Milestone Review Flysheet 2017-2018

Institution	School Name: University of North Dakota

Milestone	PDR

Vehicle Properties

Total Length (in)	108
Diameter (in)	6
Gross Lift Off Weigh (lb.)	32.32
Airframe Material(s)	Carbon Fiber
Fin Material and Thickness (in)	ABS Plastic, 0.118
Coupler Length/Shoulder Length(s) (in)	Coupler 10 / Shoulder 4

Motor Properties

Motor Brand/Designation	AeroTech L1150
Max/Average Thrust (lb.)	294 / 258
Total Impulse (lbf-s)	784
Mass Before/After Burn (lb.)	8.125 / 3.54
Liftoff Thrust (lb.)	83.9
Motor Retention Method	Nozzel Thrust Ring

Stability Analysis

Center of Pressure (in from nose)	78.398
Center of Gravity (in from nose)	60.911
Static Stability Margin (on pad)	2.91
Static Stability Margin (at rail exit)	1.75
Thrust-to-Weight Ratio	8 to 1
Rail Size/Type and Length (in)	0.25 / 144
Rail Exit Velocity (ft/s)	39.6

Ascent Analysis

Maximum Velocity (ft/s)	659
Maximum Mach Number	0.59
Maximum Acceleration (ft/s^2)	257
Predicted Apogee (From Sim.) (ft)	5888

Recovery System Properties

Drogue Parachute

Manufacturer/Model			Public Missiles Limited	
Size/Diameter (in or ft)			42	
Altitude at Deployment (ft)			5888 ft	
Velocity at Deployment (ft/s)			0	
Terminal Velocity (ft/s)			45.34	
Recovery Harness Material			Tubular Nylon	
Recovery Harness Size/Thickness (in)			1	
Recovery Harness Length (ft)			12	
Harness/Airframe Interfaces		Stainless steel U-bolt connected to bulkhead		
Kinetic Energy of Each Section (Ft-lbs)	Nose Cone	Altimeter	Fin Can	
	23788	1712	4873	

Main Parachute

Manufacturer/Model			Public Missiles Limited	
Size/Diameter (in or ft)			96	
Altitude at Deployment (ft)			1000	
Velocity at Deployment (ft/s)			106	
Terminal Velocity (ft/s)			19.75	
Recovery Harness Material			Tubular Nylon	
Recovery Harness Size/Thickness (in)			1	
Recovery Harness Length (ft)			12	
Harness/Airframe Interfaces		Stainless steel U-bolt connected to bulkhead		
Kinetic Energy of Each Section (Ft-lbs)	Nose Cone	Altimeter	Fin Can	
	4550	328	932.447	

Recovery Electronics

Altimeter(s)/Timer(s) (Make/Model)	Perfect Flight
Redundancy Plan and Backup Deployment Settings	Altimeter, arduino, tube separation and parachute ejection. Redundant parachutes to deploy if descent velocity is above critical
Pad Stay Time (Launch Configuration)	1 to 2 hours

Recovery Electronics

Rocket Locators (Make/Model)		Com-Spec at-2b Transmitter/PR-100A
Transmitting Frequencies (all - vehicle and payload)		***Required by CDR***
Ejection System Energetics (ex. Black Powder)		
Energetics Mass - Drogue Chute (grams)	Primary	5
	Backup	5
Energetics Mass - Main Chute (grams)	Primary	5
	Backup	5
Energetics Masses - Other (grams) - If Applicable	Primary	N/A
	Backup	N/A

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Payload	
	Overview
Payload 1 (official payload)	by will be on a locked bearing, once the deployment process is initiated the payload by will be orientated so that the rover is right side up. The whole payload b
Payload 2 (non-sored payload)	

Test Plans, Status, and Results	
Ejection Charge Tests	Have not been conducted for full scale rocket. Scale charge test 1 was a failure. Parachutes didn't deploy fully. Test two will be conducted before launch
Sub-scale Test Flights	Sub-scale test flight has not been completed yet. Scheduled for Nov. 4th with a backup launch date of Nov. 5th
Full-scale Test Flights	No full-scale test flight has been conducted. There is no set date for the full-scale launch. It is planned to be constructed and tests to be completed by Feb 10th

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Additional Comments