

PUBLIC INTEREST STATEMENT

By the instant application ("Application"), Leidos, Inc. ("Leidos") requests that the Commission grant A two year conventional experimental license to permit Leidos to operate the facilities specified in the instant application.

1. Purpose of Operation

This experiment, an extension of the operations previously granted under STA (WN9XLO) with some bands/ranges deleted, will allow Leidos to continue to test functionality and evaluate the performance of the L-3 Directional Tactical Common Data Link (D-TCDL) using the Extended Network Terminal (ENT-2X, L-3 PN: 1000407688) and associated antennas which include 9.45in (L-3 PN: 6003923306 and Discovery Omni (L-3 PN: 60059776-000) as well as the L-3 Omni-Direction Common Data Link (O-TCDL) using a VORTEX Communications Node (VCN) Modem (L-3 PN: 60065285-000) and Ku-band antenna (L-3 PN: 60088977-001) that is installed on Leidos' de Havilland dash-8 aircraft. An L-3 ROVER transceiver may also be used with the O-TCDL connection.

An license is requested for the transmit frequencies that will fall within the above band ranges but specific frequencies are assigned at the time of bandwidth purchase by the satellite provider. This license will support Leidos' integration, testing and fielding the L-3 communications suite system into multiple aircraft that are directly supporting DOD operations worldwide. The intended purpose of this experiment is to prove operability and performance, pursuant to government contract requirements.

Waiver of the Station ID rules set forth at Section 5.115 is respectfully requested.

The applicable government contract information is as follows;

Customer/Agency: U.S. Army
Contract No.: W56KGY-16-D-0001
Contract POC's:

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PM Sensors - Aerial Intelligence
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A. Ground-Based Transmissions

1. Ground-Based Location #2 (Bridgewater, VA):

Ground based transmissions conducted will be located at the test area center point at 38°22'00" N; 78°57'37"W, on a radius of 1km about the center point. Ground elevation above sea level at the center point coordinates is 355.1m at this location. The antenna will be no more than 5 meters above ground level when transmitting from the ground.

2. Ground-Based Location #4 (Manassas VA):

Ground based transmissions conducted will be located at the test area center point at 38°43'15" N; 77°30'54.36"W, on a radius of 1km about the center point. Ground elevation above sea level at the center point coordinates is 58.6m at this location. The antenna will be no more than 5 meters above ground level when transmitting from the ground.

B. Airborne Transmissions

1. Airborne Operations Around Bridgewater VA Ground Location #2:

Mobile airborne transmissions conducted within a flight pattern centered on the test area center point at 38°22'00" N; 78°57'37"W, with the furthest waypoints lying on a radius of 370km about the center point. The maximum flight ceiling planned is 4572m (15,000 feet) above ground level (AGL) (range will be from 14-15,000 ft). Ground elevation above sea level at the center point coordinates is 355.1m at this location. The nearest airport to the center point coordinates is the Bridgewater Airpark (VBW) at 1402 Airport Rd, Bridgewater VA, within 1 km from the center point coordinates.

2. Airborne Operations Around Manassas VA Ground Location #4:

Mobile airborne transmissions conducted within a flight pattern centered on the test area center point at 38°43'15" N; 77°30'54.36"W, with the furthest waypoints lying on a radius of 370km about the center point. The maximum flight ceiling planned is 5486.4m (18,000 feet) above ground level (AGL) (range will be from 15-18,000 ft). Ground elevation above sea level at the center point coordinates is 58.6m at this location. The nearest airport to the center point coordinates is Manassas Regional Airport/Harry P. Davis Field Washington, District of Columbia, USA within 1 km from the center point coordinates.

2. **Other technical information**

A. Emission Designators:

- a. 9M58G1D – 1781-1850 MHz
- b. 9M58G1D – 2483.5-2500 MHz
- c. 9M58G1D – 4400-4940 MHz
- d. 9M58G1D – 5250-5850 MHz
- e. 42M8G1D / 64M0G1D – 9750-9950 MHz
- f. 42M8G1D / 64M0G1D – 10150-10450 MHz
- g. 42M8G1D / 8M00G1D – 14400-14830 MHz
- h. 64M0G1D – 15150-15350 MHz

B. Direction of Emission:

a. Ground based:

- i. Multiple satellites are possible for utilization so direction cannot be predetermined but generally in a Southerly Direction.

b. Airborne:

- i. Variable, but generally in a Southerly Direction.

