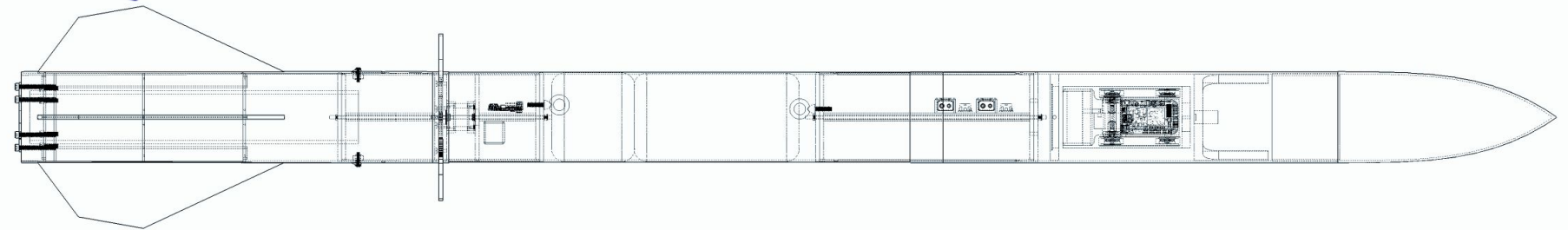
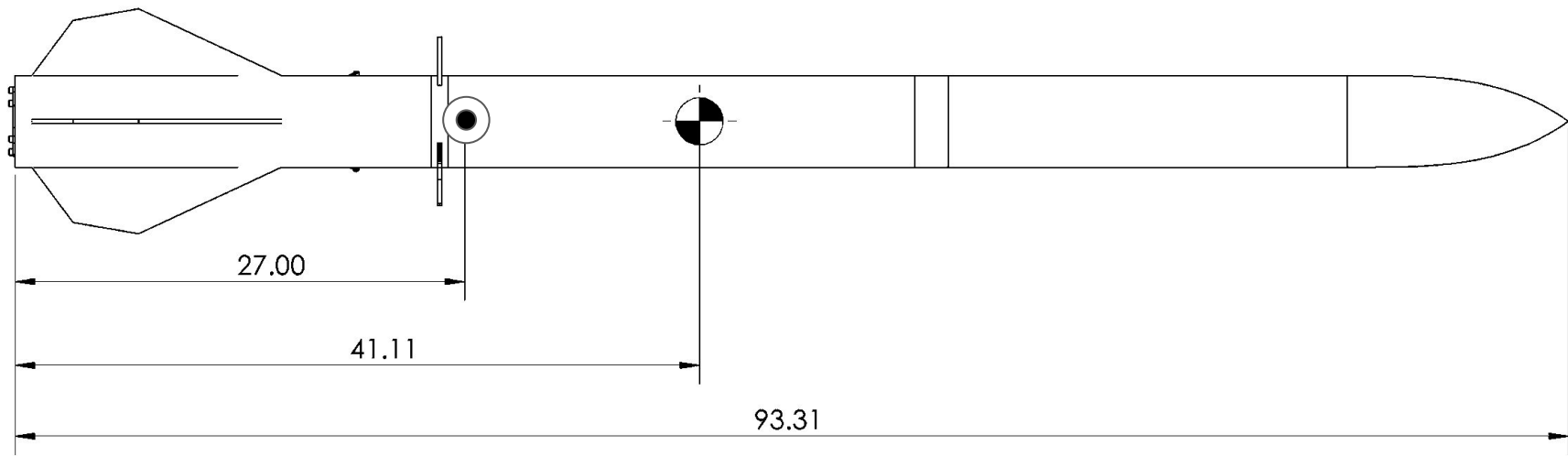




**NASA Student Launch 2018-2019**  
**Preliminary Design Review (PDR)**  
**Presentation**

# AEOLIS





Length (feet)	Diameter (inches)		Mass (lbs)	Motor Selection	Recovery System		Predicted Altitude (feet)	Vehicle Material	CG	CP
	<i>Outer</i>	<i>Inner</i>			<i>Drogue (in)</i>	<i>Main (in)</i>				
7.75	5.52	5.36	14.38	AeroTech K560W	15	58	5280	Carbon Fiber	40	27

