Milestone Review Flysheet 2017-2018

Institution	York College of Pennsylvania

Milestone	CDR

Vehicle Properties	
Total Length (in)	138 in.
Diameter (in)	6.007 in.
Gross Lift Off Weigh (lb.)	28.49 lb
Airframe Material(s)	Fiberglass Wrapped Phenolic
Fin Material and Thickness (in)	Ultem Plastic (Varies)
Coupler Length/Shoulder Length(s) (in)	6 in. +

Motor Properties	
Motor Brand/Designation	Aerotech L1150R-PS
Max/Average Thrust (lb.)	302.95 lb / 258.53 lb
Total Impulse (lbf-s)	790.65 lbf*s
Mass Before/After Burn (lb.)	8.099 lb / 3.907 lb
Liftoff Thrust (lb.)	276.7 lb
Motor Retention Method	AP 75 Flanged Motor Retainer

Stability Analysis	
Center of Pressure (in from nose)	102.36 in.
Center of Gravity (in from nose)	85.43 in.
Static Stability Margin (on pad)	2.77
Static Stability Margin (at rail exit)	3.11
Thrust-to-Weight Ratio	9.07 : 1
Rail Size/Type and Length (in)	1515 / 144 in.
Rail Exit Velocity (ft/s)	83.99 ft/s

Ascent Analysis	
Maximum Velocity (ft/s)	751.3 ft/s
Maximum Mach Number	0.67
Maximum Acceleration (ft/s^2)	306.76 ft/s^2
Predicted Apogee (From Sim.) (ft)	5,400 ft

Recovery System Properties	
Drogue Parachute	
Manufacturer/Model	Fruity Chutes
Size/Diameter (in or ft)	24 in.
Altitude at Deployment (ft)	5,280 ft
Velocity at Deployment (ft/s)	0 ft/s
Terminal Velocity (ft/s)	73.5 ft/s
Recovery Harness Material	Tubular Nylon
Recovery Harness Size/Thickness (in)	1 in.
Recovery Harness Length (ft)	16 ft
Harness/Airframe Interfaces	1/4" thick u-bolt attached to wood bulkeads will provide mounting surface for 1/4" quicklinks to the ariframe. Quicklinks will attach the recovery harness to the u-bolt.

Recovery System Properties				
Main Parachute				
Manufacturer/Model		Paramedichutes		
Size/Diameter (in or ft)		120 in.		
Altitude at Deployment (ft)		600 ft		
Velocity at Deployment (ft/s)		73.5 ft/s		
Terminal Velocity (ft/s)		12.7 ft/s		
Recovery Harness Material		Tubular Nylon		
Recovery Harness Size/Thickness (in)		1 in.		
Recovery Harness Length (ft)		14 ft		
Harness/Airframe Interfaces		1/4" thick u-bolt attached to wood bulkeads will provide mounting surface for 1/4" quicklinks to the ariframe. Quicklinks will attach the recovery harness to the u-bolt.		
Kinetic Energy of Each Section (Ft-lbs)	Nose (Payload)	Middle	Bottom	Section 4
	21.74	16.39	36.83	*

Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	*	*	*	*

Recovery Electronics	
Altimeter(s)/Timer(s) (Make/Model)	PerfectFlite Strattologger CF
Redundancy Plan and Backup Deployment Settings	2 altimeters will be contained in the electronics bay. 1 will be designated as the main altimeter and one will be designated as the redundant
Pad Stay Time (Launch Configuration)	3 hours (9V battery)

Recovery Electronics		
Rocket Locators (Make/Model)	AMW / High Power Transmitter	
Transmitting Frequencies (all - vehicle and payload)	Transmitter for Rocket Locator - **223.170 MHz** Wireless Serial Port Communication Module - **441.0 MHz**	
Ejection System Energetics (ex. Black Powder)		
Energetics Mass - Drogue Chute (grams)	Primary	3.5 grams
	Backup	4.0 grams
Energetics Mass - Main Chute (grams)	Primary	3.5 grams
	Backup	4.0 grams
Energetics Masses - Other (grams) - If Applicable	Primary	8.0 grams (CO2 ejection)
	Backup	Above charge is for nose-cone

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Payload

	Overview
Payload 1 (official payload)	Deployable Rover - See the report for a more detailed overview of the payload and its detailed drawings
Payload 2 (non-scored payload)	N/A

Test Plans, Status, and Results

Ejection Charge Tests	We completed a sub-scale rocket ejection charge test. This test confirmed that the calculations we had completed were fairly accurate and produced about the right amount of thrust to separate two sections of tubing. We will hold a black powder test with the full-scale rocket once the final rocket is assembled in early February. The rocket will be laid flat onto a table and wired directly to a current source through the key switches. We will clear a wide enough area and eject both sides of the rocket to ensure that the calculated mass is enough to seperate the rocket into the need individual pieces.
Sub-scale Test Flights	First Flight - 3,450 feet with straight flight profile / Second Flight - 3,650 feet with straight flight profile
Full-scale Test Flights	Full - Scale Flight Testing will take place on February 17th, 2018 and March 17th, 2018 at the MDRA Launch Field in Henderson, Maryland.

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Additional Comments

N/A