The History of JTAGS

A case study for rapid fielding, multi-Service R&D, and major impacts at tactical, operational and strategic levels

By Ed White

The threat posed by tactical ballistic missiles began getting serious attention from the Army and the joint community in the late 1980s. In 1988, the Satellite Early Warning System demonstration (SEWS) was initiated to experiment with theater ballistic missile (TBM) early warning concepts. The timing seems almost prophetic, given 20/20 hindsight, when the actions Saddam Hussein took, that necessitated the first Gulf War are considered. While the efforts of TBM defense during that conflict were generally effective, it was recognized that the TBM threat genie was out of the bottle and a lot more work needed to be done to develop a practical, functional defense.

After Action Reports from the Gulf War indicated a number of flaws in the existing early warning and cueing systems available to the warfighter at the time. One major deficiency was that the flight time of a SCUD missile launched against Saudi Arabia was approximately seven minutes — and the existing early warning system often was unable to generate an early warning message before the missile impacted. This was due to the message traveling first back to the United States through the U.S. Space Command, before finally being transmitted back into theater to the affected units.

False alarms were also common. Whenever an alarm went out, U.S. and coalition operations in the affected areas had to stop while the troops took passive measures to ensure their safety. This played havoc with Coalition force operational tempo.

The Tactical Event Reporting System of the time was unable to provide specific areas of probable impact within theater and so the entire theater had to literally stop and don their protective gear every time an alert was given, once again, playing havoc with operational tempo.

On the other hand, some units, particularly air defense units, were not given any warning prior to some SCUD attacks. Similarly, a number of rear area support units reported that they did not receive TBM warnings during certain engagements.

The Tactical Events Reporting System was not capable of providing launch point estimation data and so, could not effectively support aerial attack operations against SCUD launchers.

These shortfalls were highlighted in the Joint Requirements Oversight Council Theater Missile Defense Mission Needs Statement of November, 1991. The report stated that, "current C3I (command, control, computers and intelligence) systems are deficient in the capability to detect and target theater missile systems and to coordinate attack operations and active defense responses within enemy missile operating timelines. Limitations currently exist in the U.S. ability to perform rapid and accurate theater missile launch detection, definition of operating areas of hostile land mobile theater missile systems, identification and location." The Theater Missile Defense Mission Needs Statement also highlighted the requirement for a surveillance system capable of providing "timely warning and assessment of the threat, including accurate target discrimination and provide for cueing and cross-cueing of

various sensors."

Based on these defined real world needs, four pillars of Theater Missile Defense were defined.

Passive Defense is one of the basic elements of today's Joint Tactical Ground Station (JTAGS) effectiveness. Once a launch is detected, JTAGS computers can determine, within a few seconds, the approximate impact point of the missile and then warnings begin to go out to the affected units. This gives component commanders time to take measures to protect their Soldiers.

Attack Operations is defined by efforts to eliminate mobile and fixed launchers. JTAGS gives an estimated launch point within seconds of detecting the launch. This gives air and ground elements time and information to possibly mount an attack against the asset.

Active Defense means that early warning of the launch are given to defensive elements, such as Patriot batteries, so they can slew their missiles to the direction of approach and have them ready to fire once their radars acquire the incoming missile. These advance warnings, although measured in seconds or minutes provide key preparation time for the defensive missile crews, allowing them to be more set for the incoming missile, more prepared to engage and shoot it down. One feature of this capability is that no matter where the incoming missile is shot down, there is always collateral debris. The farther away from U.S. and Coalition lines and population centers the intercept takes place, the less collateral damage there is likely to be.

Command, Control, Communications, Computers and Intelligence (C4I) covers the up-line and lateral reporting capabilities that gives the various component commanders battlefield situational awareness. It also gives valuable information and intelligence such as launch point prediction to the right command elements to conduct counter battery operations.

Today's JTAGS system was born and has evolved from these requirements. The system was fast tracked in both the combat and force development arenas, allowing units to be activated and equipped in the fastest manner possible. Enablers to this process included strong and continued emphasis placed by senior Army leaders on addressing the critical theater missile defense early warning deficiencies identified during Operation Desert Shield/Desert Storm.

A second enabler was the establishment of expedited staffing and execution processes for force development. This resulted in the completion of all five phases of the process in one quarter of the time typically allocated. The five phases include; Generate Requirements; Design Organizations; Develop Organizational Models; Determine Organizational Authorizations; and finally Document Organizational Authorizations.

The third enabler was the close and continuous interaction between Army Staff and the U. S. Army Air Defense Artillery School personnel responsible for JTAGS force development and combat development respectively. These interactions also included the JTAGS materiel developers and end users.

The final enabler was the rapid execution of combat development actions by the U. S. Army Air Defense Artillery School. While the expedited staffing and im-

Across: The Joint Tactical Ground Station first Unit Equipped ceremony in Germany featured VIPs, and a new guidon design for the unit.

Below: The JTAGS system can deploy anywhere in the world in support of the warfighter.

plementation processes were working at what can only be considered breakneck speed, other significant factors were at play. The first factor is that joint considerations exerted a unique influence on the force development process. JTAGS was fielded to satisfy both Army and Navy operational requirements. As a result of the departure from most Department of Defense programs, the joint aspects of JTAGS extended to the crew level. Each JTAGS is manned by a mixed crew of Army and Navy personnel. The diverse nature of system manning generated unique issues and additional coordinating requirements throughout the force development process.

