Army Space Journal

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SPACE TECHNOLOGY

COVERING THE WARFIGHTER FROM ALL ANGLES

Army Space Journal

The U.S. Army Space and Missile Defense Command publishes **the Army Space Journal** quarterly, with special editions as required. The publication consists of four sections, FROM THE TOP — Leadership Updates; JOURNAL FORUM — Space Topics; TIP OF THE SPHERE — Space Cadre News/Features; and FLIPSIDE — SMDC Features.
The Journal provides a forum through which Space operations professionals can disseminate professional knowledge and furnish information within the U.S. Army. The purpose is to increase the effectiveness of Space operations through a professional discussion of events and lessons learned. It is also intended to inform the Army warfighter on Army Space issues.

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Back Cover Photo: SGT Michael Cost
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Editor's Blog

Today it rained.

If felt cold from the early morning Colorado late summer downpour. The patriotic music played on the Peterson Air Force Base outdoor speakers. Although they let the U.S. flag fly 24/7 on the base, revelry and retreat remain symbolic here for the start and end of the workday. On this morning, like most, many people walking to their offices stopped to pay tribute while some others continued to walk.

I stood still not only because that is my peacetime Army training of 23 years, but it seems a small thing to pause and think about our men and women in uniform fighting in Iraq and Afghanistan and other places. It seems odd to me that our life pace goes on here in America as we deal with our own daily issues, while great Americans fight so hard for military objectives while being in harm's way. It's not a criticism of mine, just a thought.

I thought of my daughter – an Air Force lieutenant – serving in Iraq with 10th Special Forces Group from nearby Fort Carson. She was born on Carson and, when she was little, she played on a swing in Iron Horse Park. Her mother and I took her from Army posts in one location or another as she grew up to attend the Air Force Academy and now serve.

Men have died in that Army unit on this deployment. My daughter has experienced a reality of war that her father can vaguely understand – as have thousands of young Americans serving in this generation. She gives her heart and professional service. Every mission brings with it a heavy real-

Blog the editor:
space.journal@us.army.mil

Note:
Dedicate the ASJ summer edition to the men and women serving with the 10th Special Forces Group!

Daughter in Iraq.

ity that I can barely comprehend.

Here are photographs of my daughter and the sandstorm she deals with – an Air Force officer leading with the men and women of one of the Army's foremost units doing work for America in Iraq. One of her Soldiers took them last spring so she could send the photographs home for Mother's Day. It's not her weapon in her hands – the Army boys thought it'd send the wrong message for her to have a dinky pistol. To her parents, she somehow looks like a little girl dressed up for Halloween. In reality, we know, she's not playing dress up. She'll come out of Iraq in a few months with knowledge of this world we will never have.

Today as I dry off from the rain to put this summer edition of the Army Space Journal to bed for printing, I've broken a rule by running a photograph of somebody in my family in a publication I edit. I haven't stretched the rule in nearly 30 years of doing this business — and doubt I'll do it again in another 30 years. I do it today to show there's a human side to this war.

Every parent and loved one of the men and women dragging combat boots through the sand of Iraq knows it. Because of this, we dedicate this edition of the Army Space Journal to those serving with the 10th in Iraq. They are symbolic of the many doing a job few of us can fully appreciate. It is not difficult to connect the dots between these professionals and our own service in bringing Space products to the fight.

As always, the blog is open. If you have any thoughts, please send them along.

Mike Howard
Editor-in-chief

LTG Kevin T. Campbell
Commanding General,
U.S. Army Space and Missile Defense Command/
Army Forces Strategic Command

Integrating Technology into the Fight

We recently completed the 11th Annual Space and Missile Defense conference in Huntsville, Ala., Aug. 14. Once again, the combined efforts of all those involved ensured a successful outcome. It was especially rewarding to hear the perspectives of diplomats, military leaders and industry leaders regarding the pressing issues of Space and Missile Defense in the context of developing world events. I recommend attending conferences like this one to enhance your professional development.

The summer edition of the Army Space Journal deals with perspectives about Space Technology. If there is a "theme" to the articles, it is that Space professionals must be current on emerging technologies in order to integrate those capabilities into the fight.

I will leave it to the authors to provide information about the types of technologies available or within reach. What I will discuss for this issue is the importance of being a productive member of the team – whether that team is a division, corps, Army or Joint staff – because all the best

technologies available cannot help the Warfighter if those technologies are not integrated into the fight. They won't be integrated into the fight unless the Space professional is considered a valued and trusted member of the team.

How do you accomplish that? Three ways:

First, you must be credible. Those you work with and those you work for must trust that you know your business better than anyone else. Someone with a satellite dish at home cannot know more than you about satellites. You must be more than technically and tactically competent; you must be the expert in your field. You must constantly update your information and your knowledge about your field. For example; you need to thoroughly understand what a satellite can do, how it works, what are its limitations, what you can do to affect shortfalls; know who are the "satellite drivers" that can provide you instant data when there is a problem. Understanding concepts is not enough, you need to know the nuts and bolts about satellites. The same can be said for sensors, or software – how do they communicate with each other? What are the limitations? What are the strengths? What are the work-arounds? What's on the horizon? What technologies are being worked on in the SMDC/ARSTRAT labs? Have you called the Future Warfare Center or the Technology Center lately? You get the idea ...

Second, you must be a team player. You may be the lone Space professional on staff but you should not be considered a lone wolf. You need to be in there getting your hands dirty, helping with the orders process, making yourself indispensable to the commander and to your fellow staff members. Do not work outside the decision-making process. As a member of the commander's staff he/she expects you to know the orders process and to interject your analysis and courses of actions at the appropriate time. The Military Decision-making Process (MDMP) applies to Space professionals as much as it applies to the combat arms folks. If you haven't participated in a Military Decision-making Process since Combined Arms and Services Staff School or Command and General Staff College, then break out the books. The commander does not have time to teach you what you should already know.

Third, get it right. You will be marginalized if your advice tends to be wrong or if you are late providing input. The old adage of: "measure twice, cut once" applies to good staff work. Check your sources, check your information and then make your recommendation. Anyone can read the morning report or the battle update brief. As a valued staff officer, you need to do the analysis – to see around the corner.

In the end, technology can only take you so far, and then it is back to basics. We may have new technologies to assist in making decisions, but it still takes good leadership skills to get things done and it still takes good personal skills to work in a group.

As always, the Army Space Journal is your publication. I encourage you to provide comments about the articles to the editor and to submit articles about topics that may be of interest to the Space community. This is your magazine – use it.

"SECURE THE HIGH G

CSM Ralph Borja
U.S. Army Space and Missile Defense/
Army Forces Strategic Command

The Best of the Best

NCO and Soldier of the Year

This edition of Army Space Journal introduces you to the 2008 SMDC/ARSTRAT Noncommissioned Officer of the Year and Soldier of the Year.

This year's competition for NCO and Soldier of the Year was extremely competitive, and I'd like to personally congratulate all the regional winners who earned the honor of competing. The regional winners are:

EUROPEAN REGION: SSG Charles L. Robinson III and SPC Michael R. Moore;

EASTERN REGION: SGT Matthew S. Davidson and SPC Abigail H. Keller;

WESTERN REGION: SSG Randolph R. Brown and SPC. Matthew S. Caple; and

PACIFIC REGION: SSG Christopher L. Barber and SGT Joseph B. Knece

These Soldiers are all exemplary of the outstanding men and women who are part of the SMDC/ARSTRAT team.

In the Flipside section you'll get to meet SSG Christopher L. Barber, the SMDC/ARSTRAT NCO of the Year who is from Charlie Detachment, 1st Space Company, 1st Space Battalion, Misawa, Japan, and SPC Michael R. Moore, the SMDC/ARSTRAT Soldier of the Year who is from Alpha Detachment, 1st Space Company, 1st Space Battalion, Stuttgart, Germany.

I'd like to expand upon the Army Space Journal article by discussing the incredible amount of effort that goes into planning for and implementing the tests used to measure these outstanding men and women. The evaluation criteria must closely mirror what the SMDC/ARSTRAT NCO and Soldier of the Year will face when they compete at the Department of the Army level against the best of the best from throughout the Army.

Thanks largely to the herculean efforts of MSG John Telgenhof, 1SG Petey Smith and Lorronica Hamil from Headquarters SMDC, and to the excellent support provided by members of the 100th Missile Defense Brigade,

the 1st Space Brigade, Staff and the Operations Center; we had an outstanding and very competitive event this year. Our NCO and Soldier candidates were subjected to rigorous tests of their physical, mental, and leadership skills, tests virtually identical to those they'll face when competing at the Department of the Army level. They were also evaluated on their ability to effectively communicate both orally and in writing.

During the Urban Orienteering Course, led by SFC Rene Saiz and his Observers/Controllers (O/Cs) of the 100th Missile Defense Brigade, our Soldiers were introduced and tested on the Army's Defense Advanced GPS Receiver (DAGR). For many, this was their first experience with the device. After hands-on training, all of the contestants were able to successfully complete the day and night land navigation tests using the DAGR as well as the traditional compass and protractor.

Weapons zero/qualification also presented a new challenge for many of our Soldiers because most had never fired the M-4 Carbine. 1SG Steve Adams and his Safeties of 1st Space Company coordinated, arranged and executed this event exceptionally and provided extra range time for our Soldiers to allow them to familiarize themselves with the M-4 prior to weapons qualification.

Kudos also to SFC Marcus Kent and his O/Cs of the 100th Missile Defense Brigade for setting up an excellent Situational Training Exercise using Simunitions and a 2K course that really tested the leadership and warfighting skills of our NCOs and Soldiers. Watching our Warrior's successfully work their way through a field medical evacuation, ambush, and hostage rescue was as rewarding for us Senior Noncommissioned Officers as I'm sure it was for them.

As I said at the beginning, this year's competition was extremely close. Thanks to 1SG Carl Torkelson and his evaluators of HHC 1st Space Brigade who started this event by administering the Army Physical Fitness Test. By the end, it came down to their performance on the written test, their written essay, and their performance before the formal evaluation board.

We wish SSG Barber and SPC Moore the best of luck as they represent us in competing for Department of the Army "Best Warrior Competition" NCO and Soldier of the Year. I'd also like to congratulate all of our Regional competitors for being selected as the best NCO and Soldier from within their respective Areas of Responsibility.

Finally, I'd like to offer a special thanks to all sponsors, commanders, leaders and staff who assisted and supported our competitors. While we could only select one NCO of the Year and one Soldier of the Year, each of you have proven to be winners and outstanding Soldiers who are extremely valuable members of our Command. I salute each of you!

Competitors had to climb steep and rough terrain during the Situational Training Exercise portion of the 2008 SMDC/ARSTRAT Noncommissioned Officer and Soldier of the Year Competition.

Photo by Sharon L. Hartman

"SECURE THE HIGH G

COL Kurt S. Story

Deputy Commander for Operations
U.S. Army Space and Missile Defense Command/
Army Forces Strategic Command

Human Understanding

Necessary in Technology Equation

I am very excited to be stationed back with the SMDC/ARSTRAT team. I want to make a difference working with the entire team supporting the warfighter in the current fight and evolving Space and missile defense operations for the future fight.

In 1988, aeroscout weapons teams from the 11th Armored Cavalry Regiment flew along the interzonal border separating East and West Germany. The pilots used folding laminated maps in their laps for navigation. They employed line-of-sight FM radios to provide position reports to the Regimental Border Operations Center – blue stickers were manually placed on a map in order to provide situational awareness. No one wanted to inadvertently cross the border and create an international incident.

GPS sure would have been nice.

Fast forward 20 years to 2008 – we no longer have analog cockpits, but digital "glass" cockpits with moving map displays, GPS navigation, blue force tracking, digital burst spot reps, and non-line-of-sight satellite communications. Advances in technology are a marvelous thing. What an improvement.

As you read this edition of the Journal and articles in other publications on technological advances, I would like you to consider the following ideas.

- Technology will never replace the human brain and the art of war;
- Don't oversell what Space-based technology can deliver
- Never stop looking for technical solutions that have a tangible benefit to the warfighter.

Technology enables decision making, but technology does not make the decision!

No Replacement for the Human Brain and the Art of War

Technology enables all we do, but it can't replace the human brain's ability to adapt and react. This idea was highlighted in COL H. R. McMaster's 2003 U.S. Army War College Student Issue Paper. He writes: "Flushed with victory and impressed with American technological superiority, many believed that new technologies in the areas of surveillance, communications, long-range precision weaponry, and stealth made possible a new way of waging war. An emerging thesis of future war depended on the unfounded yet widely accepted belief that sensors, communications, and information technologies would generate near-certainty in armed conflict."

While he lauds information technologies and robust communications that allow collaborative planning, joint integration, common operating pictures, extensive intelligence preparation of the battlespace, and decentralized execution, he says that no technology or computer simulations can "remove or even reduce . . . principal sources of uncertainty in war." As you know, in Iraq and Afghanistan, coalition forces have encountered an innovative and ever-adapting adversary that continually frustrates the desire for certainty.

