# Final Final Parts List

Microcontroller

<https://www.raspberrypi.org/products/raspberry-pi-zero-w/>

* Raspberry Pi Zero W
* $10.00
* Built-in WiFi!
* I2C capable (for altimeter)
* 9.3 grams

Microcontroller Power

<https://www.adafruit.com/product/1578>

* Lithium Ion Polymer Battery - 3.7v 500mAh
* $7.95
* 10.5 grams

Power Adapter Option 1

<https://www.adafruit.com/product/3196>

* Pimoroni LiPo SHIM
* $9.95
* Adapter for battery to Pi
* 2.6 grams

<https://www.adafruit.com/product/1904>

* Adafruit Micro-Lipo Charger for LiPo/LiIon Batt w/MicroUSB Jack - v1
* $6.95

Power Adapter Option 2

<https://www.adafruit.com/product/2465>

* PowerBoost 1000 Charger - Rechargeable 5V Lipo USB Boost @ 1A - 1000C
* $19.95
* Adapter + Charger built into one - will let us recharge while powering

Camera

[https://www.amazon.com/Smraza-Raspberry-Megapixels-Adjustable-Fish-Eye/dp/B07L2SY756/ref=sr\_1\_3](https://www.amazon.com/Smraza-Raspberry-Megapixels-Adjustable-Fish-Eye/dp/B07L2SY756/ref=sr_1_3?keywords=raspberry+pi+zero+fisheye+camera&qid=1556665063&s=gateway&sr=8-3)

* Smraza Raspberry Pi Camera Module 5 Megapixels 1080p OV5647 Sensor Adjustable Focus Wide Angle Fish-Eye Camera Lenses Webcam Video for Raspberry Pi 3 B+, 3 B, 2 B, Zero
* $23

<https://thepihut.com/products/zerocam-fisheye-camera-for-raspberry-pi-zero>

* ZeroCam FishEye - Camera for Raspberry Pi Zero
* 15 pounds ($19.56)
* Unsure of weight, but it’s small

Protective Housing (Top)

<https://www.amazon.com/TIMESETL-Stainless-12x8-inch-30x21cm-Ventilation/dp/B077M93J18/ref=sr_1_1?keywords=TIMESETL&qid=1556306114&s=gateway&sr=8-1>

* TIMESETL 3pcs Stainless Steel Woven Wire 20 Mesh - 12"x8"(30x21cm) Metal Mesh Sheet 1mm Hole Great for Air Ventilation - A4
* $11.99

Altitude Measurement:

<https://www.sparkfun.com/products/11084>

* SparkFun Altitude/Pressure Sensor Breakout - MPL3115A2
* $14.95
* Altitude data to within 30cm
* 12-bit temperature measurement in degrees Celsius
* I2C interface - only one sensor can be reside on the I2C bus
  + Therefore we won’t be able to use this with the MPU, which doesn’t matter if we do low-tech counterweight
* 3.3 Volts
* ~40microAmp per measurement-second

# 

# Final Parts List

Microcontroller:

Arduino Nano

<https://store.arduino.cc/usa/arduino-nano>

* $22
* Powered by mini-USB, 6-20V unregulated, 5V regulated
* 19mA power consumption

Arduino Pro Mini

<https://www.arduino.cc/en/Guide/ArduinoProMini>

Plus USB/Serial adapter

* 9.95

<https://www.amazon.com/Micro-Basic-Breakout-Module-Arduino-x/dp/B00N4MCS1A>

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Altitude Transmission from Sensor Pod to Ground Station

<https://www.amazon.com/Makerfire-Arduino-NRF24L01-Wireless-Transceiver/dp/B00O9O868G>

* Makerfire 10pcs Arduino NRF24L01+ 2.4GHz Wireless RF Transceiver Module New
* $11.98
* 11.3 mA @ 0dBm in TX mode, 12.3 mA @ 2000kbps in RX mode
* 1.9V - 3.6V supply voltage

Camera + Transmitter

<https://www.amazon.com/Wolfwhoop-WT05-Transmitter-Antenna-Quadcopter/dp/B06XJMQQ6Y?ref_=fsclp_pl_dp_9>

* Wolfwhoop WT05 Micro AIO 600TVL Camera (includes camera, transmitter, antenna)
* $16.55
* 3.4 grams, 5.8 GHz, 25mW
* Power by 1S lipo battery
  + 3.3V - 5.5V, 280mA consumption

Camera Power (unless we power both camera + arduino with single battery found in lab)

<https://www.amazon.com/Crazepony-230mAh-Battery-Inductrix-Connector/dp/B01N0Z0ME2/ref=pd_bxgy_img_2/184-4881938-1996110>

* Crazepony 4pcs 230mAh HV 1S Lipo Battery 30C 3.8V for Tiny Whoop Blade Inductrix JST-PH 2.0 Connector
* $12.99
* 6.3 grams per battery

Protective Housing (Top)

<https://www.amazon.com/TIMESETL-Stainless-12x8-inch-30x21cm-Ventilation/dp/B077M93J18/ref=sr_1_1?keywords=TIMESETL&qid=1556306114&s=gateway&sr=8-1>

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* $11.99

Protective Housing (Ground Station)

* Tupperware???

Ground Station Controller

<https://www.adafruit.com/category/934?src=raspberrypi>

* $5
* Raspberry pi zero

Ground Station Measurement Trigger

<https://www.amazon.com/microtivity-IM206-6x6x6mm-Tact-Switch/dp/B004RXKWI6/ref=as_li_ss_tl?ie=UTF8&linkCode=sl1&tag=rasphq_electronics-online-20&linkId=6feabfb3076863215e5b0e7d119f20dd>

* microtivity IM206 6x6x6mm Tact Switch (Pack of 12)
* $4.33

Ground Station Monitor

<https://www.amazon.com/dp/B07JBW44ZN/ref=psdc_7161089011_t1_B07G48ZH86>

* Readytosky 4.3" FPV Monitor 48CH 480 x 22 LCD Wireless Receiver Monitor Built-in Battery with Sun Hood LCD Hood Shade for RC FPV Quadcopter
* $40
* FPV 5.8 GHz, estimated 2 hour operating life

<https://andeshofy.com/products/fpv-monitor?variant=16248808112162&utm_medium=cpc&utm_source=google&utm_campaign=Google%20Shopping>

* $12.5
* FPV 5.8 ghz 2.5 - 3 hour battery life
* 800 \* 400 resolution

On-hand: raspberry pi? (zero), dowel, hinge, perm-board, 2-liter bottle, voltage converter, battery? (if not, <https://www.orbtronic.com/batteries-chargers/panasonic-3400mah-18650-li-ion-battery-cell-ncr18650b>)

Displaying Camera Orientation and video output on display

Camera Orientation

* IMU data sent over radio
* LED light indicates when level
  + Simple ++
  + How does operator re-orient easily? --
* Raspberry Pi takes all sensor input at ground station, overlays sensor measurements onto video feed, sends video to display via HDMI
  + Power --
  + More unified UX ++
* Gimbals
  + Snags --
  + Lower tech ++
  + Heavy? +-

Video Display Options

* Monitor from the lab
  + Built-in radio ++
    - Make sure this can receive our exact frequency. And that it works in general and is available
  + Expensive to buy more --
  + Rugged ++
* Smartphone
  + Do people want to bring it? --
  + Need to protect from mud --
  + More different parts? --
  + Processing Power ++
  + Free! ++
  + Install apps on the phone? --
* Tablet
  + Need to protect from mud --
  + More different parts? --
  + Processing Power ++
  + Cost? +-
  + Easier deployment ++