Memorandum

To	*Federal Communications Commission*			
From	*Firefly Aerospace*			
Subject	*Mission Overview – Jan 2021 Update*			
Date	*01/19/2021*			
Alpha	*FRN Number: 0028054328*	*STA File Number: 1386-EX-ST-2020*	*Call Sign: WQ9XZZ*	*Firefly Tracking Number: RPT_MSS_0029 Rev B*

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. It will have a 2215MHz downlink for telemetry and a 2205MHz downlink for ranging/location information. The 2215 MHz downlink will terminate 4,722 seconds into flight; the 2205 MHz downlink will terminate less than 600s into the flight. Stage Two of the launch vehicle will complete less than 2 orbits while it downlinks data to VAFB and KSAT ground station locations in Hawaii, Mauritius, and South Africa. The entire mission is expected to last approximately three hours.

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 an altitude of 300km with an inclination of 137°, 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, the Propulsion System Experiment (PSE) will be performed. PSE is an autonomously operated Hall thruster that will burn for less than two minutes. The PSE 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 PSE ceases operations. a power on signal is sent to an attached payload (a separately licensed Spinnaker 3 drag sail owned and operated independent of Firefly Aerospace) will be powered on, completing Firefly's mission. Stage Two will autonomously passivate – venting onboard propellant and gas, draining the stage's batteries, and ensuring there is no remaining source of energy available to Stage Two. All launch vehicle radios on the stage will automatically turn off at this point, The Spinnaker 3 radio will be activated at power-on of the Spinnaker 3 payload, and will remain on after the passivation of Stage Two. 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.