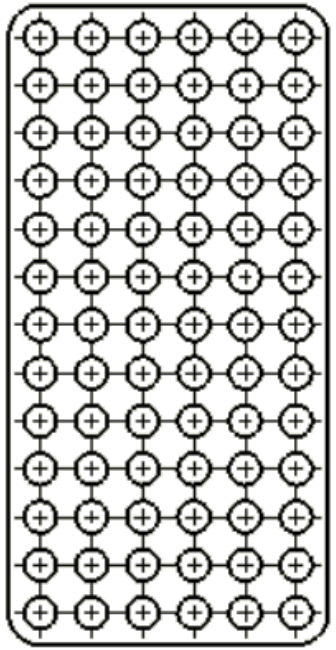


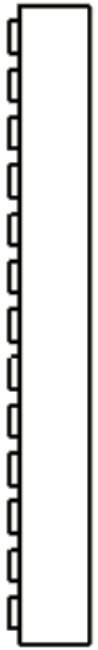


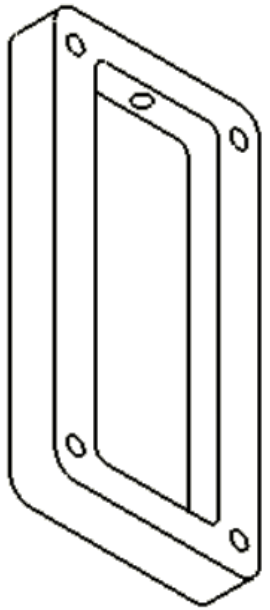


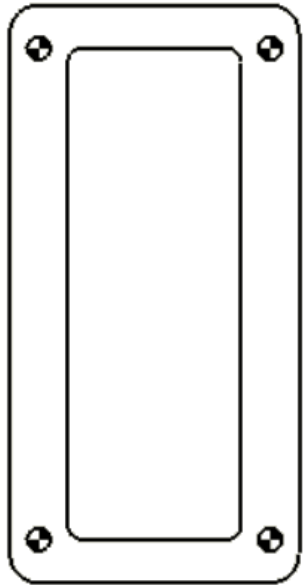


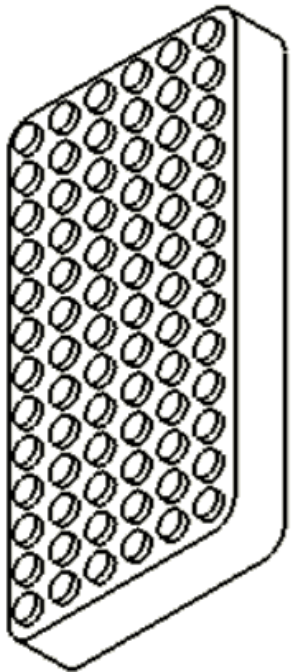
Title	UI Controller Top	Rev	A
		Date	3/16/2022
Authors	Sri	ID	8
		Group #	6



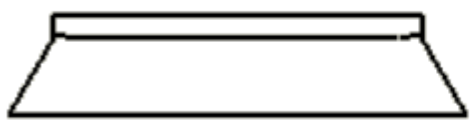




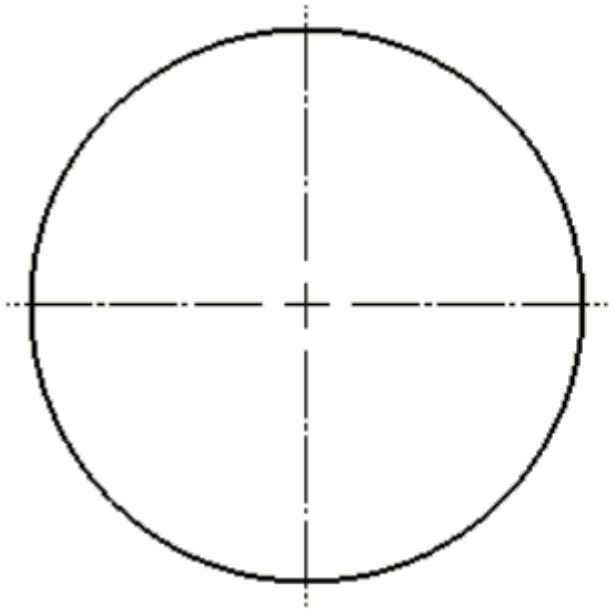


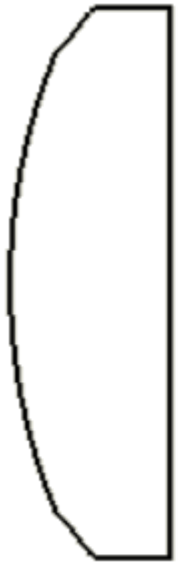


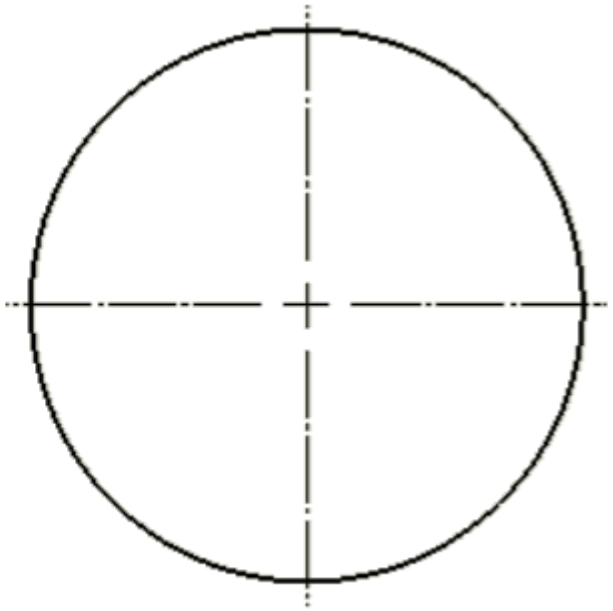
Title	UI Controller Bottom	Rev	A
		Date	3/16/2022
Authors	Sri	ID	9
		Group #	6

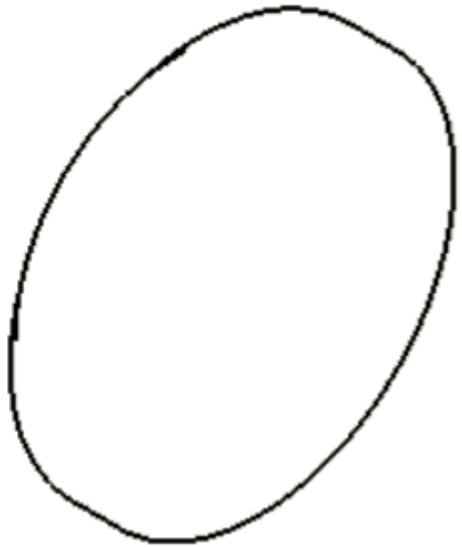


Title	UI Controller Up Button	Rev	A
		Date	3/16/2022
Authors	Sri	ID	10
		Group #	6









Title UI Controller E-Stop Button		Rev	A
		Date	3/16/2022
Authors Sri		ID	11
		Group #	6