Rocket Lab USA, Inc.
Experimental License Application
GPS Re-Radiation System
"Experimental RNSS Test Equipment for the purpose of testing GPS receivers"
File Number: 1000-EX-CN-2022

Exhibit 1 – Overview and Explanation

Purpose of this Application

Rocket Lab is seeking a 2-year experimental license to operate a GPS re-radiation system supporting the testing and integration of GPS systems and equipment in Rocket Lab's launch vehicle integration facility, which will play a critical role in Rocket Lab's launch services. This testing and integration will be conducted at Rocket Lab's indoor facility in Accomack, Virginia.

Why Rocket Lab is Applying for an Experimental License to Re-Radiate GPS Signals

Rocket Lab is an end-to-end space company offering launch services, spacecraft, satellite components, and on-orbit management to customers. Our Electron Rocket and Photon spacecraft make it easy and affordable for companies, scientists, researchers, governments, entrepreneurs, and students to get their ideas into orbit. Since 2017, Rocket Lab has successfully completed 27 separate launches with the Electron. Our current customers include NASA, DARPA, and the U.S. Space Force, in addition to dozens of private sector and academic customers.

Rocket Lab is the manufacturer of the Electron rocket, a three-stage launch vehicle designed to launch small satellites into low earth orbit. To conduct ground testing on Rocket Lab's launch vehicle – Electron inside Rocket Lab's integrated control facility (ICF). , As part of our pre-flight test and integration process, Rocket Lab will need to re-radiate GPS signals inside our laboratory near Wallops Island to ensure the operability and reliability of our launch vehicle. The proposed testing would occur in our Integration and Control Facility ("ICF"), a component of Rocket Lab's Launch Complex 2 facilities in Accomack, Virginia. Because all pre-flight testing and integration will be conducted indoors, including GPS testing, Rocket Lab must re-radiate the GPS signal indoors.

The ICF is outside the NASA's facility on Wallops Island (see LC-2 location below). And as shown in the link budget for the proposed re-radiation system at ICF, which accompanies this application as Attachment A, the emissions for the proposed system are well below the NTIA's required thresholds. Rocket Lab's proposed operations therefore poses minimal risk of interference with any GPS systems operating in the area. Rocket Lab's proposed operations also comply with all other applicable NTIA requirements, as discussed more fully below.

Compliance with NTIA Requirements

Rocket Lab will comply with all requirements in section 8.3.28 of the NTIA Manual of Regulations and Procedures for Federal Radio Frequency Management (Redbook).

a. Individual authorization is for indoor use only, and is required for each device at a specific site.

The testing facility described above is for indoor testing only, and the re-radiation systems for which Rocket Lab seeks authorization will be for indoor use only.

b. Applications for frequency assignment should be applied for as an XT station class with a note indicating the device is to be used as an "Experimental RNSS Test Equipment for the purpose of testing GPS receivers" and describing how the device will be used.

Rocket Lab assents to this requirement

c. Approved applications for frequency assignment will be entered in the GMF.

Rocket Lab assents to this requirement.

d. The maximum length of the assignment will be two years, with possible renewal.

Rocket Lab assents to this requirement.

e. The area of potential interference to GPS reception (e.g., military or contractor facility) has to be under the control of the user.

The area of potential interference is under Rocket Lab's control, as the nearest facility with GPS reception operations is greater than 30 m away from the proposed GPS re-radiation system, well outside of the system's range.

f. The maximum equivalent isotropically radiated power (EIRP) must be such that the calculated emissions are no greater than -140 dBm/24 MHz as received by an isotropic antenna at a distance of 100 feet (30 meters) from the building where the test is being conducted. The calculations showing compliance with this requirement must be provided with the application for frequency assignment and should be based on free space propagation with no allowance for additional attenuation (e.g., building attenuation.).

The EIRP calculations for the proposed GPS re-radiation system are provided in the "System Technical Description" below and comply with this requirement.

g. GPS users in the area of potential interference to GPS reception must be notified that GPS information may be impacted for periods of time.

Rocket Lab will post signs in each location where a re-radiation system is installed notifying those in the vicinity of the testing facility that there are GPS re-radiation systems in use that may impact GPS information for periods of time.

h. The use is limited to activity for the purpose of testing RNSS equipment/systems.

