

Conventional Experimental License to Test Radar Suitability

FRN: 0032756355

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February 13th, 2023**

Purpose of Operation

The purpose of this application is to request frequency authorization from the FCC for the Multi-Sensor Data TAK Experiment (MSDTE) at two demonstration locations in northern Virginia until March 2024.

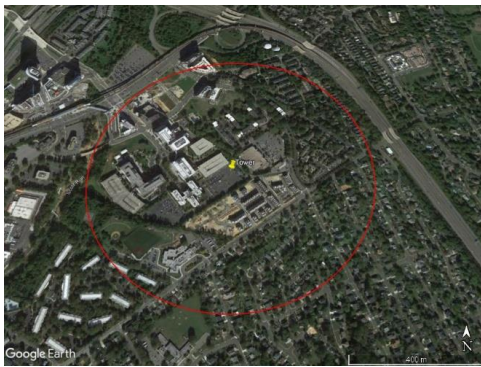
A primary objective of the MSDTE project is to provide surveillance capabilities and support to enable public safety agencies to field test new concepts and capabilities to inform investment and operational decisions. One of the primary capabilities included in the MSDTE architecture is a ground surveillance radar (GSR).

Test Summary

The experimental license is required to integrate and evaluate GSR as part of the MSDTE project for upcoming public safety demonstrations. To the greatest extent possible, a radar simulator will be leveraged during the sensor integration phase of the project. However, the engineering team will need to operate the GSR during a limited portion of the integration phase and, more importantly, during the public safety demonstrations.

Location of GSR Operation

The planned deployment sites are in the parking lot of the MITRE campus in McLean, Virginia and a rural location between Winchester and Berryville, Virginia as shown in figure 1 below. The red ring represents the approximate area where the GSR may be positioned during the demonstrations, while the yellow marker identifies the approximate coordinates as defined in table 1.



McLean VA



Winchester-Berryville VA

Figure 1. GSR Demonstration Locations.

The GSR will be mounted on a mobile tower. The height of the GSR antenna (or electrical focal point) will be at or below 20 feet AGL. The approximate coordinates, elevation, and deployment radius of the mobile tower locations are provided in table 1 below.

Table 1. Proposed Location

Site	Latitude (decimal degrees)	Longitude (decimal degrees)	Elevation (m)	Radius (km)
McLean VA	38.922	-77.203	113	0.5
Winchester-Berryville VA	39.190	-78.058	167	10.0

Technical Specifications

Equipment

The GSR used for this experiment is the Ranger R6SS radar by FLIR. The Ranger R6SS is an advanced electronic scanning surveillance radar specifically designed to detect and track personnel and vehicles.

- Instrumented range of 3.6 km for this application
- Low power X-band transmitter
 - Frequency Modulated Continuous Wave Radar
 - Mode dependent sweep (3.6 km mode only for this application)
 - Necessary Bandwidth: 86 MHz
 - Pulsewidth: 1.65 msec
 - PRF: 513 Hz
 - Output power:
 - Mean = 6.8 W
 - PEP = 8 W
- Receiver sensitivity of -140 dBm
- Mechanically scanned antenna (up to 30 degrees/second)
 - Transmit pattern (cavity array):
 - Horizontally polarized with a gain of 17 dBi
 - Horizontal and vertical beamwidths of 90 degrees and 4 degrees, respectively
 - Receive pattern (patch array):
 - Horizontally polarized with a gain of 24 dBi
 - Horizontal and vertical beamwidths of 20 degrees and 4 degrees, respectively
 - 8 simultaneous receive beams over 90-degree sector

Frequency of Operation

MITRE requests authorization to operate the R6SS radar in the 9.3 to 9.7 GHz band.

Necessary Bandwidth and Emissions Designators

For this application, the R6SS radar will be configured to operate only in the 3.6 km operating mode for all MSDTE demonstrations. In this mode, the necessary bandwidth and emissions designator for the R6SS radar is:

- 3.6 km mode uses 86M0F3N

Safety and Radiation Hazard

The Ranger R6SS has been designed to comply with the limits for a Class B digital device, pursuant to part 15 of the Federal Communications Commission (FCC) Rules. The following table indicates the safety distances to comply with the FCC, CE and UKCA Limits for Maximum Permissible Exposure (MPE) for the general population / uncontrolled exposure.

Table 2. MPE Safety Distances

Ranger Model	Max. Tx Power	Frequency Range	MPE Distance (Controlled Exposure)	MPE Distance (General Population)
R6SS	+39 dBm / 8 W	9300 – 9700 MHz	0.9 m	2.0 m

Contact Information

For questions about this application or in the unlikely event interference concerns should arise, please contact:

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