Milestone Review Flysheet 2017-2018

Institution	Purdue University	Milestone	PDR

Vehicle Properties

Total Length (in)	121
Diameter (in)	5.15
Gross Lift Off Weigh (lb.)	35.4
Airframe Material(s)	FWFG
Fin Material and Thickness (in)	0.1875 G10 FG
Coupler Length/Shoulder Length(s) (in)	12/5

Motor Properties

Motor Brand/Designation	Aerotech L1520-T
Max/Average Thrust (lb.)	352.5
Total Impulse (lbf-s)	835.16
Mass Before/After Burn (lb.)	8.05/4.09
Liftoff Thrust (lb.)	340.1
Motor Retention Method	Aeropack Retainer

Stability Analysis

Center of Pressure (in from nose)	94.79
Center of Gravity (in from nose)	77.38
Static Stability Margin (on pad)	3.38
Static Stability Margin (at rail exit)	2.49
Thrust-to-Weight Ratio	9.9
Rail Size/Type and Length (in)	1.5, 144
Rail Exit Velocity (ft/s)	83.45

Ascent Analysis

Maximum Velocity (ft/s)	692.27
Maximum Mach Number	0.62
Maximum Acceleration (ft/s^2)	323
Predicted Apogee (From Sim.) (ft)	5640

Recovery System Properties
Drogue Parachute

Manufacturer/Model	Skyangle B2
Size/Diameter (in or ft)	24"
Altitude at Deployment (ft)	Apogee
Velocity at Deployment (ft/s)	2
Terminal Velocity (ft/s)	92
Recovery Harness Material	Tubular Kevlar
Recovery Harness Size/Thickness (in)	1/2" Thick
Recovery Harness Length (ft)	40'
Harness/Airframe Interfaces	1/4" SS quick link through looped tether ends and 1/4" SS U-bolts through bulkheads

Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	2315	1277	550	N/A

Recovery System Properties
Main Parachute

Manufacturer/Model	Skyanele B2
Size/Diameter (in or ft)	100"
Altitude at Deployment (ft)	700
Velocity at Deployment (ft/s)	86
Terminal Velocity (ft/s)	13
Recovery Harness Material	Tubular Kevlar
Recovery Harness Size/Thickness (in)	1/2" Thick
Recovery Harness Length (ft)	40'
Harness/Airframe Interfaces	1/4" SS quick link through looped tether ends and 1/4" SS U-bolts through bulkheads

Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	42.5	23.43	10.01	N/A

Recovery Electronics

Altimeter(s)/Timer(s) (Make/Model)	Altus Metrum Telemetrum, Missileworks RRC3+ Sport
Redundancy Plan and Backup Deployment Settings	Fully redundant and independent systems with individual batteries, switches, wires, and ejection charges
Pad Stay Time (Launch Configuration)	

Recovery Electronics

Rocket Locators (Make/Model)		Altus Metrum Telemetrum
Transmitting Frequencies (all - vehicle and payload)		***Required by CDR***
ection System Energetics (ex. Black Powder		Black Powder
Energetics Mass - Drogue Chute (grams)	Primary	3.2
	Backup	3.2
Energetics Mass - Main Chute (grams)	Primary	3.2
	Backup	3.2
Energetics Masses - Other (grams) - If Applicable	Primary	N/A
	Backup	N/A

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Payload

	Overview
Payload 1 (official payload)	Our payload is programmed to identify three 40'x40' tarps with known RGB values in real time. This is done by processing live video taken from an onboard camera with a Rasberry Pi.
Payload 2 (non-scored payload)	N/A

Test Plans, Status, and Results

Ejection Charge Tests	Will perform continuity checks using light bulbs to detect opens or shorts and ensure a complete circuit. Will also ground test using energetics prior to flight to ensure proper pressurization and recovery gear deployment.
Sub-scale Test Flights	WIll fly an exact scale model of our full scale rocket on a smaller motor with a live payload onboard and tarps staked on the field. This will ensure that the design is sound and stable, the ejection system and recovery gear works as intended, and that the payload system can correctly identify shapes and colors.
Full-scale Test Flights	Will fly a full scale rocket on a full scale motor as if it were the scored flight. The rocket will contain a working redundant camera system and tarps of different colors will be staked to the ground. This will ensure that the design is sound and stable, our ejection system and recovery gear works as intended, and the payload functions properly

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Additional Comments