

Milestone Review Flysheet

Please see Milestone Review Flysheet Instructions.

Institution	Spring Grove Area High School
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Milestone	Preliminary Design Review
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Vehicle Properties	
Total Length (in)	105.18 in
Diameter (in)	4.00 in
Gross Lift Off Weight (lb)	24.78 lbs
Airframe Material	Fiberglass
Fin Material	Polystyrene
Drag	90.67 N

Motor Properties	
Motor Manufacturer(s)	Cesaroni
Motor Designation(s)	K510
Max/Average Thrust (lb)	115.47 lbs
Total Impulse (lbf-sec)	1670.53
Mass (before, after burn)	390 oz, 348 oz
Liftoff Thrust (lb)	667.24 lbs

Stability Analysis	
Center of Pressure (in from nose)	82.96 in
Center of Gravity (in from nose)	53.71 in
Static Stability Margin	7.31
Thrust-to-Weight Ratio	4.65
Rail Size (in)/ Length (in)	1515 / 96 in
Rail Exit Velocity (ft/s)	50.92 ft/s

Ascent Analysis		
Maximum Velocity (ft/s)	625 ft/s	
Maximum Mach Number	0	
Maximum Acceleration (ft/s ²)	646.01 ft/s ²	
Target Apogee (1st Stage if Multiple Stages)	5280 ft	
Stable Velocity (ft/s)	43.98 ft/s	
Distance to Stable Velocity (ft)	5.12 ft	

Recovery System Properties				
Drogue Parachute				
Manufacturer/Model	Elliptical			
Size	30 in			
Altitude at Deployment (ft)	Apogee			
Velocity at Deployment (ft/s)	0.03 ft/s			
Terminal Velocity (ft/s)	84.02 ft/s			
Recovery Harness Material	Tubular Nylon			
Harness Size/Thickness (in)	1.00 in			
Recovery Harness Length (ft)	50.00 ft			
Harness/Airframe Interfaces	Forged steel eye bolt on the front of the motor casing, and U- Bolts on the E-bay and nosecone. Chute held on with tubular nylon and quick links.			
Kinetic Energy of Each Section (ft-lbs)	Section 1	Section 2	Section 3	Section 4
	17.06	9.39		

Recovery System Properties				
Main Parachute				
Manufacturer/Model	Iris Ultra			
Size	72 in			
Altitude at Deployment (ft)	600 ft			
Velocity at Deployment (ft/s)	80.4 ft/s			
Terminal Velocity (ft/s)	17.5 ft/s			
Recovery Harness Material	Tubular Nylon			
Harness Size/Thickness (in)	1.00 in			
Recovery Harness Length (ft)	50.00 ft			
Harness/Airframe Interfaces	Forged steel eye bolt on the front of the motor casing, and U- Bolts on the E-bay and nosecone. Chute held on with tubular nylon and quick links.			
Kinetic Energy of Each Section (ft-lbs)	Section 1	Section 2	Section 3	Section 4
	11.94	9.39	5.12	

Recovery Electronics	
Altimeter(s)/Timer(s) (Make/Model)	PerfectFlite Stratologger Altimeter CF
Redundancy Plan	We will have a pair of altimeters, a pair of transmitters, and two ejection charges for each parachute.

Recovery Electronics	
Rocket Locators (Make/Model)	PR-100 Receiver AT-2B Transmitters
Transmitting Frequencies	***Required by CDR***
	2.50 g

Pad Stay Time (Launch Configuration)	3 hours
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Black Powder Mass Drogue Chute (grams)	
Black Powder Mass Main Chute (grams)	3.00 g

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Autonomous Ground Support Equipment (AGSE)

Capture Mechanism	Overview
	n/a
Container Mechanism	Overview
	n/a
Launch Rail Mechanism	Overview
	n/a
Igniter Installation Mechanism	Overview
	n/a
CG Location of Launch Pad (in inches) When Rail is Horizontal (Use Base of Rail as the Reference Point)	
n/a	
Moment Analysis	n/a

Payload

Payload 1	Overview
	We are testing the effects that a rocket launch will have on a colloid solution. We will see if this solution acts as a solid, or a liquid under the extreme pressures acting on it from the launch.
Payload 2	Overview
	n/a

Test Plans, Status, and Results

Ejection Charge Tests	Not yet performed
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Sub-scale Test Flights	Not yet performed
Full-scale Test Flights	Not yet performed

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Additional Comments							
	Section 1	Section 2	Section	Main	Front Half	Main	Back Front
3 Half	n/a						
Half	Back Half	Nosecone and Payload					