Milestone Review Flysheet

Institution	University of Louisville

Milestone	PDR

Vehicle Properties	
Total Length (in)	138
Diameter (in)	6
Gross Lift Off Weigh (lb)	45.9
Airframe Material	Carbon Fiber
Fin Material	Carbon Fiber
Coupler Length	12 in

Motor Properties	
Motor Designation	AeroTech L2200-G
Max/Average Thrust (lb)	697.31/494.58
Total Impulse (lbf-s)	1147.43
Mass Before/After Burn	45.9/40.3
Liftoff Thrust (lb)	697.31
Motor Retention	Custom machined retainer secured with 10-32 shoulder bolts.

Stability Analysis	
Center of Pressure (in from nose)	102.11
Center of Gravity (in from nose)	88.585
Static Stability Margin	3.12
Static Stability Margin (off launch rail)	2.2
Thrust-to-Weight Ratio	14.65
Rail Size and Length (in)	144
Rail Exit Velocity	79.3

Ascent Analysis		
Maximum Veloxity (ft/s)	721	
Maximum Mach Number	0.65	
Maximum Acceleration (ft/s^2)	469	
Target Apogee (From Simulations)	5561 feet without VDS	5280 feet with VDS
Stable Velocity (ft/s)	52	
Distance to Stable Velocity (ft)	3.8	

Recovery System Properties				
Drogue Parachute				
Manufacturer/Model	2 Custom Cruciform			
Size	1.9/1.3 ft			
Altitude at Deployment (ft)			5280/5280 +2 sec delay	
Velocity at Deployment (ft/s)			25.79 ft/s / 72.87 ft/s	
Terminal Velocity (ft/s)			93.6 ft/s / 129.0 ft/s	
Recovery Harness Material			Tubulor Nylon Shock cord	
Harness Size/Thickness (in)			9/16"	
Recovery Harness Length (ft)			12 feet / 12 feet	
Harness/Airframe Interfaces	ARRD			
Kinetic Enerfy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	2876 ft/lb	4887 ft/lb		

Recovery System Properties				
Main Parachute				
Manufacturer/Model	2 Custom Toroidal			
Size	9 ft/2.9ft			
Altitude at Deployment (ft)			590 feet / 1300 feet	
Velocity at Deployment (ft/s)			93.6 ft/s / 129.0 ft/s	
Terminal Velocity (ft/s)			14.6 ft/s 22.30 ft/s	
Recovery Harness Material			Tubular Nylon Shock cord	
Harness Size/Thickness (in)			9/16"	
Recovery Harness Length (ft)			12 feet/ 12 feet	
Harness/Airframe Interfaces	U Bolt			
Kinetic Enerfy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	70 ft lb	39.4 ft/lb		

Recovery Electonics	
Altimeter(s)/Timer(s) (Make/Model)	PerfectFlite StratoLogger CF (x4) Teensey (x2)
Redundancy Plan	Redundant Stratologgers for each recovery system. Redundant E-matches in

Recovery Electonics	
Rocket Locators (Make/Model)	Garmin Astro DC 40 (x1)
Transmitting Frequencies	***Required by CDR***

	ARRDs. Redundant Teensey for the RRS.		Black Powder Mass Drogue Chute (grams)	3
Pad Stay Time (Launch Configuration)	2 hours		Black Powder Mass Main Chute (grams)	N/A

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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
	The expiremental payload will deploy from a height of 1300ft and will be recovered via a multirotor system. The payload will utilize the multirotor system to navigate to a height above the launch rail where the launch vehicle was launched from and detect three randomly placed target within a 300ft radius of the lauch rail. The multirotor will then upright land after the system has sucessfully differentiated and identified the three targets via its onboard camera system.
Payload 2	Overview
	The variable drag system (VDS) is an active system designed to deliver the vehicle to 1 mile AGL +/- 33 ft. It uses a DC motor and central gear to actuate three drag blades into the airstream, slowing down the vehicle on its ascent to apogee.

Test Plans, Status, and Results	
Ejection Charge Tests	All ejection charges will be ground tested prior to any test flight to ensure proper seperation takes place, the black powder charges are sized correctly, and that the parachutes fully deploy from their sections.
Sub-scale Test Flights	

Full-scale Test Flights	

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Additional Comments