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AIR COMMAND AND STAFF COLLEGE (ACSC) - SPACE APPLICATIONS FACILITY

"EDUCATION WITH GLOBAL REACH"

By Lt Col Michael J. Muolo, Campaign Concepts Director (Air Command and Staff College)

EMPLOYMENT OF AEROSPACE POWER

1. Land power and aerospace power are co-equal and interdependent forces; neither is an auxiliary of the other.
2. The gaining of air and space superiority is the first requirement for the success of any major land operation.
3. The inherent flexibility of aerospace power is its greatest asset.
 - This flexibility makes it possible to employ the whole weight of the available aerospace power against selected areas in turn.
 - Such concentrated use of the aerospace striking force is a battle winning factor of the first importance.
4. The information of hostile air and space activities gained by the aircraft warning service will be furnished by the air commander to missions prior to take-off; and when urgent, to the reconnaissance unit in the air.

SOURCE: War Department Field Manual 100-20, Command and Employment of Air Power 21 July 1943.

ACSC SPACE APPLICATIONS FACILITY...EDUCATION WITH GLOBAL REACH

INTRODUCTION

The Air Command and Staff College (ACSC) has assembled a space infrastructure consisting of equipment technology essential for curriculum development, demonstrations training, exercises, war games, and independent research at the "Operational Level of War." Students and faculty now integrate aerospace doctrine and the SAF infrastructure equipment into their campaign planning exercises and operational level war games to greatly enhance their understanding of operational forces planning and execution support. This SAF is critical to the successful execution of the Academic Year (AY) 1994 and future AY curriculums. Students and faculty have access to real-time tactical command and control and near-real time battlefield information by taking advantage of available space technology. This high quality real world situation display training, war game support, and technology applications research is available throughout the entire academic year. The equipment in this Space Application Facility is fully integrated into the ACSC curriculum, including, the ACSC PC based series of exercises and war games designed by the ACSC faculty from "Toolbook" software. The Space Applications Facility allows for training and education to be relevant to the theater and the threat we intend to face. The SAF will also eventually provide for real-time internet with worldwide exercises and war games, to include the National Training Center. Central to this concept is the ACSC PC based war game system and aerospace power technology application initiative.

The current SAF was designed and developed by Major Michael J. Muolo, Course Director for Campaign Concepts under the leadership of Colonel John A. Warden III Commandant. The idea to develop an SAF followed Space User Days in March 93 and became fully operational in September 93.

PURPOSE AND SCOPE

The purpose of the ACSC SAF is to provide the ACSC students with the ability to inject live and packaged data into the way that we conduct training, exercises, and war games. This SAF Facility ensures we train and educate using state of the art equipment in the Tactical Exploitation of National Capabilities (TENCAP) and Space Applications arena. The facility provides for education with Global Reach, and demonstrates the methods for bringing the capabilities of the aerospace medium to the premier air campaign planning school in the Department of Defense.

This paper describes the philosophy and function of the SAF. It also provides a facility description, equipment in place, system description, future considerations, mission statement, and description of project. Also included is the technology application and research initiative which is a fundamental component of the SAF.

ACSC CURRICULUM AND GOALS

The RAISON DETRE for ACSC is to be the premier intermediate professional military education institution which develops and teaches the concepts needed to defend the United States through the control and exploitation of air and space. As such, the ACSC mission is to develop leaders who understand the profession of arms, the nature of war, and the application of aerospace power at the operational level; and to advance air and space concepts.

Among the goals are:

Prepare leaders to develop, articulate, apply, and exploit aerospace power during peace and war.

Prepare leaders to plan and execute joint and combined campaigns with emphasis on airpower.

