

Metrom Rail, LLC
Conventional Experimental Request
September 21, 2018

Narrative Statement

Pursuant to Section § 15.519 of Subpart F of the Commission's rules, 47 C.F.R, Metrom Rail, LLC respectfully requests a Conventional Experimental License for a 12-month period, commencing as soon as possible, for completion of Agreement 17004-0100, P.O. 9000008001, with the New York Metropolitan Transportation Authority (MTA) for POC2.

The New York MTA is investigating ultra-wideband for a variety of safety applications and has requested a demonstration of Metrom Rail's products used in conjunction with Thales CBTC system. Metrom Rail, LLC is committed to the advancement of ultra-wideband technology in rail transit safety.

Metrom Rail has submitted an official waiver request on September 20th, 2018, docket number 18-284.

Applicant

Metrom Rail, LLC
1125 Mitchell Court
Crystal Lake, IL 60014
FRN: 0025086000

Equipment to be Used

Metrom Rail has mounted 16 nodes containing the P440 radio transmitter in the subway tunnel between 7th Avenue and Church St on the Culver test track. For POC2, Metrom Rail will place a directional antenna on the front of a train and provide location and direction to the Thales CBTC system.

Metrom Rail, LLC will utilize Time Domain's P440 radio transmitter, FCC ID NUF-P440-A, for accurate ranging between trains and trains and signals. This radio transmits pulsed Ultra-Wideband (UWB) RF energy in occasional, brief bursts. During an UWB transmission burst, the pulses are sent using a 10 MHz repetition rate, with a duty cycle of less than 1%, at a power spectral density of 25 nanoWatt/MHz. The pulses are shaped to spread the signal over a bandwidth of 1 to 2 GHz in the 3.1 GHz to 5.3 GHz band.

Ranging is completed using a Two-Way Time-of-Flight technique. Pulses are received and decoded using coherent signal processing to improve the signal to noise ratio of the received signals. Independent communication channels are established by pseudo-random encoding and modulating the phase, position, and/or repetition rate of the pulse train. Due to the extremely brief pulses as well as the low power transmission, the signal appears like background noise and is spread evenly over 1 to 2 GHz of bandwidth.

Metrom Rail, LLC has developed a directional, ultra-wideband antenna specifically designed for rail applications. The antenna consists of two, vertically polarized antennas that operate independently for redundancy. The antennas are highly directional, propagating the signal directly down the tracks. Above the UWB antennas, a GPS antenna sits on top of a ground plane.

Metrom Rail, LLC has completed preliminary testing in a lab environment with the antenna to classify the antenna performance. Preliminary testing shows a 70-degree elevation beam width and a 60-degree azimuth beam width. Metrom Rail, LLC plans to fully test and certify the antennas with the PulsON 440 at a FCC accredited laboratory once the experimental testing is complete and the antenna is accepted.

Time Domain's BroadSpec elliptical dipole antenna that was FCC certified with the Pulson 440 will be used on the wayside.

Type of Emission and Bandwidth

In the 3.1-5.3G band, Metrom Rail, LLC will operate with the following:

Type of Emission: 2G00P1D

Bandwidth: 2GHz

Metrom Rail, LLC has specified the emission designator and calculated the necessary bandwidth in accordance with Sections 2.201 and 2.202 of the Commission's rules.

Contact Information

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