



Bearospace at UCLA
(LoL) Leveling on Land
2020-2021 USLI PDR

Launch Vehicle

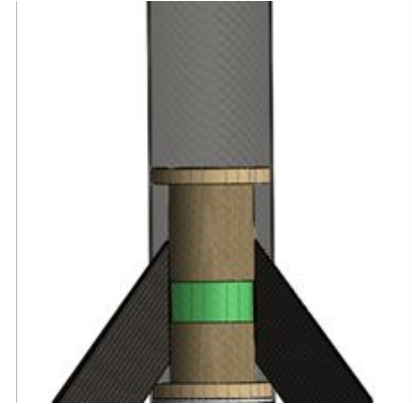
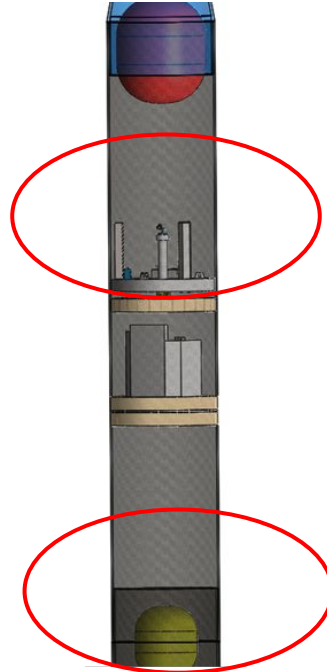


