530 nm, Green Light

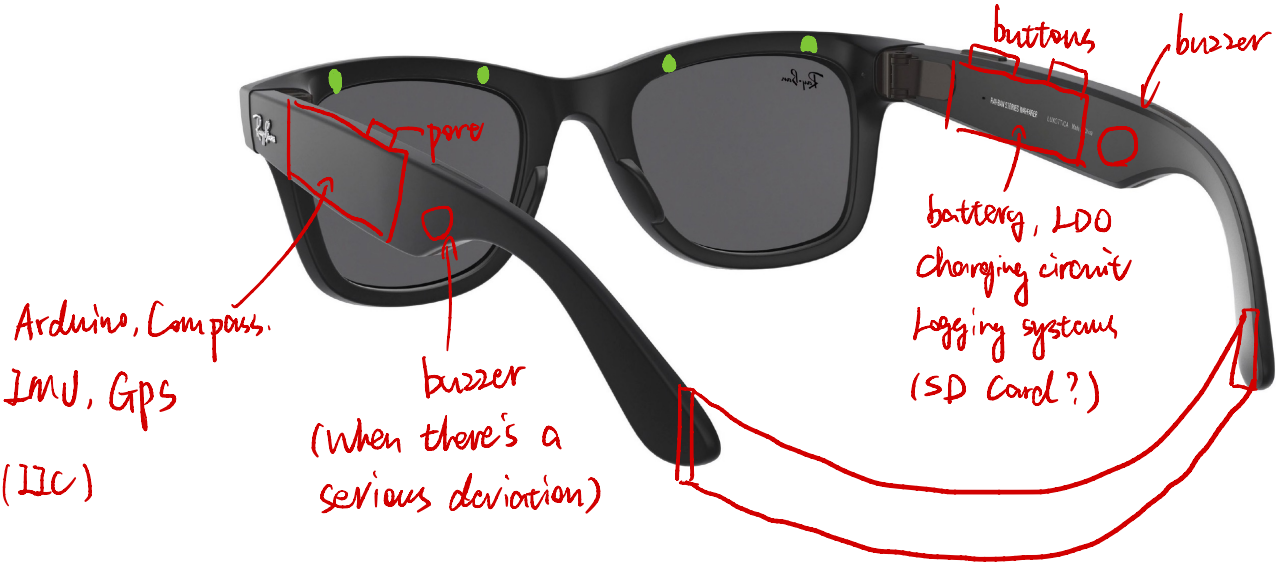
peripheral vision

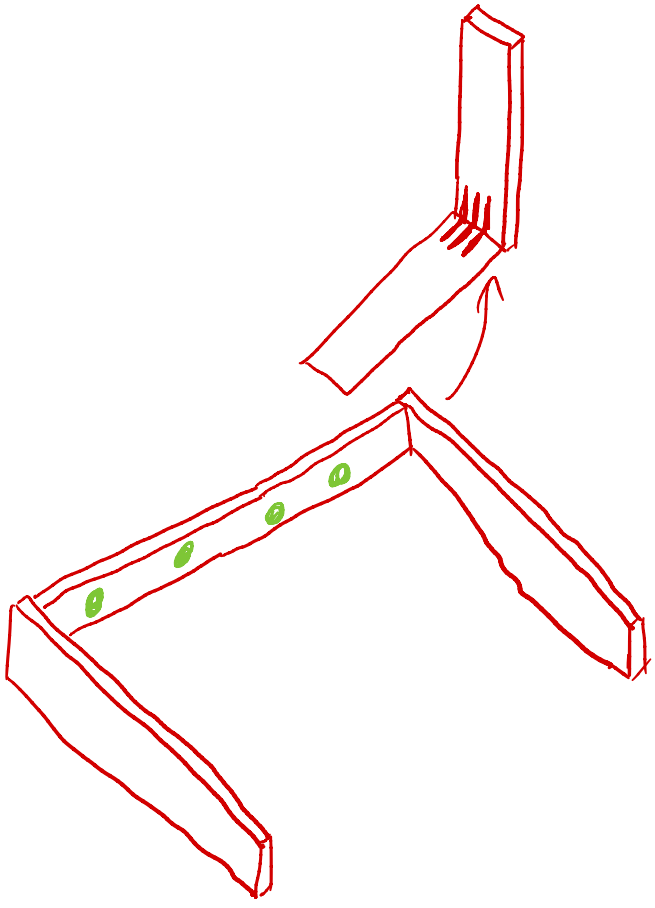
haptic

ergonomic

turn on/off

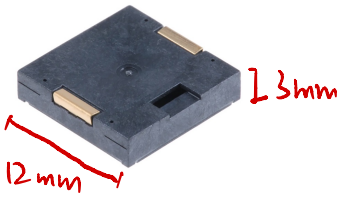
bone conduction





Arduino -> ATMega328 /4809

SMD buzzer

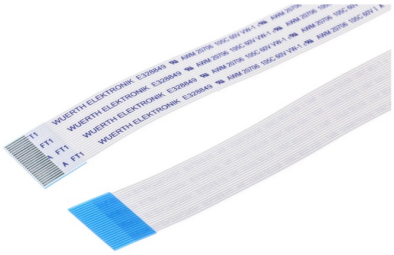


Pin Description:

