

Milestone Review Flysheet

Institution Spring Grove Area High School - Team Tesla

Milestone CDR

Vehicle Properties	
Total Length (in)	85.25
Diameter (in)	4
Gross Lift Off Weigh (lb)	17.05
Airframe Material	Fiberglass
Fin Material	Ulteem 3D Filment
Drag	1.1

Motor Properties	
Motor Manufacturer	Cesaroni
Motor Designation	K570
Max/Average Thrust (lb)	201/143
Total Impulse (lbf-s)	2062.3
Mass Before/After Burn	3.715 lb. / 1.532 lb.
Liftoff Thrust (lb)	155.19

Stability Analysis	
Center of Pressure (in from nose)	55.48
Center of Gravity (in from nose)	43.89
Static Stability Margin	2.9
Static Stability Margin (off launch rail)	3.5
Thrust-to-Weight Ratio	11.8
Rail Size and Length (in)	1.0/96
Rail Exit Velocity	72.6

Ascent Analysis	
Maximum Velocity (ft/s)	736.86
Maximum Mach Number	0.654
Maximum Acceleration (ft/s^2)	645.49
Target Apogee (From Simulations)	6525 less 20% for payload
Stable Velocity (ft/s)	44
Distance to Stable Velocity (ft)	3.1

Recovery System Properties				
Drogue Parachute				
Manufacturer/Model	FRUITYCHUTES/IFC			
Size	24 in			
Altitude at Deployment (ft)	6524			
Velocity at Deployment (ft/s)	6.41			
Terminal Velocity (ft/s)	72.4			
Recovery Harness Material	Tubular Nylon			
Harness Size/Thickness (in)	1			
Recovery Harness Length (ft)	15			
Harness/Airframe Interfaces	The harness is going to attached to key structural components via quick links to safely secure the harness to the rocket.			
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	235.9	314.5	681.4	N/A

Recovery System Properties				
Main Parachute				
Manufacturer/Model	FRUITYCHUTES/IA			
Size	72 in			
Altitude at Deployment (ft)	600			
Velocity at Deployment (ft/s)	72.4			
Terminal Velocity (ft/s)	20.1			
Recovery Harness Material	Tubular Nylon			
Harness Size/Thickness (in)	1			
Recovery Harness Length (ft)	25			
Harness/Airframe Interfaces	The harness is going to attached to key structural components via quick links to safely secure the harness to the rocket.			
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	18.2	24.2	52.5	N/A

Recovery Electronics	
Altimeter(s)/Timer(s) (Make/Model)	Perfectflite CF Altimeters
Redundancy Plan	The e-bay will have 2 altimeters. Each of the altimeters will have 2 charges located on either side of the e-bay, one for the drogue and the other for the main parachute. Two altimeters will give it a redundant system.
Pad Stay Time (Launch	Each altimeter will have a battery

Recovery Electronics	
Rocket Locators (Make/Model)	Communications Specialists, Inc. R-300 R/C ELT Receiver
Transmitting Frequencies	222.470 Hz
Black Powder Mass Drogue Chute (grams)	3.5
Black Powder Mass Main	2.5

Configuration)

life of 4 hours.

Chute (grams)

3.3

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Autonomous Ground Support Equipment (MAV Teams Only)

Capture Mechanism	Overview
	N/A
Container Mechanism	Overview
	N/A
Launch Rail Mechanism	Overview
	N/A
Igniter Installation Mechanism	Overview
	N/A

Payload

Payload 1	Overview
	The payload of our rocket is designed to test the rate of air intake through a turbine and it's ability to generate current on ascent.
Payload 2	Overview
	N/A

Test Plans, Status, and Results

Ejection Charge Tests	Each of our ejection charges contains 3.5g of black powder. These charges are designed to eject both our main and drogue parachutes through the seperation of the launch vehicle. These ejections are triggered by the altimeters.
Sub-scale Test Flights	Told by David to wait for Gavin. Still waiting...
Full-scale Test Flights	Full-scale flight is scheduled for the weekend of January 16-17, 2016.

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Additional Comments

Section 1 refers to nosecone and payload.
Section 2 refers to front body tube and e-bay.
Section 3 refers to back body tube, fins, and motor casing.