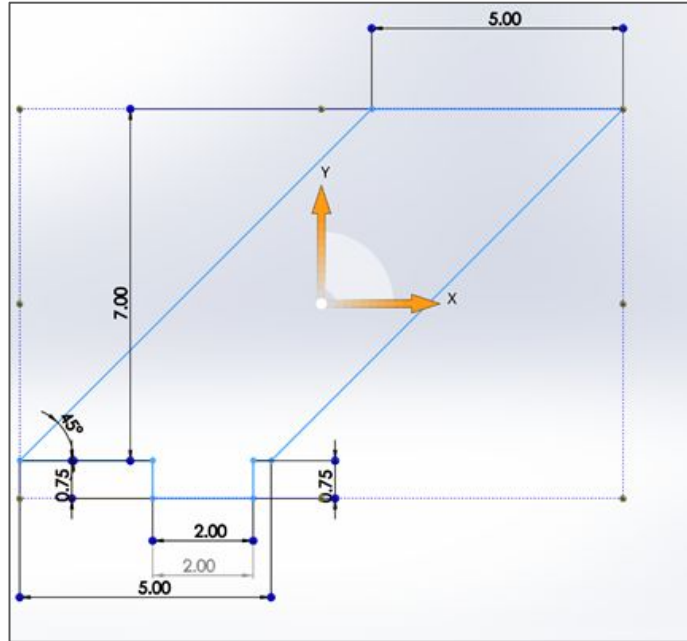


Launch Vehicle Overview

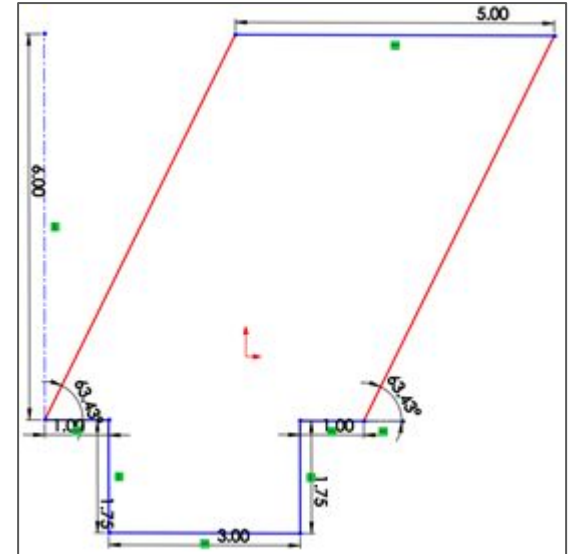
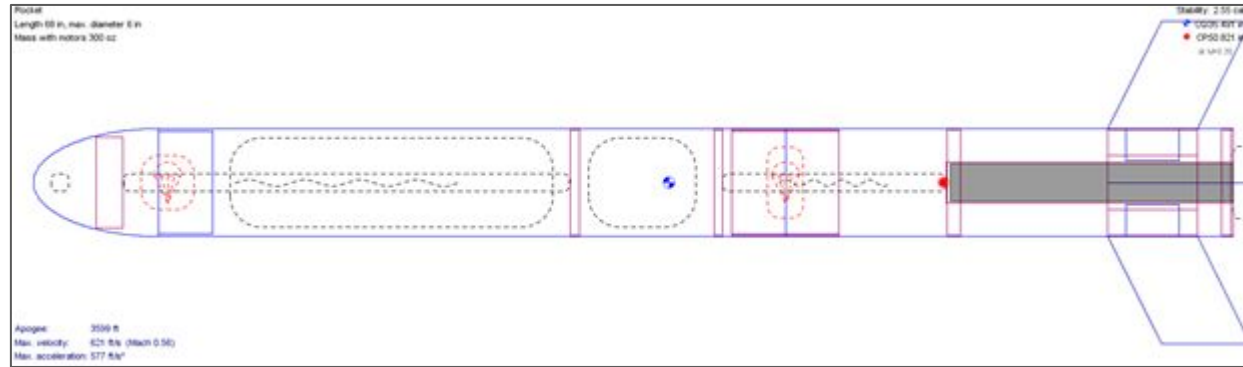


Components

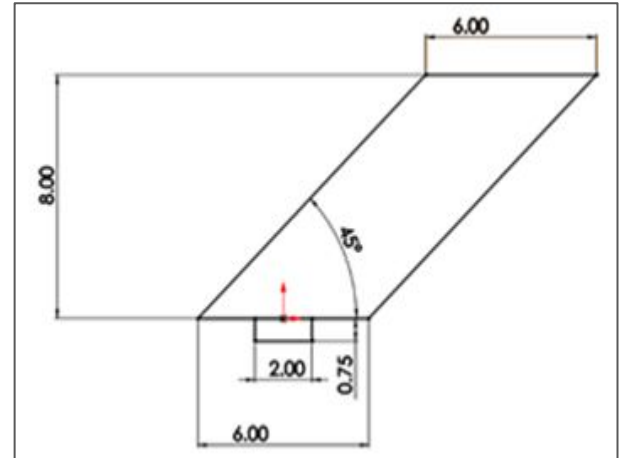
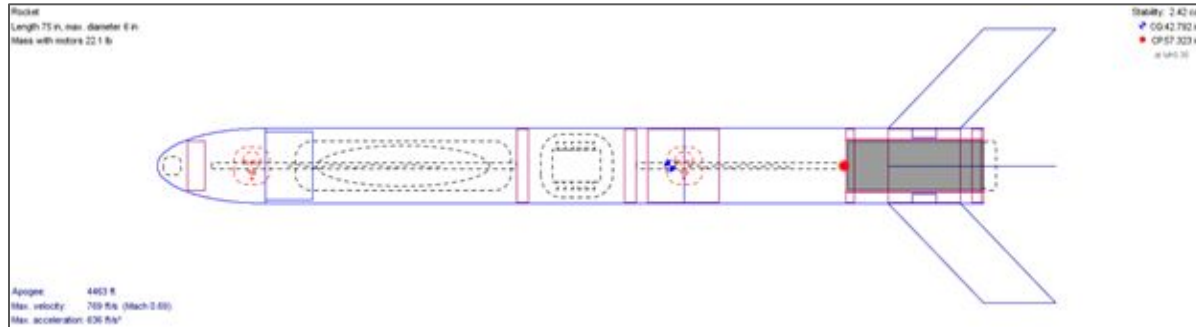




