

REQUEST FOR EXPERIMENTAL SPACE STATION PAYLOAD AUTHORIZATION

Lockheed Martin Corporation (“Lockheed Martin”) hereby seeks authority under Part 5 of the Federal Communications Commission’s rules to conduct secondary payload experimental satellite operations of a cubesat in conjunction with the NASA Exploration Mission-1 (“EM-1”) mission. The EM-1 mission is currently projected for a June 2020 launch from the Kennedy Space Center, and will include multiple cubesat secondary payloads that will be deployed in lunar orbit.

Specifically, Lockheed Martin herein seeks authority for the Lunar InfraRed (LunIR) experimental program, which it will conduct in coordination with the National Aeronautics and Space Administration (“NASA”) under Contract No. NNH16CO94C. The LunIR payload will transmit payload data from lunar orbit for a period of up to 6 months. Given the complexity of the EM-1 mission, Lockheed Martin is herein seeking full experimental authority, rather than Special Temporary Authority, to account for any potential shifts in the deployment schedule of the launch and orbit-raising activity.

Experimental mission overview.

The subject cubesat will host Lockheed Martin’s LunIR capabilities, based on a new, compact mid-wave infrared sensor to scan and image the surface as it flies over the moon.

Space station segment.

LunIR will ride along on the upper stage of the Space Launch System as a secondary payload to the Orion EM-1 mission. After it is deployed, LunIR’s trajectory will carry it over the lunar surface.

The spacecraft will capture IR images of the Lunar surface and downlink those images to Earth in the X-band frequency band identified in the accompanying FCC Form 442. Mission data will be analyzed for extensibility and application toward NASA lunar, Mars and deep space Strategic Knowledge Gaps.

The primary onboard instrument is a compact, low-power Mid-Wave Infrared (MWIR) Sensor. Key technology elements of the MWIR sensor are an integrated micro-cryocooler and a high temperature nBn based 1 Megapixel focal plane.

At the end of the mission, the spacecraft will be disposed in a heliocentric parking orbit. Lockheed Martin attaches to the instant application a comprehensive Orbital Debris Assessment, based on NASA-STD-8719.14.

Ground station segment.

The Lockheed Martin spacecraft will be under the control of two earth station facilities – Morehead State University in Morehead, Kentucky; and the Goonhilly-6 Earth Station in Cornwall, England. The operators of those facilities are obligated to have in place their own authority to participate in this mission. The location details of those receiver facilities follow:

(1) Morehead State University
Receiving X-band signals only
38-06-47.07 N / 083-15-43.16 W

(2) Goonhilly-6
Receiving both UHF and X-band signals
50-02-47.32 N / 05-10-55.64 W