

Milestone Review Flysheet

Institution	The Pennsylvania State University
Milestone	FRR

Vehicle Properties	
Total Length (in)	116
Diameter (in)	5.15
Gross Lift Off Weigh (lb)	40.13
Airframe Material	Fiberglass
Fin Material	Fiberglass
Drag	

Motor Properties	
Motor Manufacturer	Cesaroni
Motor Designation	L1350-CS
Max/Average Thrust (lb)	376.0/303.4
Total Impulse (lbf-s)	958.4
Mass Before/After Burn(oz)	642/570.4
Liftoff Thrust (lb)	320

Ascent Analysis	
Maximum Velocity (ft/s)	659
Maximum Mach Number	0.59
Maximum Acceleration (ft/s ²)	250
Target Apogee (From Simulations)	5282
Stable Velocity (ft/s)	25
Distance to Stable Velocity (ft)	1.7

Stability Analysis	
Center of Pressure (in from nose)	93
Center of Gravity (in from nose)	80.4
Static Stability Margin	3.54
Static Stability Margin (off launch rail)	2.45
Thrust-to-Weight Ratio	7.65
Rail Size	1515
Rail Length (ft)	13
Rail Exit Velocity	68.2

Recovery System Properties				
Drogue Parachute				
Manufacturer/Model		Fruity Chutes		
Size		15"		
Altitude at Deployment (ft)		5280		
Velocity at Deployment (ft/s)		0		
Terminal Velocity (ft/s)		65.87		
Recovery Harness Material		Kevlar		
Harness Size/Thickness (in)		3/4"		
Recovery Harness Length (ft)		20		
Harness/Airframe Interfaces		Quicklinks and 3/8" steel closed eye bolts		
Kinetic Energy of Each Section (Ft-lbs)	Section 1 (Front)	Section 2 (Booster)	Section 3 (Avionics Bay)	Section 4
	749.25	1188.1	n/a	

Recovery System Properties				
Main Parachute				
Manufacturer/Model		Fruity Chutes		
Size		84" Elliptical, 72" Iris Ultra		
Altitude at Deployment (ft)		500		
Velocity at Deployment (ft/s)		61.55		
Terminal Velocity (ft/s)		14.55		
Recovery Harness Material		Kevlar		
Harness Size/Thickness (in)		3/4"		
Recovery Harness Length (ft)		18		
Harness/Airframe Interfaces		Quicklinks and 3/8" steel closed eye bolts		
Kinetic Energy of Each Section (Ft-lbs)	Section 1 (Front)	Section 2 (Booster)	Section 3 (Avionics Bay)	Section 4
	9.4	66.37	32.56	