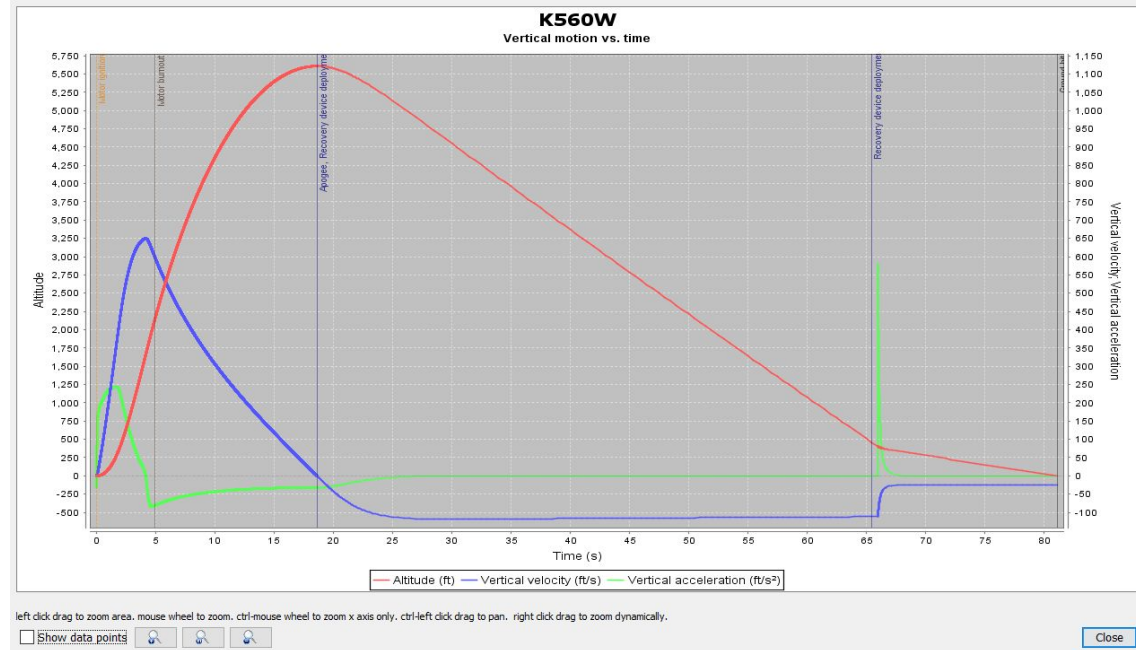
*Static Stability Margin: 2.35*

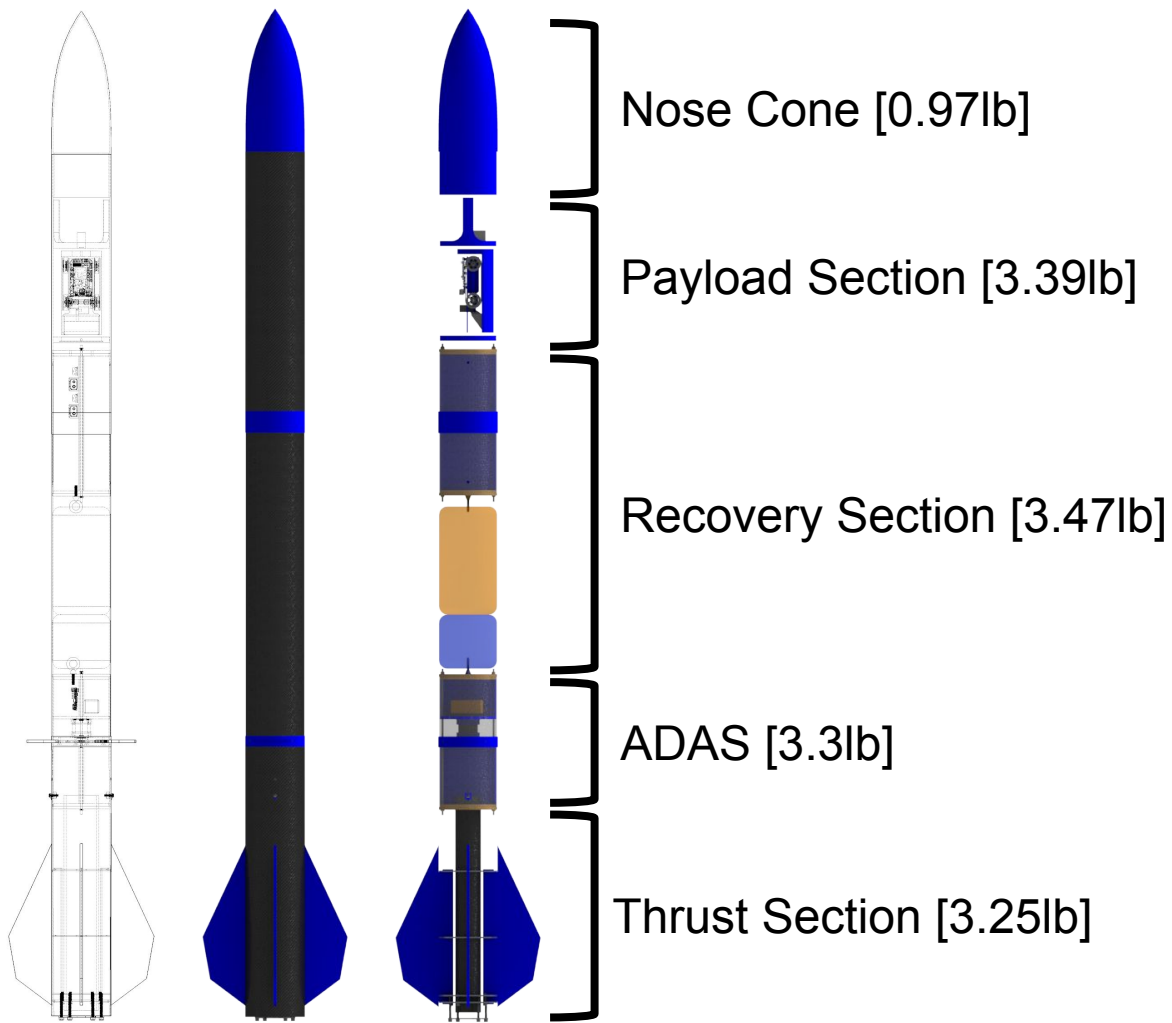
