

Milestone Review Flysheet 2017-2018

Institution Tarleton State University

Milestone FRR

Vehicle Properties

Total Length (in)	120"
Diameter (in)	6"
Gross Lift Off Weigh (lb.)	51.677
Airframe Material(s)	G12 Fiberglass
Fin Material and Thickness (in)	G10 Fiberglass, 1/4"
Coupler Length/Shoulder Length(s) (in)	12"/ 6"

Motor Properties

Motor Brand/Designation	L2200G
Max/Average Thrust (lb.)	696.94/494.58
Total Impulse (lbf-s)	1147.42
Mass Before/After Burn (lb.)	167.36/88.75
Liftoff Thrust (lb.)	562.14
Motor Retention Method	Quick Change Flange Mount

Stability Analysis

Center of Pressure (in from nose)	92.6292"
Center of Gravity (in from nose)	78.45"
Static Stability Margin (on pad)	2.3
Static Stability Margin (at rail exit)	2.57
Thrust-to-Weight Ratio	22.203:1
Rail Size/Type and Length (in)	1515/Extruded Aluminum 10'
Rail Exit Velocity (ft/s)	83.183

Ascent Analysis

Maximum Velocity (ft/s)	646.23
Maximum Mach Number	0.5742
Maximum Acceleration (ft/s^2)	450
Predicted Apogee (From Sim.) (ft)	5255

Recovery System Properties

Drogue Parachute

Manufacturer/Model	b2 Rocketry/ SkyAngle Cert 3
Size/Diameter (in or ft)	Drogue - 21.8'
Altitude at Deployment (ft)	Apogee
Velocity at Deployment (ft/s)	0
Terminal Velocity (ft/s)	120
Recovery Harness Material	Kevlar
Recovery Harness Size/Thickness (in)	1/2"
Recovery Harness Length (ft)	30'

Recovery System Properties

Main Parachute

Manufacturer/Model	b2 Rocketry/ SkyAngle Cert 3
Size/Diameter (in or ft)	XXL - 105"
Altitude at Deployment (ft)	500'
Velocity at Deployment (ft/s)	120
Terminal Velocity (ft/s)	15
Recovery Harness Material	Kevlar
Recovery Harness Size/Thickness (in)	1/2"
Recovery Harness Length (ft)	30'

Harness/Airframe Interfaces

Parachute is tied to Kevlar shock cord. The Kevlar shock cord is tied to U-bolts which are bolted to bulkplates with backing plate. Bulkplates, with the exception of AV Bay lids, are epoxied in using Proline 4500.

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Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	2301.27	2675.12	3790.93	N/A

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	40.55	47.15	66.8	N/A

Recovery Electronics

Altimeter(s)/Timer(s) (Make/Model)	StratoLogger CF
Redundancy Plan and Backup Deployment Settings	One Extra StratoLogger CF
Pad Stay Time (Launch Configuration)	10 Hours

Recovery Electronics

Rocket Locators (Make/Model)	Garmin DC50		
Transmitting Frequencies (all - vehicle and payload)	151,880 MHz		
Ejection System Energetics (ex. Black Powder)			
Energetics Mass - Drogue Chute (grams)	Primary		
	Backup		
Energetics Mass - Main Chute (grams)	Primary		
	Backup		
Energetics Masses - Other (grams) - If Applicable	Primary		
	Backup		

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Payload

Payload 1 (official payload)	Overview
	The payload is a rover that will be autonomously deployed after landing. The weight of the rover is 41.274 ounces. The rover is stowed in a section directly behind the nose cone. After the rover deploys, it will 5 feet and deploy solar panels.
Payload 2 (non scored payload)	Overview

Test Plans, Status, and Results

Ejection Charge Tests	Ejection charge tests are an important part of this project and used to ensure that premature deployment does not happen during flight as well as to keep stress of the recovery system at a minimum. All tests will be scheduled the day before a test launch.
Sub-scale Test Flights	A minimum of two sub-scale test flights will be scheduled. All sub-scale flights will happen prior to any full-scale test flights.
Full-scale Test Flights	No full-scale test flights will occur until a successful sub-scale flight has been completed. The first few full-scale flights will be focused on a successful flight and recovery. Every flight afterward will be focused on achieving the target apogee.

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Additional Comments