

Milestone Review Flysheet

Institution California State Polytechnic University, Pomona

Milestone PDR

Vehicle Properties

Total Length (in)	87.65
Diameter (in)	6.079
Gross Lift Off Weight (lb)	28.0625
Airframe Material	Blue Tube 2.0
Fin Material	ABS Plastic
Coupler Length (in)	2

Motor Properties

Motor Designation	Aerotech L1150-P
Max/Average Thrust (lb)	294.5/258.1
Total Impulse (lbf-s)	784.4
Mass Before/After Burn	8.125/3.544
Liftoff Thrust (lb)	272
Motor Retention	Aero Pack Inc. Motor Retainer

Stability Analysis

Center of Pressure (in from nose)	67.51
Center of Gravity (in from nose)	53.81
Static Stability Margin	2.28
Static Stability Margin (off launch rail)	2.26
Thrust-to-Weight Ratio	8.82
Rail Size and Length (in)	1.0/96 in.
Rail Exit Velocity (ft/s)	70.5

Ascent Analysis

Maximum Velocity (ft/s)	765
Maximum Mach Number	0.69
Maximum Acceleration (ft/s ²)	312
Target Apogee (From Simulations)	5556
Stable Velocity (ft/s)	60.1
Distance to Stable Velocity (ft)	5.79

Recovery System Properties

Dogue Parachute

Manufacturer/Model	Custom/Cruciform			
Size (ft ²)	11.25			
Altitude at Deployment (ft)	5556			
Velocity at Deployment (ft/s)	15			
Terminal Velocity (ft/s)	39.95			
Recovery Harness Material	Kevlar			
Harness Size/Thickness (in)	0.5			
Recovery Harness Length (ft)	18.25			
Harness/Airframe Interfaces	Eye bolt, quick links, and swivel			
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	86.8	168.8	290	

Recovery System Properties

Main Parachute

Manufacturer/Model	Fruity Chutes/Toroidal			
Size (ft ²)	48.8			
Altitude at Deployment (ft)	500			
Velocity at Deployment (ft/s)	39.95			
Terminal Velocity (ft/s)	18.1			
Recovery Harness Material	Kevlar			
Harness Size/Thickness (in)	0.5			
Recovery Harness Length (ft)	18.25			
Harness/Airframe Interfaces	Eye bolt, quick links, and swivel			
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	17.8	34.5	59.5	

Recovery Electronics

Altimeter(s)/Timer(s) (Make/Model)	Perfectflite StratologgerCF
Redundancy Plan	Redundant Perfectflite StratologgerCF altimeters and redundant black powder charges will eject the drogue parachute at apogee and the main parachute at 500 ft.
Pad Stay Time (Launch Configuration)	1+ hours

Recovery Electronics

Rocket Locators (Make/Model)	BRB900 GPS Receiver
Transmitting Frequencies	***Required by CDR***
Black Powder Mass Drogue Chute (grams)	2.78
Black Powder Mass Main Chute (grams)	0.62

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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
	The primary payload takes the form of a Roll Induction System (RIS). Specifically the RIS primarily consists of an autonomous aileron system which, following motor burnout, initiates two complete rotations and a counter rotation that ceases all angular displacement instigated by the active system.
Payload 2	Overview
	The secondary payload consists of a "pill" housing suspended within a payload bay whose purpose is to shield the provided fragile materials from the loads and impulses generated by the lift-off and recovery of the launch vehicle.

Test Plans, Status, and Results
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Ejection Charge Tests	Ejection charge tests are planned before every subscale and full-scale launch.
Sub-scale Test Flights	The subscale test flight is scheduled for 12/10/16
Full-scale Test Flights	The full-scale test flights are scheduled for 2/4/17 and 2/11/17

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Additional Comments