# Motor Selection and Justification

**Motor:** AeroTech K560W

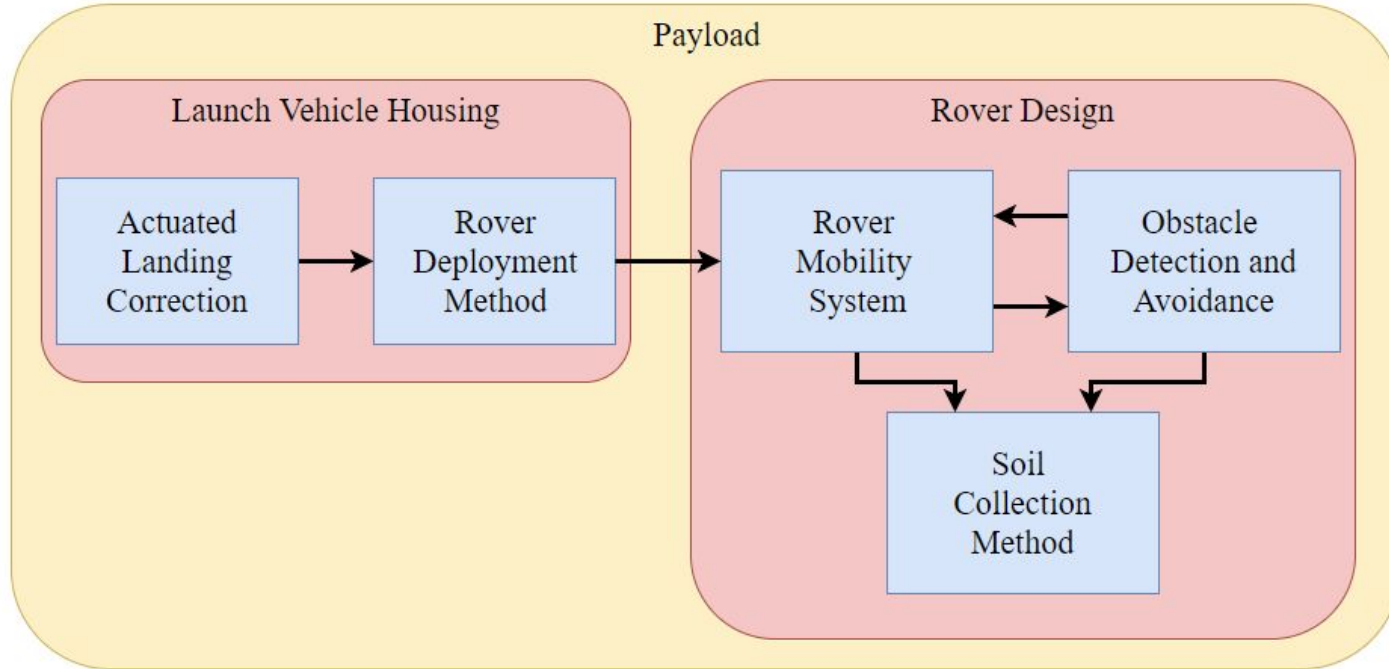
**Thrust to Weight Ratio:** 