Alternative Design 2

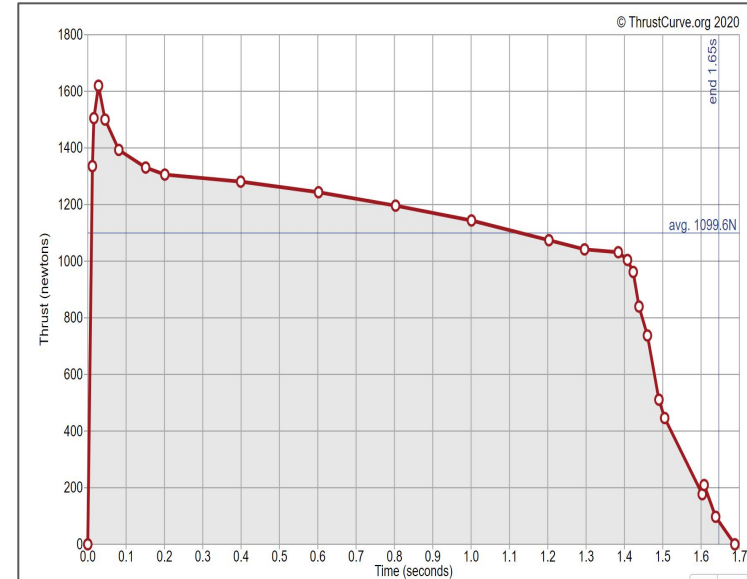


Alternative Design 3



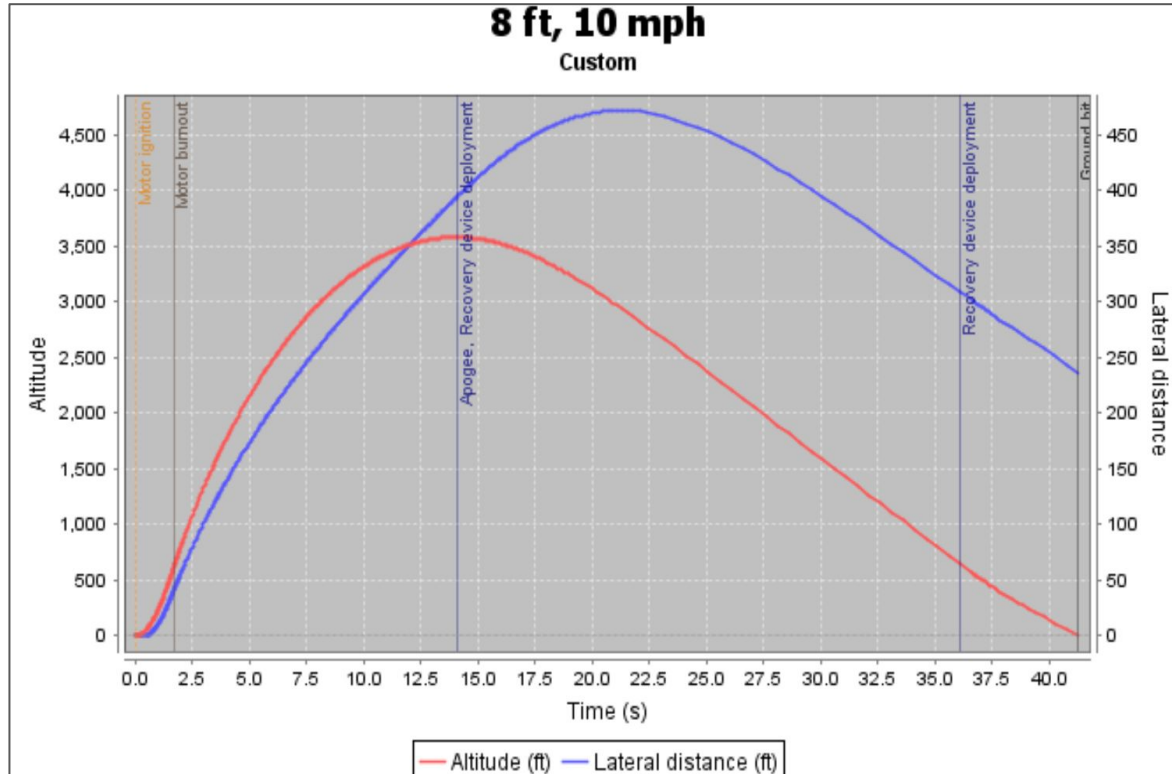
Motor Selection: AeroTech K1103X-14

Motor Diameter	2.13in	Motor Length	15.8in
Average Thrust	1099 N	Max Thrust	1620 N
Burn Time	1.65s	Total Motor Mass	3.2 lbs.
Total Impulse	1810Ns	Propellant Mass	1.8 lbs.
Thrust to Weight	13.17	Post-burn Mass	1.4 lbs.





