

## Milestone Review Flysheet 2017-2018

**Institution** Tarleton State University

**Milestone** CDR

### Vehicle Properties

Total Length (in)	120"
Diameter (in)	6"
Gross Lift Off Weigh (lb.)	49.11
Airframe Material(s)	G12 Fiberglass
Fin Material and Thickness (in)	G10 Fiberglass, 1/4"
Coupler Length/Shoulder Length(s) (in)	12"/ 6"

### Stability Analysis

Center of Pressure (in from nose)	92.6292"
Center of Gravity (in from nose)	79.1482"
Static Stability Margin (on pad)	2.26
Static Stability Margin (at rail exit)	2.33
Thrust-to-Weight Ratio	10.07:1
Rail Size/Type and Length (in)	1515/Extruded Aluminum 10'
Rail Exit Velocity (ft/s)	83.183

### 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'			
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.			
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	2301.27	2675.12	3790.93	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

### 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

### Ascent Analysis

Maximum Velocity (ft/s)	681.57
Maximum Mach Number	0.606
Maximum Acceleration (ft/s^2)	1844.57
Predicted Apogee (From Sim.) (ft)	5280

### 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.			
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	41.058	34.522	73.5949	N/A

### 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	4 grams	
	Backup	4 grams	
Energetics Mass - Main Chute (grams)	Primary	4 grams	
	Backup	4 grams	
Energetics Masses - Other (grams) - If Applicable	Primary		
	Backup		

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Payload	
Payload 1 (official payload)	Overview
	Option 2 Deployable Rover
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**