Prepare leaders to think critically

Expand and advance the aerospace body of knowledge

Given these goals, the ACSC curriculum for AY94 has several major thrusts:

Provides a conceptual framework (The Theater Air Campaign) which underpins and integrates the entire curriculum

Focuses on airpower application

Provides a research capability for the Air Force - Critical Analysis and problem solving

Enable the advancement of airpower knowledge

ACSC provides for the application and analysis of aerospace power. Wargaming is integrated throughout the curriculum via:

- Introductory exposure to air power exercise
- Crisis development exercise
- Campaign planning and Strategic attack analysis
- Deployment and employment exercises
- Multiple scenarios throughout curriculum

TENCAP/SPACE APPLICATIONS

In 1977, Congress directed the military services to implement a program to use the capabilities of centralized national assets in support of their force employment, rather than seek to develop separate tactical systems. The Air Force began their TENCAP initiative in 1979 and, in 1986, Air Force Space Command was designated the Executive Agent and implementing command for the Air Force TENCAP. The purpose of the Air Force TENCAP program is to improve the combat effectiveness of the Air Force through more effective use of national systems.

Air Force Space Command was charged to identify, advocate and help develop space assets, applications and information into the tactical force employment environment. DOXW quickly realized that paper studies were not sufficient to develop and test space capabilities for tactical operations and pursued initiatives to investigate the utility of space derived information tailored to the warfighter. Part of this effort was to provide support to Air Command and Staff College and Air University in educating warfighters on national systems and various TENCAP and Space Application activities and initiatives to leverage national capabilities in support of military operations.

ACSC Campaign Concepts Course Director currently prepares instructional materials required to educate ACSC students on TENCAP/Space Applications through student research initiatives. This effort also involves the dissemination and integration of these products into the education and training environment, especially in seminar demonstrations and war games and campaign planning.

In February 1993, the ACSC Commandant requested and secured AFSPACECOM/DOXW support for "ACSC Space User Days." The objective was to bring space infrastructure equipment to the warfighter to demonstrate the Global Reach of space power and the role that space forces play in planning and executing the air campaign. The demonstration included the Air Defense System Integrator, CONSTANT SOURCE, Multi-Spectral Imagery, and numerous other demonstrations related to near-real time intelligence, communications, weather, navigation, and imagery. The Space User Days was a resounding success. From this effort the concept of the ACSC Space Applications Facility was born. Likewise, this demonstration solidified the understanding of technology applications in support of an ACSC PC based war game network.

The ACSC curriculum for AY94 and beyond will focus on campaign planning at the operational level of war. The United States is currently in the most revolutionary period in history (Geopolitical Revolution, 2nd Industrial Revolution, and Military Technological Revolution) and the ACSC must keep abreast with these changes to administer effective state-of-the-art education and training. With the use of selected TENCAP/Space Application equipment, ACSC now can receive a series of space related products of direct impact on the application of aerospace power. This facility provides for receipt of real time and near-real time intelligence data, as well as non-time sensitive environmental data.

The SAF provides for demonstrating the global reach of aerospace power, injecting space infrastructure products into ACSC war games, and serve as a test bed for the applications of aerospace power. This facility provides for adaptive training for the theater and threat that we face. The ACSC SAF is education with Global Reach.

PROJECT OBJECTIVES

- a. Acquire selected TENCAP/Space Applications equipment and products. This suite will replicate, as much as feasible, the combat Air Forces standard equipage and capabilities.
- b. Integrate live data into ACSC curriculum and war games.
- c. Inject multi-spectral data into the ACSC curriculum and war games.
- d. Exploit technology for Aerospace Power research via architecting and implementing multi-media aerospace power application and research stations.
- e. Provide a "Educate like we fight" capability.
- f. Demonstrate the Global Reach of Aerospace Power.
- g. Construct a Space Applications Facility from a single office room.
- h. Educate selected ACSC faculty on TENCAP/Space Applications equipment use, who in turn will train other faculty and students. Initial training is available from Department of Defense schools or vendors.
- i. Ensure selected TENCAP equipment is maintainable and supportable.

FACILITY DESCRIPTION

ACSC currently has five selected TENCAP/Space Applications equipment for student and faculty use, curriculum development, and wargame/training/exercise support. These capabilities include; The Tactical Receive Equipment Simulation (TRESIM), the Standard Tactical Receive Display (S-TRED), The Graphic Intelligence Support Display (GIST), the Stand Alone TENCAP Simulator (SATS), and the Tactical Information Broadcast System (TIBS). In addition ACSC has purchased three Magellan GPS Receivers and will have live weather information by 1 Feb 94. There is a dedicated classified work area to store and operate TENCAP/Space Applications equipment at the SECRET collateral level.