Another factor was that a tri-service training approach was adopted. Existing U.S. Air Force training capabilities were leveraged to support JTAGS training requirements. This resulted in cost savings to the Army. The operators in training were to receive Initial Qualification Training from the Air Force Education Training Command. In the end it was determined that the tri-service training concept merited closer scrutiny than it initially received. Initial classes for JTAGS personnel rated the quality of training as low, and a series of other training issues arose prior to JTAGS fielding, to include disagreements over service responsibilities.

Finally, in a very positive note, the JTAGS doctrinal development efforts have proven remarkably durable. The JTAGS Operational Concept established the framework for JTAGS-related doctrinal development in 1993. With minor revisions, this operational concept remains valid to the present, even though theater missile defense concepts and doctrine have evolved significantly over time.

The development process for JTAGS was concluded very rapidly. The first unit equipped with a JTAGS production system occurred in February 1997, less than four years after the JTAGS Product Office was activated.

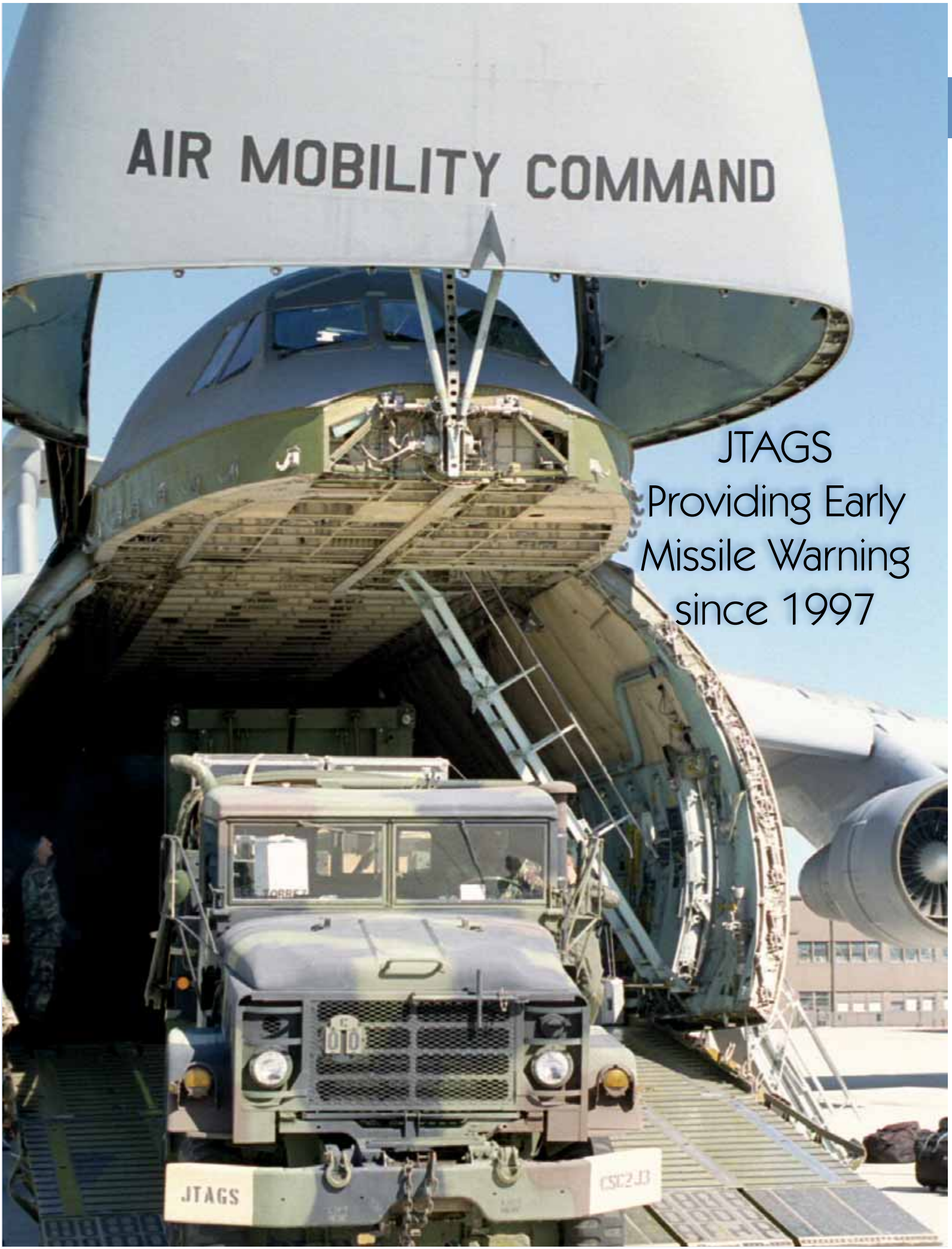
In conclusion, JTAGS is a high-impact system, capable of supporting all four pillars of theater missile defense. The system is versatile enough to be tailored to unique requirements within any of the four regional theaters of operations, to include the need to support allies. JTAGS successfully addresses many of the theater missile defense issues that affected the U.S. military operations in Desert Storm.

JTAGS provides an excellent case study not only for the rapid fielding of a warfighting system, but also on multi-service research and development, acquisition, training and unit operations. As the United States military evolves with its emphasis on joint capabilities and operations, JTAGS provides important insights for all services.