Many factors interact to set the conditions of war. It is impossible to achieve certainty or guarantee outcomes based solely on technology.

I don't I think I could put it any better than Marine GEN J. N. Mattis, U.S. Joint Forces Command commander, did in his memorandum to his staff on "Assessment of Effects-based Operations," dated Aug. 14, 2008. In that memo, he writes: "Technology and training are key enablers to gain advantages over our adversaries, but no amount of technology or training will enable us to accurately predict the reactions of complex systems. The enemy's free will, manifested by courage, imagination, resolve and other human factors deny predictability in most aspects of war. We must use focused training and technology-enabled solution or problem solving techniques to enhance initiative, pattern recognition and decentralized decision-making."

Stated simply: Technology enables decision making, but technology does not make the decision!

As Space professionals we need to recognize that all the technological capabilities we bring to the battlefield cannot entirely remove the uncertainty and fog of war. We need then to train ourselves well in our warrior tasks and the art of war, be prepared to adapt, and to use the technology to support the commander.

What? Don't promise what you can't deliver.

Don't oversell/overpromise what technology can do at this moment in time. A corollary to this is the old axiom: "If it sounds too good to be true, it probably is."

Understanding >> continues page 12

COL Bruce Smith
Director
Directorate of Combat Development
Future Warfare Center

CHANGING TECHNOLOGY

This morning at 5:10 a.m., the automatic sprinklers at my house turned on. Six minutes later the system's Zone 1 turned off and Zone 2 turned on. The sprinkler system continued to operate without my input or awareness; one hour later my lawn was watered and the system shut itself off. Meanwhile I was busy checking e-mail and my day's schedule on my BlackBerry and carrying on a conversation with a member of the Program Executive Office, Missiles and Space, two thousand miles away. A few minutes later I was able to use my home computer and check on a new bank account that I had set up for my son and transfer money instantaneously from a bank in Virginia to a bank in Texas. After setting my Ti-Vo to record a television program for later in the day, I hopped into my hybrid car and drove to work – getting 48 miles to the gallon. In short, technology made my morning activities simple, productive, and allowed me to use my time and resources more efficiently.

In comparison my father's morning routine of a few decades ago was not nearly as varied or productive. At that time if he wanted to water the lawn, he would have had to drag out a hose and continue to monitor the time and move the sprinkler around the yard accordingly. He could not have read his work related correspondence in near real-time at home, but would have had to wait until he arrived at the office. Likewise, he would have had to wait until the bank opened before he could inquire about an account, as well as wait several days for funds to transfer between banks after he had arranged to wire the money for a fee. Technology has changed the way I live from the way my father did.

Americans' lives today are different then their parents' lives in part due to technology. Of course technological advances have always impacted and changed how succeeding generations of people have lived from their ancestors. What is different about today is the pace of the technological evolution. Machines and systems we take for granted today did not exist 15 years ago. Personal computers, online banking, BlackBerries, e-mail, cell phones, ATM machines, and the ubiquitous network that links them all are making our lives more productive, more convenient, and some would argue more stressful. Whether for good or bad, technology is rapidly changing the way we live and the pace of change will continue to accelerate.

Technology, which is defined as, "the practical application of knowledge especially in a particular area" and "a capability given by the practical application of

knowledge," is not just changing individual lives; it is also impacting our businesses and institutions, to include our Army. Information networks, computing power, advanced sensors, satellite communications, smart- weapons, as well as precision navigation and targeting technologies are rapidly changing the Army. The Army is spending billions of dollars to develop weapons, radios, and vehicles that incorporate the latest technology in the effort to maintain and enhance combat power. These new technologies are enhancing the Army's capabilities but have far-reaching impacts that go beyond merely the fielding of a new piece of equipment. The Army does not employ or fight equipment; rather the Army employs and fights combat units, whether it is a squad, platoon or division. The introduction of increasingly technological advanced equipment means that the Army must evaluate and subsequently change doctrine, training, education and leadership, as well as organizational structures, in order that its units are fully prepared to utilize and win with these new capabilities. Technology must be integrated into the Army in a holistic manner in order to maximize its effectiveness.

U.S. Army Space and Missile Defense Command/Army Forces Strategic Command is at the leading edge of technology development and integration in the Army. Over the past decade, the Army, led in part by SMDC/ARSTRAT, has pushed Space capabilities to forward deployed Soldiers at the tactical level. Space-based and enabled capabilities such as satellite communications, missile warning, precision navigation and targeting, Joint Blue Force tracking, and hyper-spectral imagery are increasingly available to, and are enhancing the combat power and effectiveness of, the Army's brigades, battalions and other tactical formations. SMDC/ARSTRAT has played a pivotal role in identifying operational capability gaps that can be addressed by Space and subsequently developing solutions to fill those gaps.

Today SMDC/ARSTRAT is working on a number of efforts to mature new technologies and integrate them into the Army's future Space and missile defense forces. The Space and Missile Defense Battle Lab is actively working to define and develop High Altitude capabilities that could one day provide persistent Intelligence, Surveillance and Reconnaissance, beyond line-of-site communications and enhanced missile warning to Soldiers deployed on future battlefields. This effort will entail much more than developing the high altitude platform. To make this proposed capability a reality, SMDC/ARSTRAT will have to develop the operational concepts and architectures, as well as eventually design the organizational force structure and supporting training. At the same time, SMDC/ARSTRAT is actively working with U.S. Strategic Command and other Services

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The introduction of increasingly technological advanced equipment means that the Army must evaluate and subsequently change doctrine, training, education and leadership, as well as organizational structures, in order that its units are fully prepared to utilize and win with these new capabilities.

UNDERSTANDING

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One of the problems plaguing our troops in Iraq is the Improvised Explosive Device. We want to conquer this threat and acknowledge that our desire to find a solution might lead us to believe in a technological promise that can't deliver. One idea to counter the Improvised Explosive Device threat is that unmanned aerial vehicles can patrol roads that are susceptible to being mined. Sound good? What if the unmanned aerial vehicle can't fly because of weather or lack of good GPS signals? The enemy just needs to wait until conditions prevent the drone from flying. So we need either a different solution or a backup plan. If we believed that the unmanned aerial vehicle was the only solution to the exclusion of others, we'd put our people at unnecessary risk.

Because so much is at risk – like the lives of our people and success in battle – we need to layer capabilities, plan options and continually look for solutions,

Keep Looking for Capabilities with Tangible Benefit to the Warfighter

Keep looking for technical solutions with tangible benefits to the warfighter. Let me close with a story that John Marrs told at his retirement ceremony that, for me, goes to the heart of technological developments.

First, someone has to have an idea and a mechanism has to exist to develop and test it, and two, it has to show a "tangible benefit to the warfighter." John Marrs had 33 years of Federal Service culminating as the Technical Director for Army Space Command; and finally as a member of the Office of the Chief Scientist, SMDC/ARSTRAT. His story related to his involvement in one early accomplishment: the development of the Small, Light-weight GPS Receiver (SLGR). As you know, this is the device that let 7th Corps complete the "left hook" through the trackless desert into Iraq in March 1991. He said that in 1987, some funds provided to the NAVSTAR/GPS Program Office had been designated to "do something by encouraging commercialization" with this new positioning capability. But the element that had the funds didn't really have an idea of how the military might use it or benefit from such an effort.

The capability could have died right there, except that the staff at the Army Space Institute thought they had an idea of how Soldiers could benefit. With the active encouragement of COL Ronan I. Ellis, the Army Space Institute commandant, the Institute got the funds, worked with the developer to come up with something that could tell the Soldier where he was and was light and small enough for a Soldier to carry in his battle dress uniform thigh pants pocket.

John said that he wasn't sure they actually accomplished the latter specification, but the new device (built to commercial standards) was workable enough that Army Space Institute and Army Space Command began field training demonstrations testing it out in 1988-89 as part of the Army Space Exploitation and Demonstration Program. The SLGR proved so useful in those demonstrations that even before units were notified in late 1990 that they might deploy for Desert Storm, everyone from sergeant tank commanders to division commanders were

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calling Army Space Command to get their hands on them. Eventually the Command provided 800 SLGRs to deployed units and orchestrated the urgent purchase of 10,000 off-the-shelf commercial GPS receivers which were then allocated across the deploying forces by the Deputy Commander, 18th Airborne Corps.

Someone had an idea, others saw potential for the capability and were willing to take it on and test it out to determine whether or not it had "tangible benefits for the warfighter." FA40s can be the "point men and women" spotting, advocating, and testing that technological something that may become the next advance that will enable warriors like the SLGR did.

Conclusion

Technological advances can make our lives easier and enable the success of our missions. Think of global ballistic missile defense sensor integration, fusion of blue force tracking data from multiple systems into a common operating picture, portable phones shrunk from 5 pound boxes to light-weight pocket-sized cell phones with classified capabilities, computer drives with gigabytes of storage Space; and systems that are more user-friendly such as e-mail and intranet collaborations, just to name a few. None of us want to return to the days of horse-drawn artillery or laminated maps in our cockpits.

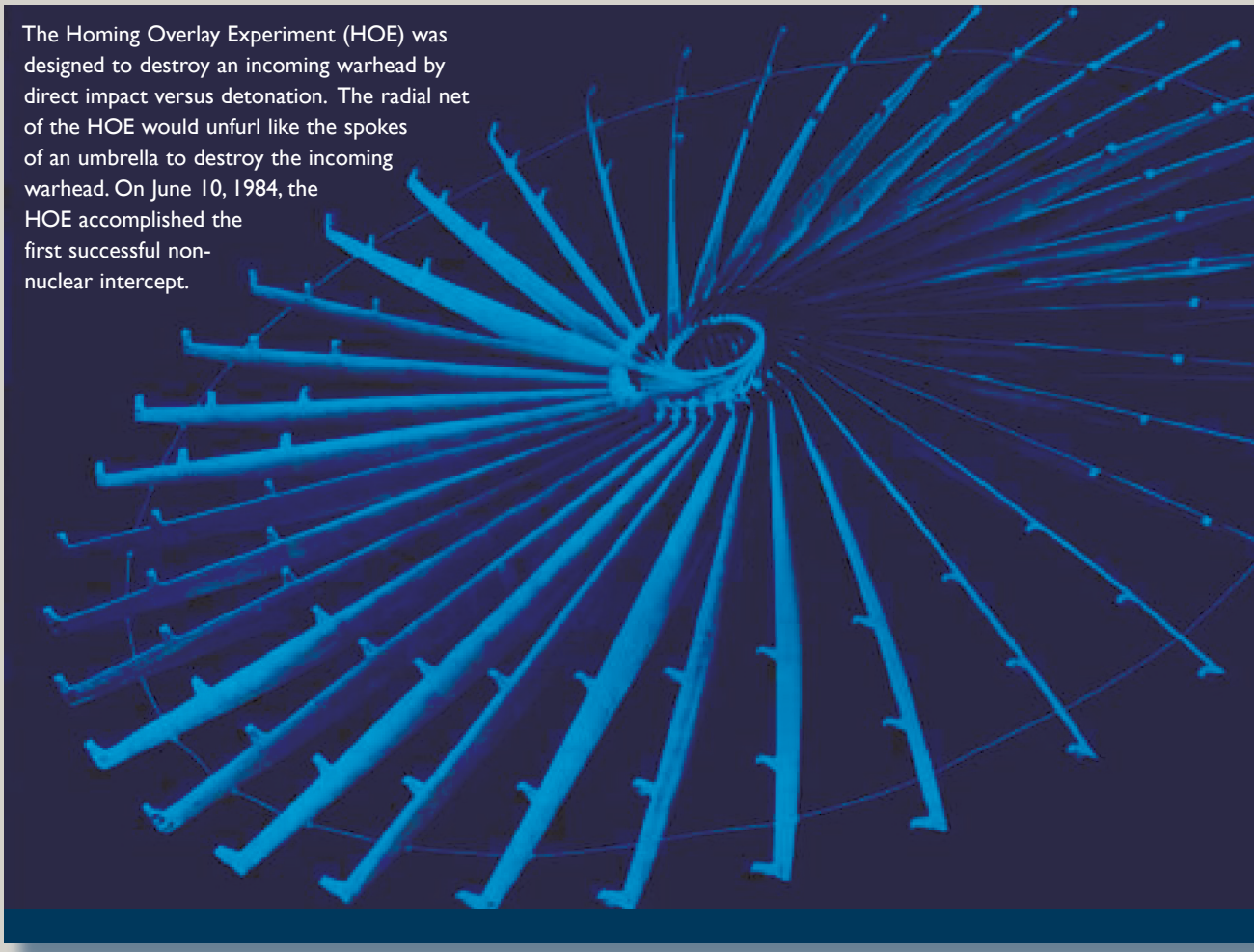
As we embrace these advances and recognize that all technology has its limitations, we remember that it is a tool for us to use and is no substitute for human decision making abilities. Too, we need to understand the limitations so that we don't oversell what today's technology can do. And someday as we keep looking at new ideas and inventions, we may discover the solution for that limitation and it will significantly benefit our warriors.

to develop the concepts and technologies to support Operationally Responsive Space. Presently Space systems' development and acquisition is a painfully slow process that often takes a decade or more from initiation to an operational system on orbit. The current processes are slow to the point of being unresponsive to the nation's rapidly evolving military operational needs. The Operationally Responsive Space concept is a fundamental change in thinking about how to best use and exploit Space technology for military operations. The goal of the Operationally Responsive Space project is to rapidly develop and deploy Space capabilities in a timely manner so that operational commanders' requirements will be met. Furthermore, SMDC/ARSTRAT is working within the Army and Joint Space Community to develop new capabilities for Theater Missile Warning, Battle Space Characterization and Space Force Enhancement. Changes in technology offer the opportunity to significantly enhance our present capabilities in these critical mission areas. SMDC/ARSTRAT's goal remains to continue to develop, refine, and integrate new Space and missile defense technologies into our Army in order that our Soldiers and forces are able to exploit our nation's Space and missile defense capabilities to the fullest.