7.7

**Exit Rail velocity:** 56 ft/s

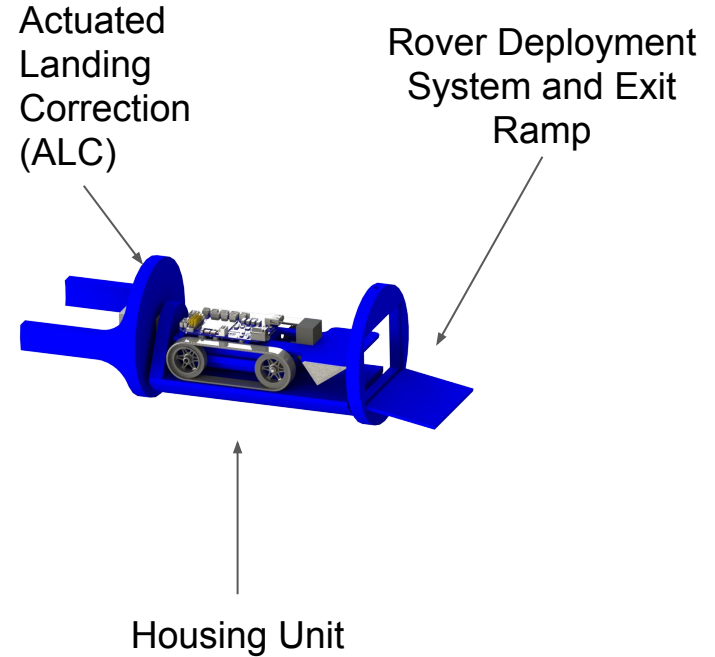
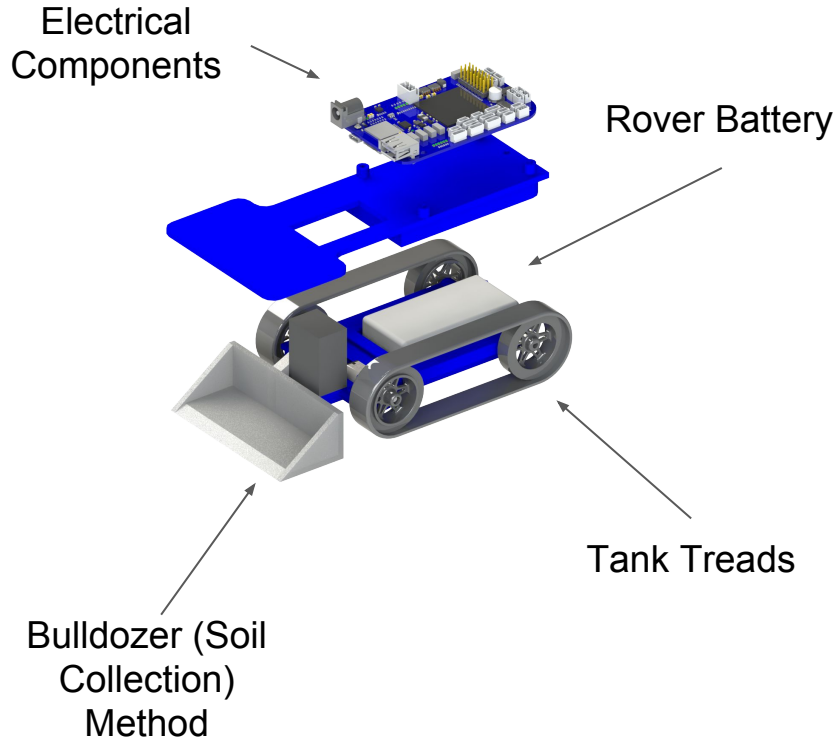




