

From: Eric Freimark

To: Behnam Ghaffari

Date: July 29, 2010

Subject: FCC File No. 0293-EX-PL-2010

Message:

We were requested to respond to Questions 1-9 of NTIA manual section 8.3.28:

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

The device will be installed at a fixed location inside a laboratory (Room 1139) in the Jamie L. Whitten National Center for Physical Acoustics on the University of Mississippi campus, and will only be operated from that location during testing of systems that require a GPS signal to operate correctly.

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.

NTIA Section 9 indicates that an application for frequency assignment is required for Federal stations. This device will be operated by the University of Mississippi, which has filed for a license with the FCC.

NTIA Section 9.1. Except as provided in Section 9.1.2, the submission of an application is required to obtain authority for a Federal radio station to use a frequency within the United States and Possessions.

If the University of Mississippi needs to file an application for a frequency assignment, please provide references to the instructions for doing so.

The device will be used in the following manner:

The National Center for Physical Acoustics (NCPA) at the University of Mississippi, under contract W9113M-06-C-0029 from the US Army Space and Missile Defense Command, is conducting infrasound research in support of the US involvement in the International Monitoring System of the Comprehensive Test Ban Treaty Organization.

This research program focuses on technologies to identify and localize sources of infrasound signals, capture and identify infrasound signals, and calibration and metrology of infrasound arrays. Key components of this research include the development of advanced infrasound sensors and the deployment of these sensors to study infrasound propagation phenomenology. Because precise localization of infrasound sources is of critical importance, knowledge of the exact location of the infrasound station arrays is crucial. In the development, calibration, and metrology of the sensors for these arrays, the University of Mississippi needs a capability to assess and optimize the functionality of the GPS components in the laboratory in a clean environment. A GPS repeater is required to meet this need since ambient GPS signals cannot penetrate to the laboratories being used in the development, calibration, and metrology of these sensors.

The University of Mississippi is specifically applying for a license to operate the GPSRKL1 repeater kit manufactured by GPS Source. This rebroadcasts the GPS L1 frequency (1572.42 MHz).

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

Our reading of the NTIA has led us to believe that the Government enters frequencies into the Government Master File (GMF). If this is a University of Mississippi function, we will gladly perform it.

Please provide a reference to the instructions for doing so.

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

The University of Mississippi application for a license indicates a requested assignment of two years. If the project is not completed by that time, a request for renewal will be filed.

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

The manufacturer of the device indicates that it has an effective range of 100 feet based on free space propagation. The building in which the device will be located is more than 0.25 miles from the nearest edge of the University of Mississippi campus.

6. 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 required calculations showing that this device will meet the requirements above are shown below.

Receive Antenna Gain: 35
Antenna Cable Insertion Loss: -12
Repeater Amp Gain: 30
Repeater Ant Gain (Best Case): 3
Range in feet: 100
Range (miles): 0.019
Range (meters) 31.17
Range (kilometers): 0.03
Repeated Signal Power @ Range (dBm): -140.09
GPS Carrier Frequency (MHz) 1575
Total System Gain: 56
Total Signal Power @ Range (Watts): 9.8 E-18
Avg Receive Power L1 dBm North America: -130
Radiated Power (dBm): -74
Free space Loss with Isotropic Antennas: -66.09
Transmitted Power: 20.0 E-12
Antenna Insertion Loss figured using LMR 240 ultra flex coax
Effective Radiated Power (W): 39.8 E-12
Effective Radiated Power (dBW): -104

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

Prominent signs will be posted in the laboratory and adjacent areas indicating that GPS information may be impacted for periods of time.

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

The GPS repeaters requested in this license application will be used for the purpose stated above only.

9. 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.

The University of Mississippi understands this requirement and will insure that a "Stop Buzzer" point of contact for the authorized device will be identified and available at all times during GPS re-radiation operation of the device.