Whether or not technology and its ever increasing rapid advance are good or bad is subject to debate. What is clear and not open to debate is the fact that rapidly changing technology is affecting our lives, our institutions and in particular the Army. The Army cannot afford to ignore changes in technology but must effectively integrate them into the force in a holistic manner. As you read this issue of the Army Space Journal, please take note of the technological advances and issues highlighted within that are impacting our Army. Also take note of the unique role that SMDC/ARSTRAT has in developing, expanding, and integrating Space technologies for both the Army and Joint Force.

"SECURE THE HIGH G

1985



The Homing Overlay Experiment (HOE) was designed to destroy an incoming warhead by direct impact versus detonation. The radial net of the HOE would unfurl like the spokes of an umbrella to destroy the incoming warhead. On June 10, 1984, the HOE accomplished the first successful non-nuclear intercept.

GEN Maxwell Thurman directed the study of Army Space Initiatives

RETROSPECTIVE: ARMY SPACE INITIATIVES STUDY – 1985 (The View from 2008)

It can be reasonably asserted that the current structure of the Army's operations with respect to Space systems was defined and laid out in the Army's first Space Master Plan – developed by the Army Space Initiatives Study. During the last half of 1985 a group of more than 30 officers and civilians led by BG William J. Fiorentino conducted the study. This group was created at the direction of the Army Vice Chief of Staff, GEN Maxwell Thurman, in response to discussions and recommendations made in the Army Space Council meetings in 1984. The study group's charge was "to develop a Master Plan for the Army's exploitation of Space through the first quarter century of the 21st century." The ASIS document focused on three principle areas "materiel investment; personnel education, training, career management and organizational structure."

Note from the Editor

The following articles are excerpts from an in depth paper written by John Marrs titled Army Space Initiatives Study – 1985 (The View from 2008):

- Retrospective: Army Space Initiatives Study – 1985 (The View from 2008)
- In the Beginning … the Origins of the Army Space Organization
- Then and Now: Space Related Research

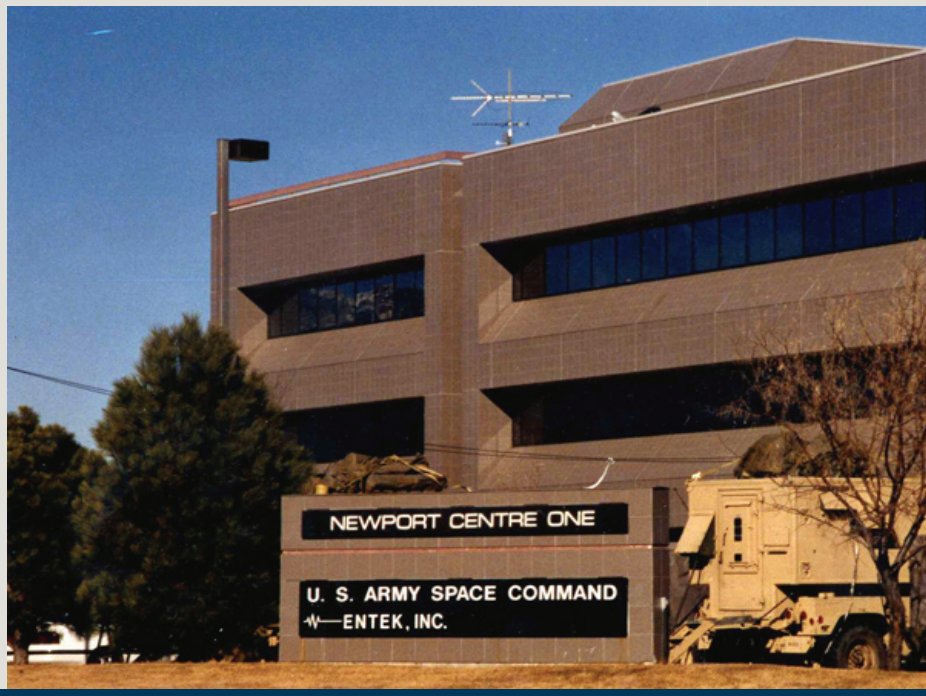
ENVIRONMENT AT THE TIME OF THE STUDY

In the early to mid 1980s there was a wave of organizational interest in Space. U.S. Space Command was just being stood up. It had been preceded by the stand-up of Air Force Space Command. The Navy and Marines were initiating their own organization called Naval Space Command located in Dalghren, Va., in that same time frame. The Army was energized to stake its place in this rapidly developing reorganization of military Space. The Army Space Council was chartered at this time to place focus on this effort. This was necessary because an effort in Space was viewed by most of the Army below the 3-star level as only potentially valuable (at best) with essentially no interest. Army Space Council at the time was chaired by the Vice Chief of Staff of the Army and included commanders of Army Materiel Command, U.S. Army Training and Doctrine Command, other commands and Headquarters Department of Army staff elements. At that level, it was recognized that high-level attention would be needed to "birth" Army organizations whose primary mission would be Space-related.

On the technical side, the Army Science Board in 1984 reviewed the Army's role in Space and concluded that "the Army was only a minor user of available Space systems, without a great deal of influence in the design and operation of the systems." This was true even though most of the first satellites (weather and communications) had been designed and built by Army Laboratories at Fort Monmouth, N.J., and launched on Army missiles. However, much of the Army expertise in Space systems was transferred to NASA in 1958 and 1959. The Long-Range Ballistic Missile role was transferred to the U.S. Air Force by the Office of the Secretary of Defense during this same period.

Newport Centre One served as the home of earlier entities of U.S. Army Space and Missile Defense Command/Army Forces Strategic Command. Moving into the building as the Army Space Agency in 1988, the Agency was changed to Army Space Command in 1989 and then to SMDC/ARSTRAT in 2002, the last year the operational headquarters was housed in the building.

SMDC/ARSTRAT photo



ARMY VISION IN 1985 FOR ITS ROLE IN SPACE:

"If the Army is now to regain an active role in Space, it must be based upon national and defense Space policies and objectives. Accordingly, an Army Space Policy was established by the Army's Secretary and Chief of Staff in June 1985. It calls for the full exploitation of Space capabilities which will enhance and contribute to the successful accomplishment of strategic, operational, and tactical Army missions. To this end an Army Space Operational Concept was developed, building upon Airland Battle Doctrine and the emerging Army 21 concept. According to that concept, the Army's activities in Space would expand logically from an early emphasis on force enhancement to the addition of Space operations support and Space control to, ultimately, the inclusion of the application of firepower from Space."

— Army Space Initiatives Study Report

It is remarkable that this concept has evolved with the Army's growing maturity in using Space capabilities and is still embedded in the Army vision for Space as articulated in the current Army Space Policy. That Space Policy unabashedly asserts the role of the Army in Space Operations.

Shortly before the Army Space Initiatives Study was chartered, the Army had created an Additional Skill Identifier of "Space Activities," 3Y, and began the effort to identify which of its Officers and Soldiers were qualified to receive it. Previously there had been no way to identify Space knowledgeable personnel short of a detailed inspection of their records. There was no organized training within the Army although Army personnel could attend such training at the Naval Postgraduate School, various U.S. Air Force courses and university training. Since no Space organizations existed, there was no requirement to manage personnel with Space as a specialty. Space expertise was being managed in a few areas such as intelligence where image interpreters had specialty codes identifying them as well as certain communications fields. But they were managed as intelligence or communication specialists – not as Space specialists.

EDUCATION/TRAINING

The Army Space Initiatives Study advocated integrating Space into the normal education by which officers entered the Army and then in the various schools they attended during their career. As a practical matter this meant the inclusion of course material on Space and the inclusion of Space capabilities into military education at U.S. Military Academy, within Reserve Officer Training Corps curriculum, and within Branch Basic/Advanced courses; Command and General Staff College and Army War College programs of instruction all needed to have Space added. To a large degree this was done in all but the basic courses although its relevance and course content varied greatly amongst the various instructional venues.

Command and General Staff College added an elective as an educational means by which the 3Y Additional Skill Identifier for Space activities could be earned. Army War College enhanced an elective and designated a professor as the lead for Space related studies. Intelligence, Signal and Engineer courses added more Space. Additionally, the Army has continued Training-With-Industry positions and encourages a small number of officers to do post-graduate academic work in Space-related degrees each year.

The 1998 creation of the FA40 Space Operations Officer designation created a need for a qualification course. This course has created several hundred Space educated Army officers. This was a major step forward for the officer ranks. Starting in the summer of 2001, U.S. Army Space and Missile Defense Command's Future Warfare Center (Force Development and Integration Center at the time) began teaching FA40 Qualification Courses in Colorado Springs, Colo. Through 2007 there have been 13 classes with 264 attendees.

Warrant Officers, Enlisted and Civilians: Other than that already associated with specific skills no Space education was developed for these personnel. The exception was Warrant Officer Tom Hennen who became an astronaut (payload specialist) and flew on the Space shuttle. As a Terrain Analyst, he worked an Army Space Exploitation and Development Program/Intelligence/Corps of Engineers demonstration called Terra Scout.

General: All of the above categories of personnel were encouraged and sometimes required to attend joint education in special mission areas such as intelligence and Space control.

Over the years, the vigor of the various education efforts waxed and waned as budgets and perception of the value of Space fluctuated. With the recreation of an "Army Space Institute like" organization called the Force Development and Integration Center (FDIC) there was once again an organization interested in Space education/training as a whole. This has continued with the FDIC training moving out of Crystal City to Colorado Springs in 2000. As FDIC was reorganized and incorporated into the SMDC Future Warfare Center, the training piece has stayed intact and remained in Colorado Springs where it manages and executes the FA40 Basic Qualifying Course.

PERSONNEL MANAGEMENT

At the time of the Army Space Initiatives Study, there was no practical way to follow or obtain Space knowledgeable people other than those few categories in Intel and Signal that had Space functions. The study advocated that personnel management include military occupational specialties for both Officers and Enlisted and to consider an equivalent designator for civilians.

The 3Y additional skill indicator was put into use for Officers and eventually for enlisted Soldiers. This allowed personnel managers to search for it during the assignment process. Thus it was possible to track Space knowledgeable personnel although actually getting a Space knowledgeable person remained an intensively managed process as new "Space" positions were created or old positions were recoded to include the 3Y requirement for the positions.

In 1998, the Army 21 review processes resulted in a restructure of the personnel system including the creation of the FA40 Space Operations Officer within the Information Operations Career Field. With Space and Missile Defense Command designated as the Space Proponent, it began to actively manage the FA40 Officer Cadre. The initial number of documented positions was 112. It has grown steadily from that number as more positions are documented across the Army and Joint communities.

No coding for Warrant Officers, Enlisted or Civilians has ever been created or even seriously worked within the system. Periodically, there was some discussion of creating a coding – particularly for civilians. However, the efforts have typically been sponsored by one or more military officers either at Headquarters Department of Army or Space and Missile Defense Command on their own initiative – once they retired or permanently changed stations, the initiatives faded away. SMDC/ARSTRAT goals and objective documents have indicated a command position supporting such coding, but the lack of commitment of resources and senior level lobbying necessary to achieve these goals and objectives has resulted in nothing happening.

FUTURE

The creation of the FA40 is probably the most significant action the Army has taken with respect to people in the Space mission area. By having FA40s, the Army has a cadre of knowledgeable personnel to help educate the Air Force and others as to the Army's needs. Although frequently intangible, over the length of my career, I have seen a subtle shift in the attitude of the Joint Space community that is a positive response to input from this Army cadre. My prediction is growth in the FA40 assignments to include more Office of the Secretary of Defense, National, and Joint positions will continue and enhance this positive trend. Any effort to reduce this increase in positions because of short-term needs must be resisted – they represent the future. When Space systems take decades to build and last decades, a few people working on the early stages will ensure the Army benefits from the billions of dollars invested to create these capabilities. Efforts to create an Acquisition Space Center of Excellence are one way to pursue this – as long as the acquisition leadership does not staff it with people who have never participated in Army field operations.