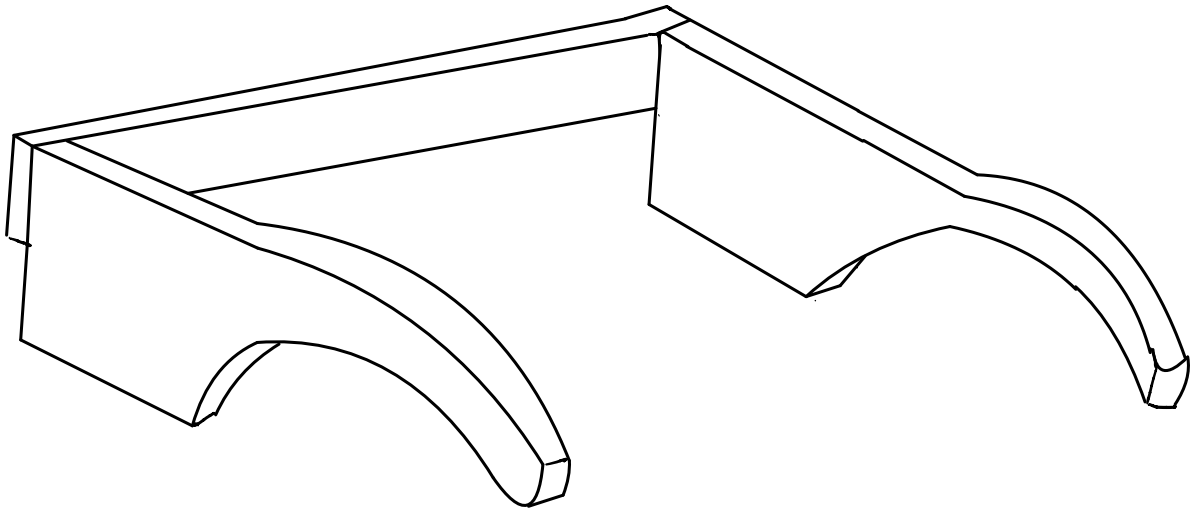
PIN	PIN Name	I/O	Description
1	GND	G	Ground
2	TX	O	Serial Data Output.
3	RX	I	Serial Data Input.
4	VCC	I	DC 3.0V - 5.5V supply input,Typical: 5.0V

