

# Milestone Review Flysheet

<b>Institution</b>	Northeastern University	<b>Milestone</b>	Critical Design Review
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Vehicle Properties		Motor Properties	
Total Length (in)	140	Motor Designation	Cesaroni L1395 Bluestreak
Diameter (in)	6.16	Max/Average Thrust (lb)	404.66/328.9
Gross Lift Off Weigh (lb)	45.713	Total Impulse (lbf-s)	1101.46
Airframe Material	BlueTube	Mass Before/After Burn	4.323 kg before and 1.848 kg after
Fin Material	G10 Fiberglass	Liftoff Thrust (lb)	359.694
Coupler Length	2 x 12 inch coupler with 6 inch overlap, 2 x 14 inch coupler with 7 inch overap	Motor Retention	Aeropack 75mm Motor Retainer

Stability Analysis		Ascent Analysis	
Center of Pressure (in from nose)	101.23 in.	Maximum Velocity (ft/s)	650
Center of Gravity (in from nose)	85.01 in.	Maximum Mach Number	0.58
Static Stability Margin	5.224 calibers of stability	Maximum Acceleration (ft/s^2)	248.15
Static Stability Margin (off launch rail)	4.258 calibers of stability	Target Apogee (From Simulations)	5318 ft
Thrust-to-Weight Ratio	7.125	Stable Velocity (ft/s)	52
Rail Size and Length (in)	1.5 X 1.5 in rail with length of 144 in	Distance to Stable Velocity (ft)	6.25
Rail Exit Velocity	73.82 feet per second		

Recovery System Properties		Recovery System Properties	
Drogue Parachute		Main Parachute	
Manufacturer/Model	Fruity Chutes Compact Elliptical Parachute	Manufacturer/Model	Fruity Chutes Iris Ultra Light Parachute
Size	18 in.	Size	Payload Section - 60 in. Booster Stage - 66 in.
Altitude at Deployment (ft)	Payload Section - 5280 ft Booster Stage - 5173 ft	Altitude at Deployment (ft)	Payload Section - 300 ft Booster Stage - 500 ft
Velocity at Deployment (ft/s)	Payload Section - 0 ft per sec Booster Stage - 25 ft per sec	Velocity at Deployment (ft/s)	Payload Section - 80 ft per sec Booster Stage - 90 ft per sec
Terminal Velocity (ft/s)	Payload Section - 80 ft per sec Booster Stage - 90 ft per sec	Terminal Velocity (ft/s)	Payload Section - 18 ft per sec Booster Stage - 19 ft per sec

Recovery Harness Material		Kevlar			Recovery Harness Material		Kevlar		
Harness Size/Thickness (in)		1/4			Harness Size/Thickness (in)		1/2		
Recovery Harness Length (ft)		15			Recovery Harness Length (ft)		40		
Harness/Airframe Interfaces		1/4 in - 20 eyebolt			Harness/Airframe Interfaces		1/2 - 13 hoist ring with 2 in. washers		
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
	25.99	61.68	71.74	65.11		25.99	61.68	71.74	65.11

Recovery Electronics				Recovery Electronics			
Altimeter(s)/Timer(s) (Make/Model)	Perfect Flite StratoLogger CF			Rocket Locators (Make/Model)	XBEE Pro XSC (S3), BigRedBee 2 M High Power GPS		
Redundancy Plan	2 StratoLoggers per black powder charge			Transmitting Frequencies	900 Mhz, 900 Mhz		
Pad Stay Time (Launch Configuration)	according to StratoLogger manual			Black Powder Mass Drogue Chute (grams)	Payload Section - 2 x 1.3 Booster Stage - 2 x 1.3		
				Black Powder Mass Main Chute (grams)	Payload Section - 2 x 1.3 Booster Stage - 2 x 1.3		

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

Capture Mechanism	Overview
Container Mechanism	Overview
	Overview

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

**Payload**

Payload 1	Overview
	Our payload is a very passive system because we wanted to minimize failure of the system. The payload should not leave the launch vehicle at any point during the launch. It will be recovered with the rocket via parachute and should not itself affect safety of the launch vehicle
Payload 2	Overview

**Test Plans, Status, and Results**

Ejection Charge Tests	Will statically ejection test all parachutes.
Sub-scale Test Flights	Sub-scale test to prove aerodynamic stability of design
Full-scale Test Flights	Full-scale to launch in Febuary/March to prove stability and structural integrity of design

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Institution	Milestone
Additional Comments	