In the Begi

the Origin of the Army Space Organization

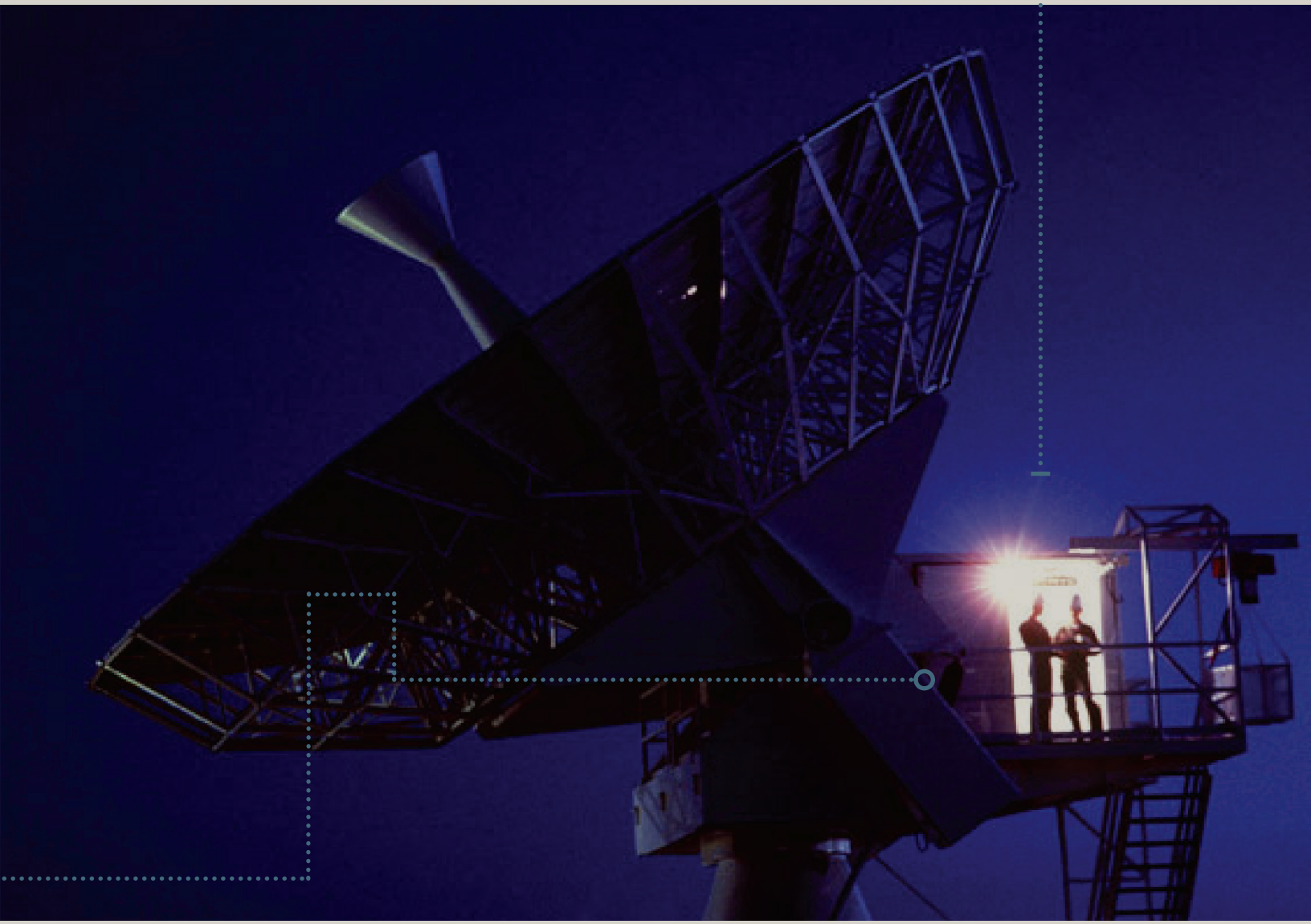
BACKGROUND

At the time of Army Space Initiatives Study, there were some Army organizations with Space in their titles. These organizations were in the intelligence and communications mission areas where the Army had already become a major user of Space products. Communications Electronics Command was recognized as the lead for the development of Satellite Communications ground terminals and user equipment for all the services. The one arguably definitive Space developer was the Tactical Exploitation of National Capabilities Program Manager/Army Space Program Office. The TENCAP Program Manager office had significant influence in defining capabilities of new national systems – particularly in the 1970s and 1980s. This influence was one of the factors giving confidence to Army leadership that great Space capabilities could be obtained for the Army with minimum Army commitment of resources. The Army Space Program Office demonstrated the ability to quickly solve issues related to getting data from National Systems to Army users.

inning ...

A night view of the Global Positioning System Satellite dish at 1879th Information Services Squadron, Falcon Air Station, Colorado.

Exact Date Shot Unknown



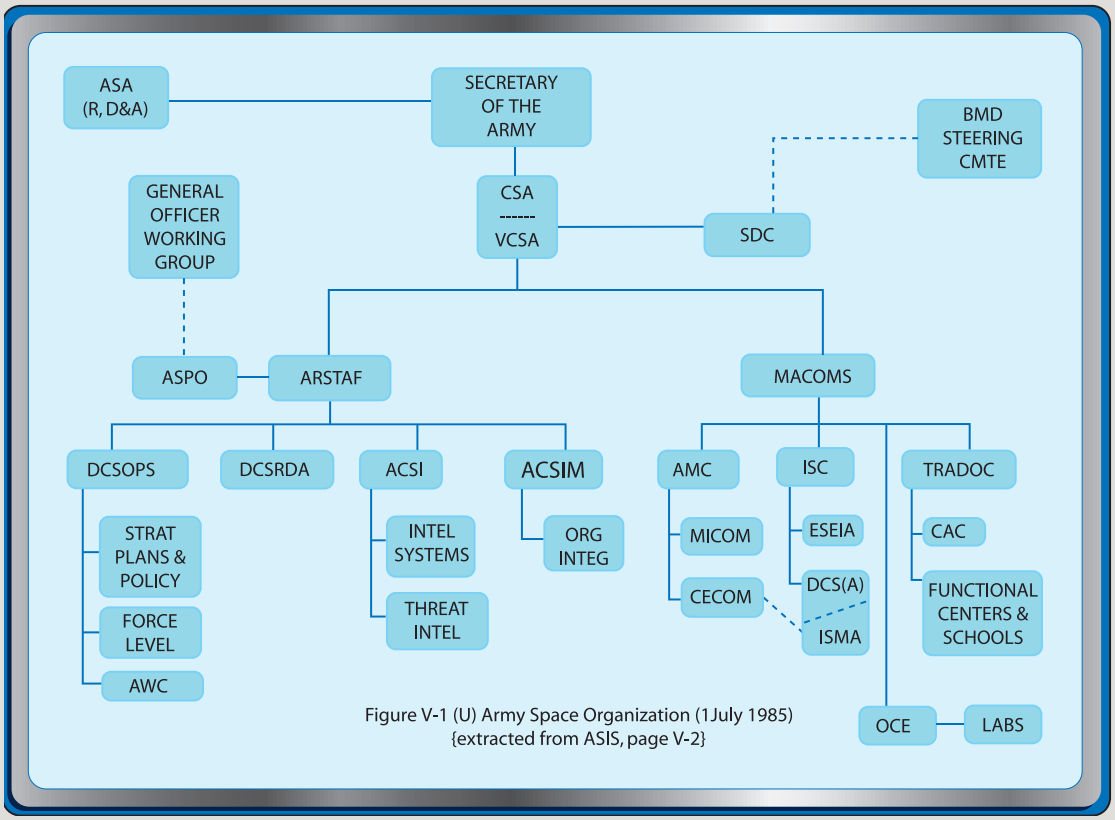
INTRODUCTION

The Army Space Initiatives Study struggled with how to develop the organizational structure within the Army to ensure the long-term survival of a critical mass of Space organizations. Such a critical mass was required to ensure that, as Army enthusiasm for Space waxed and waned, a core "Space" focused organizational structure remained viable. The Army Space Initiatives Study began by developing a task list for all of the research, development, acquisition, requirements and operations functions the Army already executed or filled, and those the Army Space Initiatives Study members recommended the Army prepare to fill. This task list was filtered through four basic objectives, quoting from Army Space Initiatives Study:

– "Provide a single voice and proponent for the Army Space effort.
– Facilitate the interaction and transfer of knowledge among Space-concerned Army institutions so that they could profit from each other's activities and exploit emerging technologies.
– Integrate Space technologies, concepts, and operations smoothly into the framework of the Army.
– Prepare the Army for Space operations."

The Army Space Initiatives Study view of the Army organizations in Space is shown in Figure 1, which was recreated from the original report. The Army Space Initiatives Study did a good job of identifying all the pieces of Space activity scattered across the Army. The shear number of organizations led Army Space Initiatives Study to propose a bold "out-of-the-box" solution. First articulated by Army Space Initiatives Study team member MAJ Terry Reininger, this solution is very similar in functional concept to what exists today … but the path from bold solution to today's force structure was anything but straight.

FIGURE 1



1985

ARMY SPACE INITIATIVES STUDY PROPOSAL FOR ORGANIZATION

Initially the Army Space Initiatives Study proposed a single organization unifying research, development, acquisition, requirements and operations. This was viewed as a straightforward and single structure which would minimize personnel requirements (for organizational overhead) while concentrating sufficient personnel into a body which had a critical mass of Space knowledge/expertise.

The Army Space Initiatives Study stated "However, when … real-world constraints were considered, this structure was judged to be unacceptable. In particular, its operation would differ substantially from current Army practices." As a result, the Study re-did the organization to cause minimum disruption across traditional organizational boundaries … particularly with Army Materiel Command and Army Training and Doctrine Command. Ironically, the original single organization proposal is close to what evolved into U.S. Army Space and Missile Defense Command/Army Forces Strategic Command.

The Army Space Initiatives Study tried to resolve this real-world constraint by proposing that Army Training and Doctrine Command and Army Materiel Command elements be collocated with Army Space Command in Colorado Springs.

The many organizations involved and their fates are better understood in a visual presentation which is shown in a series of charts taken from Army Space Initiatives Study and later various organizational briefings.

Original members of the 1st Satellite Control Battalion, now 53rd Signal Battalion. *SMDC/ARSTRAT Photo*

HEADQUARTERS DEPARTMENT OF THE ARMY STAFF RESPONSIBILITIES

Staff proponents were proposed for Assistant Secretary of the Army, Research Development and Acquisition, Assistant Deputy Chief of Staff for Operations and Plans (FD), and Assistant Deputy Chief of Staff for Research, Development and Acquisition. A Senior Executive Service, Colonel and a Colonel (dual-hatted by the same office that monitored TENCAP) each with a small staff were created for these offices during or within a year of the Study. The Assistant Secretary of the Army, Research Development and Acquisition Senior Executive Service position went away in 1993. His staff led by a Colonel continued for another year and then downsized to one GS-14 with other duties as assigned. The Assistant Deputy Chief of Staff for Research, Development & Acquisition position went away by 1992 as no "Space" budget line was created needing such oversight. The Assistant Deputy Chief of Staff for Operations and Plans (FD) position and staff waxed and waned and has evolved into the current Space and Missile Defense Division position with a Colonel and a GS-15 Deputy. The former Chief, COL Pat Rayermann, moved to National Security Space Office and was replaced by COL Rick Schantz in July 2008. NOTE: COL Rayermann and LTG Kenneth Hunzeker are the last members of the Army Space Initiatives Study team still on active duty.

ARMY SPACE COMMAND

Army Space Command was proposed as an Army Major Command. The units proposed to be part of this new command were the 235th Signal Detachment and a reserve component Military Police Brigade. The 235th provided strategic communications at echelons above Corps. The Military Police Brigade was to provide enhanced operational security at Space control facilities in times of crisis or potential attack. None of these units actually became part of Army Space Command. Instead it was determined that Army Space Command would be a Table of Distribution and Allowances organization and its first (and initially only) operational element would be the DSCS Operation Centers scattered around the world. Over the years from it creation to its demise in 2002, Army Space Command grew substantially. First created was a Satellite Control Battalion followed by Joint

Tactical Ground Station Detachments, Army Space Support Teams, a Space Battalion, a Reserve Space Battalion, a Space Brigade and then a Missile Defense Battalion and Brigade. The details of this are more correctly left to a history of Army Space Command and its evolution to the operationally focused part of U.S. Army Space and Missile Defense Command/Army Forces Strategic Command.

