

Milestone Review Flysheet 2017-2018

Institution Rensselaer Rocket Society

Milestone PDR

Vehicle Properties	
Total Length (in)	86.75
Diameter (in)	4
Gross Lift Off Weigh (lb.)	14.375
Airframe Material(s)	Spiral Bound Phenolic Resin
Fin Material and Thickness (in)	G10 Fiberglass: 0.125
Coupler Length/Shoulder Length(s) (in)	8/12/2004

Motor Properties	
Motor Brand/Designation	Aerotech k828
Max/Average Thrust (lb.)	186.14
Total Impulse (lbf-s)	476.595
Mass Before/After Burn (lb.)	4.9 / 1.875
Liftoff Thrust (lb.)	1112.06
Motor Retention Method	Mechanical

Stability Analysis	
Center of Pressure (in from nose)	67.26
Center of Gravity (in from nose)	54
Static Stability Margin (on pad)	3.29
Static Stability Margin (at rail exit)	2.34
Thrust-to-Weight Ratio	11.22
Rail Size/Type and Length (in)	96" 10-10
Rail Exit Velocity (ft/s)	77.9

Ascent Analysis	
Maximum Velocity (ft/s)	718.5
Maximum Mach Number	0.64
Maximum Acceleration (ft/s^2)	449.5
Predicted Apogee (From Sim.) (ft)	5300

Recovery System Properties									
Drogue Parachute									
Manufacturer/Model	rocket man ballistic Mach 2								
Size/Diameter (in or ft)	2'								
Altitude at Deployment (ft)	Apogee								
Velocity at Deployment (ft/s)	0								
Terminal Velocity (ft/s)	64								
Recovery Harness Material	Tubular Nylon								
Recovery Harness Size/Thickness (in)	9/16								
Recovery Harness Length (ft)	25								
Harness/Airframe Interfaces	.25 inch bulkheads with .25-20 forged iron eyebolts								
Kinetic Energy of Each Section (Ft-lbs)	<table border="1" style="width: 100%; text-align: center;"> <tr> <th>Section 1</th> <th>Section 2</th> <th>Section 3</th> <th>Section 4</th> </tr> <tr> <td>272</td> <td>426</td> <td>267</td> <td></td> </tr> </table>	Section 1	Section 2	Section 3	Section 4	272	426	267	
Section 1	Section 2	Section 3	Section 4						
272	426	267							

Recovery System Properties									
Main Parachute									
Manufacturer/Model	Lock Precision Sky angle 60 classic 2								
Size/Diameter (in or ft)	60"								
Altitude at Deployment (ft)	500'								
Velocity at Deployment (ft/s)	64								
Terminal Velocity (ft/s)	20.09								
Recovery Harness Material	tubular nylon								
Recovery Harness Size/Thickness (in)	9/16								
Recovery Harness Length (ft)	25								
Harness/Airframe Interfaces	.25 inch bulkheads with .25-20 forged iron eyebolts								
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26.86	42.02	26.39							

Recovery Electronics	
Altimeter(s)/Timer(s) (Make/Model)	Stratologger SL100
Redundancy Plan and Backup Deployment Settings	Raven3
Pad Stay Time (Launch Configuration)	> 1 hour

Recovery Electronics		
Rocket Locators (Make/Model)	Xbee - 900 MHz	
Transmitting Frequencies (all vehicle and payload)	***Required by CDR***	
Ejection System Energetics (ex. Black Powder)	Black Powder	
Energetics Mass - Drogue Chute (grams)	Primary	1
	Backup	1.5
Energetics Mass - Main Chute (grams)	Primary	2
	Backup	2.5
Energetics Masses - Other (grams) - If Applicable	Primary	
	Backup	

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Payload

Payload	
Payload 1 (official payload)	Overview
	The proposed payload design complies with NASA's requirements outlined in the 2018 NSL Handbook section 4.4 in that it will include an on board camera system designed to identify and differentiate between 3 different colored tarps. Two Pi Cam v2 camera modules will be used to capture the images, which will be analyzed in real time by a custom designed software package run on two Raspberry Pi 3 Model B's. A photograph with the colored tarps outlined will qualify as a successful experiment.
Payload 2 (non-scored payload)	Overview
	n/a

Test Plans, Status, and Results

Ejection Charge Tests	The RRS will do ground testing of parachute ejection before the first launch
Sub-scale Test Flights	The RRS will perform a test flight of a subscale dual deploy rocket
Full-scale Test Flights	Before the FRR, the RRS will complete a test flight of the rocket with an active payload

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Additional Comments

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