

PUBLIC INTEREST STATEMENT

1. Introduction

By the instant application (“Application”), BAE Systems Information and Electronic Systems Integrations Inc. (“BAE Systems”) requests that the Commission grant Special Temporary Authority (“STA”) to permit BAE Systems to operate the facilities specified in the instant application.

By this STA, BAE Systems seeks authority to evaluate the Tall Oak system. Tall Oak is an experimental development system funded by the US Government. The Tall Oak system has two components: an Array Self Synchronization module that operates at 915 MHz and a software defined radio platform which is configurable to operate in multiple frequency bands. The intention of the application is to obtain permission to transmit on these frequencies while testing at BAE Systems in Merrimack, NH for what is currently anticipated to a limited period, sporadically from May 28, 2015 to November 28, 2015. As such, issuance of STA is appropriate pursuant to Commission rules and policies.

2. Purpose of the Operation

The testing at the Merrimack Test Range is a critical part of the proof of concept and engineering development process required in support of Homeland Security efforts. Specifically, this demonstration will be conducted to show the ability to collect and process RF signals from a sparse set of apertures that are wirelessly synchronized to each other. This demonstration will apply a variety of advanced signal processing techniques to the data collected. The Application seeks authority for a flight test with communication transmissions originating from the ground around the test area center point, and a communication link transmissions originating from the air within the airspace described as follows:

A. Ground-Based Transmissions

Temporary fixed ground-based operations within a 0.5 km radius around the test area center point coordinates on the BAE Systems’ Merrimack, NH campus: 42°48’28”N; 71°29’12”W. There will be four directional antennas mounted approximately 3m above the ground on masts that are in a semicircle or diamond pattern. The antennas will be used to communicate with the airborne assets. There will also be three omnidirectional antennas mounted approximately 10m above the ground on masts that are randomly positioned near the 3m masts. Each 3m mast will also include an omnidirectional antenna for the 915MHz signal that is used for the array synchronization.

B. Airborne Transmissions

Mobile airborne transmissions originating from a manned helicopter or unmanned hexacopter flying a flight pattern centered on the test area center point at the BAE Systems’ Merrimack, NH campus (coordinates 42°48’22”N; 71°29’12”W), with the furthest waypoints lying on a radius of 1km about the center point. The maximum flight ceiling planned is 200m above ground level (AGL) (range will be from 10m to 200m). Ground elevation above sea level at the center point coordinates is 59.4m at this location. The nearest airport to the center point coordinates is the Boire Field Airport in Nashua, NH (ASH), 3.71 km from the center point coordinates.

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

BAE Systems is conducting this experiment under a contract with Northrop Grumman Corporation (NGC), who in turn is under contract with the US Government. The US Government sponsor for this activity and their contract with NGC is classified and cannot be disclosed in this application. The contract information applicable to this experiment is as follows:

Customer: Northrop Grumman Corporation
Contract No.: 7500127002
Contract POC: Mr. Chad Larsen
12900 Federal Systems Park Drive
Fairfax, VA 22033-4411
703-803-5380
chad.larsen@ngc.com

3. Other Issues

A. Transmitting Equipment – Ground Based

Manufacturer	Item	Part #	Qty	Experimental?
Ettus Research	x310 Ettus Radio	783145-01	4	Yes
Echo Ridge	Wireless Instrumented Streaming Platform	ER-WISP-1501-001	1	Yes
Epiq Solutions	Reconfigurable RF Transceiver	ES001-100	1	Yes
Intelligent Automation	Array Self Synchronization Timing Equipment	None	4	Yes
G3 Technologies	Radio Set	Pacer P300	1	Yes
QRC Technologies	Samsung Galaxy S4 Test Phone	Q6007	1	No

B. Transmitting Equipment – Airborne

Manufacturer	Item	Part #	Qty	Experimental?
Epiq Solutions	Reconfigurable RF Transceiver	ES001-100	1	Yes
QRC Technologies	Samsung Galaxy S4 Test Phone	Q6007	1	No

C. Additional Signal Amplification – Ground Based

Manufacturer	Item	Part #	Qty	Experimental?
MiniCircuits	Power Amplifier	ZVE-2W-272+	4	Yes
L-COM	Antenna	HG824-09LP-NF	5	Yes
L-COM	Antenna	HG2414D	1	Yes
TerraWave Solutions	Antenna	M3030035O10006O-B	1	Yes
Antenna Design and Manufacturing	Antenna	LPDA-770/DP	1	Yes
Hittite	Power Amp (1W)	HMC-C075	1	Yes

D. Additional Signal Amplification – Airborne

None

E. Directional Antenna Summary

Directionality only applies to ground based transmissions, there are no airborne directional antennas.

Model	Frequency	Beamwidth	Orientation (H)	Orientation (V)
HG824-09LP-NF	For 1710-1785 MHz and 1805 - 1880 MHz transmissions	80 deg (H), 59 deg (V)	Various	0 deg
HG2414D	For transmissions above 2400 MHz	25 deg	Various	0 deg
LPDA-770/DP	Used for all ground-based signals except 915 MHz	60 deg	Various	0 deg

F. Prevention of Interference

BAE Systems is well aware of its obligations under Part 5 of the Commission's rules to avoid interference to co-channel licensees in non-experimental services, and will take all steps to ensure compliance with this obligation.

BAE Systems hereby advises the Commission that the tests to be conducted under the requested Commission authorization are to be conducted near the center of BAE Systems' Merrimack, New Hampshire facilities. Such location will result in the separation of the test facilities from other existing transmit or receive facilities.

The Tall Oak system will be tested initially in a laboratory environment without free space radiation. When operating outdoors transmissions will be limited in duration, most often a few hours per day during daylight hours.

Testing will be limited to specific bands at any one time. The 915 MHZ signal is required for all of the testing but it is very unlikely that we will be operating in more than one other band simultaneously. BAE Systems will employ a monitor-before-send transmission scheme to ensure that the channels are free prior to operation under the requested STA.

G. Stop Buzzers

Primary:	George Moynihan	(603) 689-8630
Alternate:	BAE Systems Emergency Services Center	(603) 885-3842