Valuable lessons learned can be gleaned from the JTAGS experience in two respects. First, the system's rapid progress in the phases of force development, combat development and materiel development resulted from a demonstrated need to provide timely, in-theater ballistic missile early warning. Second, the system's high operational tempo derives from both real-world and exercise support requirements, and necessitates the constant awareness of Army leaders concerning system manning requirements and rates of personnel turnover.

JTAGS development has set a standard that is hard to beat. In less than four years it went from concept to concrete. In today's demanding and changing political and military environment JTAGS continues to accomplish a valuable and meaningful mission.

Ed White has 18 years experience in military public affairs and is currently an editorial assistant working for the Future Warfare Center Directorate of Combat of Development to help produce the Army Space Journal.



JTAGS Providing Early Missile Warning since 1997

Organize As We Fight Army Theater Missile Warning — JTAGS

By MAJ J. Dave Price

Warfighting commanders need a reliable, responsive and autonomous capability to provide direct downlink to report on tactical ballistic missiles using Defense Support Program satellites or IR (infrared) data for early warning and alerting. Operations have demonstrated a need and Joint Tactical Ground Stations (JTAGS) testing began in 1993. JTAGS operates today as the in-theater (processing of IR data) transportable component of the Theater Event System comprised additionally of tactical detection and reporting and the U.S. Air Force Mission Control Station. The Theater Event System Concept coordinates support of all three systems, utilizing their individual strengths to offset vulnerabilities. JTAGS communication and data architecture includes Ultra High Frequency and tactical broadcast of Integrated Broadcast System — Interactive (Ballistic Missile Defense System), Integrated Broadcast System — Simplex (Ballistic Missile Defense System), Joint Tactical Information Distribution System and Joint Range Extension, TAB 37 VMF, and various voice and T-1 backup measures in the first to detect, first to report network. JTAGS provides ballistic missile warning and enhanced IR coverage 24/7, 365 days a year.

The 1st Space Company (Theater Missile Warning) has committed three of the five JTAGS command operational systems available forward to the field in Korea (Pacific Command), Stuttgart (European Command) and Qatar (Central Command). JTAGS sections will remain in operation until the fielding of the Multi Mission Mobile Processor (see M3P note) is completed around Fiscal Year 2010. JTAGS is operated by U.S. Army Space and Missile Defense Command/U.S. Army Forces Strategic Command and the 1st Space Brigade (U.S. Army) — which is headquartered at Peterson Air Force Base, Colo. The 1st Space Company (Theater Missile Warning) command and controls three detachments and six sections with 109 officers and Soldiers deployed throughout the world. The U.S. Navy and the Naval Network and Space Operations Center (NNSOC) supports JTAGS operations by providing 16 Naval JTAGS operators and one officer outside the Continental United States (OCONUS). U.S. Strategic Command has recently delegated operational control of JTAGS operations to the newly created Joint Functional Component Command-Space and Global Strike (S&GS) command at Vandenberg Air Force Base, Calif.

The 1st Space Brigade will re-task organize with four forward and one strategic reserve back for multiple purposes to include operational responsiveness to all combatant commanders with the added value of providing Soldier predictability, better permanent change of station rotations, and family quality of life. The concept of operations for JTAGS provides for one detachment headquarters and one to two sections during peace or wartime activity. Today, the three detachments headquarters are in EUCOM, PACOM and in Texas with the remaining two operational (command systems) shelters in Colorado Springs and at Fort Bliss, Texas (schoolhouse). Alpha Detachment in EUCOM provides command and control for Alpha Detachment/1st Section (A/1) in Stuttgart and Alpha Detachment/2nd Section (A/2) in CENTCOM which are mutually supporting theaters. Charlie Detachment in PACOM provides command and control over one section (C/1) at Osan Air Base in Korea. Bravo Detachment has the contingency operations mission and Individual Qualification Training (see Initial Qualification Training note) and provides command and control over the schoolhouse and two contingency sections, Bravo Detachment/2nd Section (B/2) in Texas (which has no TOE equipment) and Charlie Detachment/2nd Section (C/2) currently in Colorado Springs, Colo. All the allocations of A/2 personnel (15 Soldiers) currently reside in Colorado as well.

The problem set reflects that 100 percent of the JTAGS mission is forward in theaters supporting combatant commanders while 67 percent of the unit personnel are stationed in the continental United States (CONUS). The 1st Space Bat-

M3P

The Multi-Mission Mobile Processor (M3P) is a Pre-Planned Product Improvement (P3I) for the Army JTAGS but delivery has been moved to FY 2010 in order to incorporate operational requirements not planned for in a DSP capable M3P system. The M3P system is a ground based SBIRS (Space based infrared satellite) system that is designed to provide Direct Downlink of the SBIRS constellation (with HEO/GEO launches) when it has fully been implemented. The Army will eventually field a total of six M3P systems to replace JTAGS.