Rocket Lab is seeking authority to use re-radiation systems for testing GPS systems on its product.

i. **A "Stop Buzzer" point of contact for the authorized device must be identified and available at all times during GPS re-radiator operations. Rocket Lab's Stop Buzzer contacts are provided below.**

Rocket Lab's Stop Buzzer point of contact for its devices will be:

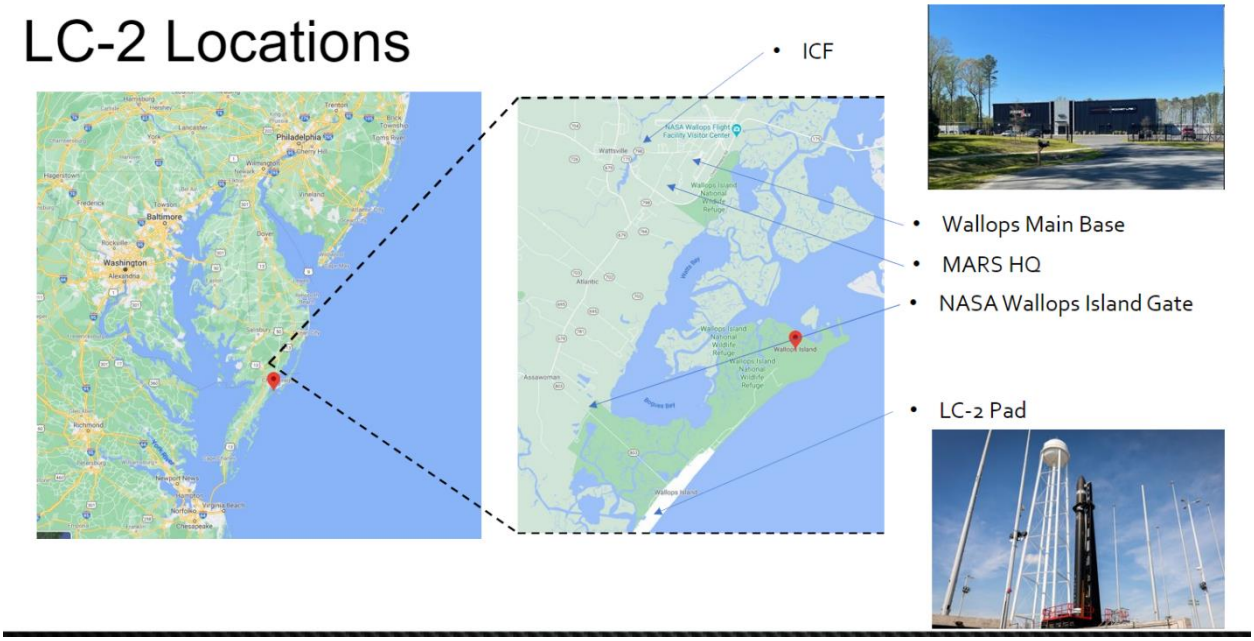
Aaron Kuipers, Director of Test & Launch
(480) 512-2126
a.kuipers@rocketlabusa.com

Aaron Kuipers maintains the telephone number for the operator at the ICF and will have the ability to initiate the shut-off of each GPS re-radiation system in use at any time.

System Technical Description

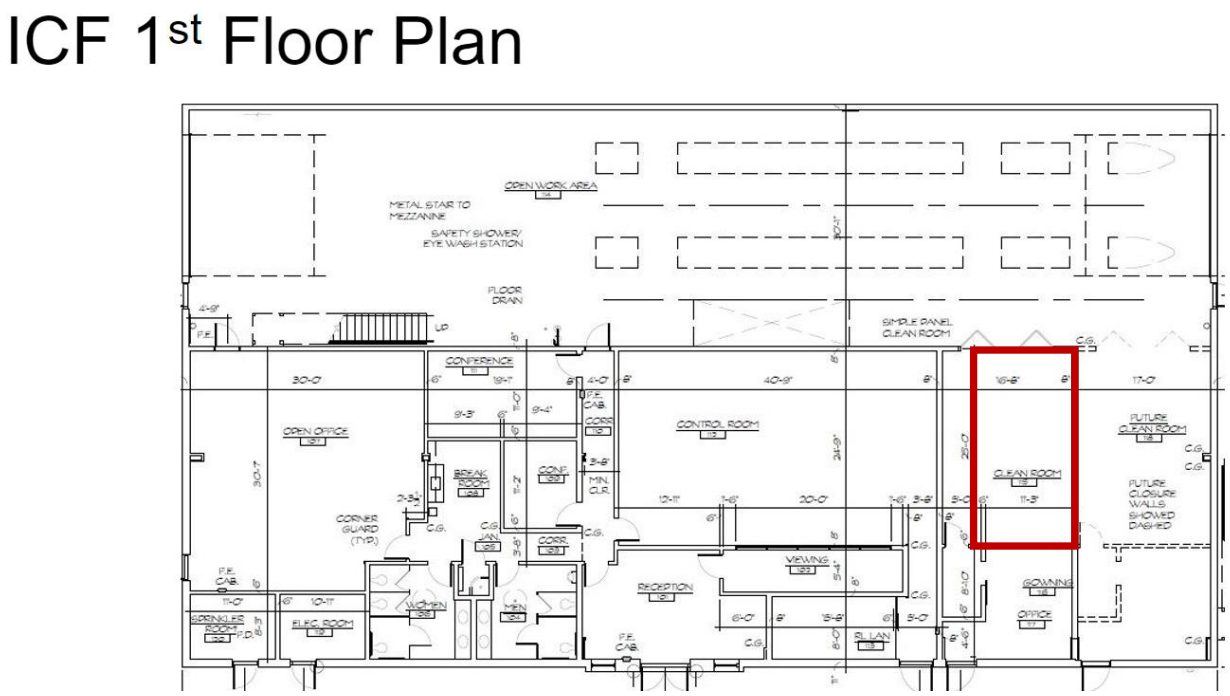
Rocket Lab will use a GPS Source GLI-Metro-G kit to re-radiate external GPS L1 and L2 signals inside Rocket Lab's Integration and Control Facility ("ICF") located in the Wallops Research Park in Accomack, Virginia. Technical descriptions of each of the components of Rocket Lab's system accompany this application as [Attachment B]. The GPS re-radiator system will be located in the ICF at 37°56'12"N 75°29'14.8"W. The following map shows the location of the ICF, as well as the locations of Rocket Lab's Launch Complex 2 ("LC-2") facilities and other facilities in the area.

