Milestone Review Flysheet 2019-2020

Institution	Piedmont Virginia Community College

Milestone	CDR

Vehicle Properties	
Total Length (in)	120
Diameter (in)	6
Gross Lift Off Weigh (lb)	29.3
Airframe Material(s)	fiberglass
Fin Material and Thickness (in)	fiberglass, 0.25
Coupler Length(s)/Shoulder Length(s) (in)	6/6.17

Motor Properties	
Motor Brand/Designation	Aerotech, L1170 FJ
Max/Average Thrust (lb)	302.59/258.53
Total Impulse (lbf-s)	790.65
Mass Before/After Burn (lb)	8.1 / 3.3
Liftoff Thrust (lb)	300
Motor Retention Method	Aeropack retainer

Stability Analysis	
Center of Pressure (in. from nose)	91.5
Center of Gravity (in. from nose)	74.9
Static Stability Margin (on pad)	2.7
Static Stability Margin (at rail exit)	2.7
Thrust-to-Weight Ratio	6.4:1
Rail Size/Type and Length (in)	1515/ 144in
Rail Exit Velocity (ft/s)	69.8

Ascent Analysis	
Maximum Velocity (ft/s)	614
Maximum Mach Number	0.8
Maximum Acceleration (ft/s^2)	183
Target Apogee (ft)	4,800
Predicted Apogee (From Sim.) (ft)	4,558

Recovery System Properties - Overall	
Total Descent Time (s)	43
Total Drift in 20 mph winds (ft)	2,073/2,342

Recovery System Properties - Energetics		
Ejection System Energetics (ex. Black Powder)		black powder
Energetics Mass - Drogue Chute (grams)	Primary	3
	Backup	3.5
Energetics Mass - Main Chute (grams)	Primary	2.5
	Backup	3
Energetics Mass - Other (grams) - If Applicable	Primary	
	Backup	

Payload Deployment	
Location: Air or Ground (if applicable)	air
Altitude of Deployment (if applicable)	500

Recovery System Properties - Recovery Electronics	
Primary Altimeter Make/Model	missile works/RRC3
Secondary Altimeter Make/Model	missile works/RRC3
Other Altimeters (if applicable)	n/a
Rocket Locator (Make/Model)	adafruit ultimate
Additional Locators (if applicable)	eggfinger
Transmitting Frequencies (all - vehicle and payload)	***Required by CDR*** (Complete on pages 3 and 4)
Pad Stay Time (Launch Configuration)	15+ hours
Describe Redundancy Plan (batteries, switches, etc.)	

Recovery System Properties - Drogue Parachute				
Manufacturer/Model			Giant Leap	
Size or Diameter (in)			24	
Main Altimeter Deployment Setting			Apogee	
Backup Altimeter Deployment Setting			Apogee + 2s	
Velocity at Deployment (ft/s)			0	
Terminal Velocity (ft/s)			95	
Recovery Harness Material, Size, and Type (examples - 1/2 in. tubular Nylon or 1 in. flat Kevlar strap)			1/2" tubular kevlar	
Recovery Harness Length (ft)			30	
Harness/Airframe Interfaces		Dual U-Bolts		
Kinetic Energy (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	4546			

Recovery System Properties - Main Parachute				
Manufacturer/Model			frulty	
Size or Diameter (in or ft)			7ft (booster), 4ft (payload)	
Main Altimeter Deployment Setting (ft)			600	
Backup Altimeter Deployment Setting (ft)			500	
Velocity at Deployment (ft/s)			95	
Terminal Velocity (ft/s)			14.3/19.4	
Recovery Harness Material, Size, and Type (examples - 1/2 in. tubular Nylon or 1 in. flat Kevlar strap)			1/2'' tubular kevlar	
Recovery Harness Length (ft)			21 ft (booster) 20ft (payload)	
Harness/Airframe Interfaces		Dual U-Bolts		
Kinetic Energy (Ft-lbs)	Section 1	Section 2	Section 3	Section 4
	61.8	21.2		

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Payload	
Payload 1 (official payload)	Overview
	sample collecting rover, housed in payload bay
Payload 2 (non-scored payload)	Overview

Test Plans, Status, and Results	
Ejection Charge Tests	
Sub-scale Test Flights	we flew our subscale rocket and it flew perfectly both parachutes deployed and brought both sections of the rocket down together
Vehicle Demon-stration Flights	
Payload Demon-stration Flights	

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Transmitter #1

Location of transmitter:	Avionics bay		
Purpose of transmitter:	GPS tracking of the booster section		
Brand	eggfinder	RF Output Power (mW)	100
Model		Specific Frequency used by team (MHz)	919
Handshake or frequency hopping? (explain)	no		
Distance to closest e-match or altimeter (in)	3.75 in. to altimeter		
Description of shielding plan:			

Transmitter #2

Location of transmitter:	payload section		
Purpose of transmitter:	GPS tracking of the payload section		
Brand	lumener	RF Output Power (mW)	200
Model	TX5G2R	Specific Frequency used by team (MHz)	5800
Handshake or frequency hopping? (explain)	no		
Distance to closest e-match or altimeter (in)	55 in.		
Description of shielding plan:			

Transmitter #3

Location of transmitter:			
Purpose of transmitter:			
Brand		RF Output Power (mW)	
Model		Specific Frequency used by team (MHz)	
Handshake or frequency hopping? (explain)			
Distance to closest e-match or altimeter (in)			
Description of shielding plan:			

Transmitter #4

Location of transmitter:			
Purpose of transmitter:			
Brand		RF Output Power (mW)	
Model		Specific Frequency used by team (MHz)	
Handshake or frequency hopping? (explain)			
Distance to closest e-match or altimeter (in)			
Description of shielding plan:			

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Transmitter #5

Location of transmitter:			
Purpose of transmitter:			
Brand		RF Output Power (mW)	
Model		Specific Frequency used by team (MHz)	
Handshake or frequency hopping? (explain)			
Distance to closest e-match or altimeter (in)			
Description of shielding plan:			

Transmitter #6

Location of transmitter:			
Purpose of transmitter:			
Brand		RF Output Power (mW)	
Model		Specific Frequency used by team (MHz)	
Handshake or frequency hopping? (explain)			
Distance to closest e-match or altimeter (in)			
Description of shielding plan:			

Additional Comments