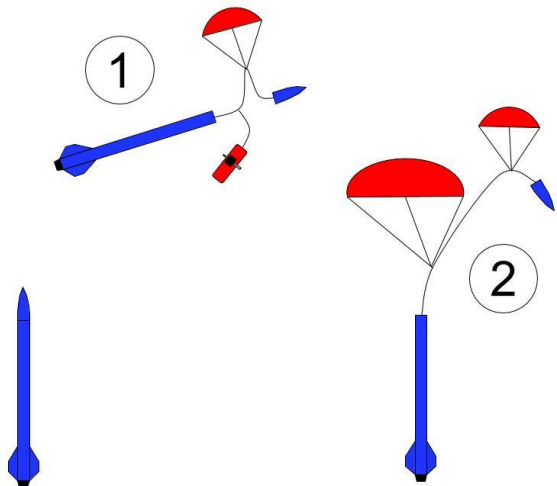
# High-Level Payload Flowchart



# Preliminary Payload Design



# Recovery/Mission Performance Predictions



- Dual deployment design
- Satisfies drift, and landing energy requirements

## 58in Main Parachute, 15in Drogue Parachute

	0 MPH	5 MPH	10 MPH	15 MPH	20 MPH
Main Parachute (58in)	8.2 ft	164 ft	387 ft	1150 ft	2400 ft
Drogue Parachute (15in)					

Table 3.2: Drift values from OpenRocket

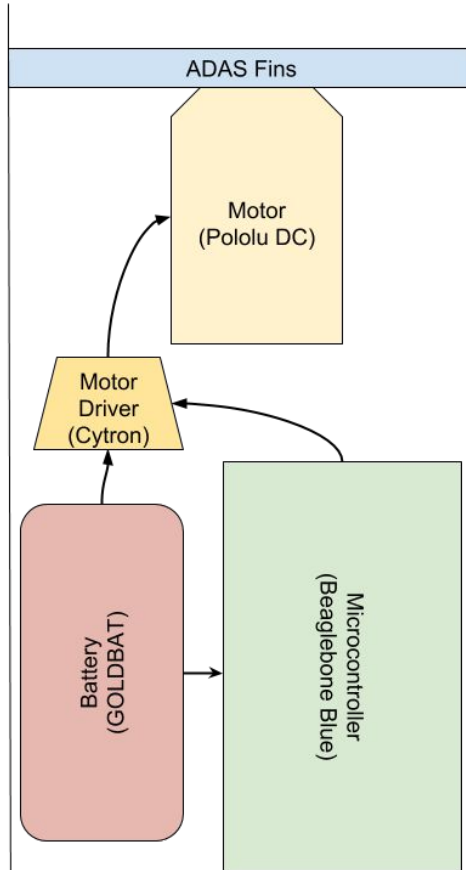
Table 3.3 details the drift using the flight time provided by OpenRocket.

