

Milestone Review Flysheet 2017-2018

Institution University of Toledo

Milestone PDR

Vehicle Properties	
Total Length (in)	86.97
Diameter (in)	5
Gross Lift Off Weigh (lb.)	26 lb
Airframe Material(s)	Fiberglass
Fin Material and Thickness (in)	Fiberglass
Coupler Length/Shoulder Length(s) (in)	4"

Motor Properties	
Motor Brand/Designation	Aerotech/K1000T-P
Max/Average Thrust (lb.)	256.28/227.51 lbf
Total Impulse (lbf-s)	561.34 lbf-s
Mass Before/After Burn (lb.)	90.8/49.1oz
Liftoff Thrust (lb.)	256.28 lbf
Motor Retention Method	Aeropack Retainer

Stability Analysis	
Center of Pressure (in from nose)	65.91 in
Center of Gravity (in from nose)	53.27 in
Static Stability Margin (on pad)	2.53
Static Stability Margin (at rail exit)	2.46
Thrust-to-Weight Ratio	9:01
Rail Size/Type and Length (in)	1010 8"
Rail Exit Velocity (ft/s)	69.5 ft/s

Ascent Analysis	
Maximum Velocity (ft/s)	660 ft/s
Maximum Mach Number	0.59
Maximum Acceleration (ft/s^2)	289.95 ft/s
Predicted Apogee (From Sim.) (ft)	5355

Recovery System Properties				
Drogue Parachute				
Manufacturer/Model	SkyAngle			
Size/Diameter (in or ft)	32in			
Altitude at Deployment (ft)	5355 ft			
Velocity at Deployment (ft/s)	9.43 ft/s			
Terminal Velocity (ft/s)	56.60 ft/s			
Recovery Harness Material	tubular nylon			
Recovery Harness Size/Thickness (in)	1/2 in			
Recovery Harness Length (ft)	25 ft			
Harness/Airframe Interfaces	1/4-20 forged eyebolts and quick links.			
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	595.98	237.26	N/A	N/A

Recovery System Properties				
Main Parachute				
Manufacturer/Model	SkyAngle			
Size/Diameter (in or ft)	80 in			
Altitude at Deployment (ft)	700 feet			
Velocity at Deployment (ft/s)	56.60 ft/a			
Terminal Velocity (ft/s)	19.65 ft/s			
Recovery Harness Material	Tubular Nylon			
Recovery Harness Size/Thickness (in)	1/2 inch			
Recovery Harness Length (ft)	25 ft			
Harness/Airframe Interfaces	1/4-20 forged eyebolts and quick links.			
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	55.37	25.27	32.1	N/A

Recovery Electronics	
Altimeter(s)/Timer(s) (Make/Model)	StratologgerCF
Redundancy Plan and Backup Deployment Settings	Second independent StrattologgerCF. Back up drogue with 1 second delay, backup main with 50 ft delay
Pad Stay Time (Launch Configuration)	1+ hours

Recovery Electronics		
Rocket Locators (Make/Model)	AltusMetrum TeleGPS	
Transmitting Frequencies (all - vehicle and payload)	***Required by CDR***	
Ejection System Energetics (ex. Black Powder)	Black Powder	
Energetics Mass - Drogue Chute (grams)	Primary	2 g
	Backup	3 g
Energetics Mass - Main Chute (grams)	Primary	2 g
	Backup	3 g
Energetics Masses - Other (grams) - If Applicable	Primary	
	Backup	

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Payload

Payload	
Payload 1 (official payload)	Overview
	ystem. A CO2 ejection system will be used to deploy the nosecone of the rocket to allow the rover to exit. After deployment, the rover will drive a minimum of 5
Payload 2 (non- scored payload)	Overview
	N/A

Test Plans, Status, and Results

Ejection Charge Tests	Ejection tests will be performed on the ground before every flight.
Sub-scale Test Flights	The subscale test vehicle is under construction with a tentative launch date of December 2, 2017.
Full-scale Test Flights	A full scale test vehicle will be constructed and flown before FRR.

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Additional Comments