SYSTEM DESCRIPTION

The SAF is composed of multiple workstations which are linked together and include a server/workstation design. In the interim, stand along workstations will be pursued with interactive operations being one of the drivers for the equipment selection process. Future equipment will include, but not be limited to, CONSTANT SOURCE, Air Defense System Integrator, Weather TRAC II, Multi Spectral Intelligence/Imagery Workstation(s), Target Intelligence/Imagery Workstation, Imagery Production Node, and Secondary Imagery Receipt/Handling Communications and Navigation equipment, and the infrastructure required to become embedded with the ACSC PC based war games. This equipment suite will grow to link with the Defense Simulation Internet and worldwide exercises and war games, to include the National Training Center. Current equipment and configuration are listed at Attachment.

FUNCTIONALITY

The SAF can work in several broad functional areas. The most critical of these is acquisition of real-time or near-real time data and the display and dissemination of space applications information. This data is integrated into ACSC war games. Brief descriptions and a compilation of the activities associated with these areas follows.

- a. Intelligence processing. Real time and near-real time data will be injected into the SAF to provide a view of the battlefield. This data will also be used in the ACSC PC based wargame activities.
- b. Multimedia space technology application research. Develop multimedia space and technology application research stations and prototype a seminar applications and research capability, with expansion to team research capability and ultimately from a single seminar system to a full class of ACSC technology exploitation and application suites.
- c. Data Display and Dissemination. The objective is to integrate the data products at the SAF into the ACSC PC based wargames for application throughout ACSC. Additionally, capability will exist to project the displayed data to large screen projectors in both the SAF and in an auditorium setting. Visual representations of complex scenarios, using SAF data, allow quick assimilation and high-level understanding of large amounts of data.

EXTERNAL CONNECTIVITY

The following external connectivities will exist in support of the SAF.

- a. CONSTANT SOURCE Receiver Suite (CSRS) with capability to capture Trap/Tadix-B
- b. Secondary imagery dissemination feed to imagery workstation.
- c. MSI production node connectivity with EROS data center Global Land Information system data base (archives all federally owned commercial satellite imagery).

FUTURE CONSIDERATIONS

While nothing is locked in, the future holds several new possibilities for the SAF. The external connectivity can be expanded to include the Theater Air Command and Control Simulation Facility, providing access to AWACS, PATRIOT, etc. Additionally, the potential exists for input of data into the SAF from various external sources, to include numerous external exercises and maneuvers, as well as links to the National Training Center. It is the goal of the SAF to "bring the battlefield to the schoolhouse". The underlying assumption is that if only the participants benefit from a live exercise or actual conflict, then we are not using the word education properly. The SAF provides for education with Global Reach. The intent is to provide continuous support for the upgrade, expansion, and/or replacement of SAF equipment and capabilities. Additionally, the SAF can serve as a test bed for prototype equipment to advance the applications of space forces to the aerospace campaign and the battlefield environments.

- a. Enhancements to the physical facility will be evaluated on an ongoing basis. The search for new equipments, capabilities, and applications will be continuous.
- b. The capability to upgrade the SAF from SECRET Collateral to SCI is possible.

c. The current and proposed configurations together form the technical basis for the way the SAF does business. The next section will further bound the project by defining the concept of operations.

SPACE APPLICATIONS FACILITY MISSION STATEMENT

The mission of the SAF is to bring space applications information to the warfighter. Associated with this mission is providing live and archived data to integrate space into the ACSC curriculum, during time of peace or war. Additionally, multi-media technology application and research stations are a fundamental component of the SAF. The space applications products provided will be integrated into the ACSC wargames, worldwide wargames, and the Defense Simulation Internat. The SAF will perform these functions by establishing a facility, resource base, and consolidated expertise to draw on, as needed, to satisfy requirements. Multi-spectral imagery production will compile data from a variety of sources to build MSI packages for use during ACSC wargames and demonstrations. This facility will integrate data from SPOT, LANDSAT, DMA, and other sources to provide for use on the SAF Intelligence/Imagery Workstation suite, to include mission planning and rehearsals.