Figure 1 – Map of Rocket Lab Facilities in Accomack, Virginia

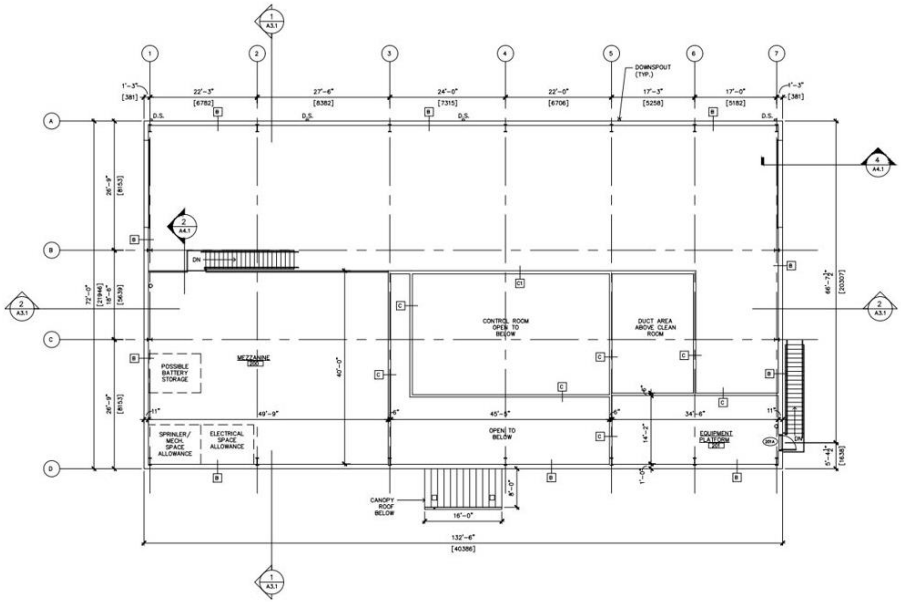


The GPS re-radiation system will be located in the Clean Room of the ICF, as depicted in the following floor plan below.

