

PUBLIC INTEREST STATEMENT

1. Introduction

By the instant request (“Application”), BAE Systems Information and Electronic Systems Integration Inc. (“BAE Systems”) requests that the Commission grant to BAE Systems a two year license to operate the facilities (the “Facilities”) specified in the instant Form 442.

2. Purpose and Nature of the Operation

BAE Systems manufactures and tests RF systems as well as antennas for DOD as well as other governmental customers. The testing specified in this Application will be conducted by BAE Systems Information and Electronic Systems Integration Inc., which is a major producer of electronic warfare systems, protection systems, and tactical surveillance and intelligence systems for all branches of the armed forces. This unit’s lines of business include Electronic Warfare/Electronic Protection, Electronic Warfare/Information Warfare, Integrated Defense Solutions, and Mission Electronics with products and services spanning the whole electromagnetic spectrum.

The testing specified in the instant Application is a critical part of the manufacture and delivery of systems provided to the military in support of war efforts. Specifically, this experiment will involve an in flight calibration and verification of a radio direction finding system on an unmanned aircraft at and around the Southern California Logistics Airport (SCLA).

The test is in support of the following government contract:

Contract No.: FA8650-10-C-7044

Customer: USAF/AFMC
AFRL/RBTC
2241 Avionics Circle, Bldg 620
Wright-Patterson AFB OH 45433-7801

PM - William Koenig (937) 255-4709; William.koenig@wpafb.af.mil
PCO – Dawn Ross (937) 255-5186; dawn.ross@wpafb.af.mil

End User: DARPA/IPTO

In addition, this experimental authority is requested to support general Internal Research and Development (IR&D) activities.

3. Descriptions of Ground-Based and Airborne Transmissions

The Application seeks authority for a flight test, with transmissions originating from the ground and the air, in and around the Southern California Logistics Airport (SCLA) and within the Class D airspace at SCLA (Victorville, CA) as follows:

A. Ground-Based Transmissions

i. Ground Location #1

Temporary-fixed ground-based locations (less than 6 m above ground) operating within a one (1) km radius around the following centerpoint coordinates:

34-39-40 N.Lat.; 117-24-03 W.Long. (NAD 83)

Ground-based transmissions will include the following bands:

Calibration:

CW Transmissions:	880-915 MHz
	1710-1785 MHz
TCDL Data Link:	15.15-15.35 GHz (2W)
CDL Data Link:	15.15-15.35 GHz (4W)

Verification:

TCDL Data Link:	15.15-15.35 GHz (2W)
CDL Data Link:	15.15-15.35 GHz (4W)

ii. Ground Location #2

Temporary-fixed ground-based locations (less than 6 m above ground) operating within a one (1) km radius around the following centerpoint coordinates:

34-39-09 N.Lat.; 117-22-24 W.Long. (NAD 83)

Ground-based transmissions will include the following bands:

Calibration:

CW Transmissions:	880-915 MHz
	1710-1785 MHz
TCDL Data Link:	15.15-15.35 GHz (2W)
CDL Data Link:	15.15-15.35 GHz (4W)

Verification:

TCDL Data Link:	15.15-15.35 GHz (2W)
CDL Data Link:	15.15-15.35 GHz (4W)

B. Airborne Transmissions

i. Airborne Transmissions Around Ground Location #1

Mobile airborne transmissions originating from an unmanned aircraft flying in a grid-type pattern, within a 2 km radius around Ground Location #1 (centerpoint coordinates of 34-39-40 N.Lat.; 117-24-03 W.Long. (NAD 83)). Maximum flight ceiling planned is 3658 m above ground level. The nearest airport to the centerpoint coordinates is SCLA – 1 km from the centerpoint. Ground elevation above sea level is 762 m at the centerpoint coordinates.

Airborne transmissions will include the following bands:

Calibration:

TCDL Data Link: 14.4-14.83 GHz (4.5W)

CDL Data Link: 14.4-14.83 GHz (25W)

Verification:

925-960 MHz (30W)

1805-1880 MHz (30W)

880-915 MHz (100mW)

1710-1785 MHz (100mW)

TCDL Data Link: 14.4-14.83 GHz (4.5W)

CDL Data Link: 14.4-14.83 GHz (25W)

ii. Airborne Transmissions Around Ground Location #2

Mobile airborne transmissions originating from an unmanned aircraft flying in a grid-type pattern, within a 1.5 km radius around Ground Location #2 (centerpoint coordinates of 34-39-09 N.Lat.; 117-22-24 W.Long. (NAD 83)). Maximum flight ceiling planned is 3658 m above ground level. The nearest airport to the centerpoint coordinates is SCLA – 6.4 km from the centerpoint. Ground elevation above sea level is 762 m at the centerpoint coordinates.

Airborne transmissions will include the following bands:

Calibration:

TCDL Data Link: 14.4-14.83 GHz (4.5W)

CDL Data Link: 14.4-14.83 GHz (25W)

Verification:

925-960 MHz (30W)

1805-1880 MHz (30W)

880-915 MHz (100mW)

1710-1785 MHz (100mW)

TCDL Data Link: 14.4-14.83 GHz (4.5W)

CDL Data Link: 14.4-14.83 GHz (25W)

iii. Airborne Transmissions Around SCLA

Mobile airborne transmissions originating from an unmanned aircraft flying in a grid-type pattern, within a 30 km radius around Southern California Logistics Airport (SCLA) and within the Class D airspace at SCLA (Victorville, CA) (centerpoint coordinates of 34-35-51 N.Lat.; 117-22-59 W.Long. (NAD 83)). Maximum flight ceiling planned is 3658 m above ground level. Ground elevation above sea level is 879m at the centerpoint coordinates.

