

# Milestone Review Flysheet

**Institution** University of California Berkeley

**Milestone** CDR

## Vehicle Properties

Total Length (in)	103
Diameter (in)	6
Gross Lift Off Weigh (lb)	32.06
Airframe Material	Blue Tube
Fin Material	G10 Fiberglass
Coupler Length (in)	12

## Stability Analysis

Center of Pressure (in from nose)	76.555
Center of Gravity (in from nose)	59.849
Static Stability Margin	2.78
Static Stability Margin (off launch rail)	2.8
Thrust-to-Weight Ratio	8.064
Rail Size and Length (in)	1515 Rail 144 Length
Rail Exit Velocity (ft/s)	78.7

## Recovery System Properties

### Drogue Parachute

Manufacturer/Model	Fruity Chutes		
Size	24" Elliptical		
Altitude at Deployment (ft)	5280		
Velocity at Deployment (ft/s)	0		
Terminal Velocity (ft/s)	66.891		
Recovery Harness Material	Tubular Kevlar		
Harness Size/Thickness (in)	1/2"		
Recovery Harness Length (ft)	20		
Harness/Airframe Interfaces	U-Bolt of Boosters, Top and Bottom Quicklinks of L2 Tender Descender		
Kinetic Energy of Each Section (Ft-lbf)	Section 1	Section 2	
	Booster	Avionics and Payload	
	798.463	943.72	

## Recovery Electronics

Altimeter(s)/Timer(s) (Make/Model)	Perfectflite Stratologger CF Missileworks RRC3
Redundancy Plan	Having two different altimeters that can both launch the drogue and main chutes
Pad Stay Time (Launch Configuration)	2 hours

## Motor Properties

Motor Designation	L1150
Max/Average Thrust (lb)	303/259
Total Impulse (lbf-s)	791
Weight Before/After Burn (lb)	8.1/3.9
Liftoff Thrust (lb)	284
Motor Retention	Aft and fore closure screws

## Ascent Analysis

Maximum Velocity (ft/s)	683
Maximum Mach Number	0.61
Maximum Acceleration (ft/s^2)	271
Target Apogee (From Simulations)	5322
Stable Velocity (ft/s)	45.25
Distance to Stable Velocity (ft)	4

## Recovery System Properties

### Main Parachute

Manufacturer/Model	Fruity Chutes; Iris Ultra Compact			
Size	72" Toroidal			
Altitude at Deployment (ft)	1000			
Velocity at Deployment (ft/s)	66.891			
Terminal Velocity (ft/s)	13.988			
Recovery Harness Material	Tubular Kevlar			
Harness Size/Thickness (in)	1/2"			
Recovery Harness Length (ft)	20 (2x)			
Harness/Airframe Interfaces	U-Bolt of Avionics Bay, Bottom Quicklink of L2 Tender Descender			
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2		
	Booster	Avionics		
	34.918	12.416		

## Recovery Electronics

Rocket Locators (Make/Model)	Eggfinder GPS System
Transmitting Frequencies	923.000 MHz
Black Powder Mass Drogue Chute (grams)	1.218 g
Black Powder Mass Main Chute (grams)	0.5 g

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### Payload

Payload 1	Overview
	SAGITTA-VL is designed to execute a “Target Detection and Upright Landing” experiment using an onboard camera housed in the upper airframe and nose cone to identify and distinguish between three differently colored 40 ft. square tarps. The upper airframe section is then ejected, and landed under its own recovery system, deploying legs built into the airframe wall in order to land on the ground upright. The purpose of this experiment is to verify the capability to examine and differentiate features of the landing zone in order to verify safe landing sites or potential ground hazards, and perform an upright landing of a reusable payload.

### Test Plans, Status, and Results

Ejection Charge Tests	Sub-scale ejection charge tests took place the day of the subscale launch and was successful.
Sub-scale Test Flights	Took place December 3rd at Livermore Unit NAR (LUNAR). Altitude reached was 4574 ft AGL.
Full-scale Test Flights	Scheduled for February 4th at Livermore Unit NAR (LUNAR). Alternate/back-up launch date scheduled for February 18th at Fresno TRA.

### Additional Comments

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