

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. In this case, a start date of January 9, 2006 has been proposed by BAE Systems.

2. **Purpose of the Operation**

BAE Systems Communication, Navigation, Identification and Reconnaissance (CNIR), a business unit of the Information and Electronic Systems Integration Sector (IESI) within BAE Systems Inc., will conduct the testing specified in this STA Request. CNIR is a leader in building technical systems for the U.S. Department of Defense and our allies in avionics, navigation, and military communications. CNIR's lines of business include C3I systems and communication systems integration, guidance and navigation, electronic identification, and reconnaissance systems.

The testing at BAE Systems' Greenlawn campus will support a contract to fabricate, test, and deliver an antenna array, as part of an aircraft electronic identification system. The technology for airborne antennas and antenna arrays for aircraft electronic identification systems has been developed over many years by BAE Systems in support of the operational needs of the DOD. In this case, the testing and adjustment of the transmission phase of each of the three identical antenna elements comprising the antenna array is essential to the proper operation of the antenna. The specific name and application of this antenna array and the associated electronic identification system, and the relevant contractor information, when disclosed together with the frequency of operation, as identified herein, is classified. Accordingly, BAE Systems notes that it is separately submitting to the Commission's Security Office, under applicable classified submission procedures, the relevant program name, contract number and point of contact for the program.

3. **Why STA is in the Public Interest**

STA is being requested in order to obtain processing 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. BAE Systems' antenna testing is critical to the fabrication and delivery of the aircraft electronic identification system and the conformance of the system to the specifications. Such systems are essential for the identification of military aircraft and their protection from friendly fire, as well as for other (classified) purposes. Pursuant to the requirements of the relevant contracts, evaluation of the performance of the antenna is currently scheduled to commence as soon as Commission grant is obtained. Grant of an STA in this instance will permit BAE Systems to meet this near-term scheduling requirement. For the foregoing reasons, approval of this STA Request is in the public interest, convenience and necessity.

4. Transmitting Equipment, Antennas and Additional Technical Information

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. All listed transmitters are commercial, not experimental in nature.

Manufacturer	Model #	Quantity
Agilent	8753E	1

Each of the three antenna elements comprising the antenna array is identical. Each antenna element is directional and radiates vertical polarization. The following information describes the directionality, beamwidth and orientation of the antennas associated with this experiment (all below 6m):

3 dB BW Vertical	3 dB BW Horizontal
45°	120°

Additional technical information regarding the proposed experiment is as follows:

- This STA Request seeks authority to allow BAE Systems to test the identical performance parameters of three identical antenna elements contained under a single radome. To measure each of the antenna element parameters, each element serves as a transmitting antenna of the radiation for which this license is required.
- Testing will be performed so as to measure, and adjust as may be required, the transmission phase of the antenna array element. The measurement of transmission phase of the antenna element is performed with the Agilent 8753E Network Analyzer serving as the transmitter, as the frequency is swept through the designated band. Radiation from the antenna element, the source antenna, is received by a simple monopole antenna located at a distance of approximately 4 feet from the antenna element and mounted on the same ground plane as the antenna element. The same Agilent 8753E Network Analyzer serves as the receiver for the measurement of relative transmission phase.

5. Note Regarding Output Power/ERP Figures

For the purpose of completion of the attached form, antenna efficiency has been assumed to be 100%. The transmitter output terminal is connected to the antenna element through a 6dB pad and a short length of coaxial cable, approximately 10 feet in length. The ERP of 0.08mW includes the effect of the attenuation of the 6dB pad at the transmitter output terminal. The ERP is 0.08mW, mean, +/- 1.5dB. As explained above, the antenna element is connected to the transmitter and the 6db pad by a small length of coaxial cable (approximately 10 feet) with insertion loss and there will be some small reflection loss. These losses will reduce the effective radiated power correspondingly, estimated to be less than 1dB.

6. Discussion Regarding The Broad Frequency Band Request In This Request

BAE Systems is mindful of the need to ensure that its frequency requests are as narrowly defined as possible to meet its project requirements while unnecessarily intruding upon bands that are allocated for government or other use. BAE Systems is also aware that the frequency band specified in the instant request, namely 500-2000 MHz, overlaps with many critical government-allocated frequency assignments and that it is critical to avoid interference with government and other users on those frequencies. However, BAE Systems respectfully submits that the physical structure of this experiment, the "sweeping" nature of the transmissions, and the limited duration of each test, demonstrates that authorization of the entire 500-2000 MHz band is appropriate in this special case, and that the experiment does not pose a risk of significant interference to authorized users in this band. These factors are discussed below:

A. Physical Structure of the Experiment

The transmissions and resulting measurements will be performed in an anechoic chamber with the door open, due to the nature of the test equipment used. ***The antenna will be mounted inside an anechoic chamber and will be oriented such that its main beam is directed forward into the chamber RF absorber,*** as indicated in the attached diagram. The chamber access door is located approximately 120° off the main beam axis which will reduce the power accordingly, by 10 dB from the power in the direction of the main beam, as was indicated earlier in this Exhibit – in other words, the ERP in the direction of the open chamber door would be reduced from 0.08 mW to 0.008 mW.

B. The Sweeping Nature of the Transmissions

With respect to the breadth of the specified band, authorization of the entire 500-2000 MHz band is necessary in this special case because the transmitter is required to sweep through the entire frequency band in order to permit the required measurements to be conducted in accordance with the contract requirements.

With respect to interference mitigation, it is further noted that because the transmitter is sweeping through the entire frequency band, the effective interfering signal is reduced because any possible interfered receiver would only occupy a small part of this spectrum. For example, if the interfered receiver is assumed to have a bandwidth of 6 MHz (television), then the equivalent duty cycle factor is reduced by $10 \cdot \log(1500/6)$ or -24 dB, corresponding to a further decrease of ERP from 0.008 mW to 0.00003 mW.

C. Limited Duration of Each Test

Interference mitigation will be further ensured because the antenna will be connected to the test equipment for only short intervals of time. Specifically, the tests will be conducted subject to the following restrictions:

- i. Testing will occur only one day per week.
- ii. On the specified day of testing, the transmitter will radiate only during a single 4 hour period, for no more than 40 minutes cumulatively (i.e., transmission intervals of approximately 5 minutes, every 30 minutes, over a 4 hour period).

7. Prevention of Interference

BAE Systems' Victor Milligan will be personally conducting the test and will be available by telephone at (631) 261-7000, ext. 3627. Mr. Milligan will act as a "stop buzzer" if any issues regarding interference arise during testing.