ARMY MATERIEL COMMAND ELEMENT

An Army Materiel Command Space Technology Directorate was proposed to be located at Colorado Springs. Its functions included managing the Space research program and integrating Space technology throughout Army Materiel Command. The directorate was to initially be supported with 30 man-years of contractor support. Instead of being set up at Colorado Springs as a direct report to Army Materiel Command, it was named the Army Space Technology and Research Office and was stood up as part of Electronics Research and Development Command (later Laboratory Command) in Adelphi, Md. This was done by Army Materiel Command to save manpower by putting both the proposed Space Division at Headquarters Army Materiel Command and the Technology Directorate under one Colonel. It lasted about five years then began to migrate down the reporting chain losing both its ability to influence the Army and its relevance to the Space community. It initially reported to the Army Materiel Command Deputy Chief of Staff for Research, Development and Acquisition, but that General also commanded Electronics Research and Development Command and that is where it was established. It was given a budget of $4-6M the first few years. Electronics Research and Development Command became Laboratory Command in the Army Materiel Command reorganization. Soon the Army Space Technology Research Office was reporting to the Chief of Staff of Laboratory Command and no longer functioned across the breadth of Army Materiel Command. In 1990, Army Materiel Command announced it was not funding the office after 1991. In 1992, the remnant became part of Space and Strategic Defense Command and after a couple of years the functions migrated to Huntsville where they eventually evolved into the Space Division of the Space and Missile Defense Technical Center. The Center has done a great job growing its initial two slots to what exists now with a budget of over $19M, roughly twice the size (after inflation) of the old Army Space Technology Research Office.

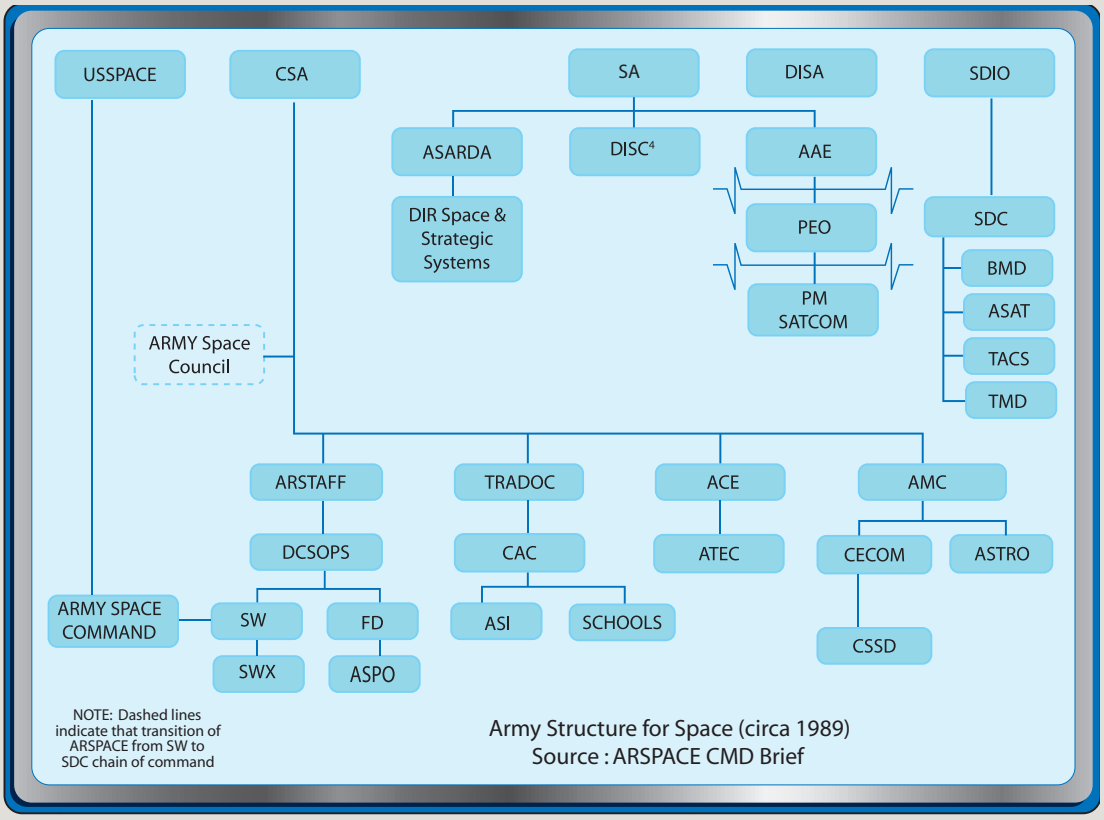
Army Materiel Command's major subordinate commands were supposed to establish a Space office or point of contact as appropriate. The only command that did was Communications Electronics Command. Although its exact organizational location and function have evolved over the years, there is still a Space and Terrestrial Communication element at Communications-Electronics Research Development and Engineering Center. Its focus is primarily on ground terminals required for Space activities – particularly communications.

ARMY TRAINING AND DOCTRINE COMMAND ELEMENT

An Army Training and Doctrine Command Space Requirements Directorate was proposed to be located in Colorado Springs. It was given the functions of working with the Army Material Command element in the development of new systems and concepts for Space support of joint/combined operations. Additionally, it was the Army Training and Doctrine Command focus for Space and Space operations at echelons above Corps. It was tasked to conduct studies to determine operational feasibility and cost effectiveness of new system concepts and make recommendations on future systems development. In actual practice, Army Training and Doctrine Command went far beyond this recommendation at the direction of GEN Maxwell Thurman (then Commanding General, Army Training and Doctrine Command). The Army Space Institute was established under Combined Arms Center at Fort Leavenworth, Kan., and incorporated several of the Army Space Initiatives Study group members into its organization. It was chartered to act as an Army Training and Doctrine Command level organization with functions approaching those of other Army Training and Doctrine Command Centers and Schools. The Colonel in charge was designated a Commandant. Unfortunately, with the departure of GEN Thurman, the Army Space Institute faded and was disbanded by 1992. Some of its functions went to Army Space Command, some to its replacement Training and Doctrine Command Program Integration Office Space (which remained at Fort Leavenworth), and

1989

FIGURE 2



Army Structure for Space (circa 1989)
Source : ARSPACE CMD Brief

some to the various Schools and Centers.

At Headquarters, Army Training and Doctrine Command, a special staff element run by a Colonel was established to coordinate Space across Army Training and Doctrine Command. That office has grown and weakened over the years but still exists.

EVOLUTION OF ARMY STRUCTURE FOR SPACE

Just like the rest of the Army, the structure for Space has evolved. The following figures capture the evolution with "snapshots" in time. The changes shown are representative of the changes going on during the period but are not definitive. I.E. additional changes in organizational names and reporting chains may not have been fully documented

By 1989, as illustrated in Figure 2, there are five principal organizational elements for Space. This represented the "high water" mark

of the Army implementation of the Army Space Initiatives Study recommendations.

1 – Army Space Command is a field operating activity under the Space and Special Weapons Directorate of the Headquarters Department of the Army Deputy Chief of Staff for Operations;

2 – Army Space Program Office (i.e. Tactical Exploitation of National Capabilities) is a field operating activity under Force Development of the Headquarters Department of the Army Deputy Chief of Staff for Operations;

3 – Army Space Institute is under Combined Army Center with the same organizational status as an Army Training and Doctrine Command School;

4 – Communications Electronics Command Space System Division is responsible for satellite ground terminal development and has remnants of the Space system developers who created the first generation of military satellites;

5 – Army Space Technology and Research Office reported to the Deputy Chief of Staff for Research, Development and Acquisition of Army Materiel Command.

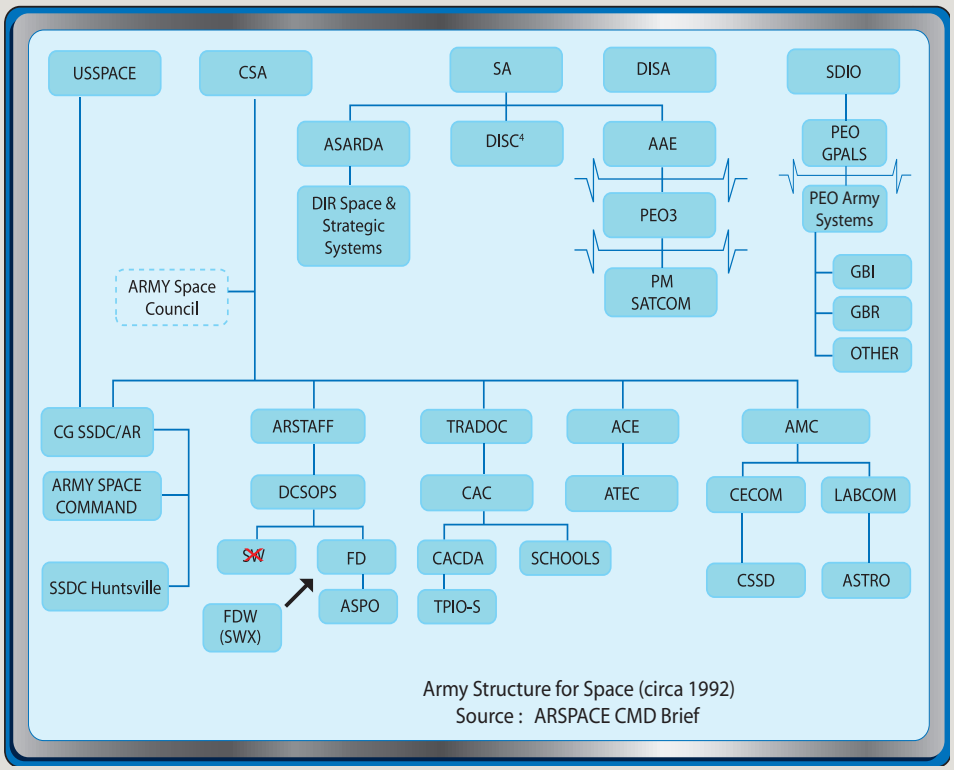
Coordination was done across these organizations to achieve unity of purpose by the Colonels in command of each organization meeting quarterly in a Space Council of Colonels. This group also provided the focus of issue moving on to the Army Space Council. The Space Division (SWX) of the Space and Special Weapons Directorate of Army Operations orchestrated the council's meetings.

By 1991, several major changes began or were concluded. As a result of a Headquarters Department of the Army reorganization, Space and Special Weapons Directorate was slated to be disbanded since one of it major functions (nuclear weapons) had gone away with removal of Army nuclear weapons from Europe. That meant that a new chain of command for Army Space Command was necessary. So the component commander hat to U.S. Space Command was given to the Commander of the Strategic Defense Command. The paperwork was put in process to combine Army Space Command and Strategic Defense Command to form a new command of Space and Strategic Defense Command. It is worth noting that at this time (and until 2002), the Commanding General Space and Strategic Defense Command (later Space and Missile Defense Command) was viewed to command two organizations (i.e. wore two hats) – the Major Command (Space and Strategic Defense Command) and the Service Component Command (Army Space Command). This meant that each organization had its own staff and functioned to a large extent independently of each other. Army Space Command reported to Space and Strategic Defense Command in the Army chain of command but its day-to-day activities were in support of Commander in Chief, U.S. Space Command. The situation was further complicated by the fact that some of the Major Command staff and the Commanding General was in Crystal City, Va., while other staff principals were in Huntsville.

The Army Space Institute was disbanded with its functions moving to the Schools and Army Space Command with a small 10 person remnant becoming an Army Training and Doctrine Command Proponent Integration Office for Space and sliding down the chain of command to work for Combined Arms Combat Development Agency.

1992

FIGURE 3



Army Structure for Space (circa 1992)
Source : ARSPACE CMD Brief

As Figure 3 shows, the integration of Army Space Command and Space and Strategic Defense Command was completed in 1992 and the Commanding General Space and Strategic Defense Command was wearing two hats – one for Army Space Command and one for the old Strategic Defense Command now generically called Space and Strategic Defense Command, Huntsville. Space and Special Weapons Directorate was dissolved and the old office has become part of Force Development as the Space Division. Army Space Technology Research Office has been demoted in the Army Materiel Command chain to working for the Laboratory Command Chief of Staff and is about to cease to exist.

The Senior Executive Service position and office in Assistant Secretary of the Army, Research Development and Acquisition is done away with. Only one person (GS-14) remained to handle Space stuff. The Army Space Technology Research Office was dissolved and the functions and two personnel were transferred to Space and Strategic Defense Command (initially in Crystal City). By 1993, the Combined Arms Combat Development Agency was eliminated and the Army Training and Doctrine Command Program Integration Office-Space closed down. Its functions were to be picked up by a branch at Headquarters Army Training and Doctrine Command with the integration functions to be handled by Battle Command Battle Lab. In 1994, Army Space Technology Research Office's old functions moved to Huntsville but the personnel remained in Crystal City and were absorbed into the Space and Strategic Defense Command Headquarters staff. Space and Strategic Defense Command Huntsville stood up an embryo Space

division "out-of-hide."

