

# Milestone Review Flysheet 2017-2018

**Institution** | Piedmont Virginia Community College

**Milestone** | PDR

Vehicle Properties	
Total Length (in)	90
Diameter (in)	6.17
Gross Lift Off Weigh (lb.)	31.75
Airframe Material(s)	G12 Fiberglass
Fin Material and Thickness (in)	G10 Fiberglass, 0.125
Coupler Length/Shoulder Length(s) (in)	6

Motor Properties	
Motor Brand/Designation	AeroTech L1150R-P
Max/Average Thrust (lb.)	294.5/258.5
Total Impulse (lbf-s)	784.4
Mass Before/After Burn (lb.)	8.125/3.544
Liftoff Thrust (lb.)	281
Motor Retention Method	AeroPack Retaining Ring

Stability Analysis	
Center of Pressure (in from nose)	68.63
Center of Gravity (in from nose)	45.48
Static Stability Margin (on pad)	3.75
Static Stability Margin (at rail exit)	3.87
Thrust-to-Weight Ratio	8.15
Rail Size/Type and Length (in)	1515, 12 ft
Rail Exit Velocity (ft/s)	78.5

Ascent Analysis	
Maximum Velocity (ft/s)	684.3
Maximum Mach Number	0.62
Maximum Acceleration (ft/s^2)	273.2
Predicted Apogee (From Sim.) (ft)	5197

Recovery System Properties				
Drogue Parachute				
Manufacturer/Model	Jolly Logic/Chute Release			
Size/Diameter (in or ft)	24in (effective)			
Altitude at Deployment (ft)	5197			
Velocity at Deployment (ft/s)	7.1			
Terminal Velocity (ft/s)	95.4			
Recovery Harness Material	N/A			
Recovery Harness Size/Thickness (in)	N/A			
Recovery Harness Length (ft)	N/A			
Harness/Airframe Interfaces	N/A			
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	2178.92	1162.52	N/A	N/A

Recovery System Properties				
Main Parachute				
Manufacturer/Model	The Rocketman/Standard			
Size/Diameter (in or ft)	144in			
Altitude at Deployment (ft)	800			
Velocity at Deployment (ft/s)	95.4			
Terminal Velocity (ft/s)	15.3			
Recovery Harness Material	Tubular Kevlar			
Recovery Harness Size/Thickness (in)	0.5			
Recovery Harness Length (ft)	24			
Harness/Airframe Interfaces	Two quick links on each end of harness attached to U-bolts.			
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	56.41	30.1	N/A	N/A

Recovery Electronics				
Altimeter(s)/Timer(s) (Make/Model)	Missile Works/RRC3 "Sport" Altimeter			
Redundancy Plan and Backup Deployment Settings	Fully redundant altimeters and ejection charges. Backup charges at apogee + 2 seconds, apogee + 4 seconds, and 500 ft			
Pad Stay Time (Launch Configuration)	15+ hours			

Recovery Electronics		
Rocket Locators (Make/Model)	Adafruit Ultimate GPS	
Transmitting Frequencies (all - vehicle and payload)	900 MHz and 5.8GHz	
Ejection System Energetics (ex. Black Powder)		
Energetics Mass - Drogue Chute (grams)	Primary	4.5
	Backup	4.5
Energetics Mass - Main Chute (grams)	Primary	4.5
	Backup	4.5
Energetics Masses - Other (grams) - If Applicable	Primary	1.5 (payload deployment)
	Backup	

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## Payload

Payload	
Payload 1 (official payload)	Overview
	Rover, utilizing non-circular wheels to reduce volume while stowed in launch vehicle. Uses solar panel as a lever to right itself from undesirable landing orientations.
Payload 2 (non-scored payload)	Overview
	N/A

## Test Plans, Status, and Results

Ejection Charge Tests	Recovery system ejection charge tests will occur after the launch vehicle is fully constructed, but before any flights. This applies to the subscale launch vehicle as well. The ejection charge for deploying the payload will be tested as soon as a payload deployment test article has been constructed.
Sub-scale Test Flights	Scheduled for December 16th, at the Battle Park launch site near Culpeper, VA.
Full-scale Test Flights	Planned for mid-February.

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Additional Comments