

Milestone Review Flysheet 2017-2018

Institution Lenoir-Rhyne University

Milestone PDR

Vehicle Properties

Total Length (in)	77"
Diameter (in)	4" to 5"
Gross Lift Off Weigh (lb.)	23.6
Airframe Material(s)	Fiber Glass
Fin Material and Thickness (in)	Fiber Glass, 1/4"
Coupler Length/Shoulder Length(s) (in)	3 1/2" 1/4"

Motor Properties

Motor Brand/Designation	K660-17
Max/Average Thrust (lb.)	242/148
Total Impulse (lbf-s)	536
Mass Before/After Burn (lb.)	4.3/1.70
Liftoff Thrust (lb.)	243
Motor Retention Method	Aero Pack retaina

Stability Analysis

Center of Pressure (in from nose)	56.3"
Center of Gravity (in from nose)	39.1"
Static Stability Margin (on pad)	3.4
Static Stability Margin (at rail exit)	3.4
Thrust-to-Weight Ratio	6.3
Rail Size/Type and Length (in)	1/4", 8'
Rail Exit Velocity (ft/s)	70

Ascent Analysis

Maximum Velocity (ft/s)	63
Maximum Mach Number	0.5
Maximum Acceleration (ft/s^2)	29
Predicted Apogee (From Sim.) (ft)	5,5

Recovery System Properties

Drogue Parachute

Manufacturer/Model	Fruity chutes/Elliptical
Size/Diameter (in or ft)	36"
Altitude at Deployment (ft)	5,530
Velocity at Deployment (ft/s)	15
Terminal Velocity (ft/s)	42
Recovery Harness Material	Tubular Nylon
Recovery Harness Size/Thickness (in)	7 /16"
Recovery Harness Length (ft)	240"

Recovery System Properties

Main Parachute

Manufacturer/Model	Fruity ch
Size/Diameter (in or ft)	72
Altitude at Deployment (ft)	100
Velocity at Deployment (ft/s)	42
Terminal Velocity (ft/s)	15
Recovery Harness Material	Tubular
Recovery Harness Size/Thickness (in)	7/1
Recovery Harness Length (ft)	10

Harness/Airframe Interfaces

U-Bolts and Quick Links

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

Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3
	56.9	N/A	N/A

Recovery Electronics

Altimeter(s)/Timer(s) (Make/Model)	Perfectflite StartologgerCF and Marsa 54
Redundancy Plan and Backup Deployment Settings	apogee. StratologgerCF at 1000ft. Marsa 54 at 800ft
Pad Stay Time (Launch Configuration)	An hour

Recovery Electronics

Rocket Locators (Make/Model)	Big Red Bee/ Beelir	
Transmitting Frequencies (all - vehicle and payload)	***Required by CDR	
Ejection System Energetics (ex. Black Powder)	4F Black	
Energetics Mass - Drogue Chute (grams)	Primary	2
	Backup Primary	2. Mair
Energetics Masses - Other (grams) - If Applicable		Mair
	Backup	

Project Overview

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Payload

	Overview
Payload 1 (official payload)	<p>have a spring-loaded mechanism that is activated by a Xbee communication system. We are also enhousing a spherical rover to move five feet and de</p>
	Overview
Payload 2 (non-scored payload)	N/A

Test Plans, Status, and Results

Ejection Charge Tests	<p>We will statically ground test all ejection charges. The team will also test how to implement ejection charges with altimeters on sub scale test</p>
Sub-scale Test Flights	<p>The BEAR Team had two succesful test launches of its sub-scale rocket, which was launched on October 20th, 2017. The objectives of the flight were stability test of rocket, the recovery system, the altituide test, the flight safety. The launch also provided experience for new members. Additional flights will be attempted to further test quality of rocket design, altimeter usage with ejection charges and tracking/communication with the</p>
Full-scale Test Flights	<p>We will fly at least full scale rocket with altimeters and ballast weight to prove stability of rocket design and workmanship. We will fly at least on fi with a lower impulse motor and full payload electronics. We will fly at least one full scale rocket with the competition motor and full payload electr may fly part of the full scale rocket (the payload/rover section) on a smaller rocket for testing of spring burn wire system and rover deployment, performed, this will most likely be a minimum of two flights and a maximum of five flights. This rocket would most likely use motors of I imp</p>

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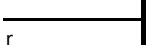
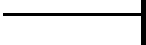
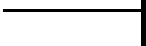
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Additional Comments

N/A



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9

30



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2

5

Nylon

6"

0

aks

Section 4

N/A



re MP

Powder



5

1.5

1.2.0

1.2.0





employ solar panels



flights.

to conduct a sub scale test of the rocket.

full scale rocket tests. The team will conduct a series of tests to determine the maximum thrust and motion. If the results are not satisfactory, the team will adjust the design and conduct further tests.



