I. Mission Summary

By this application, GeoOptics, Inc. ("GeoOptics") seeks Federal Communications Commission ("FCC") authorization to perform outdoor testing of an experimental pulsed radar altimetry system, COAST, designed for low-Earth orbit applications.

The primary objective of the COAST mission is to demonstrate and validate a novel, low-cost dual-frequency altimeter technology for precise measurement of ocean surface topography. Data from this and future altimeters are crucial for climate monitoring, oceanography, and other scientific applications, thereby serving the public interest.

The development of the altimeter has been funded by the Office of Naval Research under contract N6833523C0705 with integration for launch to the ISS funded under contract N00014-26-1-2327. The instrument itself is owned by GeoOptics.

The COAST flight system is scheduled for launch to the International Space Station in May 2027, where it will be attached as an external payload to the ISS on the Nanoracks External Laboratory (NEL), owned by Voyager Technologies, Inc (“Voyager”).

II. Radar System Testing

The COAST altimeter radar system will transmit and receive filtered, pulsed BPSK pseudo-random noise signals within two distinct frequency bands for its primary sensing functions: 5.38-5.44 GHz (C band) and 13.34-13.66 GHz (Ku band).

GeoOptics is aware that there are federal (and other) operations in the 5.38-5.44 GHz and 13.34-13.66 GHz bands and is eager to share information regarding its proposed operations with affected federal operators prior to operations to mitigate potential interference. Attached to this application in Exhibit B are the antenna gain contours for the altimeter’s transmit antenna beams. The receive beams are identical.

GeoOptics will operate the COAST altimeter on an unprotected and non-harmful interference basis. Harmful interference is unlikely due to the altimeter’s directional, narrow-beam antenna pattern, the extremely limited scale of the test campaign and the constraints we will undertake.

We will test the altimeter for up to 5 distinct days during the 60 day testing period in Colorado and 5 distinct days in California. On those days we will test for at most 120 minutes of total time spread across the day, and during testing, our duty cycle for transmitting will be 20% or less. That is, a total of 120 minutes of transmitting across the 60 day test period.

We are aware of the Ku band fixed satellite Earth-to-Space allocation in the 13.75 - 14 GHz range. To avoid creating excessive interference, we will only operate with the Ku band antenna pointed at least 20 degrees away from the geostationary arc. With this precaution and the a

reduction of more than 30 dB below the peak power for out-of-band emissions in the 13.75 - 14 GHz range, we expect the power density received at the geostationary arc in the 13.75 - 14 GHz range will be under -151 dB/m^2 during the brief periods of Ku band transmission.

Table 1. Radio frequency plan

	C band radar	**Ku band radar**
Emissions designator	60MQ1N	320MQ1N
Frequency range	5.38-5.44 GHz	13.34-13.66 GHz
Center frequency	5.41 GHz	13.5 GHz
Bandwidth	60 MHz	320 MHz
Modulation	BPSK pseudo-random noise	BPSK pseudo-random noise
Transmit RF power	15 W	11 W
Antenna dimensions (transmit and receive)	0.2m x 0.2m	0.2m x 0.3m
Polarization (transmit and receive)	Linear (single)	Linear (single)
Beamwidth	13°	4° x 6°
Antenna gain	21 dBi	30 dBi
Transmit EIRP	32 dBW	40 dBW
Max EIRP Density per Carrier	-16 dBW/kHz	-12 dBW/kHz
Gain over Temperature	-5	5
Transmit duty cycle (during operations)	2-20%	10-20%

The locations of testing are:

The University of Colorado campus (C-band)
Near Eldorado Springs, CO (C-band)
Near San Luis Obispo, CA (C- and Ku-band)

In each case, we will be aiming the antenna(s) 5-15 degrees above horizontal in order to get returns from nearby hills and mountains.