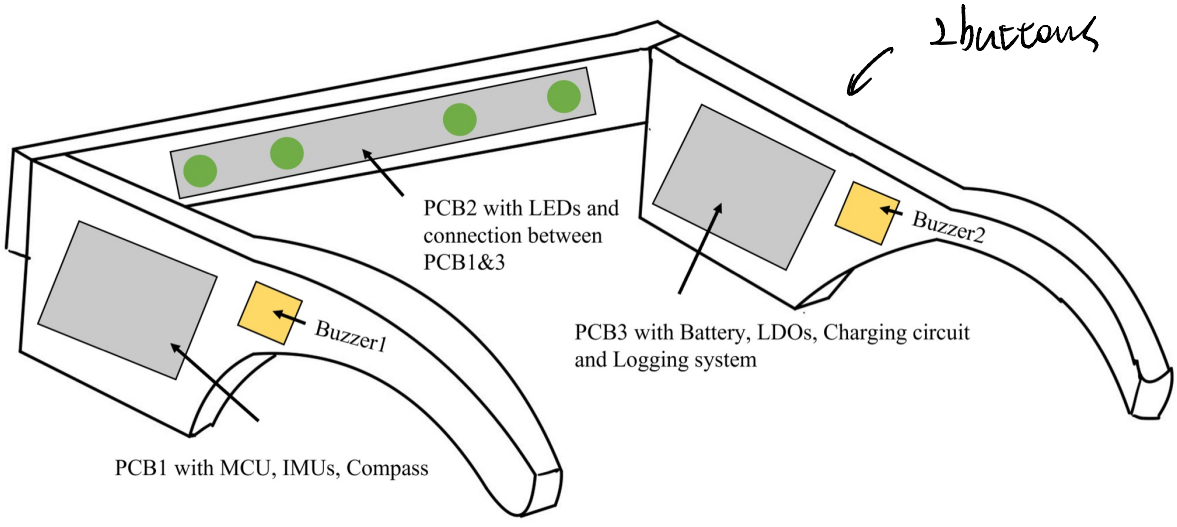
UART/I2C

12x16x6 mm

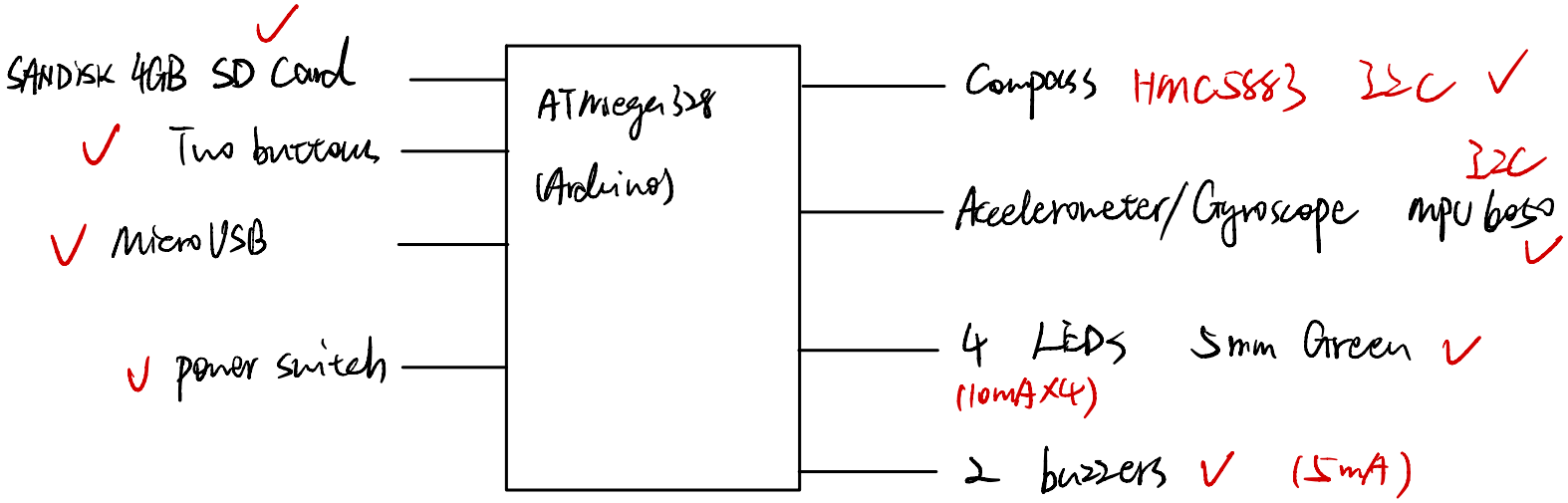


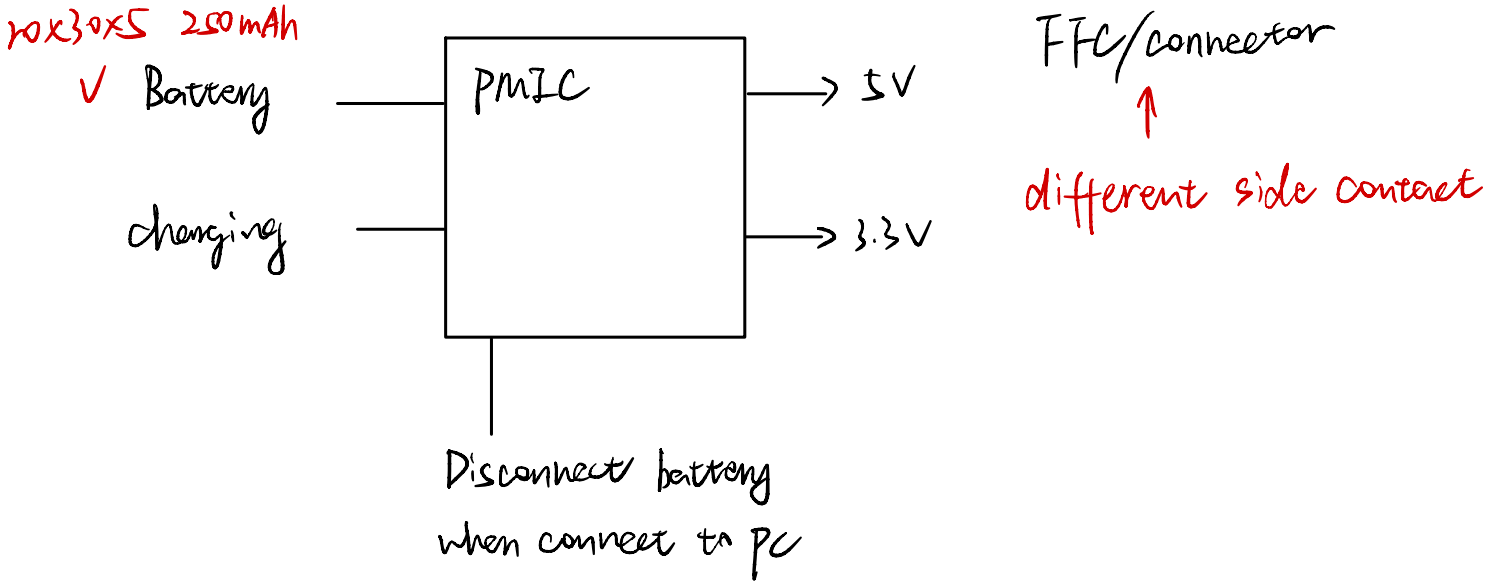
feedback, LED, audio, intensity, piezo (gesture) , software, state machine, press (short/long) , power consumptipn, risk management, economic, time for use