1. Depending on elevation and direction of travel.

C. Feed Power and off-axis emission:

a. Feed Powers will be limited to comply with criteria per 25.222

D. Aeronautical Antennas:

See attached

E. Directionality and Orientation

It is noted that a “Yes” answer has been provided for each antenna registration in reply to the question “Is a directional antenna (other than radar) used?” This “Yes” reply has been inserted because sometimes a Directional antenna will be used (other times an Omnidirectional antenna will be used). For those situations where a Directional antenna will be used, the following information is provided for each location:

(a) Width of beam in degrees at the half-power point: 3dB beam width: X-Band: 11.0 degrees, Ku-band: 9.5 degrees

(b) Orientation in horizontal plane (degrees from True North): The antenna is oriented with respect to the aircraft. So 0 degree azimuth and 0 degree elevation would point out the nose of the aircraft. Orientation is aircraft direction dependent. Ground based activities will generally be focused in a southerly direction.

(c) Orientation in vertical plane (degrees from horizontal): The antenna is oriented with respect to the aircraft. So 0 degree azimuth and 0 degree elevation would point out the nose of the aircraft. Orientation is aircraft direction dependent. Ground based activities will generally be focused in a southerly direction.

3. Prevention of Interference

Leidos is well aware of its obligations under Part 5 of the Commission’s rules to avoid interference. During testing, PSD shall not exceed limits specified in 25.222.

Testing shall be coordinated with the satellite operator. A control point operator will establish telephone communications with the satellite operator prior to any illumination of the satellite. The control point operator will maintain positive control of all transmissions and will cease transmission immediately upon request of the satellite operator or on request of the adjacent satellite operators.

Stop buzzer contacts:

DONALD PETTIT -703-785-2194

JORDAN FETTIG- 815-915-3311

The (relatively) small antennas required for aeronautical applications have wide beam-widths. This poses interference concerns to adjacent satellites. L-3 utilizes spread spectrum techniques to lower the power spectral density to acceptable interference levels. The spread spectrum modulation combined with tracking antennas and transmission suppression techniques for off pointed conditions are imperative to interference mitigation.

Appendix: Aeronautical Antennas:

a. D-TCDL

Characteristics	Values
Transmit (Tx) /Receive (Rx) Bands	X-band: 9.75 – 9.95 GHz (Gigahertz) (low); 10.15 – 10.45 GHz (high) Ku-band: 14.4 – 14.83 GHz (low); 15.15 – 15.35 GHz (high) System is floppable (can transmit/receive in either high or low band)
Directional Antenna Parameters	
Directional EIRP (equivalent isotropically radiated power)	Ku-Band: 56.5 dBm minimum (decibels of power referenced to milliwatt) X-Band: 55dBm minimum Both EIRP values assumes 4.0dB feed loss
Directional G/T (gain-to-noise-temperature)	Ku-Band: -11.5 dBi/K minimum X-Band: -13.0 dBi/K minimum Both G/T values assume 4.0 dB feed loss
Typical Range	125nm (see ARL-E Link Performance Analysis Report, 1000393695, for details)
Directional Antenna Polarization	RHCP (Right Hand Circular Polarization)
Directional Antenna Gain	X-Band Transmit/Receive: ≥ 21 dBi (decibels isotropic) Ku-Band Transmit/Receive: ≥ 22.5 dBi
Directional Waveforms	All STD-CDL waveforms up to 274Mbps (mega bits per second) per STD-CDL specification, 7681990 Rev F. All BE-CDL waveforms up to 52Mbps, per BE-CDL specification, 60038368, Rev A.
Discovery Antenna Parameters	
Discovery EIRP	Ku-Band: 37.5 dBm (assume 4.0dB feed loss)
Discovery G/T	Ku-Band: -29.0 dBi/K minimum
Typical Range	125nm (see ARL-E Link Performance Analysis Report, 1000393695, for details)
Discovery Antenna Polarization	RHCP

b. O-TCDL

Characteristics	Values
Transmit Bands	Ku-band: 14.4 – 14.83 GHz (low) C-Band: 4400 – 4940MHz (low); 5250-5850MHz (high) S-Band: 2200-2500MHz L-Band: 1710-1850 MHz
Receive Bands	Ku-band: 15.15 – 15.35 GHz (high) S-Band: 2200-2500MHz
EIRP	Ku-Band: 41.5 dBm minimum (assume 2.0dB feed loss) C-Band: 39.5 dBm minimum (assume 2.0dB feed loss) S-Band: 39.5 dBm minimum (assume 2.0dB feed loss) L-Band: 39.5 dBm minimum (assume 2.0dB feed loss)
G/T	Ku-Band: -30.0 dBi/K minimum (assume 2.0 dB feed loss) S-Band: -24.0 dBi/K minimum (assume 2.0 dB feed loss)