

## **The Boeing Company**

### **Request for Experimental License Exhibit**

L-3 Communications West Vortex Terminal Part Number 600652293-001, AirNetRover (ANR) Terminal Part Number 1000417422 and L3 Harris Bandit-2i Terminal Part Number 1000178516  
Independent Research and Development

Updated and Submitted: 12/09/19

by

Alvin B. Slatton Jr.  
The Boeing Company  
U.S. Spectrum Management and Electromagnetics  
St. Louis Regional Office  
5501 Phantom Drive MC S276-2101  
Hazelwood, MO 63042-2443  
314-545-2431

#### **Why an experimental license is necessary**

The Boeing Company requests an experimental license in order to test L-3's Vortex and L3Harris' Bandit-2i/ANR terminals (Note: The Bandit-2i is the latest model of the AirNetRover e.g. same form, fit, and function). Boeing anticipates future government contracts that will require implementation of terminals onboard airborne platforms and at ground stations. This experimental license will allow testing of both terminals in a bi-directional mode to gauge their performance. Once a government contract is granted, Boeing will procure the appropriate Federal Government frequency assignments.

Boeing currently has three (3) experimental licenses for this equipment in different geographic locations: WI2XRT (White Sands Missile Range, NM), WI2XRU (Tucson, AZ, Holloman AFB, NM, and WI2XRW (Saint Louis, MO and surrounding areas).

#### **Purpose of Operation**

The Bandit-2i/ANR terminal, to be deployed on an airborne platform or fixed wing test aircraft, will provide video telemetry data to a Vortex ground station. The Vortex terminal at the ground station will detect errors in imagery received and send commands to the Bandit-2i/ANR terminal on the airborne vehicle. For example, if part of the imagery is missing or corrupted, the Vortex terminal can direct the Bandit-2i/ANR terminal to re-transmit that data.

#### **Test Description**

Boeing plans to test the Bandit-2i/ANR and Vortex terminals by deploying a Bandit-2i or ANR terminal onboard an airborne vehicle and a Vortex terminal at a ground location. Boeing will use telemetry locations at Naval Air Warfare Center – Weapons Division (NAWC-WD) China Lake, CA as the ground stations. The airborne vehicle will fly a designated flight path at China Lake, CA and the telemetry ground station will receive the video imagery and send correction commands, as necessary, to the airborne Bandit-2i/ANR terminal. The downlink from the air terminal will be on S-Band (2360-2395 MHz). The uplink to the air terminal from the mobile platform will be on C-Band (4400-4940 MHz).

#### **Timely Response Appreciated**

Boeing will greatly appreciate a determination as quickly as possible to meet the directive schedule.

## Locations:

### Location 1

**(Request 100 kilometer radius; maximum 50,000 feet altitude)**

China Lake Test Range, California – Telemetry Location Number 1

Coso, CA

36° 07' 43"N

117° 38' 05"W

WGS84/NAD83

### Location 2

**(Request 100 kilometer radius; maximum 50,000 feet altitude)**

China Lake Test Range, California – Telemetry Location Number 2

Johannesburg, CA

35° 24' 22"N

117° 39' 28"W

WGS84/NAD83

### Location 3

**(Request 29 kilometer radius; ground testing only)**

Boeing building 191 Tarmac

Palmdale, CA

34° 38' 20"N

118° 05' 50"W

WGS84/NAD83

## Schedule

The requested experimental license is to be effective for 2-years upon a grant from the FCC/OET. Operations will be anytime, 24 hours a day, 7 days a week, within a **100 kilometer radius** and **ground up to 50,000 feet (MSL) altitude** at the above indicated locations. **Ground testing location** at Palmdale, CA **will require only a 29 kilometer radius**. Boeing would like to commence **testing January 31, 2020**.

## Stop Buzzer Contact Information

The equipment will be operated by Boeing employees.

Stop Buzzer (Primary): James Belt

Email: [james.l.belt@boeing.com](mailto:james.l.belt@boeing.com)

Desk: 314-777-9113

Mobile: 314-614-5091

Stop Buzzer (Alternate): Lester Houston

Email: [lester.l.houston-III@boeing.com](mailto:lester.l.houston-III@boeing.com)

Desk: 314-234-0621

Mobile: 314-443-8665

**Frequencies, Power and Emissions Requested**  
**Airborne Terminal**

| Frequency       | Power          | Emission                      |
|-----------------|----------------|-------------------------------|
| 2360 – 2395 MHz | 2 watts (mean) | 495KG1D<br>9M66G1D<br>19M3G1D |

**Equipment and Antenna Parameters**  
**Airborne Terminal**

|                          |                                                            |
|--------------------------|------------------------------------------------------------|
| Transmitter Manufacturer | L3 Harris (for Bandit-2i/AirNetRover)                      |
| Transmitter Part Number  | 1000178516 (for Bandit-2i)<br>1000417422 (for AirNetRover) |
| Frequency Band           | 2025 MHz – 2500 MHz (250 kHz increments)                   |
| Emission                 | See Above                                                  |
| Antenna Manufacturer     | Haigh-Farr                                                 |
| Antenna Model Number     | 6130                                                       |
| Antenna Type             | Blade                                                      |
| Antenna Gain             | 3 dBi                                                      |
| Antenna Beamwidth        | 360 degrees horizontal; 80 degrees vertical                |
| Antenna Polarization     | Vertical                                                   |

**Frequencies, Power and Emission Requested**  
**Ground Terminal**

| Frequency       | Power           | Emission                      |
|-----------------|-----------------|-------------------------------|
| 4400 – 4940 MHz | 20 watts (mean) | 495KG1D<br>9M66G1D<br>19M3G1D |

**Equipment and Antenna Parameters**  
**Ground Terminal**

|                          |                                             |
|--------------------------|---------------------------------------------|
| Transmitter Manufacturer | L-3 Communications West                     |
| Transmitter Part Number  | 600652293-001 (Vortex)                      |
| Frequency Band           | 4400 MHz – 4940 MHz (1 MHz increments)      |
| Emission                 | See Above                                   |
| Antenna Manufacturer     | Antcom                                      |
| Antenna Model Number     | 5B-0.40-5.85P-KuR-XS4-X                     |
| Antenna Type             | Blade                                       |
| Antenna Gain             | 3 dBi                                       |
| Antenna Beamwidth        | 360 degrees horizontal; 80 degrees vertical |
| Antenna Polarization     | Vertical                                    |