16MHz oscillator ✓

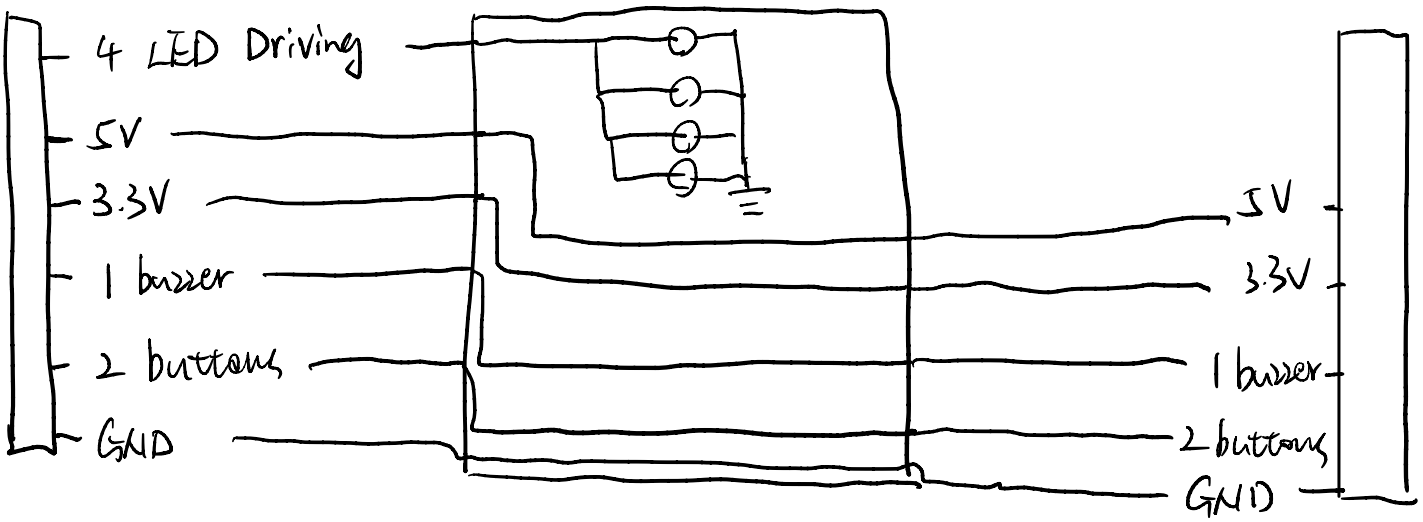


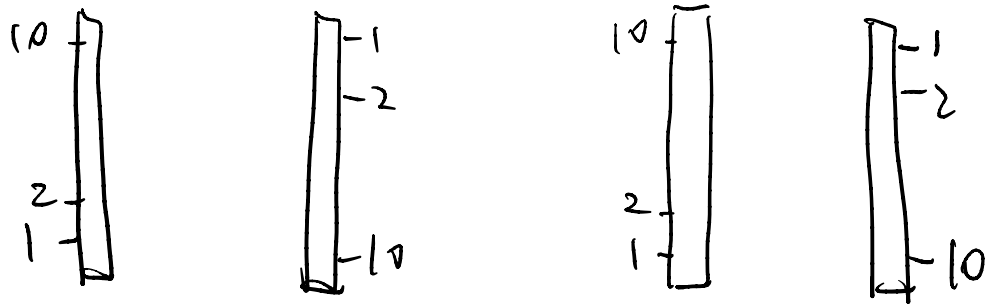


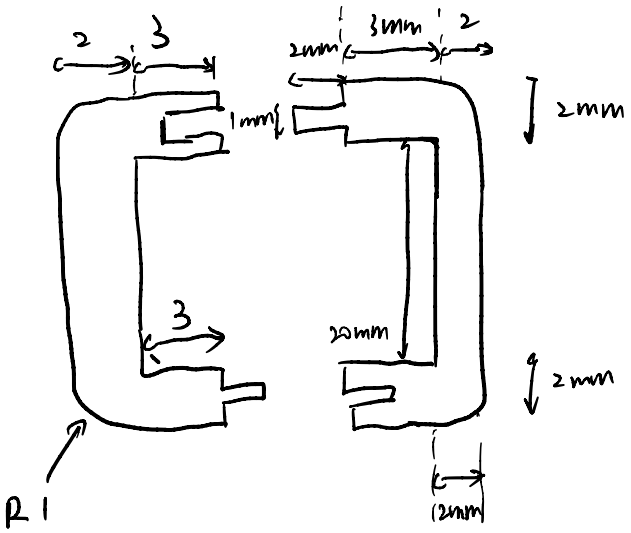
Voltage translators 3.3V ⇌ 5V ⇒ I2C ✓

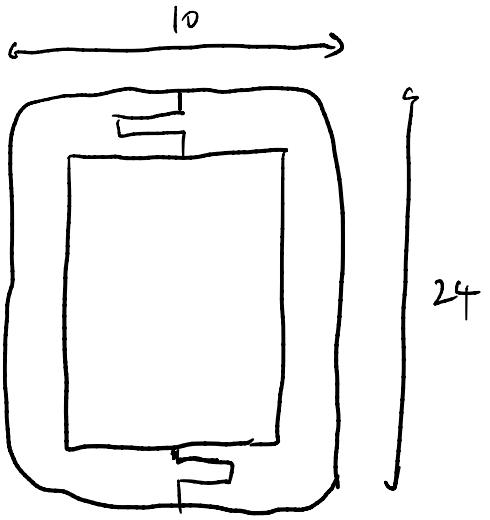
Q1: Separate LDO for sensors?

