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Raytheon

Request for FCC Experimental License

File #: 0211-EX-CN-2019

Date: 3/23/2019

Prepared by
Raytheon Company
Integrated Defense Systems
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Purpose of Operation:

Raytheon is requesting an FCC experimental license to conduct installation and checkout of an IFF Interrogator under development for an Air Force customer. These test activities include the initial integration of subsystems with the Systems Integration Laboratory equipment and confirming functionality of the secondary surveillance radar by verifying the ability to send and receive IFF signals.

FAA coordination for this test effort has been requested, which may include restrictions on permitted modes, RF output power, or hours of operation.

Technical Synopsis:

- Spectrum needed: 1030 MHz and 1090 MHz
- Power levels requested (ERP): To be specified by FAA; 75 kW maximum at 1030 MHz (attenuation can be applied if required), 15.3 W maximum at 1090 MHz
- Permitted Modes: To be specified by FAA
- Location of use: Raytheon Facility in Andover, MA (coordinates 42° 38' 16" N, 071°11' 18" W)
- Direction of radiation: 251° ± 10° (IFF) and 71° ±10° (IFF-45TS) relative to true north
- Stop buzzer contact: Kirk Fisher, office 978-470-4244, mobile 978-302-0770

Test Summary:

The IFF is mounted to the top of the primary radar's Array Subsystem. The array will be stationary during all testing. The IFF antenna will transmit to and receive from a horn antenna connected to an Aeroflex Test Set (IFF-45TS) located approximately 20-50 feet away. The ERP from the IFF-45TS is much lower than the Interrogator on the radar.

Raytheon Technical Point of Contact:

Name: Anthony Hopf
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Raytheon Spectrum Manager filing application:

Name: Karen Dyberg
Position: Spectrum Management/RF Safety
Phone: 508-490-2723 (office), 508-450-9236 (mobile)
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Period of Use:

Start date: 4/22/2019
End date: 12/31/2020

Equipment Information:

Indicate all equipment that will be involved in this operation.

Transmitter info:

Manufacturer: Raytheon
Model: IFF Interrogator
Number of units: 4, operated one at a time
Experimental (Y/N): N

Manufacturer: Aeroflex
Model: IFF-45TS
Number of units: 1
Experimental (Y/N): N

For each frequency band:

RF output at the transmitter terminals:

1030 MHz - IFF Interrogator: 4000 Watts peak, maximum.
1090 MHz - Aeroflex IFF-45TS Test Set: ≤ 1 W, maximum

Effective radiated power from the antenna (if pulsed emission, specify peak power):

IFF Interrogator: The effective radiated power from the antenna, including antenna transmit gain and cable losses is 75 kW (peak power).

Aeroflex IFF 45-TS Test Set: The effective radiated power from the antenna, including antenna transmit gain is ≤ 15.3 W (peak power).

Frequency Tolerance:

Less than 0.003 %

List each type of emission separately for each frequency (basically list the waveforms and emission designators):

6M8V1D

List as appropriate for the type of modulation (and describe as necessary):

Coded Pulse.

Necessary bandwidth. Explain how determined.

Calculated.

Locations (street address, coordinates, ground elevation above sea level, and radius of operation):

Street address: 350 Lowell Street, Andover, MA 01810
Coordinates: 42° 38 '16" North, 071° 11' 18" West
Ground elevation above sea level: 138 feet or 42.06 meters
Radius of operation: none

Is a directional antenna (other than radar used)?

Yes.

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If yes, give the following info:

Width of beam in degrees at the half-power point: 39 degrees maximum

Orientation in horizontal plane: 71 degrees $\pm 10^\circ$

Orientation in vertical plane: 18 degrees

Will the antenna extend more than 6 meters above 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.

Overall height above ground to tip of antenna in meters: Approximately 12 feet high or 3.7 meters.