Milestone Review Flysheet

Institution	The University of Akron

Milestone	CDR

Vehicle Properties	
Total Length (in)	147
Diameter (in)	5.125
Gross Lift Off Weigh (lb)	46.9
Airframe Material	Carbon Fiber/Fiberglass
Fin Material	Fiberglass
Coupler Length	10

Motor Properties	
Motor Designation	L2200G-P
Max/Average Thrust (lb)	697/504
Total Impulse (lbf-s)	1147.4
Mass Before/After Burn	10.5/4.93
Liftoff Thrust (lb)	543
Motor Retention	Thrust plate with center rings

Stability Analysis	
Center of Pressure (in from nose)	117.7
Center of Gravity (in from nose)	98.5
Static Stability Margin	3.84
Static Stability Margin (off launch rail)	3.57
Thrust-to-Weight Ratio	11.58
Rail Size and Length (in)	144
Rail Exit Velocity	92.8 ft/s

Ascent Analysis		
Maximum Velocity (ft/s)	703.7	
Maximum Mach Number	0.64	
Maximum Acceleration (ft/s^2)	458.7	
Target Apogee (From Simulations)	5442	
Stable Velocity (ft/s)	50	
Distance to Stable Velocity (ft)	4	

Recovery System Properties				
Dogue Parachute				
Manufacturer/Model		Student Designed - Elliptical		
Size		17 in diameter		
Altitude at Deployment (ft)			Apogee	
Velocity at Deployment (ft/s)			0	
Terminal Velocity (ft/s)			133	
Recovery Harness Material			Flat Webbed Nylon	
Harness Size/Thickness (in)			3/4"	
Recovery Harness Length (ft)			18	
Harness/Airframe Interfaces		2500 lb swivel hoist ring. Quick link of shock cord to hoist ring through carabiner.		
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	6549	5751		

Recovery System Properties				
Main Parachute				
Manufacturer/Model		Student Designed - Annular		
Size		130 in diameter		
Altitude at Deployment (ft)			850	
Velocity at Deployment (ft/s)			143.44	
Terminal Velocity (ft/s)			15	
Recovery Harness Material			Flat Webbed Nylon	
Harness Size/Thickness (in)			3/4"	
Recovery Harness Length (ft)			16	
Harness/Airframe Interfaces		2500 lb swivel hoist ring. Quick link of shock cord to hoist ring through carabiner.		
Kinetic Enerfy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	66.3	47.3	8	

Recovery Electonics	
Altimeter(s)/Timer(s) (Make/Model)	PerfectFlite StratologgerCF (x2)
Redundancy Plan	Each Altimeter is capable of drogue and main parachute deployment. Each altimeter will be connected to its own CO2 charge
Pad Stay Time (Launch Configuration)	1 hour 30 minutes

Recovery Electonics	
Rocket Locators (Make/Model)	Trimble Copernicus II
Transmitting Frequencies	Xbee-PRO 900: 900 MHz
Black Powder Mass Drogue Chute (grams)	CO2 23g
Black Powder Mass Main Chute (grams)	CO2 45g

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Payload	
Payload 1	Overview
	The payload will house a fragile material and protect it from the forces of a rocket launch and landing. It will utilize a spring/damper system, ballistic gel, and inflatable bladders. The bladders will be filled with air from the atmosphere using a pump.
Payload 2	Overview
	N/A

Test Plans, Status, and Results	
Ejection Charge Tests	Ejection charge tests were conducted on both drogue and main chute bays to ensure proper separation. Both tests were successful.
Sub-scale Test Flights	A test flight was performed with a successful ascent, but an unsuccessful recovery. It was concluded that the black powder charge that is used to puncture the CO2 canister vented out the wrong end of the ejection system. It is further discussed in section 4.
Full-scale Test Flights	The full scale flight test was performed, but a fiberglass tube ended up breaking during flight. Another test flight is scheduled later in March.

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Additional Comments