Airborne transmissions will include the following bands:

Verification:

925-960 MHz (30W)
 1805-1880 MHz (30W)
 880-915 MHz (100mW)
 1710-1785 MHz (100mW)
 TCDL Data Link: 14.4-14.83 GHz (4.5W)
 CDL Data Link: 14.4-14.83 GHz (25W)

The flight area is defined by the following four points:

34°41'00.00"N, 117°22'30.00"W	South East
34°40'33.42"N, 117°24'15.80"W	South West
34°51'51.90"N, 117°22'20.44"W	North West
34°40'53.86"N, 117°22'13.50"W	North East

4. Transmitting Equipment

Calibration (non-Data Link):

Manufacturer	Model	Quantity	Experimental?
Arbitrary Waveform Generator - Agilent	N8242A, opt 008, 125	4	NO
Low Band Cal Antenna – MicroStar	DL824SLD	2	NO
High Band Cal Antenna – MicroStar	QR17DL26	2	NO
Power Amplifier, Low Band - Stealth	SM08010-47L-06	4	NO
Power Amplifier, High Band - Stealth	SM1720-50L	4	NO
Directional Coupler – MECA	721-40-1.500v	8	NO
Image Reject Mixer, High Band – Marki	M08028	4	NO
Image Reject Mixer, Low Band – Pulsar	P/N IRJ6412	4	NO
Splitter, RF – MiniCkts	ZFSC-2-2500	8	NO
Amplifier, driver - MiniCkts	ZJL-3G	4	NO
Signal Generator, LO source – Agilent	E4420B	4	NO
AC Power generator – Honda	EU3000ISA	2	NO
Laptop Computer, Controls Arb - Dell	D610	4	NO

Verification (non-Data Link):

Manufacturer	Model	Quantity	Experimental?
JEM	901-0145-000 Hex Band Single Element	1	NO
BAE Systems	S3000	1	YES
Empower	BBM3K5KK0	1	YES

Data Link:

Type of Data Link	Manufacturer/Model	J/F # Airborne	J/F # Ground
CDL	L3 MINI CLD	08229	09261
TCDL	L3 Stinger	12/7834	12/7834
TCDL	L3 Stinger	12/7834	12/7834

5. **Directionality of Ground-Based Antennas**

The Antenna Registration for the ground-based transmissions specifies “Yes” in response to the question: “Is a directional antenna used?”. This is to clarify that – for the Ground-Based Calibration transmissions (on 880-915 MHz, 1710-1785 MHz) - omnidirectional (CW) antennas are employed.

However, the antennas used for the Data Link transmissions are directional, with the following characteristics:

Band	Width of Beam in Degrees at Half-Power Point	Orientation in Horizontal Plane	Orientation in Vertical Plan
TCDL Data Link 15.15-15.35 GHz (2W)	1.2 degrees	N/A	Vertical
CDL Data Link 15.15-15.35 GHz (4W)	1.2 degrees	N/A	Vertical

6. **Directionality of Airborne Antennas**

The TCDL Data Link antenna and the CDL Data Link antenna used for the airborne transmissions are omnidirectional. However, the JEM Verification airborne antenna is directional, with the following characteristics:

Band	Width of Beam in Degrees at Half-Power Point	Polarization
925-960 MHz	45 degrees	RHCP
1805-1880 MHz	45 degrees	RHCP
880-915 MHz	45 degrees	RHCP
1710-1785 MHz	45 degrees	RHCP

7. **Mitigation of Interference/Stop Buzzer.**

A. **Mitigation of Interference**

Interference potential is mitigated due to the following factors:

For the verification transmissions, the antenna will be located at the bottom of the aircraft just aft of the main gear, pointing down.

Prior to each flight BAE Systems will coordinate with the FAA and the Western Area Frequency Manager, Michael Hernandez. The Western Area Frequency Manager will be provided with specific frequencies to be used on each flight to ensure our operations do not interfere with the operations in the area's test ranges.

Authority is requested for only limited and sporadic operation of the facilities during the authorized timeframe. Specifically, operation of the facilities will occur only from 4 am-4 pm local time, and for each flight test the flight duration is anticipated to not exceed 5.5 hours, with only one flight per day. There may be extended periods of non-operation during the authorized period, while other non-RF transmission aspects of the experiment are conducted.

The transmit antennas for the TCDL and TDL ground site transmissions are highly directional.

BAE Systems understands that FAA (or other stakeholders) may require certain limited azimuth and/or elevation blanking in order to ensure that the proposed Facilities do not pose a threat of interference to adjacent emitters. Accordingly, this is to confirm that the subject system does have such blanking capabilities and that BAE Systems stands ready to work with FAA to identify any reasonably necessary azimuth and/or elevation restrictions for the system.

B. Stop Buzzer

BAE Systems advises that the following will be available by wireless telephone as “stop buzzers” if any issues regarding interference arise during testing:

Rick Ball – BAE Systems – (603) 318-6913

Neil King, Sr. Principal Systems Engineer, BAE Systems, (603) 566-3869

Mike Silence, Cell: 949-496-6468; david.m.silence@boeing.com

Back-up: Dan Wells, Cell: (760) 246-3952

For the foregoing reasons, BAE Systems respectfully submits that approval of this Application is in the public interest, convenience and necessity.