Milestone Review Flysheet 2017-2018

Institution	York College of Pennsylvania	Milestone	PDR

Vehicle Properties	
Total Length (in)	131 in.
Diameter (in)	6 in.
Gross Lift Off Weigh (lb.)	27.36 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	Cesaroni Tech. Inc. L645-P
Max/Average Thrust (lb.)	145.9 lb
Total Impulse (lbf-s)	768.8 lb*s
Mass Before/After Burn (lb.)	8.27 lb / 3.54 lb
Liftoff Thrust (lb.)	174.6 lb
Motor Retention Method	AP 75 Flanged Motor Retainer

Stability Analysis	
Center of Pressure (in from nose)	101.1 in.
Center of Gravity (in from nose)	84.08 in.
Static Stability Margin (on pad)	2.85
Static Stability Margin (at rail exit)	3
Thrust-to-Weight Ratio	5.33:1
Rail Size/Type and Length (in)	144 in.
Rail Exit Velocity (ft/s)	61.02 ft/s

Ascent Analysis	
Maximum Velocity (ft/s)	745.8 ft/s
Maximum Mach Number	0.667
Maximum Acceleration (ft/s^2)	248.4 ft/s^2
Predicted Apogee (From Sim.) (ft)	5,480 ft.

Recovery System Properties Drogue Parachute				
Manufacturer/Model		Fruity Chutes		
Size/Diameter (in or ft)		2 ft.		
Altitude at Deployment (ft)		Apogee		
Velocity at Deployment (ft/s)		0 ft/s		
Terminal Velocity (ft/s)		71 ft/s		
Recovery Harness Material		Tubular Nylon		
Recovery Harness Size/Thickness (in)		1"		
Recovery Harness Length (ft)		16 ft		
Harness/Airframe Interfaces		3/4" U-Bolt attached to wood bulkeads will provide mounting surface for 1/4" Quicklinks to the airframe. Quicklinks will attach the recovery harness to the U-Bolt.		
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4

Recovery System Properties Main Parachute				
Manufacturer/Model		MediChutes		
Size/Diameter (in or ft)		10 ft		
Altitude at Deployment (ft)		600 ft		
Velocity at Deployment (ft/s)		71 ft/s		
Terminal Velocity (ft/s)		8.5 ft/s		
Recovery Harness Material		Tubular Nylon		
Recovery Harness Size/Thickness (in)		1"		
Recovery Harness Length (ft)		12.66 ft		
Harness/Airframe Interfaces		3/4" U-Bolt attached to wood bulkeads will provide mounting surface for 1/4" Quicklinks to the airframe. Quicklinks will attach the recovery harness to the U-Bolt.		
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	19.617	17.045	38.338	N/A

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

Recovery Electronics		
Rocket Locators (Make/Model)		
Transmitting Frequencies (all - vehicle and payload)	***Required by CDR***	
ection System Energetics (ex. Black Powder		
Energetics Mass - Drogue Chute (grams)	Primary	3.5 g
	Backup	3.5 g
Energetics Mass - Main Chute (grams)	Primary	3.5 g
	Backup	3.5 g
Energetics Masses - Other (grams) - If Applicable	Primary	N/A
	Backup	N/A

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Payload

	Overview
Payload 1 (official payload)	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 will hold a black powder test with the rocket once the final rocket is assembled in mid January. 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 launch the rocket into seperate pieces.
Sub-scale Test Flights	We plan to launch the sub-scale rocket on December 16th and 17th in Price, Maryland with the Maryland Delaware Rocketry Association.
Full-scale Test Flights	Will be completed at a later date to be determined in early spring.