Mission Predictions/Flight Simulation



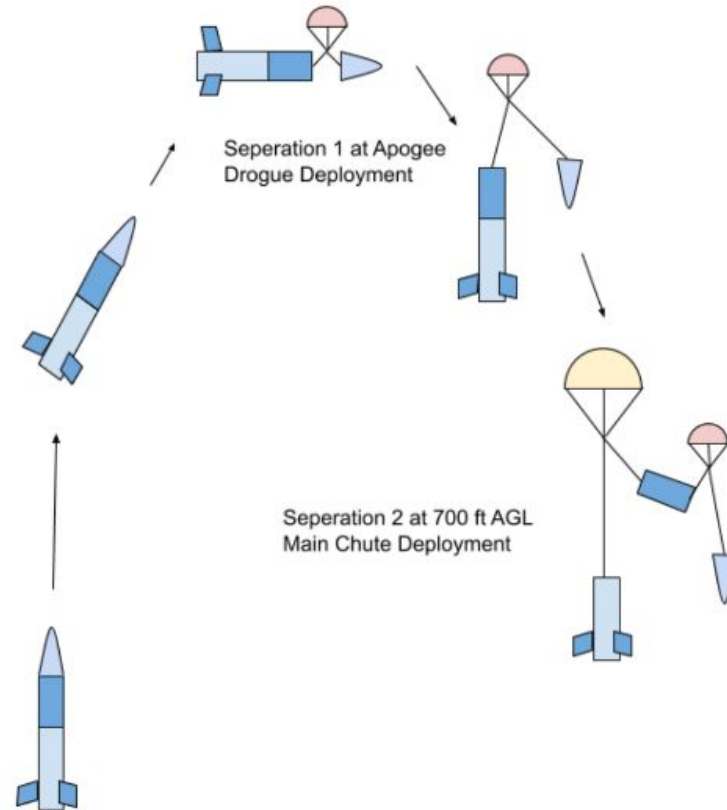
- Target Apogee: 3600 ft
- Stability: 2.55 cal
- Thrust to Weight Ratio: 13.17
- Drift from Apogee: 536 ft
- Rail Exit Velocity: 93.6 ft/s

Recovery Subsystem

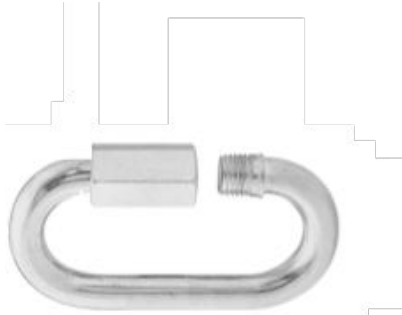




Recovery Subsystem Overview



Recovery Hardware



Capacity: 1400 lbs

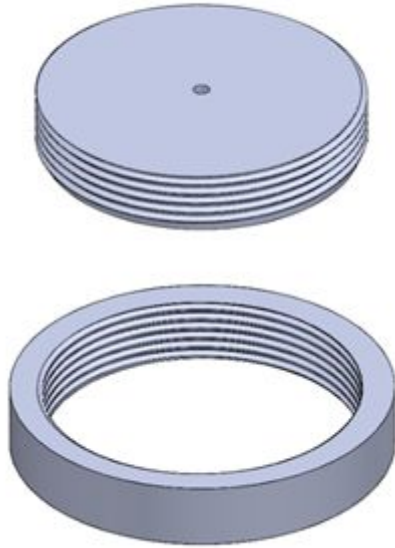


Capacity: 600 lbs



Resin Type:	Viscosity (cpl)	Density (g/cm3) (20 °C)	Gelling time (min.)	Elongation at break (%)	Hardness (Barkol)
Epoxy	156	1.2	110-130	1.0	66

Locking Mechanism





Locking Mechanism Cont.