In Figure 4, changes primarily dealing with Army Space and Missile Defense Command and Army Space Command which occurred during the mid-1990s are shown. There are several significant events. First is the creation of Army Space and Missile Defense Command from the old Space and Strategic Defense Command. This was possible because of a Memorandum of Agreement with Army Training and Doctrine Command which reached agreement that Space and Strategic Defense Command would perform the Army Training and Doctrine Command functions with respect to Space as a whole. Although specific functions remained with specific schools, Army Training and Doctrine Command acknowledged Space and Strategic Defense Command as its agent for Space and this was further codified by Headquarters Department of the Army creating and assigning the Space Proponent function to Space and Strategic Defense Command. The importance of the control of the Defense Satellite Communications System payloads was recognized by the Army with the creation of the 1st Satellite Control Battalion (first Commander, Lynn Weber and second commander COL Pat Rayermann — both Army Space Initiatives Study team members). Building on these changes Space and Strategic Defense Command transformed to Army Space and Missile Defense Command.

(The 1st Satellite Control Battalion was renamed to 53rd Signal Battalion in 2004, when it transformed from a Table of Distribution and Allowances Battalion to a Table of Elements Battalion.)

One of the subsequent organizational changes was the creation within Army Space and Missile Defense Command of the Force Development and Integration Center. In many ways it revived the functions of the old Army Space Institute. It was located with the Army Space and Missile Defense Command Headquarters element in

1995

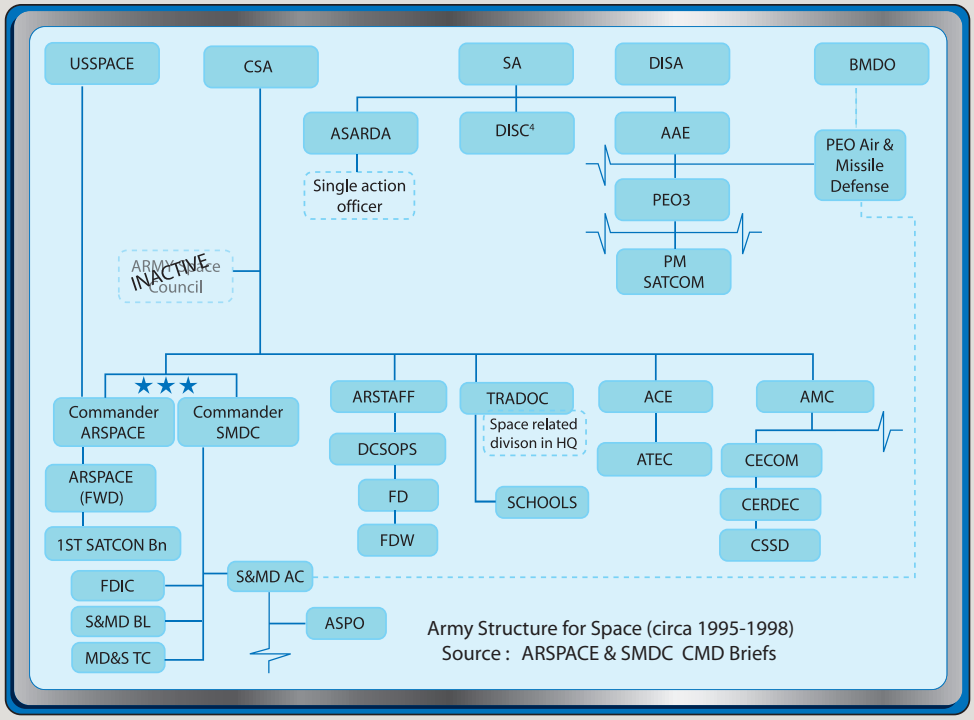
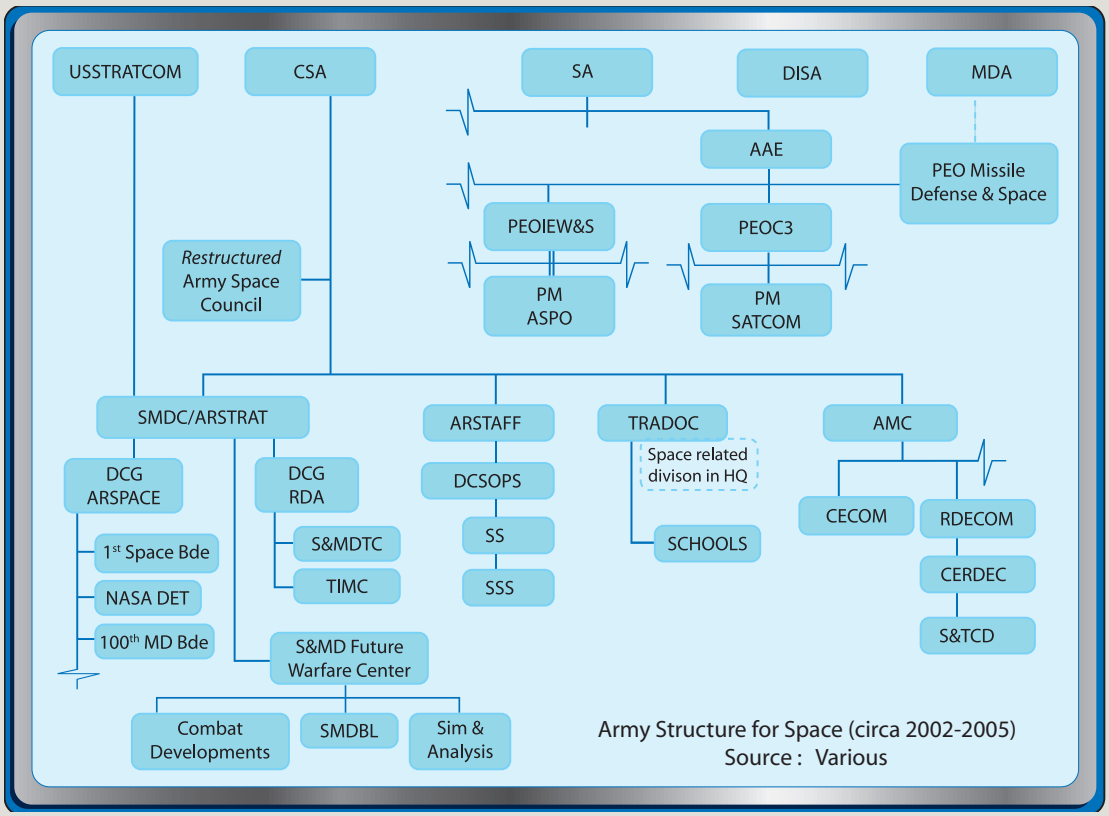


FIGURE 4

Crystal City, Va. Additionally, the embryonic Space Battle Lab (which had been created out of the demonstration elements of Army Space Exploitation and Demonstration Program in Colorado Springs) was combined with the Missile Defense Battlefield Integration Center (Huntsville) to create a new Space and Missile Defense Battle Lab with a Senior Executive Service in Huntsville as the director. During this same period, there was a jockeying of organizations on the acquisition side with the Program Executive Office functions being done as another "hat" by the Deputy Commanding General, Army Space and Missile Defense Command. Eventually the Army Acquisition Executive forced this perceived conflict of interest (i.e. Program Executive Office function in Army Space and Missile Defense Command) to be resolved by breaking that position out of the Command resulting in the evolution of the Army Space and Missile Defense Command, Deputy for Research, Development and Acquisition position.

Army Space Command continued to evolve with the establishment of the 1st Space Brigade (Provisional). The National Aeronautics and Space Administration Detachment appeared for the first time but was part of Army Space Command from its earliest days. Army personnel assigned to the NASA Detachment were under the control of NASA and Army Space Command provided administrative support only. The Research, Development and Acquisition side of Army Space and Missile Defense Command reorganized to more definitively report through the Deputy for



Army Structure for Space (circa 2002-2005)
Source : Various

FIGURE 5

Research, Development and Acquisition to the Commanding General. The Space Research and Development activities remained in the Technology Center. In a consolidation of Army Program Managers, Army Space Program Office was moved to Program Executive Office Air and Missile Defense and that office was renamed Program Executive Office Air, Missile Defense and Space. However as seen in the next figure, it did not last.

In Figure 5, the major change to note is the creation of U.S. Strategic Command by the merger of U.S. Space Command into the old U.S. Strategic Command. Headquartered at Offutt Air Force Base, Neb., this change ushered in a vigorous reassessment of the missions and mission assignments to U.S. Strategic Command with eventually eight major mission areas being assigned. This combined with pressure from Headquarters Department of the Army to reduce headquarters staffs led to the consolidation of the old Army Space and Missile Defense Command staff in Crystal City and the separate Army Space Command staff into one staff located in Huntsville, Ala. This process was accelerated by the desire to move Army elements onto military posts rather than leased facilities. For Army Space and Missile Defense Command that meant consolidation into a new, purpose-built building on Redstone Arsenal, Ala. Other items to note – the 1st Space Brigade transitioned from provisional to fully active status; the old Force Development and Integration Center was combined with Space and Missile Defense Battle Lab to create the Army Space and Missile Defense Command Future Warfare Center; the 100th Missile Defense Brigade was activated; Army Space Program Office was moved to the Program Executive Office Intelligence and Electronic Warfare and Sensors and the last dedicated person in Assistant Secretary of the Army for Acquisitions, Logistics and Technology with Space in their job description was retired and not replaced. In Army Material Command, Research, Development and Engineering Command was created and the Communications-Electronics Research Development and Engineering Center moved from Communications Electronics Command to the Research, Development and Engineering Command. Net result of all this was that the Army Space Initiatives Study vision of one all encompassing command was obtained by eliminating the last vestiges of the Army Space Command staff but at the same time the vision was reduced by the loss of the Army Space Program Office from a Space focused

2005

Program Executive Office.

Since 2005, no significant changes have occurred with respect to Army Space organizations. Obviously such changes in the future are likely. The possibility of creating a Space Acquisition Center of Excellence to help facilitate Operationally Responsive Space actions in the Army is a hopeful sign of continued interest in Space and a recognition that the acquisition side is where the Army has the least credibility and influence with the U.S. Air Force. If the proposed center can balance its manning by including operational expertise and not all acquisition personnel, then it may have a real impact in the future. My experience and observation has been that Army personnel with operational experience have great influence with U.S. Air Force Space developers. That credibility combined with some support from acquisition-trained personnel may lead to great things in the future.

It is clear that the Army has achieved sufficient organizational "mass" to be a credible player in the development of requirements and in the execution of particular Space operations. To the extent that the Army can maintain this critical mass, it will continue to influence and benefit from the billions of dollars spent by U.S. Air Force, National Reconnaissance Office, National Aeronautics and Space Administration, commercial and foreign Space communities.

Then and N

Space Related Research

The Digital Topographic Support System is an integrated electronic (computerized) system that produces annotated image maps.

Photo courtesy U.S. Army Engineer Research and Development Center

MATERIEL SOLUTIONS

The Army Space Initiatives Study group struggled with how to define Space capabilities. They chose a broad interpretation which allowed inclusion of systems that used Space but which many people would not call Space systems per se. This resulted in a long list of materiel solutions that at first glance have little to do with Space at all. However, Space is either an enabler of these capabilities or vice versa and the Study team felt that they needed to be mentioned to avoid building a "stove-piped" Space wish list. This also reflected the prevailing view of the Study team that a broad interpretation of "Space" better postured the Army to assert its role and contributions to and use of Space capabilities.

The Army Space Initiatives Study categorized materiel solutions by both cost (what was thought reasonable with respect to "payoff" at the time) and time-frame for production. In order to maintain clarity this paper follows that same categorization. To incorporate non-materiel solutions and to support research, a separate Space-Related Research line was included in all time periods.

Level 1 items – considered the minimum essential items to procure.

Level 2 items – considered to provide substantially enhanced tactical capability and significant technological advances.

Level 3 items – considered highly desirable items but believed more expensive than the Army could afford.

The time-line was broken down as follows:

Near-term was FY86-FY92
Mid-Term was FY93-FY03
Far-Term was FY03-FY25

Global Hawk (RQ-4A), an unmanned aerial vehicle touches down on a runway. The first RQ-4A flew in 1998 and has even seen service in Operation Enduring Freedom.
U. S. Air Force photo

THEN AND NOW LEVEL 1 ITEMS:

Digital Topographic Support System:

The Digital Topographic Support System was originally envisioned as a capability to exploit Digital Topographic Elevation Data from what is now the National Geospatial Intelligence Agency and make terrain environmental products and analysis available to the All Source Analysis System being built for the G-2

Then: In last stages of development.

Now: Successfully fielded with variants and expanded capabilities.

Leased Satellite Communications:

The Defense Information Systems Agency in conjunction with Army and other Services implements leases for SATCOM services. Joint Chiefs of Staff adjudicates which Combatant Commands receive what amount of available service when multiple Combatants Commands have requirements for the same services.

Then: Leased satellite communications were decentralized and the Study team advocated the Army making contingency lease arrangements worldwide

Now: In mid-1990s, in response to the congressionally directed Commercial Satellite Communications Initiative, many of the Department of Defense's leasing of commercial SATCOM were centralized through Defense Information Systems Agency.