Initial Qualification Training

1st Space Company operates the Initial Qualification Training at Fort Bliss, Texas internally and provides trained JTAGS operators and Sailors to the field utilizing one of the operational shelters. Additionally, the Navy sends reservists to the JTAGS IQT and periodically in the summer, they support JTAGS forward units with these Sailors during their annual training. IQT will move underneath the SMDC/ARSTRAT Future Warfare Center and Directorate of Combat Development which performs the Training and Doctrine requirements of this command. This final shelter will be retained by the 1st Space Brigade in a Memorandum of Agreement with the Future Warfare Center in the event of a catastrophic loss of another forward JTAGS command system. This fifth system is operationally available for unforeseen operational requirements. Due to the technical requirements and constant upgrades of JTAGS shelters data and voice architecture and initial training of crews — this system serves a valuable non-doctrinal role in Army theater missile warning that will be overcome with the delivery of the M3P system.

talion and the 1st Space Brigade have taken the initiative to task organize and re-station the 1st Space Company (Theater Missile Warning) subordinate elements to better support combatant commanders and take care of Soldiers life cycle and deployment hardships. These measures include forward deploying a fourth JTAGS command system into the PACOM area of responsibility (Japan), which will provide the proper density of equipment and personnel and redundancy for that combatant commander. This fourth JTAGS command system will come from Colorado. Additionally, the personnel allocations for A/2 will move from Colorado to EUCOM where the detachment commander can provide the best support and command relationship to the CENTCOM JTAGS site. Lastly, the contingency mission will no longer be necessary and the Bravo Detachment personnel will be task organized under both the Alpha and Charlie Detachment banners in order to maximize training and operational requirements. This will effectively eliminate augmentation and deployment requirements from the CONUS sites. This solution, on the surface appears to counter the thought process behind Department of Defense and the reduction of forces forward and base them in CONUS as Units of Action. Units of Action are designed to have a training base, a deployable platform and are to be prepared to deploy one in three years. But the reality is that the mission for these Soldiers are not OCONUS until they deploy there (Operation Iraqi Freedom, Operation Enduring Freedom, Sinai, etc.), while JTAGS operators monitor and report Ballistic Missiles 24/7 for combatant commanders today with an indefinite presence forward.

The future of the JTAGS system is designed to provide combatant commanders with a system that is relevant, decisive, and eventually integrated into Limited Defensive Operations (LDO) and Ballistic Missile Defense Systems (BMDS) as an early alerting and queuing system. This provides commanders with a continuous, assured, ballistic missile early warning and queuing system in-theater. It is both an insurance policy and force multiplier by supporting all tenants of global missile defense; attack operations, active defense, passive defense and battle management command, control, communications, computers and intelligence. In-theater missile defense remains viable today and will be for the next 10-15 years. This mission set includes strategic and tactical ballistic missile warning for centimetric early warning, enhanced IR coverage and support of LDO and BMDS and other strategic classified missions.

In summary, the contingency mission may be reduced or eliminated due to the advent of a fourth system forward, giving each combatant commander or possible combined joint task force commander coverage with a primary and backup system available to cover all areas of interest in theaters with the potential to launch ballistic missile attacks. The areas that will not be covered have little or no possibility of ballistic missile use and most of these could be covered with existing JTAGS units already in place. This allows two detachment headquarters to provide hemispheric support to all combatant commanders with Alpha Detachment maintaining support in the West and Charlie Detachment providing the same in the East.

MAJ J. Dave Price is the 1st Space Company Commander (Theater Missile Warning) in Colorado Springs, Colo and the first FA40 Space Operations branch transfer. He commands three detachment commands worldwide in support of combatant commanders. He most recently served with the 3rd Armored Calvary Regiment during Operation Iraqi Freedom and is a graduate of the Greek Command and Staff College in Thessaloniki, Greece and the final Interservice Space Intelligence and Operations Course (ISIOC).

Space Professional Personnel Update

by LTC Clay Scherer

LTC Clay Scherer is an FA40 officer serving as the Chief, FA40 Personnel Proponent Office. LTC Scherer served previously with U.S. Army Space and Missile Defense Command in the Space Division of the Force Development and Integration Center where he worked on Space Control requirements development. His previous tour was at the Naval Post Graduate School where he completed a Masters of Science in Space Systems Operations. He served as a Field Artillery Officer prior to entering the Space Operations Career Field in 2001.

Air Force Space and Missile Badge

The FA40 Personnel Proponent Office (PPO) is working with the Air Force Leader Development Division at Peterson Air Force Base, Colo., and with the senior leadership in the FA40 community to develop the Army criteria for award and wear of the new Air Force Space Badge. The Air Force approved the Army proposal to wear the Air Force Space and Missile Badge in 2001. In November 2005, the Air Force retired the Air Force Space and Missile Badge and established the Air Force Space Badge. When a Memorandum of Agreement is signed between the Air Force and U.S. Army Space and Missile Defense Command/U.S. Army Forces Strategic Command, the FA40 PPO will send out an announcement to explain the FA40 transition to the new Space Badge. At this time, FA40s are not authorized to wear the new Space Badge. Award of the Space Badge will have increased rigor in the areas of training and certification. It is important to understand that no Soldier will be required to remove the Air Force Space and Missile Badge regardless of subsequent qualification for the new Space Badge. Both badges cannot be worn at the same time but anyone awarded the old Space and Missile Badge can continue to do so.

FA40 Conference

The FA40 Training Conference will be held in conjunction with the Association of the United States Army/ Greater Los Angeles Chapter (GLAC) Conference in Long Beach, Calif. The AUSA/GLAC Conference will be June 1-2, 2006. The FA40 Training Conference is tentatively scheduled for May 30-31, 2006. Details and registration guidance will be disseminated to the FA40s as they become finalized.

