



Memorandum

To	Federal Communications Commission		
From	Firefly Aerospace		
Subject	Mission Overview		
Date	02/22/2021		
Alpha	FRN Number: 0028054328	STA File Number: 0131-EX-ST-2021	Firefly Tracking Number: RPT_MSS_0029 Rev C

MISSION OVERVIEW

The purpose of the mission is to demonstrate Alpha as a small satellite launcher and to demonstrate Firefly Aerospace is ready to support small satellite launches from Vandenberg Air Force Base (VAFB). The mission will be launched from SLC-2W at VAFB. The launch will initially target a 300 km by 300km orbit inclined at 137 degrees then the vehicle will execute a technology demonstration relight to achieve a plane change to reach a 300km by 300km orbit inclined at 137.5 degrees. Telemetry from the vehicle will be transmitted for mission duration using 2215 MHz and a redundant downlink using 2205 MHz will be in use only during the period of Range Safety responsibility (approximately eleven minutes into the flight). Stage Two of the launch vehicle will downlink data to the VAFB Telemetry Receiving Station (VTRS) and Kongsberg Satellite Services (KSAT) ground station locations in Hawaii (Paumalu), Mauritius, and South Africa (Hartebeesthoek) over a period of less than 2 orbits. The entire mission is expected to be approximately two hours in duration.

The launch vehicle uses a traditional Flight Termination System (FTS) - ground-commanded initiation of the onboard ordnance, with additional failsafes, for the purpose of ending powered flight if necessary. The FTS will be armed just prior to launch and will not receive a ground commanded signal once the period of Range Safety responsibility has ended. The FTS will be inoperable after passivation.

Once the vehicle reaches the initial altitude it will deploy all separable payloads. After this deployment, Stage Two will perform a relight to achieve a plane change to a 137.5° inclination. After the relight, a small Hall thruster will burn for less than two minutes. It is orientated such that it will put a small moment on Stage Two, which is easily compensated by the stage's attitude control system. After the hall thruster ceases operations, a power on signal is sent to an attached payload (Spinnaker 3 drag sail) completing Firefly's mission. Stage Two will autonomously passivate after the final telemetry downlink – venting onboard propellant and gas, draining the stage's batteries, and ensuring there is no remaining source of energy available to the stage. All launch vehicle radios will automatically turn off at this point. No attached payloads are capable of transmitting or receiving any signals (the payload attached to Stage Two has an onboard transceiver which has been disabled and will be inoperable). The passivation and RF control script for the vehicle is programmed into the control system and is autonomous. The launch vehicle does not include a command receiver; therefore, the RF communication link from the launch vehicle is not able to be controlled or turned off from the ground.