

# Milestone Review Flysheet 2017-2018

**Institution** St. Monica's Homeschool

**Milestone** CDR

Vehicle Properties	
Total Length (in)	100.8
Diameter (in)	4.04
Gross Lift Off Weigh (lb.)	22.87
Airframe Material(s)	BlueTube
Fin Material and Thickness (in)	Aircraft plywood
Coupler Length/Shoulder Length(s) (in)	8

Motor Properties	
Motor Brand/Designation	Aerotech K1275R
Max/Average Thrust (lb.)	353/289
Total Impulse (lbf-s)	505.4
Mass Before/After Burn (lb.)	8.19/6
Liftoff Thrust (lb.)	353
Motor Retention Method	Aero Pack Tailcone retainer

Stability Analysis	
Center of Pressure (in from nose)	63.43
Center of Gravity (in from nose)	50.44
Static Stability Margin (on pad)	3.25
Static Stability Margin (at rail exit)	3.3
Thrust-to-Weight Ratio	15.66
Rail Size/Type and Length (in)	1515
Rail Exit Velocity (ft/s)	105

Ascent Analysis	
Maximum Velocity (ft/s)	639.6
Maximum Mach Number	0.6
Maximum Acceleration (ft/s^2)	464.5
Predicted Apogee (From Sim.) (ft)	5412

Recovery System Properties				
Drogue Parachute				
Manufacturer/Model	RocketMan Ballistic Drogue Mach II			
Size/Diameter (in or ft)	3 ft			
Altitude at Deployment (ft)	5280*/1000			
Velocity at Deployment (ft/s)	0*/115			
Terminal Velocity (ft/s)	115*/40			
Recovery Harness Material	Kevlar			
Recovery Harness Size/Thickness (in)	11/32"			
Recovery Harness Length (ft)	35			
Harness/Airframe Interfaces	3/16 "stainless steel quiklinks connected to 1/4" eyenuts			
Kinetic Energy of Each Section (Ft-lbs)	Booster Assembly	Payload assembly	Section 3	Section 4
	2,477*	2,603*	N/A	N/A
	233	266		

Recovery System Properties				
Main Parachute				
Manufacturer/Model	FruityChutes Iris Ultra Compact			
Size/Diameter (in or ft)	7 ft			
Altitude at Deployment (ft)	600 ft			
Velocity at Deployment (ft/s)	40			
Terminal Velocity (ft/s)	14 ft/s			
Recovery Harness Material	kevlar			
Recovery Harness Size/Thickness (in)	11/32"			
Recovery Harness Length (ft)	35			
Harness/Airframe Interfaces	3/16 "stainless steel quiklinks connected to 1/4" eyenuts			
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	31	30	N/A	N/A

Recovery Electronics	
Altimeter(s)/Timer(s) (Make/Model)	Featherweight Raven/Missile Works RRC3 Sport
Redundancy Plan and Backup Deployment Settings	The primary drogue bundle charge at apogee, back-up at apogee +1 sec. Primary drogue at 1,000 ft. back-up at 900 ft. Primary main at 600 ft. back-up at 500 ft.
Pad Stay Time (Launch Configuration)	4 hr.

Recovery Electronics		
Rocket Locators (Make/Model)	EggTimer TRS Flight Computer	
Transmitting Frequencies (all - vehicle and payload)	119-121 in two MHz Intervals	
Ejection System Energetics (ex. Black Powder)	Black Powder	
Energetics Mass - Drogue Chute (grams)	Primary	0.5
	Backup	0.7
Energetics Mass - Main Chute (grams)	Primary	0.6
	Backup	0.9
Energetics Masses - Other (grams) - If Applicable	Primary	0.1
	Backup	0.1

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**Payload**

Payload 1 (official payload)	Overview
	We are sending brine shrimp to test the impact of G-Forces upon the shrimp. We are doing this to determine the likelihood that the shrimp could survive the forces.
Payload 2 (non- scored payload)	Overview

**Test Plans, Status, and Results**

Ejection Charge Tests	We will complete before full-scale test.
Sub-scale Flight Tests	Flight #1 12/19/17 Cd=.55 First ejection charge did not fire, main tangled with nomax. Semi-ballistic flight. Flight #2 12/30/17 Cd=.55 Perfect flight.
Full-scale Test Flights	N/A

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Additional Comments

As our first deployment stage, a parachute will be bundled up by tying the drogue with a ziptime connected to a cable cutter. The cable cutter will then go off at 1000 ft and release the drogue. The velocity at deployment is of t/s and the terminal velocity is 115 ft/s.

\*Drogue Bundle