GPS Re-Radiation (Re-Rad) System Technical Description per NTIA Chapter 8.3.28

Purpose for the Application

The purpose of this application is to obtain a 2-year experimental license to operate a GPS re-radiation system.

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Why we are Applying for a License

The Boeing Company would like the ability to perform functional testing to confirm the operational parameters of the GPS receiver system located on the Unit Under Test (UUT).

Technical Description

This technical description shows compliance with all NTIA items in Chapter 8.3.28.

1. Individual authorization is for indoor use only, and is required for each device at a specific site. *Operation will be conducted within a commercial building located on Boeing property. The device information is provided in application and specific site information provided below.*

2. 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. *Boeing concurs to the XT station class.*

3. A**pproved applications for frequency assignment will be entered in the GMF**. *Boeing concurs.*

4. The maximum length of the assignment will be two years, with possible renewal. *Boeing concurs.*

5. The operation must be at specified fixed location and mobile operation is not authorized. *Boeing concurs.*

6. The area of potential interference to GPS reception (e.g., military or contractor facility) has to be under the control of the user. *The building and site is under Boeing's control.*

7. 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.) *Link budgets provided below confirming compliance with specified levels. Calculations do not allow for building attenuation.*

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

9. The use is limited to activity for the purpose of testing RNSS equipment/systems. *Use will be limited to testing RNSS equipment.*

10. A "Stop Buzzer" point of contact for the authorized device must be identified and available at all times during GPS re-radiation operation of the device under any condition. *Stop Buzzer information provided below.*

Location

The GPS Re-Radiation systems will be utilized in the following location:

The Boeing Company
20403 68th Ave S. Kent WA
NL47-25-7, WL122-15-17.

Test Equipment:
Spirent GSS6700 Simulator

Technical Description:

Frequency: L1 1575.42 MHz
Emission: 24M0G1D
Effective Radiate Power: Maximum -104.45 dBm or .0367 picowatts

Component	Gain (dB)	Signal[1]	Units	Comment
DUT GPS RSSi		-130	dBmi	Desired GPS signal level at DUT
FSPL	-25.55	-104.45	dBm	Predicted loss between DUT and GPS antenna
GPS Simulator Antenna Output	0.00	-104.45	dBm	Level at output of GPS antenna (broadcasting simulated GPS signal)
GPS Re-Rad EIRP		**-104.45**	**dBmi**	
Free Space Loss	**-65.9**	**-170.35**	**dBmi**	**30 m @ 1575 MHz**

Frequency: L2 1227.60 MHz
Emission: 24M0G1D
Effective Radiate Power: Maximum -106.62 dBm or .0217 picowatts

Component	Gain (dB)	Signal[1]	Units	Comment
DUT GPS RSSi		-130	dBmi	Desired GPS signal level at DUT
FSPL	-23.38	-106.62	dBm	Predicted loss between DUT and GPS antenna
GPS Simulator Antenna Output	0.00	-106.62	dBm	Level at output of GPS antenna (broadcasting simulated GPS signal)
GPS Re-Rad EIRP		**-106.62**	**dBmi**	
Free Space Loss	**-63.7**	**-170.32**	**dBmi**	**30 m @ 1227 MHz**

Stop Buzzer:
Marissa Reid: 206/641-5193