

Milestone Review Flysheet

Institution University of California Berkeley

Milestone PDR

Vehicle Properties

Total Length (in)	96
Diameter (in)	6
Gross Lift Off Weigh (lb)	29.25
Airframe Material	Blue Tube
Fin Material	Fiberglass
Coupler Length (in)	6

Stability Analysis

Center of Pressure (in from nose)	71.293
Center of Gravity (in from nose)	57.236
Static Stability Margin	2.34
Static Stability Margin (off launch rail)	2.38
Thrust-to-Weight Ratio	8.839
Rail Size and Length (in)	96
Rail Exit Velocity (ft/s)	67.4

Recovery System Properties

Dogue 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	L
Max/Average Thrust (lb)	303/259
Total Impulse (lbf-s)	791
Mass Before/After Burn	8.1/3.9
Liftoff Thrust (lb)	1262
Motor Retention	Aft and fore closure screws

Ascent Analysis

Maximum Velocity (ft/s)	747
Maximum Mach Number	0.66
Maximum Acceleration (ft/s^2)	300
Target Apogee (From Simulations)	5697
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	***Required by CDR***
Black Powder Mass Drogue Chute (grams)	2.97 g
Black Powder Mass Main Chute (grams)	0.2 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

Have not yet been scheduled. Planning is in progress and first test will occur 1-2 weeks before first sub-scale test flight.

Sub-scale Test
Flights

Scheduled for December 3rd at Livermore Unit NAR (LUNAR). Alternate/back-up launch date scheduled for December 17th at Fresno TRA.

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