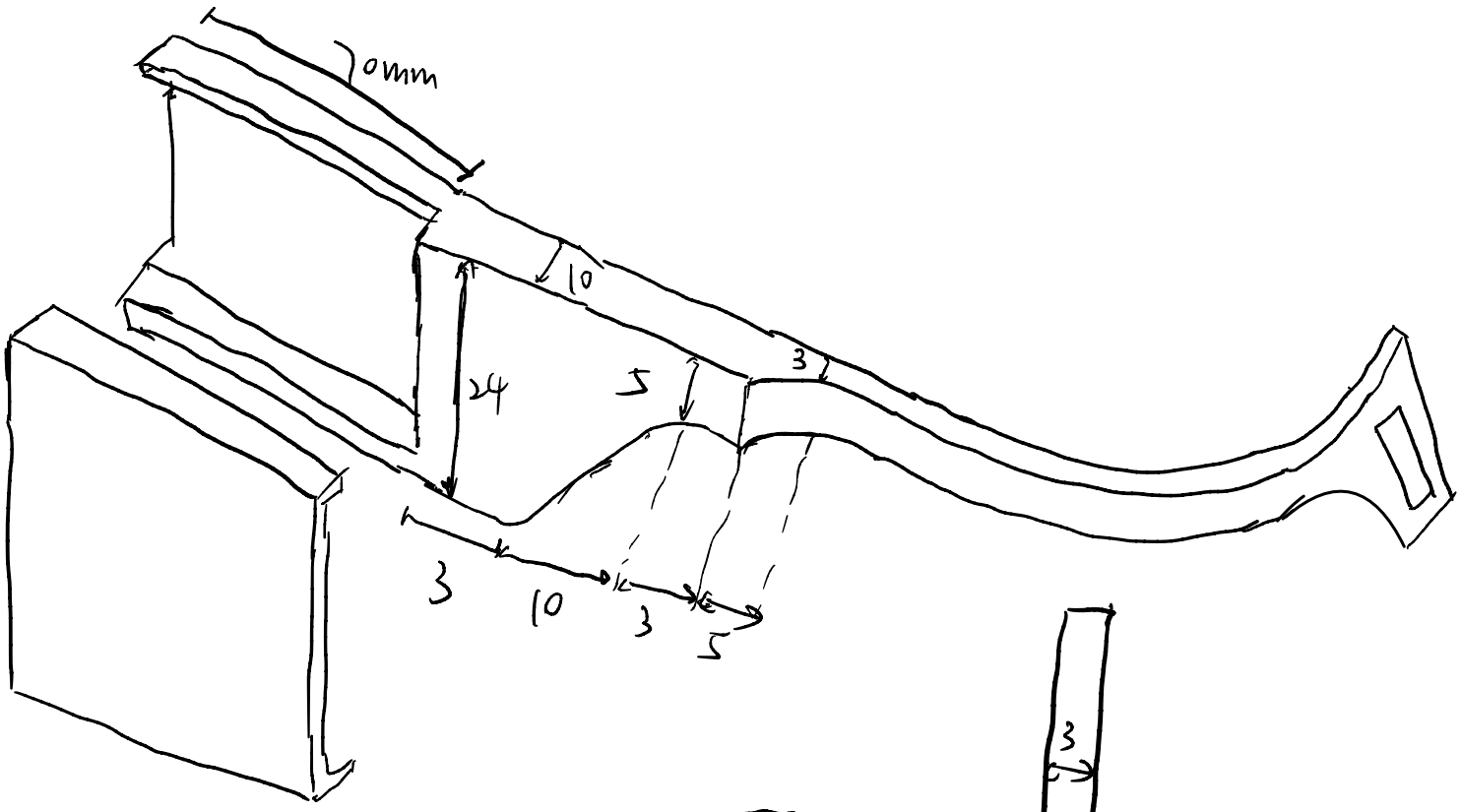
Q2: Not available in preferred supplier. → desolder