OPMS III Review

The Officer Personnel Management System (OPMS) is currently undergoing a lengthy review process that will result in some significant changes to the current OPMS construct. The most notable change will be to the current construct that places officers into four groupings: Operations, Operational Support, Institutional Support and Information Operations (which contains the FA40 Career Field). The new OPMS III construct has not been finalized, however a functional realignment of the basic branches and Career Fields has been approved. The new functional alignment will likely be separated into three categories: Maneuver, Fires & Effects; Operations Support; and Force Sustainment. This three-category design was concurred on by a one and two star general officer steering committee and will be forwarded to a three star GOSC in late January 2006. The FA40 Career Field will be in the Operations Support category in the Network & Space Operations sub-category. The Network & Space Operations sub-category will consist of officers in the Signal branch, Space Operations Career Field, Telecommunications Career Field (FA24) and the Information Systems Automation Career Field (FA53). The OPMS III review is ongoing and will continue through July 2006.

Training Insights

by Larry Mize

MEET THE FWC-DCD TRAINERS. Beginning in this edition, you will have the opportunity to hear from your Space trainers who design, develop, plan and execute your Space education and training opportunities. It will be a pleasure to introduce your trainers as they contribute quarterly articles to your Army Space Journal. In this issue, Tom Coleman, Chief Curriculum and Faculty Development wrote about a recent site visit to Kirtland Air Force Base in an article on page 8F.

Larry Mize serves as Chief of Training and Education for the Future Warfare Center, Directorate of Combat Development. Mize graduated from Xavier University in Cincinnati, Ohio with a Bachelor of Science degree in Math. He entered active service in the U.S. Navy, serving as a commissioned officer specializing in Naval Intelligence. He served operational and staff tours of duty associated with aircraft carrier combat deployments to Southeast Asia, on board service combatant ships deployed to the Middle East/Persian Gulf, on the staff of Commander Middle East Forces home ported in Manama, Bahrain, and in direct support of Naval Special Warfare Forces (SEALS). He attended French language training at the Defense Language Institute in Monterrey, Calif., and subsequently served as U.S. Naval Liaison Officer to the Commander French Forces Indian Ocean/ French Foreign Legion in Djibouti. He attended the Naval Postgraduate School in Monterrey, Calif., and was awarded an MS in Space Systems Technology in 1986. In 2000 he joined ACS Defense Inc., and supported the development of Tactics, Techniques, and Procedures (TTP) doctrine for U.S. Space Command's new Computer Network Defense and Computer Network Attack missions. Mize then entered civil service as an Information Operations Warfare Specialist with Army Space Command

2006 FA40 Course Update

SOOQC 06-01 runs Jun. 08 - Aug. 18, 2006
SOOQC 06-02 runs Sept. 7 - Nov. 17, 2006

These 11-week courses include:

- incorporation of National Security Space Institute (NSSI) 4-week Space 200 course as the space fundamentals phase of SOOQC
- 5-days of SCI-level Space Operations Training (must have "FINAL" Top Secret/ SCI clearance to be read-on)

Contact: Larry Mize, SMDC FWC DCD Chief of Training at: larry.mize@smdc-cs.army.mil (719) 554-4545 for more information.

NSSI Space 300 pilot Course FY06

NSSI completed the first two prototype Space 300 courses in Oct. 2005 and Feb. 2006. The four-weeks long course serves as the capstone course for continuing Space professional development and expands the purview established within Space 200 and one's own career to encompass a truly National perspective, to include considerations of joint, National, civil, commercial and foreign Space. The reading load is heavy, both prerequisite and during the course, and the evaluations are thought provoking, essay-style tests. LTC Tom James and MAJ(P) Robert Guerriero attended and represented SMDC/ARSTRAT. FWC DCD has worked in close coordination with NSSI in developming the course and evaluates the course as a critical vehicle for continued professional development for FA40 COL, LTC. Follow-on pilots are scheduled for:

- SP300 06-B: 08 May 06 - 02 Jun 06
- SP300 06-C: 21 Aug 06 - 15 Sep 06

Contact: LTC Clay Scherer, Chief of FA40 Proponent Office, Clay.Scherer@smdc.army.mil, (703) 602-1508 DSN 332 for more information and quotas.

Army Element at NSSI Expands Responsibilities

The Army Element at the National Security Space Institute coordinates as FWC DCD's onsite integrator. The chief of the element is LTC Jorge Rangel. LTC Rich Wolfe, MAJ Tod Pingrey and MAJ Patrick O'Brien are instructional staff. With the recent establishment of MG (SEL) Erica Steuterman as chancellor, and the arrival of other service and national agency representatives, FWC DCD has designated Wolfe as Army liaison to NSSI. The position parallels similar assignments on the part of the Navy, Marines and national agencies. His duties will include formalizing the NSSI/Army partnership via an MOA, assessing Army educational requirements and representing DCD interests. Rangel remains chief of the element, providing oversight, training and management of the assigned Army instructors. Wolfe will focus on direct support to the chancellor within the NSSI command section while Rangel will focus on the academic side, working with the school heads and course directors.

