Milestone Review Flysheet

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Milestone	CDR

Vehicle Properties	
Total Length (in)	104
Diameter (in)	4.02
Gross Lift Off Weigh (lb)	13.176
Airframe Material	Phenolic
Fin Material	G-10 Fiberglass
Drag	Polished Surfaces

Motor Properties	
Motor Manufacturer	Aerotech
Motor Designation	K1103X
Max/Average Thrust (lb)	233.69
Total Impulse (lbf-s)	396.34
Mass Before/After Burn (oz)	51.5/22.2
Liftoff Thrust (lb)	233.69

Stability Analysis	
Center of Pressure (in from nose)	72
Center of Gravity (in from nose)	36
Static Stability Margin	9.13
Static Stability Margin (off launch rail)	6.1
Thrust-to-Weight Ratio	15.74
Rail Size and Length (in)	39.37
Rail Exit Velocity	63.5 ft/s

Ascent Analysis		
Maximum Veloxity (ft/s)	753	
Maximum Mach Number	0.669	
Maximum Acceleration (ft/s^2)	677	
Target Apogee (From Simulations)	5400	
Stable Velocity (ft/s)	750	
Distance to Stable Velocity (ft)	590	

Recovery System Properties				
Dogue Parachute				
Manufacturer/Model		SkyAngle Cert-3 Drogue		
Size		6.3 sq. ft		
Altitude at Deployment (ft)			5434	
Velocity at Deployment (ft/s)			0	
Terminal Velocity (ft/s)			50	
Recovery Harness Material			Kevlar	
Harness Size/Thickness (in)			5\8	
Recovery Harness Length (ft)			20.8	
Harness/Airframe Interfaces		Swivel Joint, 1500 lbf max; 1.5 in eyebolt fixed to foreward motor centering ring and rear payload section bulkhead		
Kinetic				
	Section 1	Section 2	Section 3	Section 4

Recovery System Properties				
Main Parachute				
Manufacturer/Model		SkyAngle Classic-II 52		
Size		29.5 sq. ft		
Altitude at Deployment (ft)			800	
Velocity at Deployment (ft/s)			50	
Terminal Velocity (ft/s)			14.5	
Recovery Harness Material			Kevlar	
Harness Size/Thickness (in)			5\8	
Recovery Harness Length (ft)			20.8	
Harness/Airframe Interfaces		Swivel Joint, 1500 lbf max; 1.5 in eyebolt fixed to foreward motor centering ring and rear payload section bulkhead		
Kinetic				
	Section 1	Section 2	Section 3	Section 4

44.94	495.83	304.16	N/A

3.78	52.2	29.4	N/A

Recovery Electonics	
Altimeter(s)/Timer(s) (Make/Model)	Perfectflite Stratologger SL100
Redundancy Plan	Featherweight Raven3
Pad Stay Time (Launch Configuration)	1 hour

Recovery Electonics	
Rocket Locators (Make/Model)	GPS Radio Link
Transmitting Frequencies	***Required by CDR***
Black Powder Mass Drogue Chute (grams)	2.1
Black Powder Mass Main Chute (grams)	1.7

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Autonomous Ground Support Equipment (MAV Teams Only)	
Capture Mechanism	Overview
Container Mechanism	Overview
Launch Rail Mechanism	Overview
	Include Description of rail locking mechanism
Igniter Installation Mechanism	Overview

Payload	
Payload 1	Overview
	Analysis of structural protuberances by altering the deployment angle of 3D printed drag flaps and examine the differneces in pressure created. After motor burn out, the rocket's altitude and velocity are plotted against an idealized curve. Drap flap angle is adjusted in order to match the curve and reach the target altitude. Pressure readings are taken inside the drag-flap area are out side of it in order to observe pressure variation.
Payload 2	Overview
	Atmospheric measurements with a sensors array and a camera to capture images of the horizon. Sensors and camera gather data via a clear Lexan Polycarbonate section of Body Tube. The camera follows the horizon with a rotating collar around the central axis based on a gravity-controlled system.

Test Plans, Status, and Results	
Ejection Charge Tests	
Sub-scale Test Flights	Sub-scale test flight run with 3.0" diameter paper rocket with plywood fins that is 64" in length. Fin structure was extremely similar to full-scale rocket fin structure. Test flight completed sucecessfully. Actual apogee of 1237' was higher than projected apogee of 1000'. First recovery deployment event occurred at apogee as expected with a small streamer deployed as the drogue. Second recovery deployment event occurred at 700' as expected with a 20" Nylon parachute deployed as the main parachute. Both events were triggered with an electronic deployment system run by a Perfectflite Stratologger SL100 altimeter similar to the one that will be used in the full-scale launch vehicle. The launch vehicle was successfully recovered with no damage to the launch vehicle.
Full-scale Test Flights	

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Additional Comments