

**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 December 1, 2005 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 the development and deployment of commercial and military applications of the Global Position Navigation System, the principal radio navigation system in use throughout the world. BAE Systems' antenna testing is a critical part of the development, manufacture and deployment of antennas for the GPS navigation system for the Armed Services and commercial aviation.

Specifically, the testing for which authority is requested in this case will support three specific programs related to the development of the GPS navigation system, as follows:

- **FAA Differential GPS antenna for LAAS.**

The differential GPS antenna is a key element of the FAA Local Area Augmentation System (LAAS) for aircraft precision approach and landing. It is part of a ground-based reference system that broadcasts GPS corrections to approaching aircraft so that such aircraft can achieve the required accuracy for precision landing.

The relevant FAA contract information is as follows:

FAA William J. Hughes Technical Center
Contract - DTFAC-04-C-00017
Ms. Phyliss Schlegel, 609-485-4380.

- **US Army GPS SAS Program**

Currently there are a large number of smaller aircraft within the DOD that do not have anti-jam (AJ)-GPS capabilities. The size, cost and complexity of these systems preclude

these platforms from being updated with AJ-GPS systems. Despite this restriction, AJ-GPS is desirable on all DOD airborne platforms. In recent years, many advances have occurred in GPS and AJ-GPS technology. The DOD is interested in harnessing these emerging technologies to possibly meet the demand of these smaller aircraft. This project will evaluate antennas for such applications.

The relevant contract information is as follows

Computer Sciences Corp. (CSC), is acting as the contractual representative of the US Army CERDEC office

US Army contract - DAAB07-03-D-B007; CSC subcontract - S-2707.

US Army CERDEC contact, Steve Ahren, 732-616-9699

CSC contact, William Monk, 732-460-3814

- Research for anti-jam GPS antenna

Internal BAE Systems research is to be performed to develop a very small anti-jam GPS antenna array suitable to small platforms or platforms having restricted antenna mount areas and in support of the US Army GPS SAS program.

Those agencies having expressed an interest in this project include:

NAVSTAR GPS Joint Program Office
Emile, Eddy, 310-363-6507

ARMY Helicopter group,
Ahrens, Steve, (732) 427-3894

Navy ONR
Dr. John C. Kim, 703.696.4214

Air Force Research Laboratory
Jimmy Carter, 850-882-7321 x2775

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. As explained above, BAE Systems antenna testing is a critical part of the development, manufacture and deployment of antennas for the GPS navigation system for the Armed Services and commercial aviation. Pursuant to the requirements of the relevant contracts and projects, 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 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.

Manufacturer	Model	Quantity	Experimental?
Hewlett Packard	8510C (or equivalent)	1	No

Additional technical information regarding the proposed transmissions is as follows:

- The testing to be performed for each contract/project is identical. The measurement of the reflection coefficient of the antenna array element is performed with the HP 8510C Network Analyzer by injecting the transmitter power into the antenna element and measuring the signal reflected from the antenna element, as the frequency is swept through the designated band. The transmitted signal is CW. The radiation from the antenna is incidental to this testing, only necessary because the antenna must be free to radiate so as to give the correct measurement of reflection coefficient.

5. Directionality/Beamwidth and Orientation of Antennas

A. Omni-Directional Antennas - FAA differential GPS antenna for LAAS

The differential GPS antenna is an array of 19 elements. The individual antenna element pertains to this STA Request. The antenna element has an isotropic pattern that is RHCP. The Output Power and ERP are 0.63 mW, mean.

5. Directionality/Beamwidth and Orientation of Antennas, cont.

B. Directional Antennas

i. US Army GPS SAS Program

This effort is to evaluate, for application to small aircraft, anti-jam GPS antenna arrays that already have been developed. The individual antenna elements of these arrays pertain to this STA Request. The general pattern is an upper-hemispheric coverage radiating RHCP, omnidirectional in azimuth (360° in the horizontal plane) and a 120°, 3 dB beam width, in the vertical plane. The ERP is 2.5 mW, mean.

ii. Research for Anti-Jam GPS antenna

This effort is to develop a very small anti-jam GPS array suitable to small platforms or platforms having restricted antenna mount areas. The individual antenna element of this array pertains to this STA Request. The general pattern is an upper-hemispheric coverage radiating RHCP, omnidirectional in azimuth (360° in the horizontal plane) and a 120°, 3 dB beam width, in the vertical plane. The ERP is 2.5mw, mean.

6. Note Regarding Output Power/ERP Figures

For the purpose of completion of the attached form, antenna efficiency has been assumed to be 100%. In practice, there will be some small resistance and reflection losses that will reduce the reported transmitter power to the antenna as well as the effective radiated power, by the amount of these losses.

7. Prevention of Interference

BAE Systems' Gary Schay will be personally conducting the test and will be available by telephone at (631) 261-7000, ext. 3802. Mr. Schay will act as a "stop buzzer" if any issues regarding interference arise during testing.