Proto 0.5

Planning:

* Card board!
* We wanted to build something just to get out minds wrapped around the idea.
* Wanted something that would securely hold the battery in place
* Came up with the battery chamber idea & contact charging
* Position Based landing
* Square base

Final –

* Card board prototype!

Proto 1

Planning:

* Use an ARdrone to land and switch batteries
* Use ROS and the downward facing camera on the ardrone to land on a base and change it’s battery
* Using Opencv
* Attach mechanical battery chamber to bottom of ARdrone
* Land on base and have motors push batteries through
* Land according to which leds on the base were lit up

Execution and Problem Solving:

* Learning to use ROS
* Learning OpenCV
* Designed Base Under Carriage
* Designed Base
* Basic Custom Flight code and keyboard controller
* Minimal Automated Flying
* Built and Attached Undercarriage
* Tried and failed to use OpenCV to Land on Base

Final Product:

* Almost landing on the base
* Motors that wouldn’t push the battery though
* Battery Chamber worked when assisted

Proto 1.5

Summary:

Planning:

* Quad Part List
  + ESC, Flight Controller, Battery, Motors, Power Distribution Board
* First Flights using RC
* Mini PC:
  + Beaglebone Black
* Build the copter, fly it with RC control, put Beaglebone on, fly via Wifi with Keyboard controller, Fly via keyboard and imaging, land via imaging.

Execution & Problem Solving:

* Put together copter, not a huge problem
* Learned about Multiwii
* \*Wouldn’t accelerate properly, learned about plane vs copter
* Bad motor
* Started working on computer controlled system
* Communication via ZMQ
* Limited Video Transfer and processing
* Controll flight controller via Arduino
* PPM and PWM waves
  + 1-2ms every 20ms
* Burned out pin
* Don’t put propellers on until fully tested
* Reworked Copter’s power system
* Second Flight controller (Marshal’s)
  + Outdated Firmware
* Third flight controller (KK 2.1)
* Tweaking everything and got it to fly
* Controlling via Arduino
* Controlling via Arduino and Beaglebone
  + Usb Hub
  + Beaboard for power
  + TX/RX 3.3 to 5V
* Using 555 timer
* Using raspberry pi and Arduino (No flight board)
* Using raspberry pi, Arduino, and Flight board
* Rebuilding keyboard controller
* Basic Flight (Broken Propeller)
* PS3 controlled flight
* Halved throttle
* More stabilization for controller

Final Product:

* Copter that is able to fly around
* Show video

Proto 2 – Parallel to Proto 1.5

Planning:

* Build and base and copter completely from scratch
* 3D print Copter that would be able to carry our battery chamber
* Build base that would spin according to available battery

Execution and Problem Solving:

* Talk to Alan

Final Product:

* Copter was impressive
* Struts and body were not held together very well
* Overall Pretty heavy
* Base was spinning
* Base is pretty big
* Used pulley system instead of gears
* Moving on it’s own?
* Battery exchange system didn’t work very well
* Batteries didn’t fit due to wires.