ZOLL response to FCC request for additional information regarding application for Experimental license.

2022JUL25

ZOLL responses in { } below.

Provide additional info and change following below: 1) Our experimental licenses are usually being authorized for duration of two years. Please change it to 24 months.

{ZOLL: The unit has been in operation since first license granted 4/1/2017. See below.

> To: DEAN SEVERNS
> E-Mail: DSEVERNS@ZOLL.COM
> From: OET Systems Administration (Batch Processing) OET Systems Administration (Batch Processing)
> Date: March 23, 2017
> Subject: OET Experimental License Grant Notification, Call Sign: WI2XSZ File Number: 0268-EX-CN-2016
> ---
> Message:
> This is notification that the filing associated with callsign WI2XSZ and file number 0268-EX-CN-2016 has been granted. It will remain in effect until its scheduled expiration date of 04/01/2019.

Understand that experimental licenses are only effective for two years at a time. Perhaps there is a different licensing mechanism for hard fixtures that will be in use for the life of the product. Our medical device is expected to be in active manufacturing for about ten years, same as the present product it will be replacing. And we don't even expect to start shipping to customers until next year. Thus, expected use is until year 2033. The alternative is to setup multiple RF shielded chambers with a GPS repeater in each one, which is a significant cost and does not test far field reception. Understand we would still need a license to purchase those repeaters. Thus, only 24 months does not seem like a reasonable length of time for this fixed application.}

2)submit an exhibit describing in great details the purpose of your operation
{ ZOLL: Repeater is used to check and set the Real-Time-Clock (RTC) in two different products during the manufacturing process. Time is kept with a backup battery. This is the primary purpose of the GPS module, as is not expected to get a position lock on a regular basis. Just provide the opportunity to keep the RTC from drifting too many minutes away from UTC over the products' expected 5yr life. The time/date on the GPS module cannot be set manually.

Photos of signage and location of dedicated circuit breaker is shown is photos below. Repeater is mounted in ceiling above the sign. Active receiving antenna is mounted on roof.

}

3)For GPS re-radiator operation, the frequency available is 1575.42 Mhz. Please go back your application to edit it as well as ERP, output power.Also, provide bandwidth.
{ ZOLL: License application includes the frequency range and maximum output setting of the repeater:

Action Frequency	Station Class Output Power/ERP	Mean Peak Frequency Tolerance (+/-) Emission Desig
New	1560.00000000-1590.00000000 MHz FX	300.000000 pW 300.000000 pW M

Can’t just select one satellite to repeat. Need at least three to get a position fix for the GPS receiver modules to set the RTC. To clarify, this is a repeater of live satellites, not an emulator.
}

4)In accordance with NTIA manual section 8.3.28 (Use of Fixed Devices That Re-Radiate Signals Received From the Global Positioning System), please address and confirm each item from (a) through (i) and attach your response as correspondence to this email.

Chapter 8
Procedures and Principles for the Assignment and Coordination of Frequencies

8.3.28 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.

> {ZOLL: Application is for ground level indoor use in 30mx30m manufacturing area. Only one line of sight window at opposite corner of radiating antenna. Other outside windows are blocked by walls with metal studs. Remaining walls are steel reinforced concrete construction. Ceiling corrugated steel and concrete for floor above. No present GPS reception, thus the need for a re-radiator to set/test Real-Time-Clock in product manufactured.}

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.

> {ZOLL: See application for experimental license. Device is used to perform functional test of GPS receivers in product manufactured. i.e. Verify position lock and set battery backed Real-Time-Clock.}

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

> {ZOLL: Believe this is an FCC function.}

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

> {ZOLL: Prefer increased length of time for this fixed application.}

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.

{ZOLL: Entire facility/land is owned and under control of ZOLL's parent company Asahi Kasei. Public access (sidewalk/street) is separated by parking lots and greenways. Only exposed windows face street with parking lot and greenway before reaching sidewalk/street. Approximately 30m.}

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.

$$P_{Tmax} = P_R + 20\log_{10} f + 20\log_{10}(30 + d) - 27.55$$

Where: P_{Tmax} is the maximum permissible EIRP in dBm
P_R 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.

P_{Tmax} can then be converted to picowatts by using the formula: $P_{Tmax(pW)} = 10^{\left(\frac{P_{Tmax}}{10}+9\right)}$

Applications requesting power greater than the Ptmax 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.

{ZOLL: Ptmax = -140[dBm] + 20log10(1575.42) + 20log10(30+15) – 27.55

Ptmax = -70.5[dBm]

Ptmax = 10^(-70.5/10 + 9) = 89[pW]

Proposed unit has programmable/monitored output range of -85dBm to -65dBm.
Will be set to minimum needed, but never higher than -71dBm. }

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.

{ZOLL: In this application, not interfering, but providing. Sign is posted in production area indicating GPS re-broadcast is in operation.}

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

{ZOLL: Will only be used for functional test of product manufactured.}

i. A "Stop Buzzer" point of contact for the authorized device must be identified and available at all times during GPS re-radiator operations..

{ZOLL: A power-off switch is accessible with appropriate Signage.}

5)Experimental RNSS test device for the purpose of testing stand-alone GPS receivers or GPS receivers that are an integral component of and equipment under test. How does your operation comply with this requirement?
{ ZOLL's medical device is not used for navigation. Getting a position fix is required for the GPS module to 'set' the internal RTC. This is sufficient demonstration of functionality. Previous site survey has shown insufficient signal inside the two story building with multiple types of GPS receivers.
}

The items indicated above must be submitted before processing can continue on the above referenced application. Failure to provide the requested information within 30 days of 07/22/2022 may result in application dismissal pursuant to Section 5.67 and forfeiture of the filing fee pursuant to Section 1.1108.