4 LED Driving
5V
3.3V
1 buzzer
2 buttons
GND
5V
3.3V
1 buzzer
2 buttons
GND

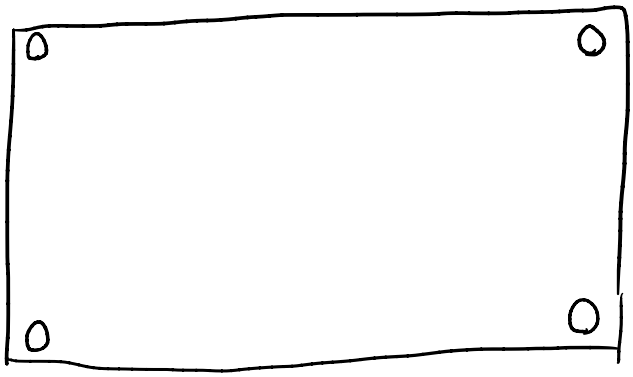

10
2
1
1
2
10
10
2
1
1
2
10

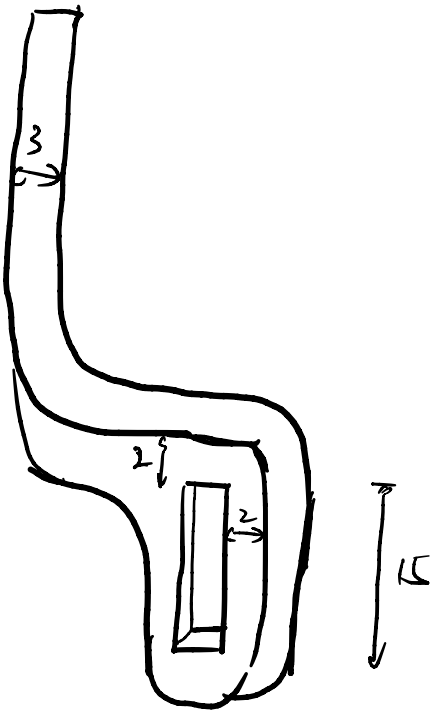

2
3
2mm
3mm
2
1mm
2mm
3
20mm
2mm
R1
12mm


10
24


10mm
10
24
5
3
3
10
3
5


2
2
R=5

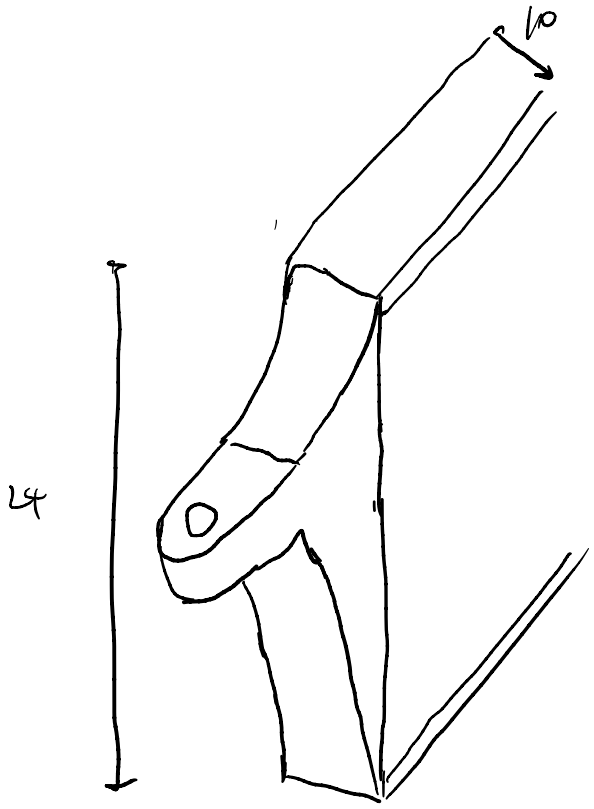


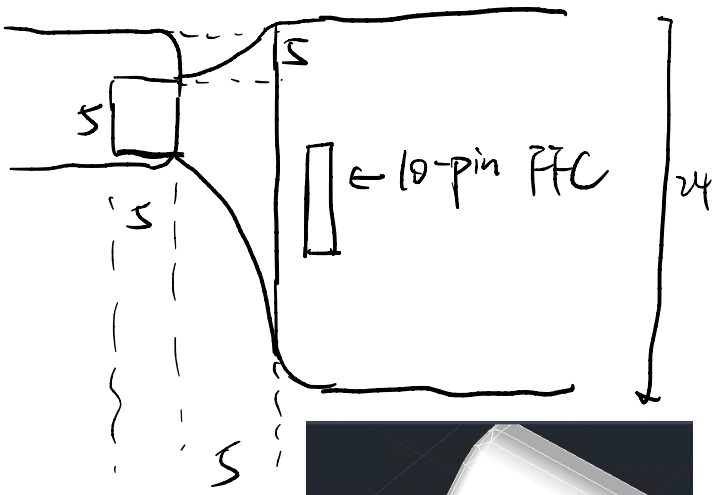

3
2
2
15

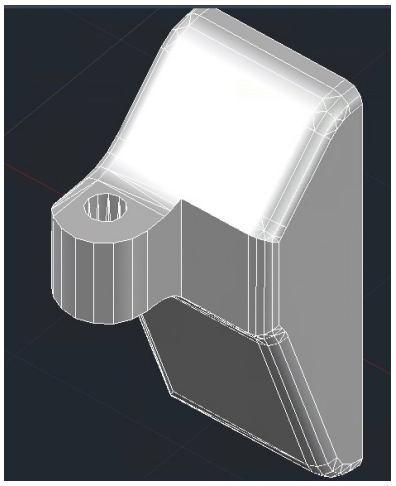
22

70

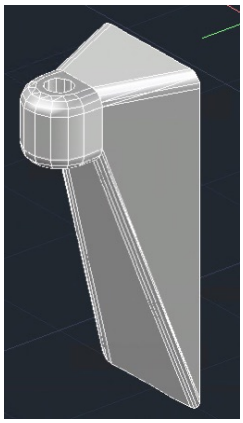
5

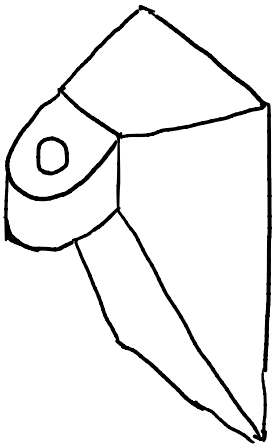


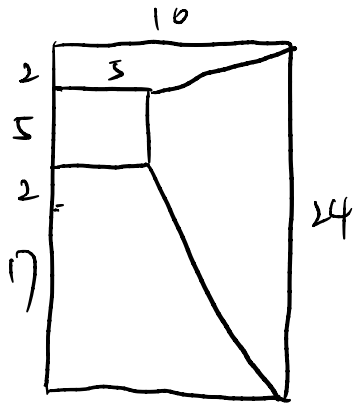


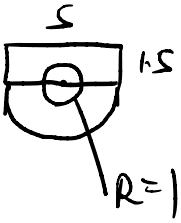


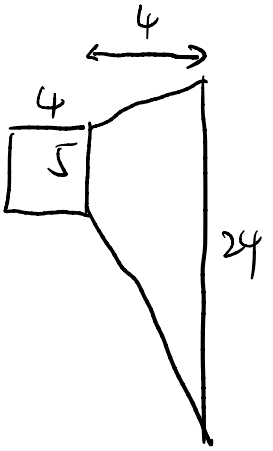
Design V2

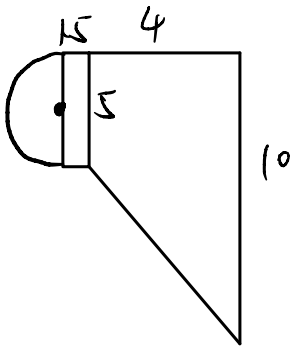


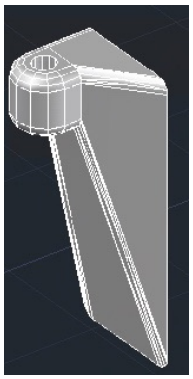




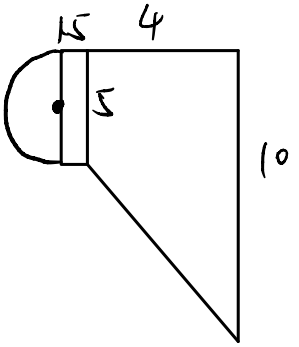


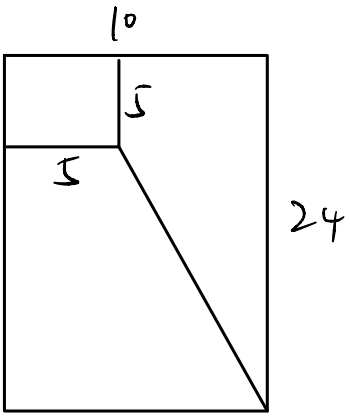


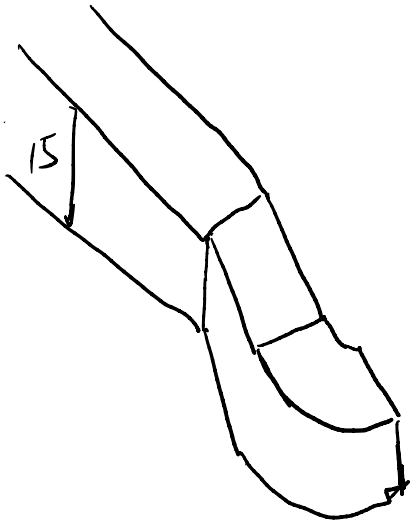


