

Milestone Review Flysheet 2017-2018

Institution	AIAA OC Section	Milestone	FRR
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Vehicle Properties	
Total Length (in)	144.75
Diameter (in)	4
Gross Lift Off Weigh (lb.)	30.64
Airframe Material(s)	Fiberglass
Fin Material and Thickness (in)	Fiberglass
Coupler Length/Shoulder Length(s) (in)	Minimum is 4"

Motor Properties	
Motor Brand/Designation	Cesaroni K661
Max/Average Thrust (lb.)	170.43/144.21
Total Impulse (lbf-s)	547.75
Mass Before/After Burn (lb.)	5.57/2.28
Liftoff Thrust (lb.)	144.21
Motor Retention Method	Aero Pack 75 mm Retainer

Stability Analysis	
Center of Pressure (in from nose)	105.3845
Center of Gravity (in from nose)	85.9246
Static Stability Margin (on pad)	7.65
Static Stability Margin (at rail exit)	9.56
Thrust-to-Weight Ratio	5.5 : 1
Rail Size/Type and Length (in)	96
Rail Exit Velocity (ft/s)	49.31

Ascent Analysis	
Maximum Velocity (ft/s)	467.69
Maximum Mach Number	0.42
Maximum Acceleration (ft/s^2)	616.9
Predicted Apogee (From Sim.) (ft)	3734

Recovery System Properties									
Drogue Parachute									
Manufacturer/Model	Fruity Chutes								
Size/Diameter (in or ft)	18"								
Altitude at Deployment (ft)	Apogee								
Velocity at Deployment (ft/s)	16.54								
Terminal Velocity (ft/s)	85.81								
Recovery Harness Material	Tubular Nylon								
Recovery Harness Size/Thickness (in)	1/0.0071								
Recovery Harness Length (ft)	25								
Harness/Airframe Interfaces	machine-closed stainless steel eye bolts, tubular nylon shock cord								
Kinetic Energy of Each Section (Ft-lbs)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Section 1</th> <th>Section 2</th> <th>Section 3</th> <th>Section 4</th> </tr> </thead> <tbody> <tr> <td>806.1</td> <td>480.29</td> <td>1108.03</td> <td>1588.32</td> </tr> </tbody> </table>	Section 1	Section 2	Section 3	Section 4	806.1	480.29	1108.03	1588.32
Section 1	Section 2	Section 3	Section 4						
806.1	480.29	1108.03	1588.32						

Recovery System Properties				
Main Parachute				
Manufacturer/Model	Fruity Chutes			
Size/Diameter (in or ft)	60"			
Altitude at Deployment (ft)	700			
Velocity at Deployment (ft/s)	116			
Terminal Velocity (ft/s)	21.04			
Recovery Harness Material	Tubular Nylon			
Recovery Harness Size/Thickness (in)	1/0.0071			
Recovery Harness Length (ft)	25			
Harness/Airframe Interfaces	machine-closed stainless steel eye bolts, tubular nylon shock cord			
Kinetic Energy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	49.01	29.2	67.37	96.57

Recovery Electronics	
Altimeter(s)/Timer(s) (Make/Model)	Stratologger CF Flight Computer/RRC3 Flight Computer
Redundancy Plan and Backup Deployment Settings	use of primary and secondary flight comoputer, both different models; independent batteries
Pad Stay Time (Launch Configuration)	Approximately 1 hour

Recovery Electronics		
Rocket Locators (Make/Model)	What is the RF for Whistle? 900 mHz from cell tower?	
Transmitting Frequencies (all - vehicle and payload)	DX8 - 2.4 GHz DXe - 2.4 GHz TeleGPS - 434.55 MHz	
Reaction System Energetics (ex. Black Powder)	4F Black Powder	
Energetics Mass - Drogue Chute (grams)	Primary	3.57
	Backup	5
Energetics Mass - Main Chute (grams)	Primary	1.93
	Backup	2.71
Energetics Masses - Other (grams) - If Applicable	Primary	
	Backup	

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Payload

	Overview
Payload 1 (official payload)	Unmanned Aerial Vehicle that applies the Magnus Effect; will first have autonomous control, with RC control as a backup.
	Overview
Payload 2 (non-scored payload)	

Test Plans, Status, and Results

Ejection Charge Tests	Both tested, with success. Some problems with unravelling drogue chute, but otherwise illustrated we had a sufficient mass for gunpowder. Backup charges for the primary and druge chute bodies were 40% larger in mass.
Sub-scale Test Flights	1623 ft apogee; successful dual deployment noted
Full-scale Test Flights	3740 ft apogee; successful dual deployment noted

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Additional Comments

The intent of the UAV is to glide. It will not be able to generate enough lift to go upward. It only has enough lift to fall at a controlled rate. We had scheduled a weather balloon test for the UAV on February 25, 2018. However, we were forced to delay it until March 3, 2018. This test has had to be further delayed and has been scheduled for March 8, 2018 at the football field of Irvine High School at 4 p.m.

The balloon test was completed on March 11, 2018. It was not successful.