	0 MPH	5 MPH	10 MPH	15 MPH	20 MPH
Main Parachute (58in)	0 ft	246 ft	658 ft	1523 ft	2345 ft
Drogue Parachute (15in)					

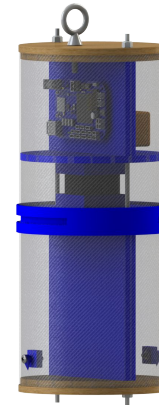
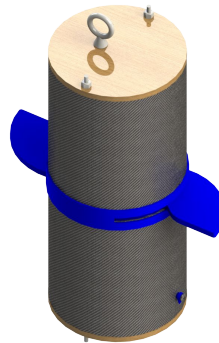
Table 3.3: Drift using flight times from OpenRocket



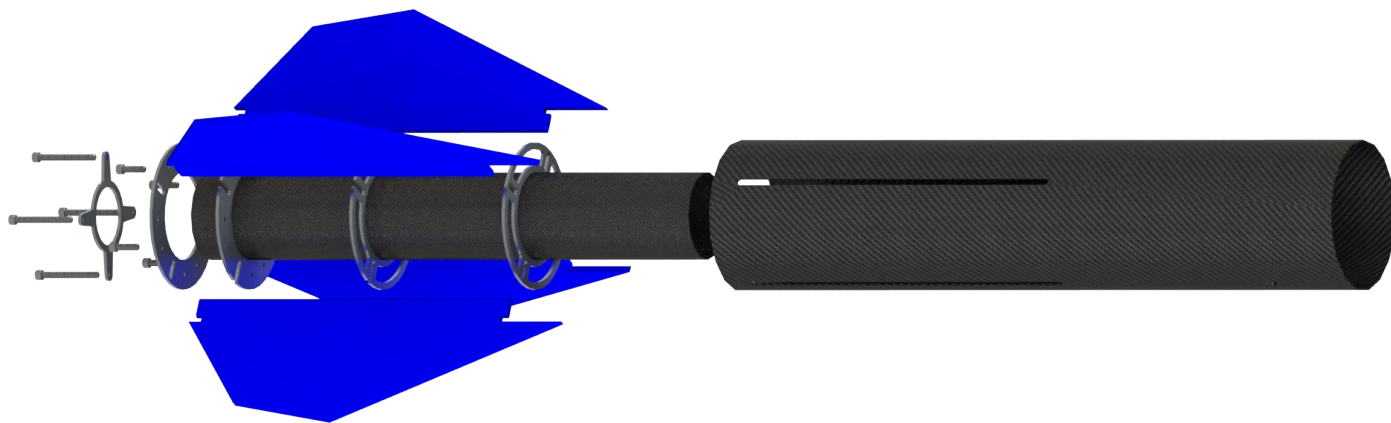
# ADaptive Aerobraking System (ADAS)



- Fully deployed dual, semi-circular fins
- Increases cross sectional area by 25%, thus increasing drag and decreasing speed
- Allows the rocket to reach the desired altitude by doing real-time calculations



# Thrust Section



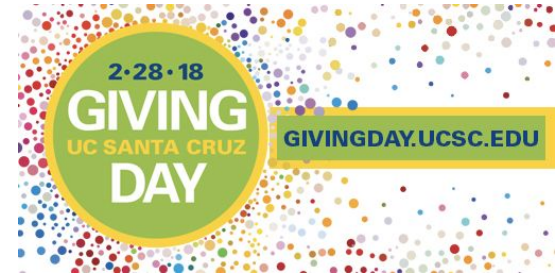
# Requirements Compliance Plan

- Strictly adhere to verification plans
- Conduct extensive tests during development and before deployment as outlined in Section 6 of the PDR
- Demonstrate adherence to NASA handbook requirements, including the High Power Rocket Safety Code
- Abide by safety manual and ensure that all members complete safety training and adhere to best practices



# Budget and Funding

- UCSC's Giving Day event
- GoFundMe
- Combined, raised over \$5,000
- Refer to section 6.2 for details about budget
  - Estimated cost of rocket: \$933
  - Estimated total cost, including transportation: \$5333.70
- Financial outreach program
  - Establish sponsorships with companies
  - Capital grants, material discounts
  - Partner with local and non-local businesses



# Outreach

To support our continuing mission to promote diverse STEM education, the team hosts various outreach events for students of all ages, at the University and in the local community. Events usually include launching paper rockets and other hands-on activities. Topics discussed include the history, science, and significance of rocketry, past and future NASA missions, and of mentor local robotics and rocketry teams, lending a generation of scientists and engineers. The team also promotes diversity and gender representation to STEM through that this will create a brighter future.

