

**STA REQUEST
AND DESCRIPTION OF OPERATIONS**

1. **Introduction**

By the instant application ("STA Request"), BAE SYSTEMS Information and Electronic Systems Integration Inc. ("BAE SYSTEMS") requests that the Commission grant special temporary authority ("STA") to permit BAE SYSTEMS to operate the facilities (the "Facilities") specified in the instant STA Request.

STA is requested for a period of six (6) months from the date of grant of this STA Request. Due to the requirements of the government program referenced herein, grant of the instant STA Request is respectfully requested by no later than May 13, 2005.

2. **Purpose of the Operation**

BAE SYSTEMS Information & Electronic Warfare Systems (IEWS), a business unit of the Information and Electronic Systems Integration Sector (IESI) within BAE SYSTEMS North America, will conduct the testing specified in this STA Request. IEWS is a major producer of electronic warfare systems, protection systems, and tactical surveillance and intelligence systems for all branches of the armed forces. IEWS' 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 at the Litchfield Antenna Test Range is a critical part of the manufacture and delivery of military systems provided to the Armed Forces in support of Homeland Security as well as war efforts. As a general matter, the purpose of the facilities for which consent is requested herein is to measure individually the performance of scale model antennas of various types (i.e., loop, monopole, dipole), then install arrays of these antennas on scale models of various military fixtures, and measure the performance of the antennas in their installed configuration. Due to the nature of the program for which the system is being designed, BAE SYSTEMS is not in a position to discuss the particular anticipated system function in any greater detail, and the security guidelines do not permit BAE SYSTEMS to reveal the contract number, agency, or the point of contact (POC) for the customer.

3. **Discussion Regarding the Specified Frequency Bands**

The STA Request seeks Commission authority to operate within a number of different frequency bands. Although BAE SYSTEMS is aware that requesting authority for such a broad selection of frequencies will require significant review and coordination efforts, BAE SYSTEMS notes that the subject system's capabilities will span the HF to Millimeter-wave frequency spectrum. As contractually specified by all government procurement agencies, any development and/or product sell-off requires realistic measurement of a system. Should BAE

SYSTEMS be denied the critical ability to perform radiation measurement over a broad range of frequencies, such denial would severely hinder the execution of the programs and systems developed by the company in support of Homeland Security efforts. Accordingly, authorization under such a broad variety of frequency bands is necessary in this context.

It is further noted that the Commission has already previously granted STA to BAE SYSTEMS to operate on virtually all of the same requested frequency bands at the company's Merrimack, NH Antenna Test Range (which is located only 3.3 miles from the Litchfield Antenna Test Range) See File Nos. 0114-EX-ST-2005 (WC9XCL) and 0010-EX-ST-2005 (WB9XZE).¹ Accordingly, BAE SYSTEMS trusts that the Commission's coordination and processing of this STA Request may benefit from the prior grant of these same frequency bands at an adjacent antenna range.

4. Why STA is in the Public Interest

STA is being requested in order to obtain processing by the Commission and Other Governmental Agencies as expeditiously as possible so that the commencement of operation of the proposed facilities can occur as soon as possible. As a leader in technological advancements, BAE SYSTEMS continually drives new research efforts in support of the war fighter. Each candidate antenna design is fabricated and tested using the antenna measurement system described in the application. Accordingly, evaluation of the performance of the antenna will be conducted in the near term before integrated into the system. In this particular case, authority to operate the Facilities under STA is necessary so that BAE SYSTEMS can demonstrate and verify performance of the subject system in accordance with the guidelines of military contracts for which BAE SYSTEMS will be competing in the very near future. As stated above, the testing at the Antenna Test Range Facilities is a critical part of the manufacture and delivery of military systems provided to the Armed Forces in support of Homeland Security as well as war efforts, and BAE SYSTEMS is not in a position to delay the commencement of these tests. Commission grant of STA in this case will permit BAE SYSTEMS to commence operations under a timeframe that will permit it to timely verify performance and submit the system to the government under applicable bidding procedures. For the foregoing reasons, approval of this STA Request is in the public interest, convenience and necessity.

