

# Milestone Review Flysheet 2017-2018

**Institution** UC Berkeley

**Milestone** PDR

## Vehicle Properties

Total Length (in)	113
Diameter (in)	6.079 and 4.014
Gross Lift Off Weigh (lb.)	27.125
Airframe Material(s)	Blue Tube, Kraft Phenolic, FiberGlass
Fin Material and Thickness (in)	Fiberglass, .118
Coupler Length/Shoulder Length(s) (in)	6in/4in depending on diameter

## Stability Analysis

Center of Pressure (in from nose)	78.214
Center of Gravity (in from nose)	63.549
Static Stability Margin (on pad)	2.41
Static Stability Margin (at rail exit)	1.6
Thrust-to-Weight Ratio	6.877
Rail Size/Type and Length (in)	144
Rail Exit Velocity (ft/s)	82.8

## Recovery System Properties

### Drogue Parachute

Manufacturer/Model	Fruity Chutes
Size/Diameter (in or ft)	24" Elliptical
Altitude at Deployment (ft)	apogee/5280ft
Velocity at Deployment (ft/s)	0
Terminal Velocity (ft/s)	67.041
Recovery Harness Material	Tubular Kevlar
Recovery Harness Size/Thickness (in)	1/4"
Recovery Harness Length (ft)	12ft

Harness/Airframe Interfaces		1) U-Bolt on Transition tube, 2) Top and bottom links of Tender Descender			
Kinetic Energy of Each Section (Ft-lbs)	Nosecone	Booster	Section 3	Section 4	
	733	700			

## Motor Properties

Motor Brand/Designation	Cesaroni Technology L730-P
Max/Average Thrust (lb.)	1217/738 (N)
Total Impulse (lbf-s)	2764
Mass Before/After Burn (lb.)	4.956/1.975
Liftoff Thrust (lb.)	130.5
Motor Retention Method	54 mm Threaded Slimline motor retainer

## Ascent Analysis

Maximum Velocity (ft/s)	609
Maximum Mach Number	0.55
Maximum Acceleration (ft/s^2)	284
Predicted Apogee (From Sim.) (ft)	5555

## Recovery System Properties

### Main Parachute

Manufacturer/Model	Fruity Chutes/iris Ultra Compact
Size/Diameter (in or ft)	72" Toroidal
Altitude at Deployment (ft)	800
Velocity at Deployment (ft/s)	67.041
Terminal Velocity (ft/s)	17.29
Recovery Harness Material	Tubular Kevlar
Recovery Harness Size/Thickness (in)	1/4"
Recovery Harness Length (ft)	75ft

Harness/Airframe Interfaces		1) Tender Descender quicklinks 2) U-Bolt of avionics bay			
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4	
	Nosecone	Booster			
	51.63	49.27			

## Recovery Electronics

lbs)				
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Recovery Electronics	
Altimeter(s)/Timer(s) (Make/Model)	Perfectflite Stratologger CF
Redundancy Plan and Backup Deployment Settings	Two altimeters, each connected to its own ejection charge; two tender descenders
Pad Stay Time (Launch Configuration)	2 hours

Rocket Locators (Make/Model)	TeleGPS	
Transmitting Frequencies (all vehicle and payload)	***Required by CDR***	
Ejection System Energetics (ex. Black Powder)	Black Powder	
Energetics Mass - Drogue Chute (grams)	Primary	4
	Backup	4
Energetics Mass - Main Chute (grams)	Primary	0.5
	Backup	0.5
Energetics Masses - Other (grams) - If Applicable	Primary	
	Backup	

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Payload	
Payload 1 (official payload)	Overview
	The goal of the payload experiment is to have an autonomous rover deploy from the rocket, drive over five feet away, and deploy solar panels. The payload will be located above the booster and recovery portions of the rocket and directly below the nosecone on the launch pad and during ascent. After recovery and upon landing, a pneumatic cylinder will activate and break two 40lb shear pins, separating the payload section from the lower transition section. After separation, a scissor lift will activate, pushing the rover out of the payload tube. Once the rover has emerged from the rocket, it will rotate two skids outwards to prevent the two-wheeled rover from free spinning. Afterwards, the rover will drive forward approximately ten feet to fulfill the handbook requirements. Upon stopping, it will deploy the solar panels by rotating the hood of the rover up, revealing the two sheets of solar panels.
Payload 2 (non-scored payload)	Overview

Test Plans, Status, and Results	

Ejection Charge Tests	
Sub-scale Test Flights	
Full-scale Test Flights	
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Additional Comments

