

# Milestone Review Flysheet

<b>Institution</b>	Northwestern University	<b>Milestone</b>	PDR
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Vehicle Properties		Motor Properties	
Total Length (in)	108	Motor Designation	3300-L3200
Diameter (in)	5.5	Max/Average Thrust (lb)	837/721.5
Gross Lift Off Weigh (lb)	31.5	Total Impulse (lbf-s)	741.9
Airframe Material	G12 Fiberglass	Mass Before/After Burn	7.2/3.54
Fin Material	G12 Fiberglass	Liftoff Thrust (lb)	701
Coupler Length	6"	Motor Retention	Retainer ring

Stability Analysis		Ascent Analysis	
Center of Pressure (in from nose)	81.502	Maximum Velocity (ft/s)	745
Center of Gravity (in from nose)	66.034	Maximum Mach Number	0.67
Static Stability Margin	2.81	Maximum Acceleration (ft/s^2)	848
Static Stability Margin (off launch rail)	2.25	Target Apogee (From Simulations)	5221
Thrust-to-Weight Ratio	22.9:1	Stable Velocity (ft/s)	40
Rail Size and Length (in)	1.5/96	Distance to Stable Velocity (ft)	< 8
Rail Exit Velocity	104 ft/s		

Recovery System Properties		Recovery System Properties	
Dogue Parachute		Main Parachute	
Manufacturer/Model	Fruity Chutes: Elliptical	Manufacturer/Model	Fruity Chutes: Iris Ultra Parachute
Size	18"	Size	108"
Altitude at Deployment (ft)	5221	Altitude at Deployment (ft)	700
Velocity at Deployment (ft/s)	0	Velocity at Deployment (ft/s)	77.43
Terminal Velocity (ft/s)	77.43	Terminal Velocity (ft/s)	12.73
Recovery Harness Material	Nylon	Recovery Harness Material	Nylon
Harness Size/Thickness (in)	9/16"	Harness Size/Thickness (in)	9/16"
Recovery Harness Length (ft)	45	Recovery Harness Length (ft)	24
Harness/Airframe Interfaces	Threaded welded eye bolts and 880 lb quick links	Harness/Airframe Interfaces	Threaded welded eye bolts and 880 lb quick links

Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4	Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	2593					71			

Recovery Electronics				Recovery Electronics			
Altimeter(s)/Timer(s) (Make/Model)	2 Missileworks RRC3			Rocket Locators (Make/Model)	Specialist Rocket Hunters beacon		
Redundancy Plan	with one acting as a backup. They both set off charges independently of each other			Transmitting Frequencies	223.450, 223.210, 222.180, 223.330		
Pad Stay Time (Launch Configuration)	are powered on the pad stay time is 1 hour			Black Powder Mass Drogue Chute (grams)	2.5		
				Black Powder Mass Main Chute (grams)	2.5		

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### Autonomous Ground Support Equipment (MAV Teams Only)

Capture Mechanism	Overview
Container Mechanism	Overview
Launch Rail Mechanism	Overview
	***Include Description of rail locking mechanism***
Igniter Installation Mechanism	Overview

Payload	
Payload 1	Overview
	An electrical motor will rotate a flywheel inside the launch vehicle post motor burnout, which will induce a counter-spin of the vehicle body to maintain the system's angular momentum.
Payload 2	Overview
	An actuator will extend angled fins out of the vehicle's body, inducing rotation of the vehicle. Once 2 rotations have been achieved, a second set of angled fins will be extended to produce a counter-moment to stop rotation.
Test Plans, Status, and Results	
Ejection Charge Tests	Ground test before both subscale flight and fullscale flight
Sub-scale Test Flights	56" subscale is under construction, no test flight yet
Full-scale Test Flights	Waiting for successful subscale flight
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Additional Comments	