¹ It is noted that, through 30 MHz, the frequency requests in this STA Request match the frequencies granted for BAE SYSTEMS' Merrimack Antenna Test Range in File No. 0114-EX-ST-2005 (WC9XCL), except that the instant STA Request includes one additional frequency, namely, 10.05 MHz. In addition, from 30 MHz-26 GHz, the frequency requests in this STA Request match the frequencies granted for BAE SYSTEMS' Merrimack Antenna Test Range in File No. 0010-EX-ST-2005 (WB9XZE), except that the instant STA Request includes one additional frequency band, namely, 120.1-129.2 MHz.

5. Other Issues

A. Requested Area of Operation

The Litchfield Antenna Test Range is comprised of multiple separate testing locations on the BAE SYSTEMS campus at which the subject experiment may be conducted. In addition, depending on the particular requirements of the experiment (i.e., when generating signals at zero degree elevation), it may be necessary to move a given antenna along the bore site line on the range up to a distance of 100 feet. ***Accordingly, in order to accommodate these requirements, by this STA Request, BAE SYSTEMS is requesting authority to operate all of the specified facilities within a 1,500 foot radius from the centerpoint geographic coordinates identified in the STA Request*** (i.e., 42-48-22 N.Lat.; 071-25-33 W.Long. [NAD 83]). Commission approval of such area of operation will provide BAE SYSTEMS with the flexibility it requires to move the specified test equipment to any appropriate testing location on the Litchfield Antenna Test Range during the authorized term of operation, in response to the requirements of the experiment.

B. Directionality and Height of Antennas

A single Antenna Registration has been submitted for the instant STA Request, and such Antenna Registration specifies “Yes” in response to the questions: “Is a directional antenna used?”, and “Will the antenna extend more than 6 meters above the ground....” In accordance with discussions with Commission staff, such approach was taken in order to simplify the filing process and to reduce the amount of duplicative information contained in the STA Request. However, as further discussed with Commission staff, certain of the antennas involved in the subject experiment are not directional in nature, and certain of the antennas do not exceed 6 meters in height. Therefore, the following breakdown of antenna groupings is set forth to provide an accurate understanding of the directionality and height of the antennas involved in the experiment:

i. Non-Directional (Omni-directional) Antennas
With Heights Lower Than 6 Meters

This antenna grouping relates to 8 different antennas which are non-directional (omni-directional) in nature, and which do not exceed 6 meters in height above the ground (or above any structure). These antennas are as follows:

Manufacturer	Model #	Quantity	Gain (Nominal)	3dB BW E (Vertical)	3dB BW H (Horizontal)
Shakespeare	229B	2	-15 to +5 dBi	OMNI	N/A
Sanders	1/4Mon	4	-5.2 dBi	OMNI	N/A
Electro Metrics	EM-6924	2	+2.6 dBi	OMNI	120°
Sanders	TASES 36	2	-60 to -5dBi	OMNI	N/A
Sanders	TASES 24	2	-31.5 to +1.1 dBi	OMNI	N/A
Sanders	TASES 12	2	-10 to -5	OMNI	N/A
Sanders	Slant	1	-20 to -5	OMNI	N/A
BAE	AJCN46	1	-20 to -2 dBi	OMNI	120°

ii. Directional Antennas
With Heights Lower Than 6 Meters

This antenna grouping relates to 3 different antennas which are directional in nature, and which do not exceed 6 meters in height above the ground (or above any structure). These antennas are as follows:

Manufacturer	Model #	Quantity	Gain (Nominal)	3dB BW E (Vertical)	3dB BW H (Horizontal)
Sanders	1/2 Horn	1	+8dBi	60-30°	N/A
Sanders	1/2 Horn	1	+8dBi	60-45°	N/A
Sanders	BRD	1	-30 to -5dBi	35°	N/A

iii. Directional Antennas
With Heights Above 6 Meters

This antenna grouping relates to 13 different antennas which are directional in nature, and which exceed 6 meters in height above the ground (or above any structure).² These antennas are as follows:

