

# Milestone Review Flysheet

**Institution** Spring Grove Area High School

**Milestone** PDR

Vehicle Properties	
Total Length (in)	85.25
Diameter (in)	4
Gross Lift Off Weigh (lb)	20.61
Airframe Material	Fiberglass
Fin Material	G10 Fiberglass
Drag	Cd. 75

Motor Properties	
Motor Manufacturer	Cesaroni
Motor Designation	K570
Max/Average Thrust (lb)	201/143
Total Impulse (lbf-s)	2062.9
Mass Before/After Burn	3.715 lb/ 1.532 lb
Liftoff Thrust (lb)	201

Stability Analysis	
Center of Pressure (in from nose)	55.48 in
Center of Gravity (in from nose)	52.34
Static Stability Margin	2.14
Static Stability Margin (off launch rail)	2.38
Thrust-to-Weight Ratio	5.81
Rail Size and Length (in)	72
Rail Exit Velocity	43.23

Ascent Analysis		
Maximum Velocity (ft/s)	605.49	
Maximum Mach Number	0.538	
Maximum Acceleration (ft/s^2)	14.36	
Target Apogee (From Simulations)	5326.97	
Stable Velocity (ft/s)	43.9993	
Distance to Stable Velocity (ft)	3.745	

Recovery System Properties				
Dogue Parachute				
Manufacturer/Model	FRUITYCHUTES/IFC			
Size	24 in			
Altitude at Deployment (ft)	5326.97			
Velocity at Deployment (ft/s)	1.11			
Terminal Velocity (ft/s)	73.7638			
Recovery Harness Material	Tubular Nylon			
Harness Size/Thickness (in)	1			
Recovery Harness Length (ft)	15			
Harness/Airframe Interfaces	The harness is going be attached to key structural components via quick links to safely secure the harness to the rocket.			
Kinetic Enerfy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	82242.2199	17877.2722	18601.7544	N/A

Recovery System Properties				
Main Parachute				
Manufacturer/Model	FRUITYCHUTES/IA			
Size	72 in			
Altitude at Deployment (ft)	600			
Velocity at Deployment (ft/s)	73.7638			
Terminal Velocity (ft/s)	16.249			
Recovery Harness Material	Tubular Nylon			
Harness Size/Thickness (in)	1			
Recovery Harness Length (ft)	25			
Harness/Airframe Interfaces	The harness is going be attached to key structural components via quick links to safely secure the harness to the rocket.			
Kinetic Enerfy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	399.0831	867.497	902.6526	N/A

Recovery Electronics	
Altimeter(s)/Timer(s) (Make/Model)	Perfectflite CF Altimeters
Redundancy Plan	The ebay will have 2 altimeters. Each altimeter will have 2 charges located on either side of the e-bay, one for drogue and the other for the main. Two altimeters will give it a redundant system.
Pad Stay Time (Launch Configuration)	Each altimeter will have a battery life of 4 hours.

Recovery Electronics	
Rocket Locators (Make/Model)	Communications Specialists, Inc. R-300 R/C ELT Receiver
Transmitting Frequencies	***Required by CDR***
Black Powder Mass Drogue Chute (grams)	3.5
Black Powder Mass Main Chute (grams)	3.5

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

Capture Mechanism	Overview
	N/A
Container Mechanism	Overview
	N/A
Launch Rail Mechanism	Overview
	N/A
Igniter Installation Mechanism	Overview
	N/A

### Payload

Payload 1	Overview
	Our payload is designed to test the rate at which air intake, through a turbine, will generate current on ascent.
Payload 2	Overview
	N/A

### Test Plans, Status, and Results

Ejection Charge Tests	Each ejection charge will be 3.5g of black powder. These charges will eject both our main and drogue parachutes through the separation of the launch vehicle. These ejections are triggered by altimeters.
Sub-scale Test Flights	Subscale flight is scheduled for November of 2015.
Full-scale Test Flights	N/A

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### Additional Comments

- The hole in the nose cone for the payload will create additional drag and, as a result, we may need to increase the motor size to meet the mile height.
  - Section 1 refers to the nose cone and payload.
  - Section 2 refers to the front body tube and e-bay.
  - Section 3 refers to the back body tube, fins, and motor casing.