Milestone Review Flysheet

Institution	Piedmont Virginia Community College

Milestone	FRR

Vehicle Properties	
Total Length (in)	107.5
Diameter (in)	5.525
Gross Lift Off Weigh (lb)	35.83
Airframe Material	G12 Fiberglass
Fin Material	G10 Fiberglass
Coupler Length	14 in

Motor Properties	
Motor Designation	Aerotech L1150R
Max/Average Thrust (lb)	294.5 / 258.5
Total Impulse (lbf-s)	801.35
Mass Before/After Burn	8.1 / 3.9
Liftoff Thrust (lb)	292.3
Motor Retention	Screw-on Retainer

Stability Analysis	
Center of Pressure (in from nose)	86.9
Center of Gravity (in from nose)	60.3
Static Stability Margin	3.33
Static Stability Margin (off launch rail)	3.4
Thrust-to-Weight Ratio	7.6:1
Rail Size and Length (in)	1515, 144
Rail Exit Velocity	71 ft/s

Ascent Analysis		
Maximum Veloxity (ft/s)	597.56	
Maximum Mach Number	0.53	
Maximum Acceleration (ft/s^2)	263.63	
Target Apogee (From Simulations)	5118	
Stable Velocity (ft/s)	52	
Distance to Stable Velocity (ft)	6.82	

Recovery System Properties				
Dogue Parachute				
Manufacturer/Model	Sunward Group Ltd / 18" Nylon Parachute			
Size	18 in			
Altitude at Deployment (ft)	5118			
Velocity at Deployment (ft/s)	0			
Terminal Velocity (ft/s)	116.5			
Recovery Harness Material	Tubular Kevlar			
Harness Size/Thickness (in)	1/2			
Recovery Harness Length (ft)	27			
Harness/Airframe Interfaces	1 swivel tied to each end of the harness with 2 quick links attached to each, each quick link attached to a different U-bolt on the airframe.			
Kinetic Enerfy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	2622	847.7	1763	N/A

Recovery System Properties				
Main Parachute				
Manufacturer/Model	Giant Leap Rocketry / Tac-1			
Size	84 in			
Altitude at Deployment (ft)	800			
Velocity at Deployment (ft/s)	116.5			
Terminal Velocity (ft/s)	19.3			
Recovery Harness Material	Tubular Kevlar			
Harness Size/Thickness (in)	1/2			
Recovery Harness Length (ft)	27			
Harness/Airframe Interfaces	1 swivel tied to each end of the harness with 2 quick links attached to each, each quick link attached to a different U-bolt on the airframe.			
Kinetic Enerfy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	72.2	23.3	48.5	N/A

Recovery Electonics	
Altimeter(s)/Timer(s) (Make/Model)	Missile Works / RRC3 "Sport" Altimeter
Redundancy Plan	Use two altimeters with separate batteries. Use separate ejection charges for each altimeter.
Pad Stay Time (Launch Configuration)	~83 hr

Recovery Electonics	
Rocket Locators (Make/Model)	Adafruit/Adafruit Ultimate GPS Breakout
Transmitting Frequencies	902.4 - 927.6 MHz, 64 channels at 0.4 Mhz intervals
Black Powder Mass Drogue Chute (grams)	3
Black Powder Mass Main Chute (grams)	3

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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
	Roll induction and counter roll. After motor burnout, the rocket will roll three times about its long axis. While rolling, it will use a camera to detect the ground targets from the target identification challenge. After it has completed 3 rolls, the rocket will return to whatever roll it had after motor burnout.
Payload 2	Overview

Test Plans, Status, and Results	
Ejection Charge Tests	The ejection charge test for the Full-scale rocket was performed successfully prior to its test flight. The drogue ejection speed was 17.4 ft/s and the main ejection speed was 34.69 ft/s.
Sub-scale Test Flights	The subscale test flight was performed on December 10th; however, there was a motor anomaly which caused the rocket to crash shortly after motor ignition. The data that was gathered from the flight was analyzed and is included in the CDR report and slides. The results verified the functionality of the airframe, and provided a chance to finalize checklists for both launch and packing.
Full-scale Test Flights	The full scale test flight was conducted on February 11th. It was a successful flight with an apogee 5150ft and a drift of 1584ft.

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Additional Comments