PROJECT DESCRIPTION

SAF is a unique concept providing a specialized niche in the TENCAP and Space Applications environment. The SAF provides the opportunity to educate 500+ students per year on TENCAP and allows for the normalization of space in the premier Air Campaign school in the Department of Defense. It allows for a case-by-case test bed facility for incorporation of very selective prototype equipment into the education and training environment. The SAF also provides for the development of a multimedia computer based technology application and research center. This center would capitalize on the "Education with Global Reach" aspects of the SAF, providing aerospace power students the data collection and processing facility to understand today's battlefield and architect tomorrow's.

SPACE APPLICATIONS FACILITY UTILIZATION

The SAF is used on a full time basis. The degree of utilization at any given time will be dependent on a number of factors.

a. Day-to-day Operations: The facility is integrated into the core ACSC curriculum and opportunities pursued that will match the curriculum coverage to the SAF capability. As an example, the GIST equipment can be integrated to the electronic battlefield curriculum and the TIBS Equipment can be integrated into the aerospace superiority segment of the curriculum. Obviously, the SAF will be fully integrated into those segments of the curriculum which focus on space support to warfighting.

b. Wargame/Exercise Support: The SAF is fully integrated into the ACSC PC based wargame scenarios. There are many opportunities to integrate the data received into the planning and execution of wargames.

c. War/conflict access. A vital element of the SAF is to provide the warfighter the view of the battlefield. As conflict develops/occurs, the SAF will provide an opportunity to "bring the battlefield to the schoolhouse". The SAF will also mature to bring worldwide exercises and the National Training Center activities to ACSC.

d. Visit tailored activities: These are primarily system demonstrations showing what is available, system capabilities, and activities to integrate the SAF into the ACSC curriculum. Demonstrations are typically the same for each visitor.

e. **Operational utility:** As required, this facility equipment could be used to support real world operations, e.g., use of the Weather TRAC II system to support weather altering procedures.

f. **Student and faculty research support:** Students and faculty will be capable of extensive research at the Operational Level of War and be able to integrate ideas and equipment into their campaign planning exercises and operational level wargames. This training and student research will be available throughout the entire academic year.

EDUCATION AND TRAINING

One of the functional requirements of TENCAP is to conduct various level of education and training; the SAF provides a forum for this activity. The system ensures students are aware of space applications equipment and initiatives, train for employment of these systems, and are the beneficiaries of education with Global Reach. The SAF provides for "Train like we Fight". This is education and adaptive training at its best - preparing for today's battlefield by providing live and packaged data to conduct wargames, research, and mission rehearsals. As the SAF matures, the vision is to bring the major national wargames to ACSC electronically, insuring that the participants in an exercise, or actual conflict, are not the only ones to learn from the encounter.

RESEARCH INTEGRATION

To effectively integrate the SAF into the ACSC curriculum student research assistants, under the supervision of faculty, coordinate individual course requirements with each of the eight course directors. Students researchers are for the most part not associated with the space career field to demonstrate the "user-friendly" nature of the SAF. These researchers develop specific products that are incorporated directly into each PC based exercise. For example; a course exercise may involve a contingency operation against a specific country. Research assistance would use the SAF resources to develop a comparable input allowing each student to gain valuable "hands-on" education as to how TENCAP capabilities are used to support warfighting. Students filter into the SAF and extract the necessary information to support their individual Course of Action. This method has been extremely successful and beneficial to the students.

CONCLUSIONS

Since its conception the SAF has become a high interest item to all services and has received a great deal of notoriety in local and national news releases. The ACSC SAF is the only one of its kind anywhere in the PME Schools. Comparable facilities are at two other locations; HQ USAF/XOOR and Nellis but for demonstration only. The ACSC facility has proven to be a valuable educational tool and critical to the understanding of campaign planning and the application of space power.

Attachment

"The Battlefield Into The Schoolhouse"

