

Milestone Review Flysheet

Institution The Pennsylvania State University

Milestone CDR

Vehicle Properties	
Total Length (in)	116
Diameter (in)	5.12
Gross Lift Off Weigh (lb)	30
Airframe Material	Fiberglass
Fin Material	Fiberglass
Drag	

Motor Properties	
Motor Manufacturer	Cesaroni
Motor Designation	L645-GR
Max/Average Thrust (lb)	175/145
Total Impulse (lbf-s)	768.8
Mass Before/After Burn(oz)	480/406
Liftoff Thrust (lb)	120

Stability Analysis	
Center of Pressure (in from nose)	96.581
Center of Gravity (in from nose)	80.773
Static Stability Margin	3.08
Static Stability Margin (off launch rail)	2.02
Thrust-to-Weight Ratio	4.83
Rail Size and Length (in)	1.5/156
Rail Exit Velocity	59.8

Ascent Analysis	
Maximum Velocity (ft/s)	615
Maximum Mach Number	0.55
Maximum Acceleration (ft/s^2)	154
Target Apogee (From Simulations)	5273
Stable Velocity (ft/s)	23
Distance to Stable Velocity (ft)	3

Recovery System Properties				
Dogue Parachute				
Manufacturer/Model		Fruity Chutes		
Size		15"		
Altitude at Deployment (ft)		5280		
Velocity at Deployment (ft/s)		0		
Terminal Velocity (ft/s)		111.1		
Recovery Harness Material		Kevlar		
Harness Size/Thickness (in)		1/2"		
Recovery Harness Length (ft)		20		
Harness/Airframe Interfaces		Quicklinks and 1/2" steel closed eye bolts		
Kinetic Energy of Each Section (Ft-lbs)	Section 1 (Front)	Section 2 (Booster)	Section 3 (Avionics Bay)	Section 4
	1197	3366.4	n/a	

Recovery System Properties				
Main Parachute				
Manufacturer/Model		Fruity Chutes		
Size		84"		
Altitude at Deployment (ft)		400		
Velocity at Deployment (ft/s)		103.68		
Terminal Velocity (ft/s)		15.288		
Recovery Harness Material		Kevlar		
Harness Size/Thickness (in)		1/2"		
Recovery Harness Length (ft)		6		
Harness/Airframe Interfaces		Quicklinks and 1/2" steel closed eye bolts		
Kinetic Energy of Each Section (Ft-lbs)	Section 1 (Front)	Section 2 (Booster)	Section 3 (Avionics Bay)	Section 4
	17.439	63.004	4.9645	

Recovery Electronics	
Altimeter(s)/Timer(s) (Make/Model)	Stratologger SL100 Altimeter
Redundancy Plan	A second identical altimeter and two e-matches in each separation charge.
Pad Stay Time (Launch)	

Recovery Electronics	
Rocket Locators (Make/Model)	Garmin Astro 320 GPS Beacon
Transmitting Frequencies	MURS (151.820 MHz-154.600 MHz)
Black Powder Mass Drogue Chute (grams)	7.4
Black Powder Mass Main	

Configuration)

4 hours

Chute (grams)

7.76

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Autonomous Ground Support Equipment (MAV Teams Only)

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

Payload

Payload 1	Overview
	Terrain Analysis Package: Terrain Scanning System that will identify and locate hazards in the rocket's landing area. It will then notify the ground station of the locations of the hazards.
Payload 2	Overview
	Active Stabilization Package: Rocket stability control system that will be able to control the rate of roll during flight

Test Plans, Status, and Results

Ejection Charge Tests	Ground Test of fully packed chute at High Pressure Combustion Lab (HPCL), awaiting approval.
Sub-scale Test Flights	2 Planned subscale flights, currently awaiting clear weather. First is now scheduled for 1/16/16
Full-scale Test Flights	2 Planned Full-Scale flights: First with 1 mile apogee and the Active Stabilization Package off, Second with 1/2 mile apogee and Active Stabilization Package On.

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Additional Comments

