

Raytheon Technologies Request for FCC Experimental License

- File No: 1665-EX-CN-2023
- Confirmation No: EL378751

Applicant Name (Company): Raytheon
1001 Boston Post RD
Marlborough, MA 01752
Date: 10/23/2023

Purpose of Operation: Raytheon Company is requesting for a 2-year FCC license in the following frequency ranges (below) to assess the performance of the drone-to-antenna communication link.

Requested Frequencies

4.400-4.940 GHz
5.850-5.925 GHz
21.2-21.4 GHz
21.4-22 GHz
22.5-22.55 GHz
23.55-23.6 GHz

Raytheon Technical Point of Contact:

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Stop Buzzer: David Insana; 603-540-9935

Raytheon Spectrum Manager filing application

Azuka Anuniru
Spectrum Management Manager
Phone: 508-490-3170
Email: Azuka.Anuniru@raytheon.com
FRN: 0003628344

Period of Use:

Start Date: 11/06/2023.
Stop Date: 11/05/2025.

Equipment Information:

Transmitter Info:

Manufacturer: Raytheon Company

Number of units: 1

Experimental: No

Antenna Information:

Manufacturer: Proxicast - Vandal Resistant Low Profile 4G/5G Antenna - 3-5 dBi Gain - Fixed Mount - 10 ft coax lead

Antenna Type: Omni Directional

No of Units: 1

Experimental: N

Dimensions: 3.2 inches / 82 mm (Height) x 1.9 inches / 48 mm at base (Diameter)

Manufacturer: MI-Wave K-Band, WR-42, Omnidirectional Antenna

Antenna Type: Dipole-Omni Directional

No of Units: 1

Experimental: N

Dimensions: 4.371 inches (Height) X 3.965 Inches (Diameter)

Emission Designators

56M0W7D

56K0F1D

56M0Q3N

56M0N0N

Pulse Information

Max pulsewidth = 187 msec

List as appropriate for the type of modulation:

Effective radiated power from the antenna (If pulsed emission, specify peak power): The maximum ERP out of the antennas (max instantaneous power) is 0.032 Watts.

Frequency Tolerance: 0.001ppm

Necessary Bandwidth: Explain how it is determined:

The Necessary bandwidth was calculated, and emission designator is below. It represents the -20 dB bandwidth for each waveform type. 56 MHz

Location:

1) The Raytheon facility in Tewksbury, Massachusetts is located at 42°38'19.79"N, 71°14'36.59"W. The street address is 50 Apple Hill Drive, Tewksbury, 01876. The antenna testing will take place within 2 km meters of these cited coordinates at a maximum ground elevation of **121** meters.

Is a directional Antenna (Other than the radar used): **No, it is omnidirectional in azimuth.**

Width of beam in degrees at the half-power point: **360 deg Azimuth, 70 deg Elevation**

Orientation in horizontal plane (degrees from True North): **+/- 180 deg**

Orientation in vertical plane (degrees from horizontal): **+/-20 deg relative to horizon**

Will the antenna extend more than 6 meters above the ground, or if mounted on an existing building, will it extend more than 6 meters above the building, or will the proposed antenna be mounted on an existing structure other than a building: **No**

- a. Overall height above ground to tip of antenna in meters: **121**
- b. Elevation of ground at antenna site above mean sea level in meters: **68**
- c. Distance to nearest aircraft landing area in kilometers: **12.91**

Lawrence Municipal Airport	12.91km
Laurence G Hanscom Field	20.77km
Nashua Airport – Nashua, NH (OQU)	27.47km

(d) List any natural formations of existing man-made structures (hills, trees, water tanks, towers, etc.) which, in the opinion of the applicant, would tend to shield the antenna from aircraft: **None**