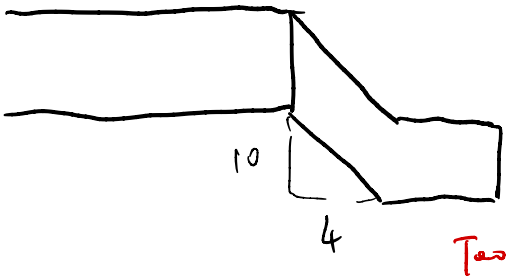


Design V3

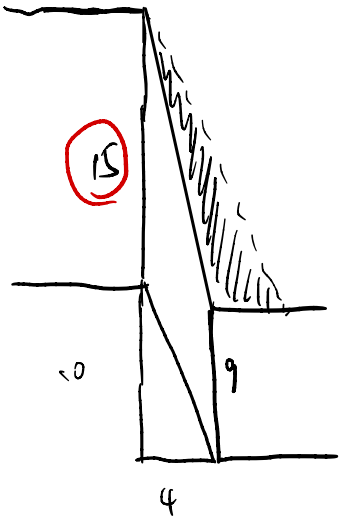


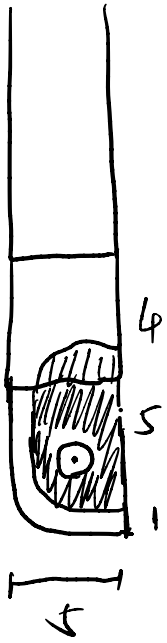


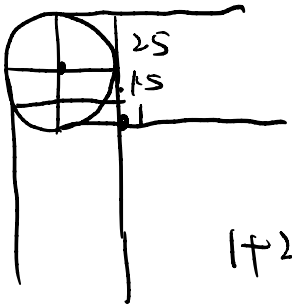




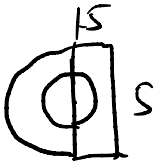
Too big



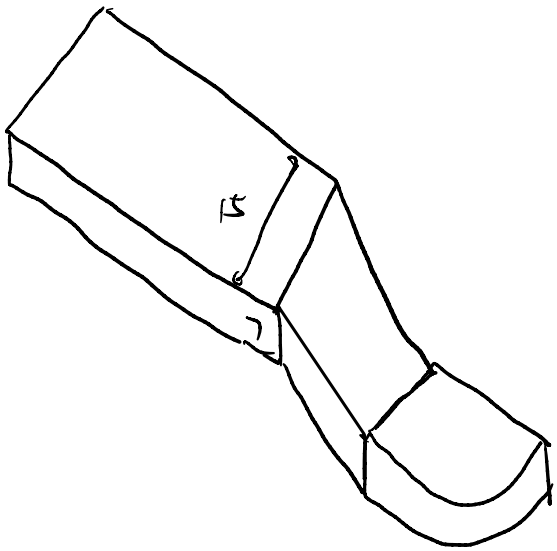


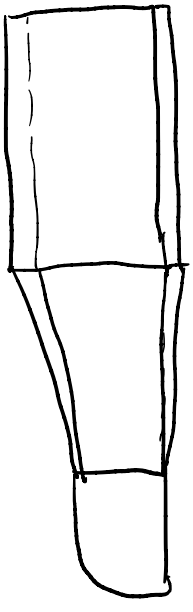


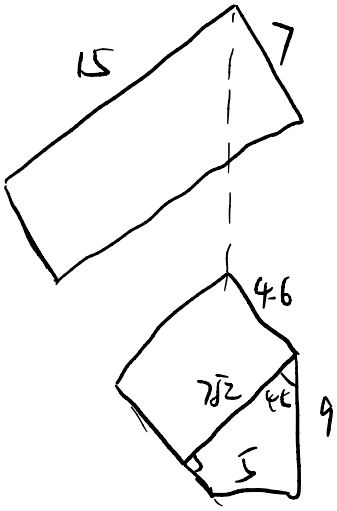
1+25+5

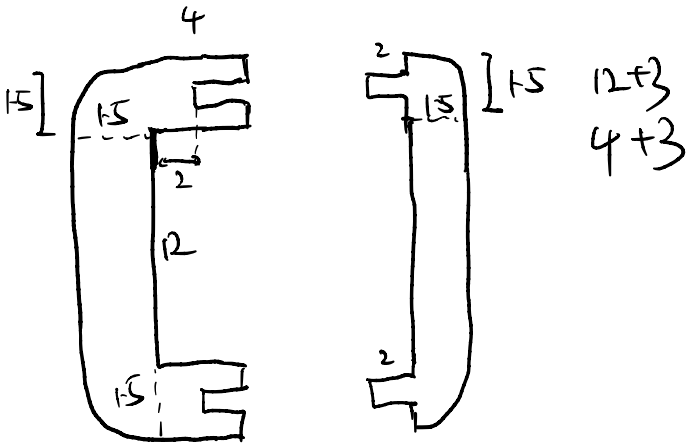


25-1

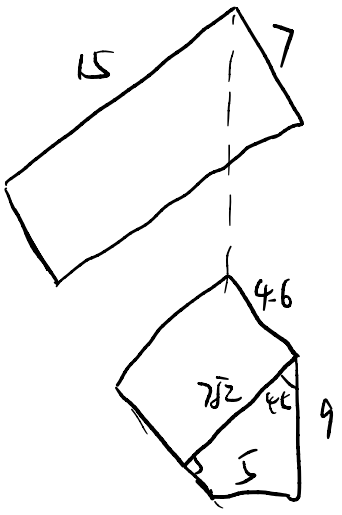


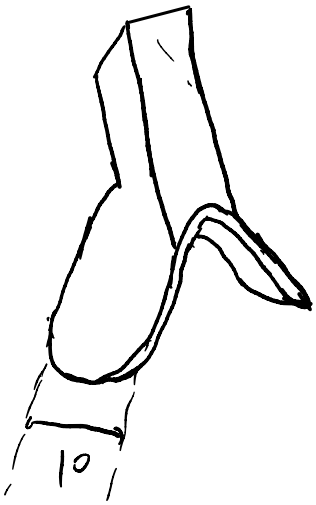


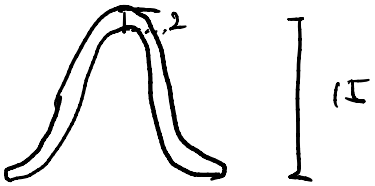




12+3
4+3



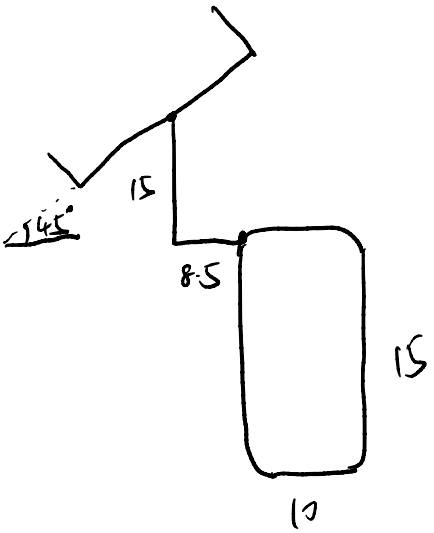


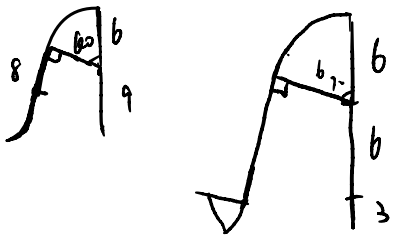


30.3

89.713

129.125





$\delta = 13.5$

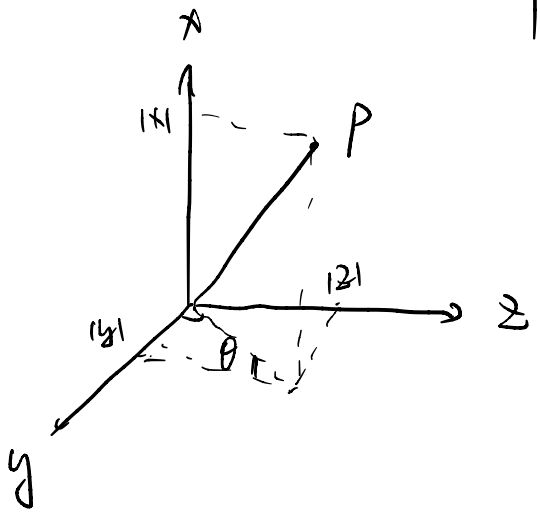
$\theta = 10$

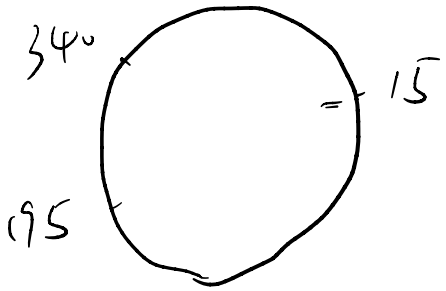
calibrate mpu6050 / HMC5883L
