

Milestone Review Flysheet 2017-2018

Institution St.Monica's Homeschool Group

Milestone PDR

Vehicle Properties

Total Length (in)	90.3
Diameter (in)	4.04
Gross Lift Off Weigh (lb.)	20.9 lb.
Airframe Material(s)	Blue Tube
Fin Material and Thickness (in)	Aircraft Plywood 1/4"
Coupler Length/Shoulder Length(s) (in)	>=4.0 in.

Motor Properties

Motor Brand/Designation	Ceseroni/K-1200
Max/Average Thrust (lb.)	306.5/268.3
Total Impulse (lbf-s)	452.6
Mass Before/After Burn (lb.)	20.9/18.8
Liftoff Thrust (lb.)	277.6
Motor Retention Method	Aerotech Tailcone retainer

Stability Analysis

Center of Pressure (in from nose)	63.4311
Center of Gravity (in from nose)	50.4366
Static Stability Margin (on pad)	3.25
Static Stability Margin (at rail exit)	
Thrust-to-Weight Ratio	12.84
Rail Size/Type and Length (in)	144" 15/15
Rail Exit Velocity (ft/s)	100 ft/sec

Ascent Analysis

Maximum Velocity (ft/s)	663 ft/sec
Maximum Mach Number	0.594
Maximum Acceleration (ft/s^2)	442
Predicted Apogee (From Sim.) (ft)	5,650

Recovery System Properties

Drogue Parachute

Manufacturer/Model	Rocketman/ Ballistic Drogue
Size/Diameter (in or ft)	3'
Altitude at Deployment (ft)	1,000
Velocity at Deployment (ft/s)	125
Terminal Velocity (ft/s)	40
Recovery Harness Material	using 316 stainless steel quick links
Recovery Harness Size/Thickness (in)	3/8
Recovery Harness Length (ft)	25

Harness/Airframe Interfaces	Harness connected using 316 stainless steel quick links to welded eyebolts
-----------------------------	--

Recovery System Properties

Main Parachute

Manufacturer/Model	FruityChutes/Iris Ultra Compact
Size/Diameter (in or ft)	84"
Altitude at Deployment (ft)	500
Velocity at Deployment (ft/s)	40
Terminal Velocity (ft/s)	9.6
Recovery Harness Material	kevlar
Recovery Harness Size/Thickness (in)	3/8
Recovery Harness Length (ft)	75' or 100'

Harness/Airframe Interfaces	Harness connected using 316 stainless steel quick links to welded eyebolts			
-----------------------------	--	--	--	--

Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	40.28 lbf	23.16 lbf	16.55 lbf	

Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	1005.61 lbf	576.4 lbf	424.44 lbf	

Recovery Electronics	
Altimeter(s)/Timer(s) (Make/Model)	Primary-Featherweight Raven Secondary- Missileworks RRC3
Redundancy Plan and Backup Deployment Settings	Drogue: Primary at apogee; Secondary at apogee + 1 s. Main: Primary at 500 ft.; Secondary at 450 ft.
Pad Stay Time (Launch Configuration)	4 hours

Recovery Electronics		
Rocket Locators (Make/Model)	EggFinder Mini	
Transmitting Frequencies (all - vehicle and payload)	***Required by CDR***	
Ejection System Energetics (ex. Black Powder)	Black Powder	
Energetics Mass - Drogue Chute (grams)	Primary	
	Backup	
Energetics Mass - Main Chute (grams)	Primary	
	Backup	
Energetics Masses - Cable cutter (grams) - If Applicable	Primary	0.1
	Backup	0.1

Milestone Review Flysheet 2017-2018

Institution St.Monica's Homeschool Group

Milestone PDR

Payload	
Payload 1 (official payload)	Overview
	Live brine shrimp enviroment with cooling system and arduino controller.
Payload 2 (non-scored payload)	Overview
	N/A

Test Plans, Status, and Results

Ejection Charge Tests	The evening before test flight(sub-scale 12/1/17 and 12/8/17; full-scale 1/25/18 to 2/2/18)
Sub-scale Test Flights	Scheduled between 12/2/17 and 12/9/17 at CATO field in Durham
Full-scale Test Flights	scheduled 1/27/18 to 2/3/18 at CATO field in Durham
Milestone Review Flysheet 2017-2018	

Institution St.Monica's Homeschool Group

Milestone PDR

Additional Comments

At apogee, our drogue parachute bundle will be deployed. The bundle will be secured by a zip tie and two cable cutter deployment devices. Deploying a bundle in this manner will allow the rocket to descend very quickly. When the rocket hits 1,000 ft AGL, the cable cutter devices will be engaged and allow the drogue chute to open completely.