Remotely Piloted Vehicles/ Unmanned Aerial Vehicles:

Space communications and global positioning system, position, navigation and terrain allows the flight and indeed launch of hell fire missiles by "pilots" in the Continental U.S. flying aircraft in combat theaters half a world away.

Then: The Study advocated pursuit of a series of aggressive programs to develop a mature family of remote and unmanned systems. This meant Aquila and Amber programs at the time. These systems were viewed as part of a mixed team of ground, airborne, and satellite systems necessary to support combat operations. It was envisioned that these platforms would have a satellite link to move data beyond line-of-sight.

Now: RPV/UAV systems are ubiquitous across the battlefield from very sophisticated Global Hawk to hand launched microcraft. Space is an integral part of command, control and data movement for many of these systems.

Advanced Computer Technology:

Although government involvement helped, the computers and software of today are driven by the explosive growth in commercial uses of hardware and the video, business, and gaming software developed for mass markets.

Then: The Study advocated both hardware and software efforts to develop "tactical supercomputers." Various contemporary government developments were envisioned as the route to this capability.

Now: Computers with processing power and sophisticated software far exceed the dreams of the Study team.

Artificial Intelligence Technology:

A futuristic concept (like an anti-gravity car in every garage) is simple to envision and describe, but poses practical difficulties that make its implementation doubtful before the end of the Study time frame.

Then: The Study advocated efforts to develop artificial intelligence for tactical applications including robotics, image understanding, natural language processing and optimal search strategies.

Now: Artificial Intelligence retains potential benefit on the battlefield; however, development of Artificial Intelligence capabilities has generally been less than envisioned by the Study team.

Counter-Terrorism/Low Intensity Conflict System:

Rapid fielding of small communication and computer capabilities.

Then: The Study advocated several systems including lightweight computers, lightweight satellite communications, remotely monitored sensors, millimeter wave physical security systems, and Remotely Piloted Vehicles for a variety of tasks including downed pilot extraction and Special Operations Force team resupply.

Now: These items have come into existence for the most part. Particularly since Desert Storm, the use of remotely piloted vehicles has expanded, although some of the missions such as downed pilot extraction have not come to pass.

Space-Related Research:

The program of Space research and development was centered on Army Materiel Command (Laboratory Command) Army Space Technology Research Office and had about $3M in FY87. The budget never grew and by 1991 was essentially zeroed. The function was transferred to Space and Strategic Defense Command in Crystal City, Va., in 1992. Eventually, the functions were moved to Space and Strategic Defense Command Huntsville and Space funds gradually grew to about $19M. Substantial Space related funding is being executed by Communications-Electronics Research Development and Engineering Center and others but these funds are typically labeled for communications or other functions.

Then: The Study advocated a modest $3M program in FY87 rising to $11M by FY90 to do Space technology integration in support of future developments.

Now: Although a modest program exists it does not have the robustness envisioned by Army Space Initiatives Study.

Single Channel Objective Tactical Terminal /MILSTAR Program:

The Single Channel Anti-jam Man Portable (346 fielded starting in the late 1980s) provides single operator, Extremely High Frequency capability with all satellite low-data-rate payloads. It is used extensively where remote operations and limited local infrastructure do not support non-satellite communications.

Then: The Study advocated the Single Channel Objective Tactical Terminal be fielded as soon as possible.

Now: Single Channel Objective Tactical Terminal was never fielded because it was too big and heavy, required three dedicated operators, and took lots of time to install. Fort Monmouth took its learning experience from it and exploited

A futuristic concept (like an anti-gravity car in every garage) is simple to envision and describe, but poses practical difficulties that make its implementation doubtful before the end of the Study time frame.

the rapid development in electronics to instead field the Single Channel Anti-jam Man Portable radio and subsequently the Secure, Mobile Anti-jam, Reliable, Tactical Terminal.

Improved Space-Based Communications (Mid-term item FY93-03):

Rapid growth in user requirements means that currently over 80 percent of communications in support of Central Command activities are on leased commercial satellites. Fielding of the next generation of Department of Defense communications satellites (Wideband Global Satcom) had been delayed in getting on-orbit, but the first launch of WGS-1 in October 2007, was successful, with two more launches planned for FY09.

Then: The Study, in the mid-term, advocated a mix of leased Satellite Communications, use of Defense Satellite Communications System reserve transponders, mobile ground control stations, and a universal modem using Demand Assigned Multiple Access.

Now: Some of these solutions were implemented but by far the biggest growth has been the use of lease commercial satellites. A large part of Satellite Communication used in Desert Storm was over leased commercial satellites. Mobile ground control stations (with some exceptions) have not been built and existing Defense Satellite Communications System mobile ground control stations have been deactivated.

Army Communications Satellite (Far-Term post-FY03)

The Department of Defense program for future communication satellites is called Transformational Satellite Communications System. The program is experiencing continued programmatic uncertainty due to the high cost required to develop and produce it.

Then: The Study advocated for Army to initiate development and deployment of Army-owned satellite(s)/transponder(s).

Now: No such satellites exist nor do any plans for Army procuring of such satellites exist.

Global Integrated Surveillance/Weapons System (Far-Term post-FY03):

U.S. Strategic Command is currently advocating the need for a fully integrated global Intelligence Surveillance and Reconnaissance capability and better integration/visibility of sensor data to/from weapon platforms. If these aspects are implemented in the next decades the Study vision will have been realized with the exception of Space-basing of weapons.

Then: The Study estimated that fielding Space-based capabilities to both conduct in Space target analysis as well as conduct combat operations from Space would be possible by 2005. The Study advocated for a fully integrated Space and terrestrial global surveillance and attack capability.

Now: Although specific systems composed of multiple components have achieved what the Study team envisioned on a limited basis, the full potential advocated remains to be put in place.

THEN AND NOW LEVEL 2 ITEMS:

Position/Navigation Systems:

Army Space Initiatives Study team clearly underestimated the profound impact of the Global Positioning System (GPS) in virtually every aspect of military, commercial and personal activities. Nor did they anticipate the interest in fielding of competing Space systems by the Russians, Chinese and Europeans.

Then: The Study advocated continued development such as the Position Location Reporting System-Joint Tactical Information Distribution Hybrid System. The GPS was recognized as the foundation with most applications directed towards artillery, aviation, and tactical location via communications systems such as Position Location Reporting System.

Now: GPS is everywhere throughout the force including in individual munitions such as artillery shells. The Army remains actively engaged in specifying ground force requirements for the next generation GPS satellites and user equipment and is currently fielding the Defense Advanced GPS Receiver (DAGR) and Ground-Based GPS Receiver Application Module that implements Selective Availability Anti-spoof Module technology, to replace the Precision Lightweight GPS Receiver and is working towards an enhanced, better protected, next generation of user equipment.

Electronic Countermeasures/Directed Energy Weapon Vulnerability/ Susceptibility Research:

Protection of Space capabilities is a major concern area for military and national intelligence communities, however, it remains poorly resourced and protection capabilities are rarely identified as one of a system's Key Performance parameters.

Then: The Study advocated increasing programs for research throughout the electro-magnetic spectrum to include Directed Energy Weapon effects.

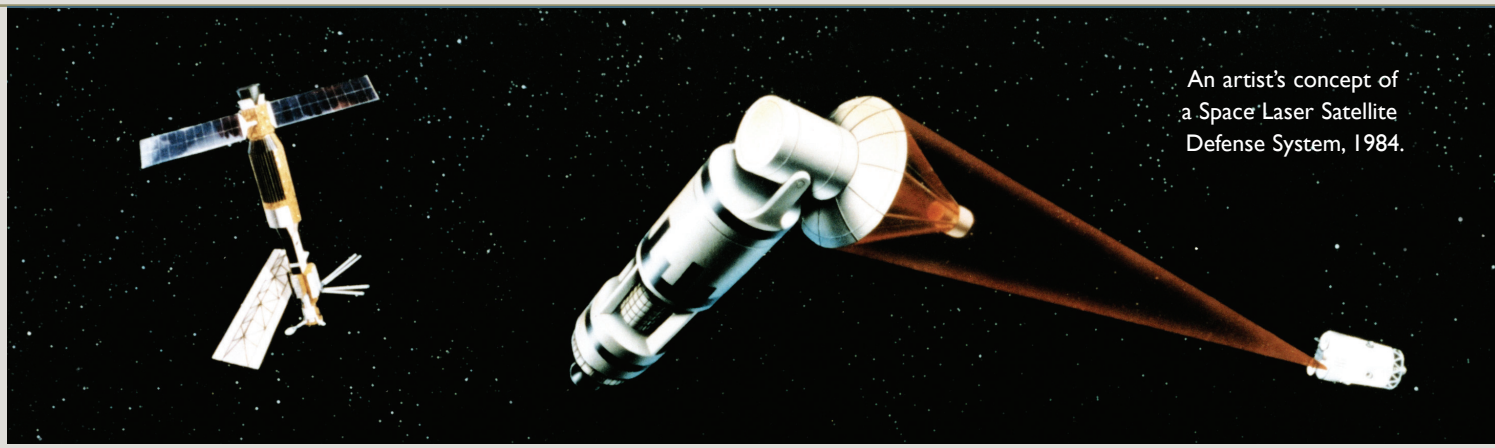
Now: Research has been expanded to include more than just tradition Radio Frequency Electronic Countermeasures but it not clear that vulnerability research for Space systems (with respect to Directed Energy Weapon) have kept pace with offensive capabilities.

Cheapsats:

Although standard buses exist, most satellites use unique buses with commonality limited to multiple payloads in a series. The reduced costs and standardization associated with volume production generally have not been implemented in the Space business.

Then: The Study advocated the development of a standard satellite bus (or family of buses) and a series of modest capability payload packages primarily associated with command, control communications and intelligence. The idea was to build payloads in quantity to reduce costs. The Study team also recommended funding to determine feasibility to use standard Army missiles – Pershing II as an example – for a launch capability.

Now: Both, government funded and commercial funded, organizations have developed standard buses. No Army launch capability was ever seriously examined.



An artist's concept of a Space Laser Satellite Defense System, 1984.

Tactical Exploitation of National Capabilities (TENCAP):

The TENCAP Program, started in the 1970s, provided modest Army resources to pick low hanging fruit from the strategic intelligence capabilities built up by National Reconnaissance Office and others. Details of specific activities remain classified.

Then: The Study advocated expanded funding for TENCAP. The Study team viewed TENCAP as tremendously successful and a program that should be expanded to additional tactical users.

Now: TENCAP success has continued and related capabilities have expanded from being only at Corps in 1985 down to Brigade or even lower echelons today.

Command and Control and Airborne Management System:

Existing techniques have relied on terrestrial and airborne command and control systems. The Space role has been limited to GPS and communication pipes which support operational command and control.

Then: The Study advocated a Space-based system which insures command and control down to the aircraft and Forward Support Air Defense Artillery weapons level.

Now: No such Space-based system was ever seriously proposed.

Nuclear Detection and Tracking System:

Nuclear detection devices on the tactical battlefield were probably never more than a neat idea, but the practical aspects of having the required intelligence and delivery capabilities to support their dissemination and operations was very unlikely.

Then: The Study advocated development and procurement of a tactical nuclear detection system based upon the Torso Vest technology. The idea was to use Remotely Piloted Vehicles to drop thousands of the devices across the tactical battlefield and use satellite communications for reporting.

Now: With the decline of the potential threat, this proposal was never acted upon.

Space Test Program:

A useful way to get small (and cheap) experiments a ride to Space. Army experiments found in record include BLAST (a laser communication experiment), high resolution photography for terrain analysis, a medical experiment to reduce the time necessary for blood clotting, and ground moisture monitoring for insect vector estimation.

Then: The Study advocated Army funding for worthwhile experiments submitted by Army Laboratories or other elements of the Research and Development community. Also considered were proposals from commercial sources and sponsorship of high school or college science projects. Flights would be arranged via the joint Space Test Program to fly on the shuttle or other Space flight opportunities.

Now: A number of experiments were funded including at least four on the shuttle including a specialist (terrain analyst) flying on the shuttle. The Space Test Program still operates and Space and Missile Defense Technical Center monitors its effort. The Army sits on the Space Experiments Review Board of the Program.

In 1994, the Extended Range Interceptor (ERINT) was selected as the interceptor for the Patriot Advanced Capability-3 (PAC-3). *U.S. Army Photo*

Medical Research and Development Program:

The Space Test Program provided resources along with Army Space Technology Research Office, the Intelligence Center and School and the Engineering Schools to actually conduct some experimental analyses to show insect vector estimation was feasible in the early 1990s. Additionally, the Army Space Technology Research Office and the Army Medical Command sponsored some experiments which were flown on the shuttle with respect to limiting blood flow or enhancing clotting for grievous wounds. It is unknown if the Army medical community has continued work in these areas but certainly similar medical experiments have flown in Space in the last few years.