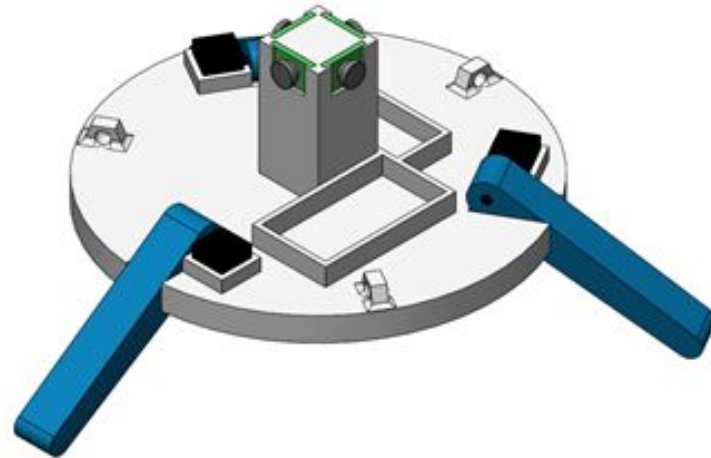
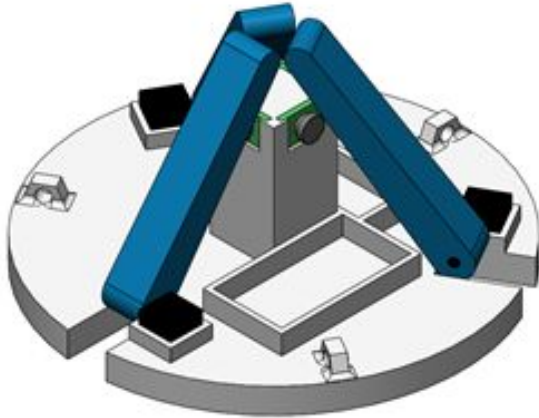


Payload Designs



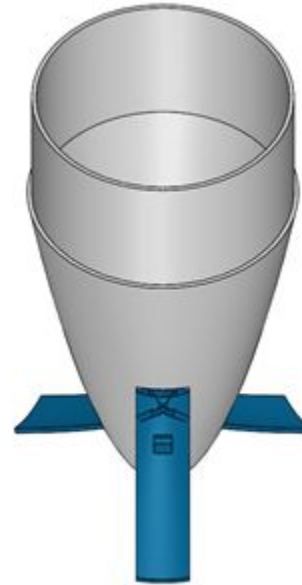
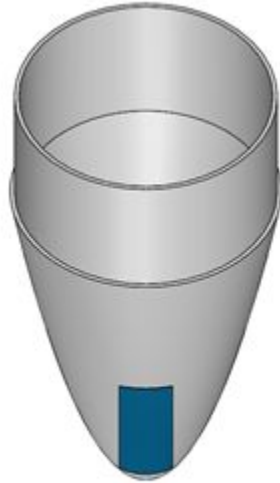


Payload Alternative 1



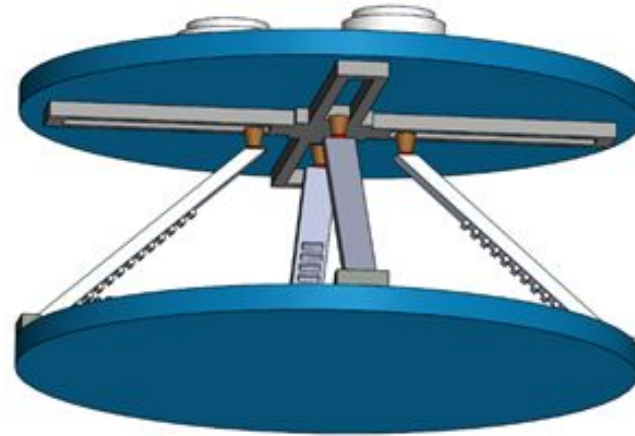
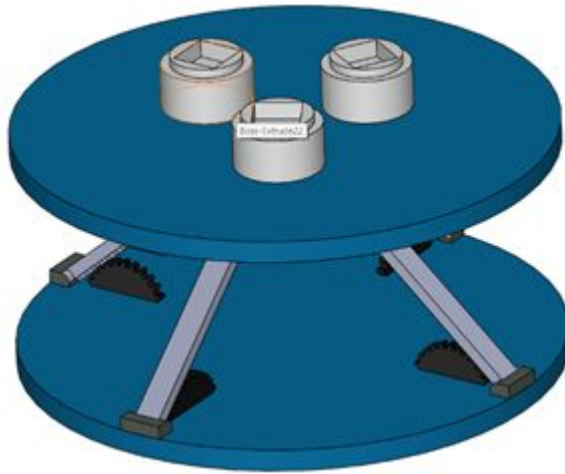