Manufacturer	Model #	Quantity	Gain (Nominal)	3dB BW E (Vertical)	3dB BW H (Horizontal)
KMA	26500	1	-6dBi	90°	90°
SA	26-0.1	1	+8 dBi	60°	120°
SA	29-0.1	2	+8 dBi	60°	120°
SA	27-1.0/8	1	+8 dBi	9°	1.5°
SA	28-1.0/8/10	1	+8 dBi	9°	4.5°
SA	11-0.9	1	+13.7dBi	40°	35°
SA	11-1.1	2	+15.5dBi	30°	27°
SA	11-1.7	2	+15.5dBi	30°	27°
Condor	AS-48461	1	+5-+18dBi	60-10°	60-10°
Narda	639	2	+16.5dBi	6-20°	6-20°
AEL	H-1498	1	+8-+12dBi	60-30°	60-30°
SA	28-2.0/8/10	1	+8dBi	60-30°	60-30°
Sanders	Dual Horn	1	+8dBi	60-30°	60-30°

C. Note Regarding Output Power/ERP Figures

For the purpose of completion of the attached form, antenna efficiency has been assumed to be 100%. Therefore, the transmitter power and the radiated power are reported as equal (i.e., both the Output Power and the ERP are reported as “.007 W”). In practice the antenna

² In the attached form, the “overall height of above ground to tip of antenna” is identified as 36.6 meters. It should be noted that this figure represents the highest point to which the subject antennas would be raised in the course of the experiment. Based on the particular requirements of the experiment, a given antenna in this grouping may be lowered, or raised to the 36.6 meter limit, to generate appropriate receive angles.

efficiency and cable loss between the transmitter and the antenna will be considered and the transmitter power adjusted to achieve the approved output radiated power level.

D. Note Regarding “Mean” Power Designation

In the attached form, the power levels are reported as a “Mean” value. The transmitter will not be left on continuously due to the nature of the experiment and the need to physically reposition the unit under test between measurements, cycle through frequencies, change elevation angles of the transmit antenna, etc. where the transmit power is reduced to zero. The actual duty cycle of the transmit system is approximately 7%. Mean power is therefore a more accurate representation of the applicant’s proposed activity.

E. Transmitting Equipment

In response to Item No. 8 in the Administrative portion of the STA Request, the following information is provided with respect to the transmitting equipment to be involved in the experiment. It is noted that each of these transmitters is non-experimental in nature:

Manufacturer	Model	Quantity
Fluke	Fluke 6060	1
HP	HP8341	1
HP	HP8643A	2
HP	HP8340B	2
HP	HP8662A	1
HP	HP8671A	1
HP	HP8753A	2
HP	HP8753D	2
HP	HP8753E	2
HP	HP8510B	1
HP	HP8510C	1
Agilent	E8257D	1

F. Additional Signal Amplification

Due to the low gain of the transmit antennas, an additional signal amplification may be utilized as follows:

Power Amplifiers	Model	Frequency Band	Power Output	Quantity
OPHIR	5069	.5MHz to 500MHz	8W	1
OPHIR	5094	1MHz to 1000MHz	3W	1
OPHIR	5160	.8GHz to 4.2GHz	7W	1
CPI	VZV-2776K4/K6	4.0GHz to 18GHz	25W	1
ENI	510L	1.7MHz to 500MHz	9.5W	2
ENI	603L	.8 MHz to 1000MHz	3W	1
ENI	550L	1.5 MHz to 400 MHz	50W	1
Amplifier Research	5W1000	1MHz to 1000MHz	50W	1

G. Prevention of Interference

BAE SYSTEMS hereby advises the Commission that the tests to be conducted under the requested Commission authorization are to be conducted solely on the campus of BAE SYSTEMS' Litchfield, New Hampshire facilities. Such location will result in the separation of the test facilities from other existing transmit or receive facilities. BAE SYSTEMS' Richard C. Ball will be personally conducting the test and will be available by wireless telephone at (603) 318-6913. Mr. Ball will act as a "stop buzzer" if any issues regarding interference arise during testing.