

# Milestone Review Flysheet

**Institution** Rensselaer Polytechnic Institute

**Milestone** Preliminary Design Review

## Vehicle Properties

Total Length (in)	98
Diameter (in)	6
Gross Lift Off Weigh (lb)	24.5
Airframe Material	Phenolic Resin
Fin Material	G 10 Fiberglass
Coupler Length	12 in

## Motor Properties

Motor Designation	2856-L910-CS-P
Max/Average Thrust (lb)	235.6/203.6
Total Impulse (lbf-s)	645
Mass Before/After Burn	92.3 oz / 44.1 oz
Liftoff Thrust (lb)	208
Motor Retention	Non-flanged Aluminum Retainer

## Stability Analysis

Center of Pressure (in from nose)	74.3
Center of Gravity (in from nose)	59.2
Static Stability Margin	2.46
Static Stability Margin (off launch rail)	2.03
Thrust-to-Weight Ratio	9.59 max/ 8.31 avg
Rail Size and Length (in)	15-15 144in
Rail Exit Velocity	78.2 ft / s

## Ascent Analysis

Maximum Velocity (ft/s)	709
Maximum Mach Number	0.64
Maximum Acceleration (ft/s^2)	279
Target Apogee (From Simulations)	5344 ft
Stable Velocity (ft/s)	78.2
Distance to Stable Velocity (ft)	12

## Recovery System Properties

### Dogue Parachute

Manufacturer/Model	Rocketman Ballistic Mach II			
Size	4 sq. ft			
Altitude at Deployment (ft)	Apogee			
Velocity at Deployment (ft/s)	0			
Terminal Velocity (ft/s)	77			
Recovery Harness Material	Tubular Nylon			
Harness Size/Thickness (in)	1			
Recovery Harness Length (ft)	250			
Harness/Airframe Interfaces	1500 lb size 12/0 Nickel plated swivel joint, 1.5 in eyebot fixed to forward centering ring and rear airframe bulkhead.			
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	300	775	600	N/A

## Recovery System Properties

### Main Parachute

Manufacturer/Model	Skyangle Classic-II 60			
Size	39 sq. ft			
Altitude at Deployment (ft)	700			
Velocity at Deployment (ft/s)	77			
Terminal Velocity (ft/s)	22.2			
Recovery Harness Material	Tubular Nylon			
Harness Size/Thickness (in)	1			
Recovery Harness Length (ft)	250			
Harness/Airframe Interfaces	1500 lb size 12/0 Nickel plated swivel joint, 1.5 in eyebot fixed to forwardmost bulkhead in upper airframe.			
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	26	67	52	N/A

## Recovery Electronics

Altimeter(s)/Timer(s) (Make/Model)	Featherweight Raven3
Redundancy Plan	Perfectflite Stratologger SL100
Pad Stay Time (Launch Configuration)	1 hour

## Recovery Electronics

Rocket Locators (Make/Model)	GPS Transmission
Transmitting Frequencies	***Required by CDR***
Black Powder Mass Drogue Chute (grams)	1.7
Black Powder Mass Main Chute (grams)	1.7

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## Autonomous Ground Support Equipment (MAV Teams Only)

Capture Mechanism	Overview
Container Mechanism	Overview
Launch Rail Mechanism	Overview
	***Include Description of rail locking mechanism***
Igniter Installation Mechanism	Overview

## Payload

Payload 1	Overview
	Induction of roll and counter roll is achieved by the actuation of opposing blades protruding from the rocket body. The two sets of blades are controlled by independent motors driving independent slotted cam plates. The protrusion of the blades will be dynamically controlled based upon the rocket's angular velocity. Following the completion of the payload objective, the blades will deploy to act as an active drag control system.
Payload 2	Overview
	N/A

## Test Plans, Status, and Results

Ejection Charge Tests	Ejection charge tests will be conducted prior to any dual deploy launch.
Sub-scale Test Flights	Sub-scale test flights will be conducted in December.
Full-scale Test Flights	Full scale test flights will be conducted in late February / early March.

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Additional Comments