Army Element NSSI contact info: jorge.rangel@afspc.af.mil (719) 593-8794 Ext 30o; richard.wolfe@afspc.af.mil (719) 593-8794 Ext 369; clifton.pingrey@afspc.af.mil (719) 593-8794 Ext 125; patrick.obrien@afspc.af.mil (719) 593-8794 Ext 369

American Military University

American Military University and FWC DCD have an existing MOA wherein SOOQC graduates receive 15 graduate hours credit to be applied towards an AMU MS Space Operations degree. With 2005 graduates and all graduates thereafter, AMU has taken this MOA one step further with the offer of a 25 percent partial scholarship to one graduate. FWC DCD conducts a formal selection board and the first recipients were MAJ Larry Roberts and MAJ David Reid.

Contact Tom Coleman, FWC DCD Training, Thomas.coleman@smdc-cs.army.mil for additional information.

FWC-DCD Training Branch and NSSI Web sites. For more information on the above Space Notes or to answer your training questions go to:
-FWC-DCD: http://www.smdc.army.mil/FWC/Training/Training.html
-NSSI: http://www.sopsc.us/index.asp

Space Operations Officers Visit New Mexico Facility

By Tom Coleman, FWC DCD Training

Eighteen students and four instructors from last summer's first Space Operations Officer Qualification Course (SOOQC) made the long journey to New Mexico's Kirtland Air Force Base in July on the first of three site visits that are part of the 11-week course.

Since the start of class, the students, all Army officers, were exposed to a demanding classroom curriculum at the Future Warfare Center, Directorate for Combat Development (FWC DCD) training facility in Colorado Springs, Colo. The students participated in a total of three site visit trips to various Space agencies in the Continental United States to receive hands on training and to give them an overview of the full scope of some of the capabilities of selected Space organizations.

The students were accompanied by Tom Coleman, Dave Berge, Lenny Gehrke, and LTC Jorge Rangel, all part of the FWC DCD Training Cadre. July 6 - 7 were spent visiting various Space-mission oriented units on the Air Force Base. The first place students were able to visit was the Big Crow Program Office where they received an overview briefing and facilities tour.

They learned that the Big Crow Program was established in 1996 with a charter to provide Electronic Warfare environments for testing U.S. military radio frequency sensor, communication and navigation systems. However, over the years the need to exercise ever more sophisticated systems has led to the development of an in-house capability that far exceeds Big Crow's original charter and to a customer base that extends throughout and beyond the military services.

Big Crow's mission and capabilities now span the electronic spectrum, encompassing Electronic Warfare, telemetry, radar and electro-optical systems. Mobile and deployable worldwide, the Big Crow program offers a variety of unique capabilities to the nation's research, development, test and evaluation (RDT&E), training and commercial communities. The students were also able to visit a variety of these related organizations and learn firsthand, how Space support is provided to the warfighter.

The students then visited the Air Force Research Laboratory (AFRL) headquarters building and received an overview briefing and guided tour of the facilities. Part of the tour included the Composite Materials Lab where students asked lots of questions and the laboratory folks were quick to provide thorough and accurate answers.

In addition to the AFRL Composite Material Lab tour, the students received a briefing and tour at the AFRL's Aerospace Engineering Facility.

Located on the west side of Kirtland, the facility is a "one-stop shop" for Space experiment integration, verification and testing. Its scientists and engineers test

Left: A lone U.S. Marine, one of the Space Operations Officer Qualification Course students contemplates a site feature during the tour at Kirtland Air Force Base, N.M.

Below: Members of the course pose at Kirtland Air Force Base during a recent tour of the SMDC facility on the base.

components and payloads, integrating them for Space and near-space (high altitude balloon) flights.

The 16,500 square foot facility is equipped to provide: vibration, shock acceleration, environmental and thermal variation testing to flight components and payloads. Experimenters and contractors at AFRL's Space Vehicles Directorate conduct integrated payload testing under realistic launch and orbit environments. This facility is operated by the AFRL's Space Technology Integration and Demonstration Division. Again, students asked lots of questions and received professional answers from all the sites visited over the two days at Kirtland.

On the second day, the students were able to visit the Operations Center to take a look at Research and Development Spacecraft Operations as well as visit and talk to folks at the Department of Defense Space Test Program facility.

The students also visited the Mobile Spacecraft Telemetry, Tracking and Commanding range and the Starfire Optical Range before heading back to Colorado Springs to get ready for the Space 200 portion of the course.

Once the students completed the four-week Space 200 course, they attended another site visit, this time to Vandenberg Air Force Base, Calif., where they visited the Northrup Grumman facility to receive information about Space Technology as well as to participate in a Boeing Satellite Industry Tour. The visit to Vandenberg included site visits and tours to the 14 Air Force, Space Air Operation Center, 30th Space Wing, 614th SIS, 2nd Range Operations Squadron, Western Range Control Center tour, Ground-based Midcourse Defense (GMD) facilities tour, Launch Control Center/Readiness Control Room, and the Missile Assembly Building. The third major field trip for the class was a week-long trip to the Washington, D.C., area where students had the opportunity to visit a variety of Space-related agencies such as SMC HQs, National Security Space Office, National Reconnaissance Office, National Security Agency, Army Space Program Office, Topographic Engineering Center, National Ground Intelligence Center and other agencies.

The field trips are an integral and vital part of each of the Space Operations Officer Qualification Course — providing hands on experiences to complement classroom instruction throughout the 11-week experience.

