

## Milestone Review Flysheet

**Institution**

Citrus College

**Milestone**

PDR

### Vehicle Properties

Total Length (in)	119
Diameter (in)	6.08
Gross Lift Off Weigh (lb)	34.12
Airframe Material	Blue Tube 2.0
Fin Material	10-ply aircraft plywood
Coupler Length	12"

### Motor Properties

Motor Designation	L1170-FJ
Max/Average Thrust (lb)	1140
Total Impulse (lbf-s)	4183
Mass Before/After Burn	34.12/27.95
Liftoff Thrust (lb)	1140
Motor Retention	Commercially Purchased Aerotech

### Stability Analysis

Center of Pressure (in from nose)	93.84
Center of Gravity (in from nose)	66.26
Static Stability Margin	2.47
Static Stability Margin (off launch rail)	4.6
Thrust-to-Weight Ratio	7.5
Rail Size and Length (in)	15/15
Rail Exit Velocity	39.53 ft/s

### Ascent Analysis

Maximum Velocity (ft/s)	738.97
Maximum Mach Number	0
Maximum Acceleration (ft/s <sup>2</sup> )	281.21
Target Apogee (From Simulations)	5280 ft.
Stable Velocity (ft/s)	44
Distance to Stable Velocity (ft)	3.77

### Recovery System Properties

#### Drogue Parachute

Manufacturer/Model	Fruity Chutes Iris Ultra 30"			
Size	30"			
Altitude at Deployment (ft)	5598.4			
Velocity at Deployment (ft/s)	0			
Terminal Velocity (ft/s)	8.57			
Recovery Harness Material	Tubular Nylon			
Harness Size/Thickness (in)	1"			
Recovery Harness Length (ft)	30'			
Harness/Airframe Interfaces	Harnesses will be attached to a U-Bolt that is secured on a bulkhead epoxied to the airframe.			
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	138.22	79.73	89.69	N/A

### Recovery System Properties

#### Main Parachute

Manufacturer/Model	Fruity Chutes Iris Ultra 144"			
Size	144"			
Altitude at Deployment (ft)	799.99			
Velocity at Deployment (ft/s)	99.38			
Terminal Velocity (ft/s)	7.07			
Recovery Harness Material	Tubular Nylon			
Harness Size/Thickness (in)	1"			
Recovery Harness Length (ft)	30'			
Harness/Airframe Interfaces	Harnesses will be attached to a U-Bolt that is secured on a bulkhead epoxied to the airframe.			
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	4.09	2.36	3.32	N/A

### Recovery Electronics

Altimeter(s)/Timer(s) (Make/Model)	Missile Work RRC2+
Redundancy Plan	Redundant Missile Work RRC2+ altimeter, drogue and main ejection charges, ignitors, and batteries.
Pad Stay Time (Launch Configuration)	Upward of 8 hours

### Recovery Electronics

Rocket Locators (Make/Model)	TeleGPS
Transmitting Frequencies	***Required by CDR***
Black Powder Mass Drogue Chute (grams)	2.42
Black Powder Mass Main Chute (grams)	4.34

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Payload

	Overview
Payload 1	The team will design and construct a container to protect one or more fragile samples before, during, and after flight. The container will be able to safely hold a maximum amount of eight separate samples. The main container components are: radiation shield, outer shell, inner chamber, and inner chamber rack. The main role of the container is to protect the sample(s) from impact, shock, contamination, temperature change, pressure change, and radiation. The container was designed with the main objective being sample retrieval from the surface of Mars.
	Overview
Payload 2	N/A

Test Plans, Status, and Results

Ejection Charge Tests	Sub-scale: Middle of November/ Full-scale: Middle of December
Sub-scale Test Flights	12/3/16
Full-scale Test Flights	2/11/17

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Additional Comments

N/A
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