Milestone Review Flysheet

Institution	University of California Berkeley

Milestone	FRR

Vehicle Properties	
Total Length (in)	103
Diameter (in)	6
Gross Lift Off Weigh (lb)	33.3
Airframe Material	Blue Tube
Fin Material	G10 Fiberglass
Coupler Length (in)	12

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

Stability Analysis	
Center of Pressure (in from nose)	76.555
Center of Gravity (in from nose)	58.654
Static Stability Margin	2.98
Static Stability Margin (off launch rail)	2.8
Thrust-to-Weight Ratio	7.76
Rail Size and Length (in)	1515 Rail 144 Length
Rail Exit Velocity (ft/s)	62.9

Ascent Analysis	
Maximum Velocity (ft/s)	656
Maximum Mach Number	0.59
Maximum Acceleration (ft/s^2)	260
Target Apogee (From Simulations)	5131
Stable Velocity (ft/s)	45.25
Distance to Stable Velocity (ft)	4

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)	67.041		
Recovery Harness Material	Tubular Kevlar		
Harness Size/Thickness (in)	1/4''		
Recovery Harness Length (ft)	12ft D2B		
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	
	549.003	1032.34	

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)	67.041			
Terminal Velocity (ft/s)	13.76			
Recovery Harness Material	Tubular Kevlar			
Harness Size/Thickness (in)	1/4''			
Recovery Harness Length (ft)	48.75ft B2M, 24.58 M2D			
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		
	23.15	13.79		

Recovery Electonics	
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

Recovery Electonics	
Rocket Locators (Make/Model)	Eggfinder GPS System
Transmitting Frequencies	923.000 MHz
Black Powder Mass Drogue Chute (grams)	4 g
Black Powder Mass Main Chute (grams)	0.5 g

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Payload

	Overview
Payload 1	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 sucessful. Full-scale ejection charge tests took place the day of the March 4th full-scale launch and was sucessful.
Sub-scale Test Flights	Took place December 3rd at Livermore Unit NAR (LUNAR). Altitude reached was 4574 ft. AGL.
Full-scale Test Flights	Took place March 4th at Livermore Unit NAR (LUNAR). Altitude reached was 4541 ft. AGL. Another fuul-scale test flight is scheduled for March 12th.

Additional Comments