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# Maharishi School SLI PDR Presentation

— Team No Way But Up —

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# Overview

- Team Member Introduction
- Vehicle Dimensions, Materials, and Justifications
- Motor Selection and Justification
- Stability
- Thrust-to-Weight-Ratio and Rail Exit Velocity
- Subsystems
  - Recovery
  - GPS
  - Full-Scale
- Payload
- Requirement Compliance Plan

# Our Team

Karthik - Safety Officer / Vehicle Design

Frank - Student Team Leader / Vehicle Design

Daniel - Payload

Kai - Payload

Luciana - Educational outreach

Yenet - Educational Outreach

Deepika - Website Content Manager

Shristi - Project and Budget Manager



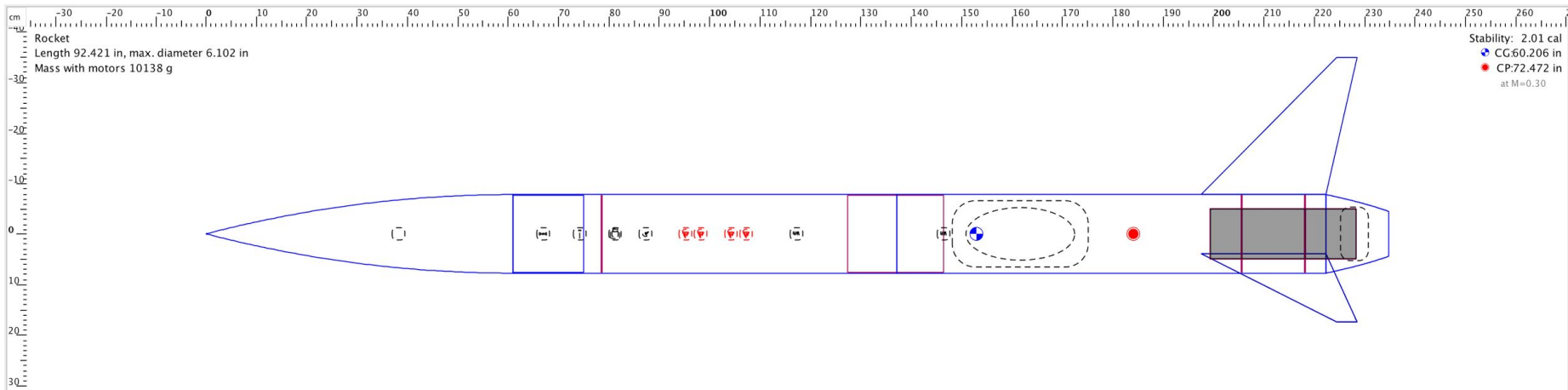
# Vehicle Dimensions, Materials Justifications

Component	Material	Qty	Weight (grams)	Total Weight (grams)	Length (inches)	Width (inches)	Thickness (inches)
<b>Vehicle</b>							
<b>Nosecone</b>	Fiberglass	1	794	794	24	6.1	0.125
<b>Upper Body Tube</b>	Fiberglass	1	1355	1355	30	6.1	0.079
<b>Lower Body Tube</b>	Fiberglass	1	1513	1513	33.5	6.1	0.079
Fins	Fiberglass	3	548	548	n/a	10.63	0.118
Motor Retention	Aluminum	1	45	45	1	4.1	n/a
<b>Propulsion</b>							
Aerotech K680 Motor	APCP, plastic	1	n/a	n/a	11.3	3.86	n/a

# Motor Selection and Justification

To select a motor we needed to have all of the details of components for the rocket. The total final weight from our table was 10139 grams, or 22.35 pounds (this varied as we loaded different motors). This corresponded closely with the weight of the individual components entered into OpenRocket using their data base. We selected several different motors made by Aerotech, since Aerotech has a reputation for being consistent and reliable. Our target altitude was just above 1 mile. From the simulations, the K680 single use motor carried our rocket to 5,283 feet – just more of the needed 5,280 feet (better to err on the high side of 1 mile) with a burn time of 3.5 seconds.

# Stability



# Thrust-to-Weight-Ratio and Exit Rail Velocity

Refer to Milestone Review Flysheet

# Subsystems

## Recovery:

The vehicle will use redundant dual deployment for recovery and one more ejection for payload.

## GPS:

GPS and Downlink Transmitter for the vehicle will be a Beeline GPS from Big Red Bee

## Full Scale:

Our full scale model will be 92 inches tall and have a 98mm motor mount. We will use an Aerotech K680 single use to propel the rocket up to approximately 5280 ft. we will deploy a drogue at apogee, and our main parachute at 750 ft.



# Payload

The payload will be an engineering project, called a Sky Crane, that will assist in the landing of our rocket within a specified amount of time, similar to the Team America Rocketry Challenge duration time requirement. This engineering payload will function through the unravelling of a shock cord through the use of a motor/winch when the arduino board and altimeter work together to determine that the rocket is either too high and/or descending too slowly. Through the unravelling of this shock cord, the lower portion of our rocket will reach the ground faster, and achieve our set time goal.

# Verification Requirements

We have made a verification plan for requirements 1-5 in the handbook.

Refer to PDR Project Plan Requirements Verification section