Figure 2 – Floor Plan of Integration and Control Facility



ICF 2nd Floor Plan

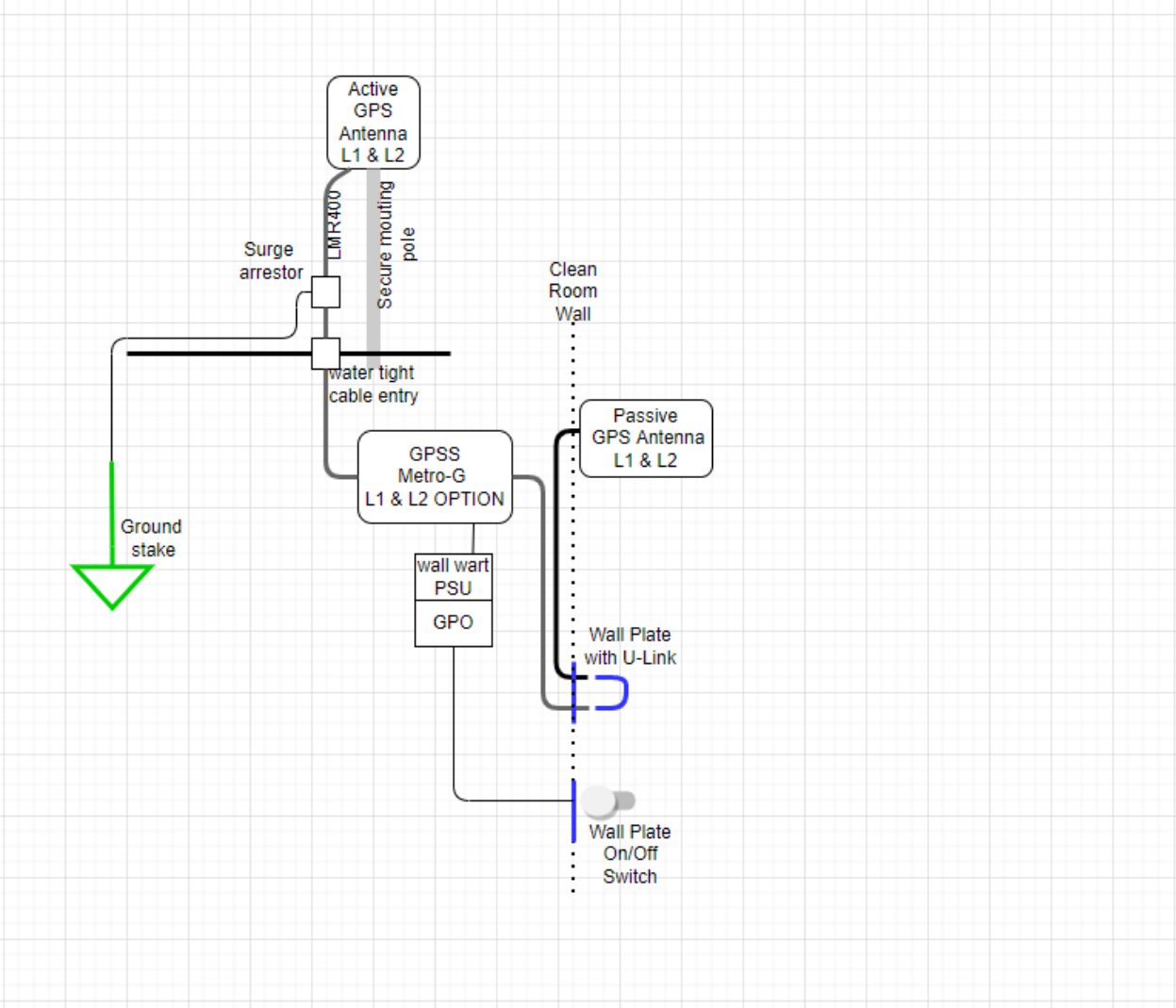


The GPS re-radiation system comprises:

- A roof-mounted L1 & L2 GNSS active antenna with LNA;
- A surge arrestor
- A GLI-METRO-G GNSS amplifier and controller;
- An internally mounted L1 & L2 passive antenna;
- Coaxial feedline cables; and
- An illuminated wall-mounted power switch

A diagram of this system is included below in Figure 3.

Figure 3 – GPS Re-Radiation System Diagram



GPS signals are received by the roof-mounted active GPS antenna and passed through [20] meters of LMR240 cable into the facility through a water tight cable entry and into the GLI-METRO-G GNSS amplifier and controller. Provided the input power is within the acceptable range of -115 to -85 dBm, the amplifier will output any value set by the installer between -85 and -65 dBm. The link budget in Attachment C calculates an input power of -101.6 dBm for L1 and -99.1 dBm for L2, both of which are well within the acceptable range.

The maximum output of the GLI-METRO-G amplifier can be calculated by summing the gains and losses between the output of the amplifier and an isotropic antenna 100 feet away. The amplifier output is passed through [10] meters of LMR400 cable to a passive antenna. The passive antenna's maximum gain is 3.2 dBi at the L1 frequency and 2.3 dBi at the L2 frequency. With the propagation loss over a 100 feet calculated using the Friis Free Space Loss Equation, the total losses sum to 64.9 dB for L1 and 63.6 dB for L2. Thus, to meet the requirement of -140 dBm at 100 feet, the maximum transmit power of the GLI-METRO-G must be no more than -75.1 dBm for L1 and -76.4 dBm for L2. Rocket Lab will use the lower of these two values and

transmit at no more than -76.4 dBm. As shown in Appendix C, the resulting power complies with the requirements of 8.3.28(f).

System Use

This system will be operated only when GPS equipment testing is being performed. To the greatest extent feasible, Rocket Lab will employ a test hood or "antenna hat" to establish an enclosed environment between the GPS transmitter and receiver. The test hat is intended to contain radiofrequency energy in the immediate vicinity of the receiver and minimize, if not eliminate, radiofrequency leakage from the test into the indoor test environment of Rocket Lab's clean-room facility. Where maintaining the integrity of the rocket and protecting mission-critical instrumentation against contaminants precludes the use of enclosed test hats for GPS reception, Rocket Lab may find it necessary to operate the GPS test equipment inside the clean room, but without a test hat. In such cases, Rocket Lab will limit testing to the minimum amount of time necessary to assess the functionality and reliability of the launch vehicle system components under study.