Milestone Review Flysheet

Institution	University of South Florida

Milestone	Critical Design Review

Vehicle Properties	
Total Length (in)	138
Diameter (in)	4
Gross Lift Off Weigh (lb)	23.2
Airframe Material	G12 Fiberglass
Fin Material	G10 Fiberglass
Drag	62 lbf

Motor Properties	
Motor Manufacturer	Cesaroni
Motor Designation	CS L910s
Max/Average Thrust (lb)	244.165/203.924
Total Impulse (lbf-s)	1919.21
Mass Before/After Burn	23.2/17.1 lb
Liftoff Thrust (lb)	235

Stability Analysis	
Center of Pressure (in from nose)	114 in
Center of Gravity (in from nose)	92.512 in
Static Stability Margin	5.38
Static Stability Margin (off launch rail)	5.38
Thrust-to-Weight Ratio	8.93
Rail Size and Length (in)	121
Rail Exit Velocity	82.3 ft/s

Ascent Analysis	
Maximum Veloxity (ft/s)	746
Maximum Mach Number	0.67
Maximum Acceleration (ft/s^2)	298
Target Apogee (From Simulations)	5280
Stable Velocity (ft/s)	85
Distance to Stable Velocity (ft)	11

Recovery System Properties				
Dogue Parachute				
Manufacturer/Model		SkyAngle		
Size		6.3 sq ft		
Altitude at Deployment (ft)			Apogee	
Velocity at Deployment (ft/s)			0	
Terminal Velocity (ft/s)			63.04	
Recovery Harness Material			Tubular Nylon	
Harness Size/Thickness (in)			1	
Recovery Harness Length (ft)			34.5	
Harness/Airframe Interfaces		Connection between eye bolts on the Nosecone/Payload Bay Bulkhead and Fore Altimeter Bay fastened to the Fore airframe.		
Kinetic Enerfy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	190.8	219.745	448.067	

Recovery System Properties				
Main Parachute				
Manufacturer/Model		SkyAngle		
Size		56 sq. ft		
Altitude at Deployment (ft)			500	
Velocity at Deployment (ft/s)			63.04	
Terminal Velocity (ft/s)			15.93	
Recovery Harness Material			Tubular Nylon	
Harness Size/Thickness (in)			1	
Recovery Harness Length (ft)			34.5	
Harness/Airframe Interfaces		Connection between eye bolts on Aft altimeter Bay and eye bolts on top centering ring of the motor mount		
Kinetic Enerfy of Each Section (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	12.184	14.032	26.612	

Recovery Electonics	
Altimeter(s)/Timer(s) (Make/Model)	RRC3/Missile Works
Redundancy Plan	2 Altimeters wired to redundant seperation charges
Pad Stay Time (Launch Configuration)	3 Hours

Recovery Electonics	
Rocket Locators (Make/Model)	TeleGPS/Apogee
Transmitting Frequencies	100kHz Band starting at 434.550 MHz
Black Powder Mass Drogue Chute (grams)	3.5 g
Black Powder Mass Main Chute (grams)	4 g

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Autonomous Ground Support Equipment (MAV Teams Only)	
Capture Mechanism	Overview
	The robotic arm will be attached to the base of a rover mechanism. After the payload has been approached a camera on the end of the robotic gripper will determine the payload location and orient itself for capture. Upon capture the rover will return to a predefined base and confirm payload location and orientation at a static camera attached to the base of the rail.
Container Mechanism	Overview
	The container mechanism for the AGSE is a linear actuator system, with an attached payload sled that can be closed or opened with radio signalling.
Launch Rail Mechanism	Overview
	The launch rail will be lifted by a worm and gear mechanism. A locking rod will move from groove to groove in order to safely support the rod from slippage. The ratcheting mechanism will also serve to increment the number of degrees raised using discrete units that will allow us to definitivley raise the rail to 15 degrees from vertical.
Igniter Installation Mechanism	Overview
	The igniter will be installed in a linear actuator attached to the baseplate of the AGSE rail. The igniter will be kept straight by a guide hole in the blast plate and directed upwards by the linear actuator after the launch rail is in position.

Payload	
Payload 1	Overview
	The AGSE payload will be a sealed PVC pipe 3" in length and 3/4" in diameter filled with sand in order to weigh 4 oz.
Payload 2	Overview

Test Plans, Status, and Results	
Ejection Charge Tests	The ejection charge tests precede each launch with programming of altimeter and test fires.
Sub-scale Test Flights	The subscale launch was a success with an achieved altitude of 4092 feet.
Full-scale Test Flights	The full-scale test launch is scheduled for 2/20/16

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Milestone	

Additional Comments