Payload Alternative 2



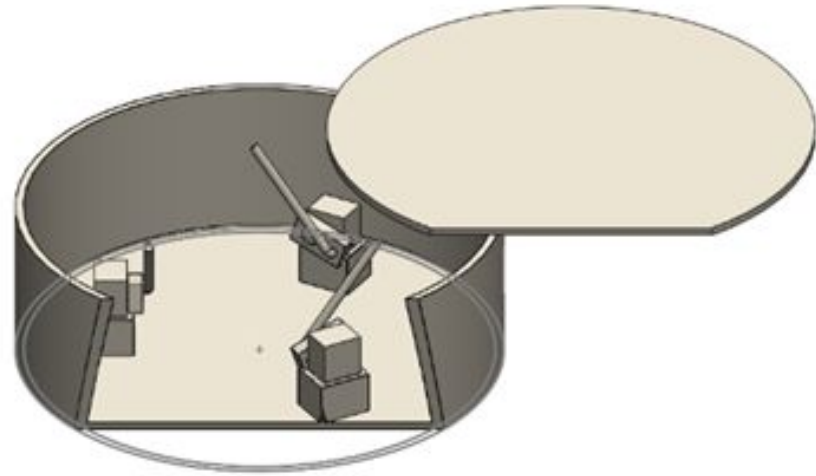
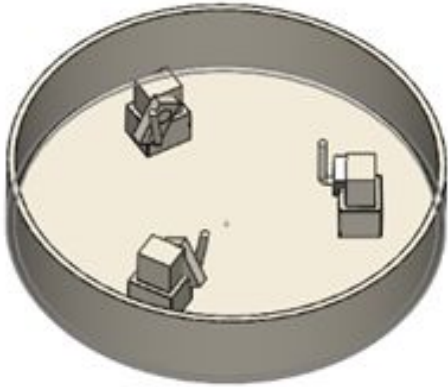


