

From: Michael Staring

To: Behnam Ghaffari

Date: March 13, 2020

Subject: 0238-EX-CN-2020

Message:

Subj: FCC Requirements

8.3.27 Use of Fixed Devices That Re-Radiate Signals Received from the Global Positioning System

Except as otherwise authorized under Section 7.14, federal agencies and departments may, under the following conditions, operate fixed devices that re-radiate signals received from the GPS.

- a. Individual authorization is for indoor use only and is required for each device at a specific site. Confirmed.
- 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. Acknowledged.
- c. Approved applications for frequency assignment will be entered in the GMF. Acknowledged.
- d. The maximum length of the assignment will be two years, with possible renewal. Acknowledged.
- e. The area of potential interference to GPS reception (e.g., military or contractor facility) has to be under the control of the user. Areas beyond the range for potential interference are protected by the maximum power calculation described in f. below, and thus no further record notes are required for frequency assignments. Confirmed.
- f. The equivalent isotropically radiated power (EIRP) must be such that the 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 calculation for maximum EIRP shall be based on free space propagation with no allowance for additional attenuation (e.g., building attenuation) as shown below.

$$PT_{max} = PR + 20 \log_{10} f + 20 \log_{10}(30 + d) - 27.55$$

Where: PT_{max} is the maximum permissible EIRP in dBm

PR is the power received at 30 meters from the building (i.e. -140 dBm/24 MHz)

f is frequency in MHz (i.e. 1575.42 for L1, 1227.60 for L2, 1176.45 for L5)

d is the distance between the radiator and the closest exterior wall of the building in meters.

($PT_{max}+9$)

PT_{max} can then be converted to picowatts by using the formula: $PT_{max}(pW) = 10^{PT_{max}+9}$ IO

Applications requesting power greater than the PT_{max} calculated at $d = 0$ meters (i.e. 39.3 pW for L1, 23.8 pW for L2, and 21.9 pW for L5) must provide the distance from the transmit antenna to the nearest exterior wall so that reviewing agencies can determine if the requested power meets the maximum EIRP described above. See attached for L1 and L2 calculations.

- 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. Acknowledged.
- h. The use is limited to activity for the purpose of testing RNSS equipment/systems. Acknowledged.
- i. A "Stop Buzzer" point of contact for the authorized device must be identified and available at all times during GPS re-radiator operations. Mike Staring, Director of Compliance, 703 328-4011, mstaring@radausa.com.

Respectfully,

Michael Staring
Director of Compliance

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p.s. I will attempt to upload the complete response as an attachment to the case.