

# Milestone Review Flysheet

**Institution** California State Polytechnic University Pomona

**Milestone** Flight Readiness Review

## Vehicle Properties

Total Length (in)	105
Diameter (in)	6
Gross Lift Off Weigh (lb)	45.2
Airframe Material	Blue Tube 2.0
Fin Material	PLA
Coupler Length	13.5"

## Motor Properties

Motor Designation	Aerotech L2200G
Max/Average Thrust (lb)	697 / 473
Total Impulse (lbf-s)	1136
Mass Before/After Burn (lbm)	10.47 / 4.93
Liftoff Thrust (lb)	585
Motor Retention	Aero Pack Inc. Motor Retainer

## Stability Analysis

Center of Pressure (in from nose)	81.3
Center of Gravity (in from nose)	65
Static Stability Margin	2.63
Static Stability Margin (off launch rail)	2.68
Thrust-to-Weight Ratio	10.5
Rail Size/Length (in)	1515/144
Rail Exit Velocity	95.5

## Ascent Analysis

Maximum Velocity (ft/s)	736
Maximum Mach Number	0.66
Maximum Acceleration (ft/s^2)	475
Target Apogee (From Simulations)	5850
Stable Velocity (ft/s)	50
Distance to Stable Velocity (ft)	3.4

## Recovery System Properties

### Dogue Parachute

Manufacturer/Model	Custom/Cruciform			
Size (ft <sup>2</sup> )	6.39			
Altitude at Deployment (ft)	5280			
Velocity at Deployment (ft/s)	0			
Terminal Velocity (ft/s)	67.8			
Recovery Harness Material	Kevlar			
Harness Size/Thickness (in)	0.5			
Recovery Harness Length (ft)	40			
Harness/Airframe Interfaces	1/3" Ubolts, 1/4" Quicklinks, 1500lb Swivel			
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	1871	756	114.1	N/A

## Recovery System Properties

### Main Parachute

Manufacturer/Model	FruityChutes			
Size (ft <sup>2</sup> )	80			
Altitude at Deployment (ft)	500			
Velocity at Deployment (ft/s)	67.8			
Terminal Velocity (ft/s)	13.6			
Recovery Harness Material	Kevlar			
Harness Size/Thickness (in)	0.5			
Recovery Harness Length (ft)	40			
Harness/Airframe Interfaces	1/3" Ubolts, 5/8" Quicklinks, 3300lb Swivel			
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	74.7	30.12	4.56	N/A

## Recovery Electronics

Altimeter(s)/Timer(s) (Make/Model)	PerfectFlite StratologgerCF
Redundancy Plan	Redundant Perfectflite StratologgerCF altimeters and redundant black powder charges
Pad Stay Time (Launch Configuration)	1+ hours

## Recovery Electronics

Rocket Locators (Make/Model)	BRB900 GPS Reciever / Trackimo Quad Band
Transmitting Frequencies	900 Mhz, 850 Mhz, 1900 Mhz
Black Powder Mass Drogue Chute (grams) primary/secondary	5.2/6.2
Black Powder Mass Main Chute (grams) primary/secondary	4.0/5.0

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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 takes the form of a Fragile Material Protection (FMP) system. It consists of a pill housing suspended within a payload bay whose purpose is to shield the provided fragile material(s) from the loads and impulses generated by the lift-off and recovery of the launch vehicle.

## Test Plans, Status, and Results

Ejection Charge Tests	Ejection charge tests confirmed and refined the black powder required for parachute ejection charges and was completed on 2/12/2017
Sub-scale Test Flights	The subscale test flight was completed on 12/10/2016
Full-scale Test Flights	The full-scale flight test was completed on 3/4/2017.

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Additional Comments