

Description of BlackVe Research Test Using GPS Repeater

Overview

BlackVe, Inc. requires use of an L1 GPS signal repeater, for ground testing and verification of a spacecraft being assembled in a clean room at their facility located in Albuquerque, NM. The period of operation will be from August 17, 2026 to February 17, 2027. A COTS GPS repeater system designed for this purpose will be used.

Calculations are provided as an exhibit to this application, showing that the signal strength 100 feet from the building is -152.64 dBm, which is below the limit of -140 dBm.

5600 Eagle Rock Ave NE
Albuquerque, NM 87113
Lat Long: 35°11'10.3"N, 106°34'58.5"W

Test System

The system will utilize the HNRRKIT available from GPS Networking. This kit consists of an outdoor mounted, active L1 GPS receiving antenna (L1GPSA-B), connecting cable, a variable gain amplifier (HNRRKAMP-B/5/110), and a re-radiating antenna (L1RRKPA-B) located in the clean room. The spacecraft will receive the re-radiated signal. A GPS splitter (LDCBS1X2) splits the receiving antenna GPS signal between two devices, the amplifier and a standalone GPS receiver.

The outdoor antenna will be mounted on a tripod or other moveable fixture. The outdoor receiving antenna connects to the GPS splitter located inside of the integration facility via a 50 ft. run of RG58U coaxial cable. The splitter connects the receiving antenna to the amplifier via a 1 ft. run of LMR-400. The remaining GPS splitter connection terminates into a GPS receiver via a 30 ft. run of LMR-400.

The amplifier is connected to the reradiating antenna via a 130 ft. run of LMR-400 coax. The reradiating antenna is mounted on a wall of the enclosed cleanroom that is separate from the building exterior walls.

Compliance

Per the link budget provided, the ERP output of re-radiating antenna is -113.9 dBW, or 4.03×10^{-12} W, or 4.03 picowatts, or 4.03×10^{-9} milliwatts. The corresponding emission 100 feet from the building is -152.64 dBm, which is below the limit of -140 dBm.