check the presence of micro SD

stage 0
- blinking all LEDs
- waiting for user to press Button 1
- otherwise stay here forever

stage 1
- Button 1 pressed.
- Record the current 5883 reading.
- Setting it as the desired direction
- light up LEDs accordingly
- power up buzzer to alert with big deviation
- writing readings mpu/5883 to micro SD at 50Hz
- Look to another direction if B1 pressed again
- return to stage 0 if B2 pressed

Additional button functions { Turn on/off the buzzer
adjust the brightness of LEDs





360 + 15 - 340

heading (15 ~ 195) => Delta (0, 180)

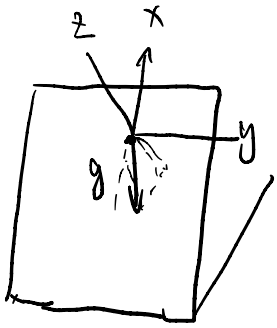
heading (195 ~ 360, 0 ~ 15) => Delta (-180, 0)

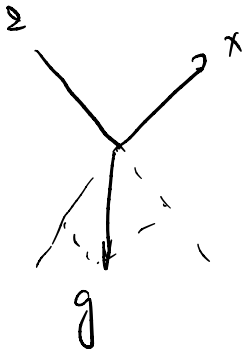
↓

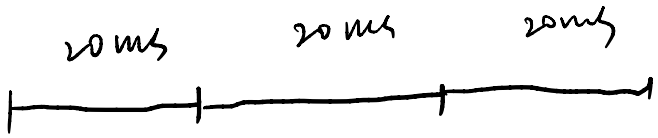
(-15, 0)

if δ > 180.
heading -360 - target

if δ < 180.
360 - target + heading







6x int16 (2 byte)