Payload Alternative 3





Leading Design Choice



Deployment Mechanism



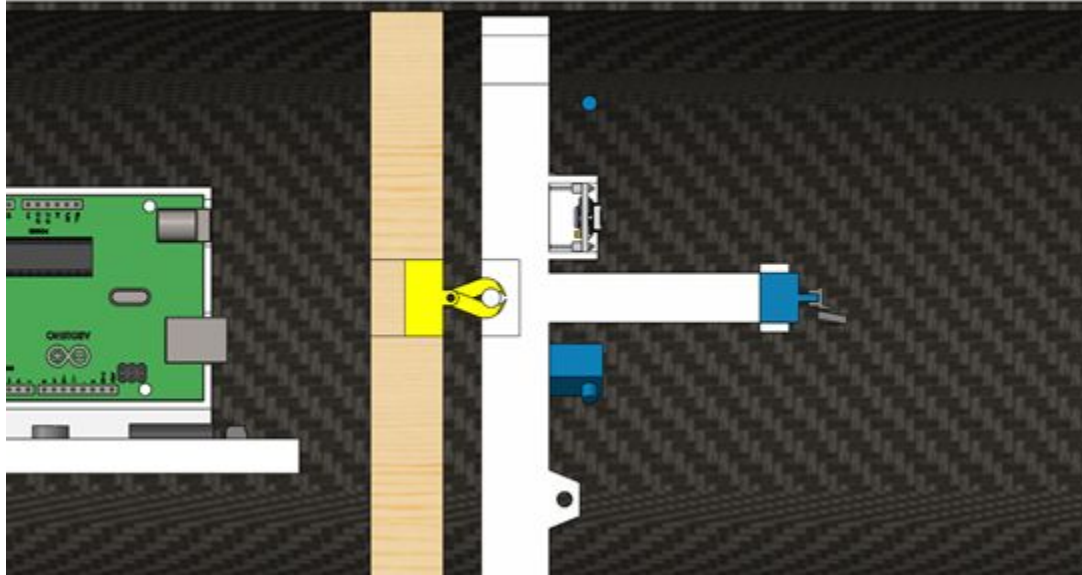


Deployment Mechanism Alternative 1





Deployment Mechanism 2





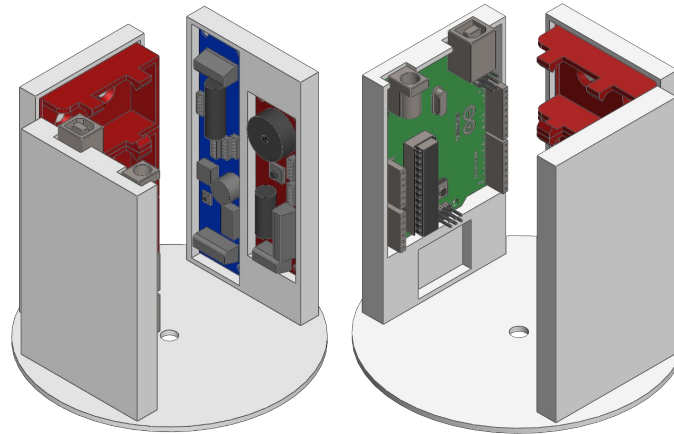
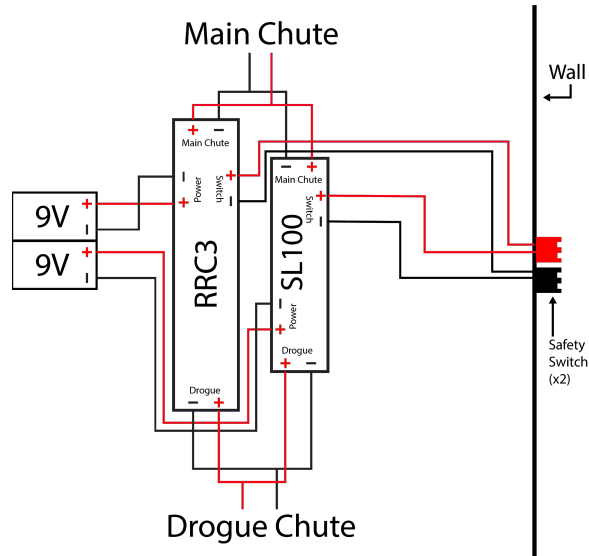
Leading Design Choice



Electronics Overview



Electronics - Avionics



Altimeters

- Stratologger SL100 Altimeter
- RRC3 Sports Altimeter

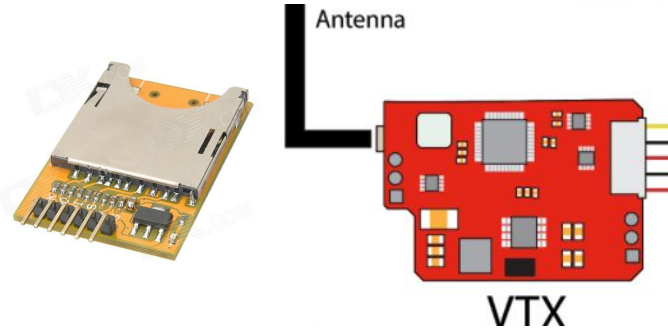
Ejection Peripherals

- Arduino Uno
- BMP180

Power

- 3x 9V Battery

Electronics - Payload



- Furious FPV Camera
- SD Card Reader
- 11.1 V LiPo Battery
- 2.4 GHz Video Transmitter
- 120 and 360 degree servo motors
- Gyroscope Accelerometer

Questions?