Tom Coleman serves as Chief, Curriculum and Faculty Development for the Future Warfare Center, Directorate of Combat Development. Coleman graduated from Brigham Young University with a Bachelor's Degree in Communications and holds a Master of Science Degree in Human Resource Management from Troy State University. Coleman enlisted in the U.S. Air Force in 1971 then entered Officer Training School in 1979 and was commissioned as an Imagery Intelligence Officer. In 1983, Coleman cross trained and began serving as an Air Force Education and Training Officer. His training assignments included tours with HQ ROTC, USAF Occupational Measurement Center, USAF Academic Instructor School (AIS), and serving as Chairman, Evaluation Department, AIS, Ira C. Eaker Center for Professional Development, Air University. Prior to his current position, he served as Senior Aerospace Science Instructor in JROTC, and was a full time instructor and Assistant Director of Faculty Development at the U.S. Air Force Academy.

Professional Reading

"Space Notes" excerpts professional articles of interest to Space professionals. The section will attempt to present a broad spectru m of newsworthy items, with references to the full article for those who wish to read further. Suggestions and submissions for this section are solicited, and should be forwarded to the Managing Editor at Space.journal@us.army.mil.

Air Force Seeks Boost in Space Spending

WASHINGTON — The U.S. Air Force is asking Congress for $9.8 billion for military Space programs in 2007, an increase of $500 million over the current budget, according to U.S. Defense Department officials.

NASA Seeks 30 Percent Increase for Exploration Program; Overall Budget Would Rise Just One Percent

WASHINGTON — Efforts to replace the Space shuttle fleet with new Moon-bound spacecraft would receive big spending increases under NASA's 2007 budget request, while nearly every other part of the U.S. Space agency's budget would be held flat or decline.

NASA budget: Right vector, time for more thrust

COLORADO SPRINGS, Colo. (Feb. 6, 2006) Space Foundation President and Chief Executive Officer Elliot G. Pulham made the following statement today in response to the release of the President's FY 2007 budget proposal for NASA:

"The Vision for Space Exploration and the President's budget proposal has NASA headed in the right direction. This is the right vector, but it is time for more thrust.

We commend the White House for providing NASA with a budget that demonstrates commitment to Space exploration. The modest 3.2 percent increase over the FY06 baseline means the nation can carry through on its commitments to return the Space shuttle to flight, complete the International Space Station, and pursue renewed exploration of our solar system.

U.S. to deploy radar in Japan

Associated Press

The United States plans to deploy in Japan within the next six months mobile X-band radar for an advanced early warning system against ballistic missiles, a senior U.S. Missile Defense Agency official said Monday.

The Japanese Air Self-Defense Force base in Tsugaru, Aomori Prefecture, is seen as the most likely candidate site to build the ground-based radar chiefly aimed at detecting incoming missiles from North Korea.

22 SOPS supports NASA mission to Pluto

Air Force Space Command News Service
Staff Sgt. Don Branum
50th Space Wing Public Affairs

SCHRIEVER AIR FORCE BASE, Colo.—The 22nd Space Operations Squadron here provided critical support for NASA's New Horizons probe, which launched from Cape Canaveral Air Force Station, Fla., Jan. 19.

The Air Force Satellite Control Network relayed booster and upper-stage telemetry data from the Spacecraft to engineers on the ground, said Maj. Karilynne Wallace, 22nd SOPS Detachment 1 commander at Vandenberg Air Force Base, Calif.

When one of NASA's remote tracking stations had problems just prior to the launch, the Diego Garcia tracking station became the primary site for critical telemetry, said CPT Richard Rutowicz, an AFSCN crew commander for 22nd SOPS.

The tracking station provided "good to excellent" telemetry, according to end users.

"As the first of 18 possible launches scheduled for 2006, this successful launch demonstrates the criticality of the network tasking order and AFSCN to launch operations," said Brian Bayless, 22nd SOPS scheduling branch chief.

Journey to the edge of the Solar System

Air Force Space Command News Service
1st Lt Kevin Coffman, 45th SW Public Affairs
PATRICK AIR FORCE BASE, Fla.—The 45th Space Wing supported the successful launch of the NASA Pluto New Horizons Spacecraft on an Atlas V rocket from Space Launch Complex 41 here Jan. 19.

The wing provided Eastern Range and launch base support to Lockheed Martin and International Launch Services, who served as the commercial Spacecraft and booster vehicle provider to NASA.

Launch officials scrubbed the mission twice earlier due to weather issues. This launch marked the first time an Atlas V has flown with five boosters strapped-on. Prior to this mission, three was the most. This was the fastest rocket to leave the Earth's atmosphere with about two and a half million pounds of thrust at launch and ending up traveling to Pluto at 36 thousand mph.

Lockheed Martin Delivers Pac-3 Stockpile Reliability Test Missiles

DALLAS, Texas (SPX) Feb. 06, 2006

Lockheed Martin recently delivered the first Patriot Advanced Capability-3 (PAC-3) Stockpile Reliability Test (SRT) Missiles to the U.S. Army during a ceremony at Lockheed Martin's facility in Camden, Ark. The delivery marked the first major milestone in the Operations and Support (O&S) phase of the PAC-3 Missile program.

Russia To Build New, Anti-Missile Warning System

MOSCOW (AFP) Jan. 31, 2006

Russian Defense Minister Sergei Ivanov announced Tuesday that Russia would build a new missile defense warning station in the south of the country, thus decreasing its dependence on radar systems based in nations such as Azerbaijan and Ukraine.

