Milestone Review Flysheet

Institutio	University of Iowa	Milestone	PDR

Vehicle Properties

Total Length (in)	66.14
Diameter (in)	48
Gross Lift Off Weigh (lb)	10.91
Airframe Material	Fiberglass
Fin Material	Carbon Fiber
Drag	Yes

Motor Properties

Motor Manufacturer	Cesaroni
Motor Designation	K261-P
Max/Average Thrust (lb)	83.2/58.4
Total Impulse (lbf-s)	454.7
Mass Before/After Burn	4.23/1.6
Liftoff Thrust (lb)	27.27

Stability Analysis

Center of Pressure (in from nose)	53.15 in
Center of Gravity (in from nose)	43.7 in
Static Stability Margin	2.36 cal
Static Stability Margin (off launch rail)	2.37
Thrust-to-Weight Ratio	7.63
Rail Size and Length (in)	3in, 6ft
Rail Exit Velocity	54.46 ft/s

Ascent Analysis

Maximum Veloxity (ft/s)	797.24
Maximum Mach Number	0.725
Maximum Acceleration (ft/s^2)	209
Target Apogee (From Simulations)	5226.38 ft
Stable Velocity (ft/s)	45
Distance to Stable Velocity (ft)	3ft

Recovery System Properties

Dogue Parachute

Manufacturer/Model	Sunward Group Ltd.
Size	5 x 50 in
Altitude at Deployment (ft)	5226.38
Velocity at Deployment (ft/s)	797.24
Terminal Velocity (ft/s)	24.02
Recovery Harness Material	
Harness Size/Thickness (in)	
Recovery Harness Length (ft)	
Harness/Airframe Interfaces	
Kinetic	

	Section 1	Section 2	Section 3	Section 4

Recovery System Properties

Main Parachute

Manufacturer/Model	Fruity Chutes
Size	36 in diameter
Altitude at Deployment (ft)	5026.38
Velocity at Deployment (ft/s)	531.5
Terminal Velocity (ft/s)	24.02
Recovery Harness Material	
Harness Size/Thickness (in)	
Recovery Harness Length (ft)	
Harness/Airframe Interfaces	
Kinetic	

	Section 1	Section 2	Section 3	Section 4

Recovery Electonics	
Altimeter(s)/Timer(s) (Make/Model)	
Redundancy Plan	
Pad Stay Time (Launch Configuration)	

Recovery Electonics	
Rocket Locators (Make/Model)	
Transmitting Frequencies	***Required by CDR***
Black Powder Mass Drogue Chute (grams)	
Black Powder Mass Main Chute (grams)	

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Autonomous Ground Support Equipment (MAV Teams Only)	
Capture Mechanism	Overview
	Capture mechanisms will consist of linear actuators and servo powered conveyor belts.
Container Mechanism	Overview
	Container methods will consist of enclosed metal conveyor systems and a rotating cargobay within the rocket.
Launch Rail Mechanism	Overview
	The launch rail will consist of a torsion spring and winch system to bring the rail to full height. A lock between the grounded lauch pad and the rotating rail will consist of a latch connecting the two
Igniter Installation Mechanism	Overview
	Igniters will be inserted into the rocket by a linear actuator and a voltage will be applied to the ignitors.

Payload	
Payload 1	Overview The Payload bay will be a rotating inner cylander powered by a servo motor. It will be made of the same material as the outer airframe and include a light sensor to detect the PVC payload
Payload 2	Overview A sand filled PVC cylinder will be contained in the payload bay. It will be the size and shape outlined in the handbook and provided to us at the time of the competition

Test Plans, Status, and Results	
Ejection Charge Tests	We shall construct a full scale section of the recovery system to test the recovery charges. The charges will be fired with the chutes inside to verifiy successfull ejection and operation of the electronic matches.
Sub-scale Test Flights	A sub scale model of the rocket will be launched in January with Appropriate Reynolds number, thrust to weight ratio, and CP/CG locations. This will ensure the true estimate of the rocket's safety
Full-scale Test Flights	A full scale test will be designed and conducted after CDR.

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Additional Comments