

Milestone Review Flysheet

Institution The University of Akron

Milestone PDR

Vehicle Properties	
Total Length (in)	121
Diameter (in)	5
Gross Lift Off Weigh (lb)	41
Airframe Material	Fiberglass
Fin Material	Fiberglass
Coupler Length	10

Motor Properties	
Motor Designation	Aerotech
Max/Average Thrust (lb)	371/303
Total Impulse (lbf-s)	887
Mass Before/After Burn	8.55/4.2
Liftoff Thrust (lb)	214
Motor Retention	Thrust plate with center rings

Stability Analysis	
Center of Pressure (in from nose)	83.217
Center of Gravity (in from nose)	70.637
Static Stability Margin	2.45
Static Stability Margin (off launch rail)	2.45
Thrust-to-Weight Ratio	7.5
Rail Size and Length (in)	144
Rail Exit Velocity	73.4 ft/s

Ascent Analysis		
Maximum Velocity (ft/s)	615	
Maximum Mach Number	0.55	
Maximum Acceleration (ft/s ²)	266	
Target Apogee (From Simulations)	5312	
Stable Velocity (ft/s)	50	
Distance to Stable Velocity (ft)	8	

Recovery System Properties				
Dogue Parachute				
Manufacturer/Model	Elliptical handmade of Rip-Stop Nylon			
Size	30in Diameter			
Altitude at Deployment (ft)	5,280			
Velocity at Deployment (ft/s)	0			
Terminal Velocity (ft/s)	80.28			
Recovery Harness Material	Tubular Webbed Nylon			
Harness Size/Thickness (in)	5/8			
Recovery Harness Length (ft)	2			
Harness/Airframe Interfaces	22ft of 1" Mil-Spec 17337 cord connected by swivel to QTY (2) 2ft harnesses. Harnesses are fastened to airframe by U-Bolts.			
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	3002.0	2001.3		

Recovery System Properties				
Main Parachute				
Manufacturer/Model	Annular handmade of Rip-Stop Nylon			
Size	165in Diameter			
Altitude at Deployment (ft)	800			
Velocity at Deployment (ft/s)	80.28			
Terminal Velocity (ft/s)	11.35			
Recovery Harness Material	Tubular Webbed Nylon			
Harness Size/Thickness (in)	5/8			
Recovery Harness Length (ft)	2			
Harness/Airframe Interfaces	24ft of 1" Mil-Spec 17337 cord connected by swivel to QTY (2) 2ft harnesses. Harnesses are fastened to airframe by U-Bolts.			
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	6.0	54.0	40.0	

Recovery Electronics	
Altimeter(s)/Timer(s) (Make/Model)	QTY (2) PerfectFlite StratologgerCF
Redundancy Plan	Each Altimeter is capable of drogue and main parachute deployment. The main altimeter will be linked to the main CO2 charges. The redundant Altimeter will be connected to redundant CO2 charges.
Pad Stay Time (Launch Configuration)	3 hours

Recovery Electronics	
Rocket Locators (Make/Model)	Trimble Copernicus II
Transmitting Frequencies	Xbee-PRO 900HB: 902-928 MHz
Black Powder Mass Drogue Chute (grams)	CO2 (est. 20g. Ground tests for sub-scale launch will confirm)
Black Powder Mass Main Chute (grams)	CO2 (est. 40g Ground tests for sub-scale launch will confirm)

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Autonomous Ground Support Equipment (MAV Teams Only)

Capture Mechanism	Overview
Container Mechanism	Overview
Launch Rail Mechanism	Overview
Igniter Installation Mechanism	Overview

Payload

Payload 1	Overview
Payload 2	Overview

Test Plans, Status, and Results

Ejection Charge Tests	A ground test will be done prior to sub-scale flight tests to ensure the selected CO2 amount is appropriate to fully and reliably eject the main and drogue parachutes. Once Ground tests are successful for the sub-scale flight, 1:1 tests will be done.
Sub-scale Test Flights	
Full-scale Test Flights	

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Additional Comments