MISSILE DEFENSE

BMD Watch: Trident Subs Will Fight Terror

By Martin Sieff, UPI Senior News Analyst
WASHINGTON (UPI) Jan. 25, 2006

The U.S. Navy is converting some of its prized nuclear strategic submarines to launch precision, conventional munitions strikes against terrorist bases and similar targets.

Four ultra-stealth Ohio-class SSBNs are having their 24 Trident II D-5 nuclear ballistic missiles removed and replaced with up to 154 Tomahawk cruise missiles, Defense Industry Daily reported Jan. 18.

Congress Gives Alaska $150M Boost With Missile Defense Deployment

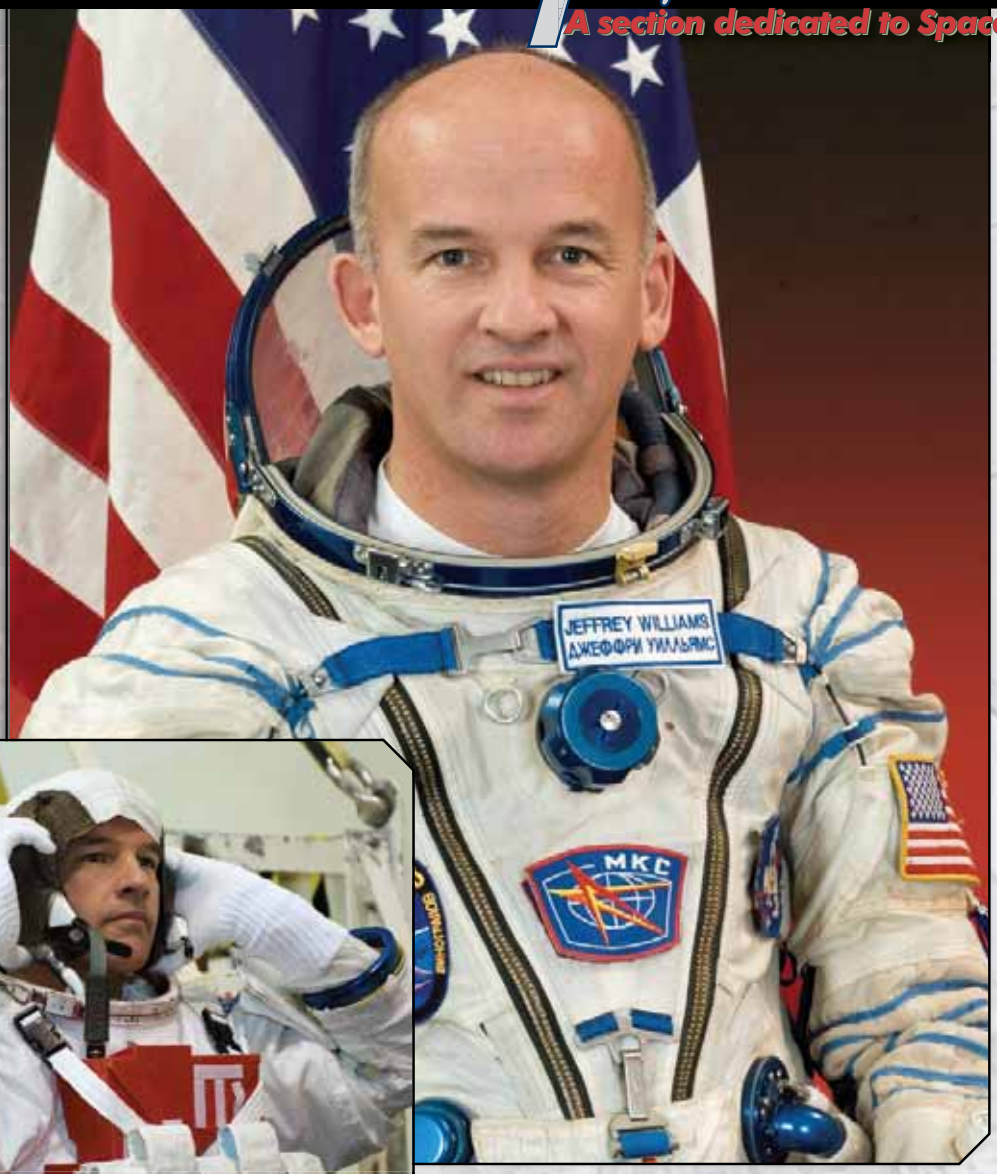
WASHINGTON, D.C. (UPI) Feb. 08, 2006

Congress has given the long-troubled Missile Defense Agency's Ground-Based Midcourse-Interceptor program a financial boost, allowing it to deploy planned interceptors more rapidly, the MDA's chief has told an Alaska newspaper.

The new Defense Appropriations Bill contains provisions to shift $150 million from within the MDA's budget from other programs to fund expanded and accelerated interceptor deployment, Air Force LTG Henry "Trey" Obering III told the Fairbanks Daily News-Miner in an interview published Sunday.

The Flipside

A section dedicated to Space Operations



First active–duty Army Soldier serving tour aboard the International Space Station

Army Astronaut COL Jeffrey Williams, is one of four members of the thirteenth crew of the International Space Station, which took up residence in late March. Williams, a veteran of STS 101, is serving as the flight engineer and NASA science officer and will perform a spacewalk, which will focus on continued outfitting of the station to prepare external hardware for the addition of station elements and tending to external science experiments.