Then: The Study advocated pursuing national imagery capabilities combined with terrain analysis and medical disease propagation models to better estimate areas at risk of insect disease outbreaks. Secondly they advocated a sensor designed to provide individual causality location and status information via satellite communications and thirdly, the examination of blood clotting in Space.

Now: Commercial sources provide data to allow this to be done to determine ground conditions favorable for insect vectors of disease. No individual casualty sensor was ever pursued. Blood clotting experiments were done as part of the Space Test Program effort.

NASA Advanced Communication Technology Satellite:

Description: The Advanced Communication Technology Satellite was a very successful demonstration and pathfinder for Army requirements and use of Ka wideband broadcast communications. The demonstrations turned "operational" when Army Space Command supported operations in Haiti. The satellite survived much longer than its original intended life of 2-4 years. It was finally shut down in the spring of 2004

Then: The Study advocated entering into a Memorandum of Understanding with NASA in 1993 to examine the technologies being developed and use NASA's channels for experimentation.

Now: Army Space Command through the Army Space Exploitation and Demonstration Program and in conjunction with U.S. Army Signal Center built a mobile broadcast ground station and demonstrated it during various Army and joint exercises and experiments. Eventually equipment was transferred to U.S. Army Southern Command for operational use (1997).

Advancement in GPS Technology
Above — Precision Lightweight GPS (PLGR)
Below — Defense Advanced GPS Receiver (DAGR)

U.S. Army

Space-Related Equipment Training and Demonstrations:

The AN/TSC-85 and 93 terminals were pulled out of echelons Corps and below and fielded to the Expeditionary Signal Battalions along with the Phoenix quad band terminal. Echelons Corps and Below now have numerous SATCOM terminals; from Secure Mobile Anti-Jam Reliable Tactical Terminal's (down to Brigade); Joint Network Node Veridian Status Accounting Tracking Systems (down to Battalion); Trojan Spirits (down to Brigade); Combat Service Support Veridian Status Accounting Tracking Systems (down to Battalion); Global Broadcast Service (down to Battalion) and so on. Many other commercial SATCOM systems have been procured via unit Operational Needs Statements in support of Operations Iraqi and Enduring Freedom.

Then: The Study advocated buying Space-related equipment and evaluating it in experiments and exercises. Identified opportunities were focused on Air Defense utility and included AN/TSC-93 Satellite Communication terminal for tactical communications; commercial GPS terminals; use Space Test Program to evaluate Air Defense Artillery vulnerabilities.

Now: Air Defense Brigades were equipped with AN/TSC-85/93s by Desert Storm; GPS terminals were not fielded to Air Defense units until the Small Lightweight GPS Receiver and then Precision Lightweight GPS Receiver became available.

Integrated Closed-Loop Intelligence/Target Acquired System (Mid-term FY93-FY03):

A global sensor vision and various service programs to make "every sensor a shooter and every shooter a sensor." It is still under works to implement the basic concept of integrated intelligence and fire unit command and control.

Then: The Study advocated using satellite communications to enable the merger of intelligence, surveillance and reconnaissance and "shooter" command and control to allow all system to interact.

Now: A dream still being worked.

Automatic Target ID System (Mid-term FY93-FY03):

Automatic Identification techniques have provided insight but brute force computation capabilities have improved so rapidly as well as change detection techniques that the system as such has not been a big player.

Then: The Study advocated funding for hardware and software efforts to achieve near-real-time automatic target recognition. The software portion focused on Automatic Identification efforts. The hardware portion focused on the "Fourier Camera" work of Jet Propulsion Laboratory, but it was never funded by the Army.

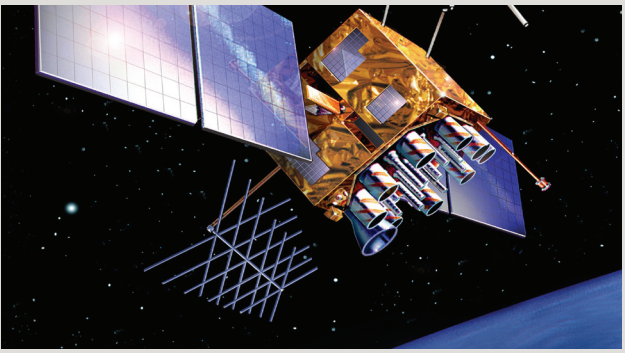
Now: Neither effort ever led to an operational capability.

Smart Sensors (Mid-term FY93-FY03):

Smart sensors continue to be an area of pursuit including the ability of sensor systems to manage them. This includes self-organizing mesh networks and sleep modes to save power.

Then: The Study advocated efforts to produce self-managing sensor systems to move sensor analysis and management to the tactical sensor itself to reduce communication loads going to the rear.

Now: Although not done with Automatic Identification, many of the techniques currently in use greatly reduce quantity of data that must be transmitted to rear areas.



Artist rendition of a GPS Satellite

Automatic Multi-sensor Integration (Mid-term FY93-FY03):

But one more aspect of the Global Sensor Vision of integrated intelligence, surveillance and reconnaissance articulated recently by U.S. Strategic Command. Reluctance remains in the intelligence community about the use of the term correlated intelligence when speaking of fused sensor info … but the technology is moving that way.

Then: The Study advocated a development effort to allow diverse sensors on one platform to integrate their observations to provide a correlated intelligence product.

Now: This has been achieved to some extent with EOIR sensor suites and further work continues with other sensor combinations.

Space support to the warfighter

U.S. Army Photos

Commercial Reserve Communications Satellite Program (Mid-term FY93-FY03):

Desert Storm illustrated the point that the capability to rapidly obtain use of commercial Satellite Communications required funding and contracts in place well before the need arises. Even so, the Department of Defense has not invested in a program of regular leasing of commercial Satellite Communications and the continued rapid growth of information exchange requirements means military use of Satellite Communication is likely to always strain existing capacity when major operations take place.

Then: The Study advocated funding a program similar to the one used to obtain U.S. owned aircraft and merchant ships in a time of national emergency and the funding to exercise it at least once a year.

Now: A viable means of establishing the equivalent of a Civil Reserve Air Fleet program for commercial Satellite Communication has never been identified.

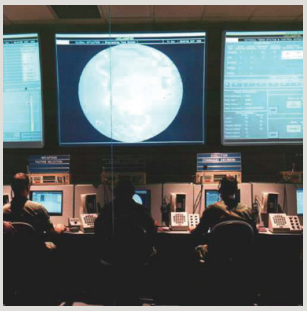
Space-Base Processing Centers (Mid-term FY93-FY03):

We still have not figured out how to do it on earth – much less with the complications of putting into Space. Not likely before the end of the Study period.

Then: The Study advocated using super computers in Space to provide what we now call the Common Operating Picture and then tailor that to the needs of individual commanders.

Now: No plans to put such a capability in Space.

Situational Awareness



U.S. Army Photos

Kinetic Energy Weapons (Mid-term FY93-FY03):

Electromagnetic guns are another perennial "almost there" technology. It promises better range and penetration energies but practical aspects of fielding have so far prevented any operational use.

Then: The Study advocated closely monitoring development of electromagnetic guns. The belief was that such a gun could be Space-based.

Now: Such technology has never progressed to an operational system.

Unmanned Aerial Vehicle Hunter-Killer (Mid-term FY93-FY03):

Robotics has not advanced as quickly as the Study envisioned. In larger part this is true because Artificial Intelligence or AI like programming has not progressed to allow operational autonomous operations except in much defined circumstances.

Then: The Study advocated the development of autonomous Unmanned Aerial Vehicle reconnaissance and killers working in concert.

Now: No such systems exist, although the technology exists to field such systems for use in limited scenarios.

Military Aerospace Vehicle (Mid-term FY93-FY03):

Marines have an approved operational need statement for a similar capability using Space launch.

Then: The Study advocated defining Army requirements for hypersonic transports to move supplies, personnel and equipment.

Now: No Army requirement has ever been approved.

Decision Aids (Mid-term FY93-FY03):

Communications and sensor integration capabilities are not yet in place to support this. The Study was a little premature on this, but it is certainly conceivable in the next decade or so. Given the ubiquity of unmanned vehicles (particularly aircraft), this idea continues to have merit. Given the explosive growth in commercial automobile and various internet mapping programming, it is likely this capability will be routinely available in the next decade.

Then: The Study advocated development of a system to combine airborne and satellite imagery to provide near-real-time maps.

Now: Digital Topographic Support System and various commercial systems can produce maps using such data sources but it is not near-real-time.

Cooperative Autonomous System (Far-term post FY03):

Given that the Study goes out to 2025 this is not an unreasonable expectation. Confidence in autonomous combat operations will have to be obtained for this to be politically viable no matter what technology exists.

Then: This extends the Unmanned Aerial Vehicles Hunter-Killer concept previously mentioned to include ground combat vehicles

Now: Active research underway to make this feasible.

Satellite Communications Terminal Technology (Far-term post FY03):

Has a potential advantage in throughput, multi-channel and better survivability.

Then: The Study advocated continued technology development to exploit Extremely High Frequency advantages for all combat forces.

Now: Such work continues at Communications-Electronics Research Development and Engineering Center and may be incorporated into the Army's next-generation tactical Satellite Communication terminal program, the High Capacity Communications Capability terminal.

THEN AND NOW LEVEL 3 ITEMS:

Air Defense Multiple Sensor Integration Systems:

Air Defense has worked issue with out Space as part of the sensor set with the exception of Ballistic Missile Defense which includes Digital Signal Processing. At various times, special Space sensors have been proposed but none funded to the point of being developed.

Then: The Study advocated an Air Defense system that would be capable of integrating ground, air, and Space sensors to provide correlated target data.

Now: No Space sensor dedicated to Air Defense exists nor are any programmed.

Light-weight Composite Materials:

Detectors may be linked with Satellite Communication but there is no specific program to field such a CB capability.

Then: Army Space Initiatives Study advocated development of miniature CB sensors using Satellite Communication to report their results.

Now: Lots of work in miniature detectors.

Improved Reserve/National Guard Training:

This was included in Study because the Study team believed dedicated circuits owned by the Army would be required. Also they assessed at the time that such distribution via "private broadcast networks" over Satellite Communications would be the most efficacious and cost effective means available.

Then: The Study advocated leasing Satellite Communications to provide television and other capabilities to aid in Reserve/National Guard training.

Now: To the extent that is applicable distance learning using Video teleconference and Internet protocol-based, browser-enabled tools which were not envisioned by the Study. To some extent these capabilities use leased circuits provided by Defense Information Systems Agency

Super High Frequency Improvements:

Not strictly a Space issue. It was included because improved materials for antennae, especially ones which would permit weight reduction (such as graphite fiber), would facilitate use of Satellite Communications at lower, more tactical echelons of the Army.

Then: The Study advocated improving Super High Frequency antenna by reducing its weight using graphite fiber technology.

Now: Evolution of materials technology has permitted development using a broad range of carbon composites.

Satellite Communications

U.S. Army Photos

Alternate Means of Communications:

The Army Space Exploitation and Demonstration Program experimented with laser to Space shuttle communications with limited success. This is not strictly a Space issue but the vacuum of Space provides the best environment to utilize laser communications.

Then: The Study advocated pursuing research in Multi-Megawatt, meteor burst, and laser communications.

Now: Research proceeds on all three and some capability exists in Multi-Megawatt and meteor burst.

Equipment Monitoring and Reporting System (Mid-term FY93-FY03):

Not strictly a Space issue – Army Space Initiatives Study was grasping when they included this.

Then: The Study advocated developing a self-diagnostic monitor on each critical move, shoot, and communicate system which isolates and records the source of system failure and report same via Satellite Communications to appropriate units.

Now: Diagnostics have progressed but there is no specific system to feed the information via Satellite Communications.

Multi-spectral Orbital Sensor Constellation (Mid-term FY93-FY03):

At the time of Army Space Initiatives Study, the U.S. Air Force and Navy had competing designs. Competition eventually killed both efforts. WARFIGHTER, Tactical Satellite, and Operationally Responsive efforts to fly tactical support radar or other multi-spectral sensors continued since Army Space Initiatives Study up to the present time. Space and Missile Defense Command (Future Warfare Center) continues to work closely with the IC to successfully initiate development of these satellites.

Then: Army Space Initiatives Study advocated Army participation in a joint program to put in place Space-Based Radar and/or a Space-Based Infrared system of four satellites.

Now: Army requirement were articulated and interest is high. Space and Missile Defense Command Future Warfare Center has worked extensively with Army exercise community to evaluate the potential value of such systems and to help refine Army requirements.

Army Anti-satellite (Mid-term FY93-FY03):

There has been strong resistance due to U.S. and international concerns/politics pertaining to the "weaponization of Space" concerns about unnecessarily creating excessive debris in earth orbital Space, and no firm decision or requirement currently exists to field such a system. The recent Chinese anti-satellite weapon test and the U.S. shoot down of a U.S. failed satellite (to prevent potential ground effects) have provided much more data to evaluate the debris concern.

Then and Now
continues page 50

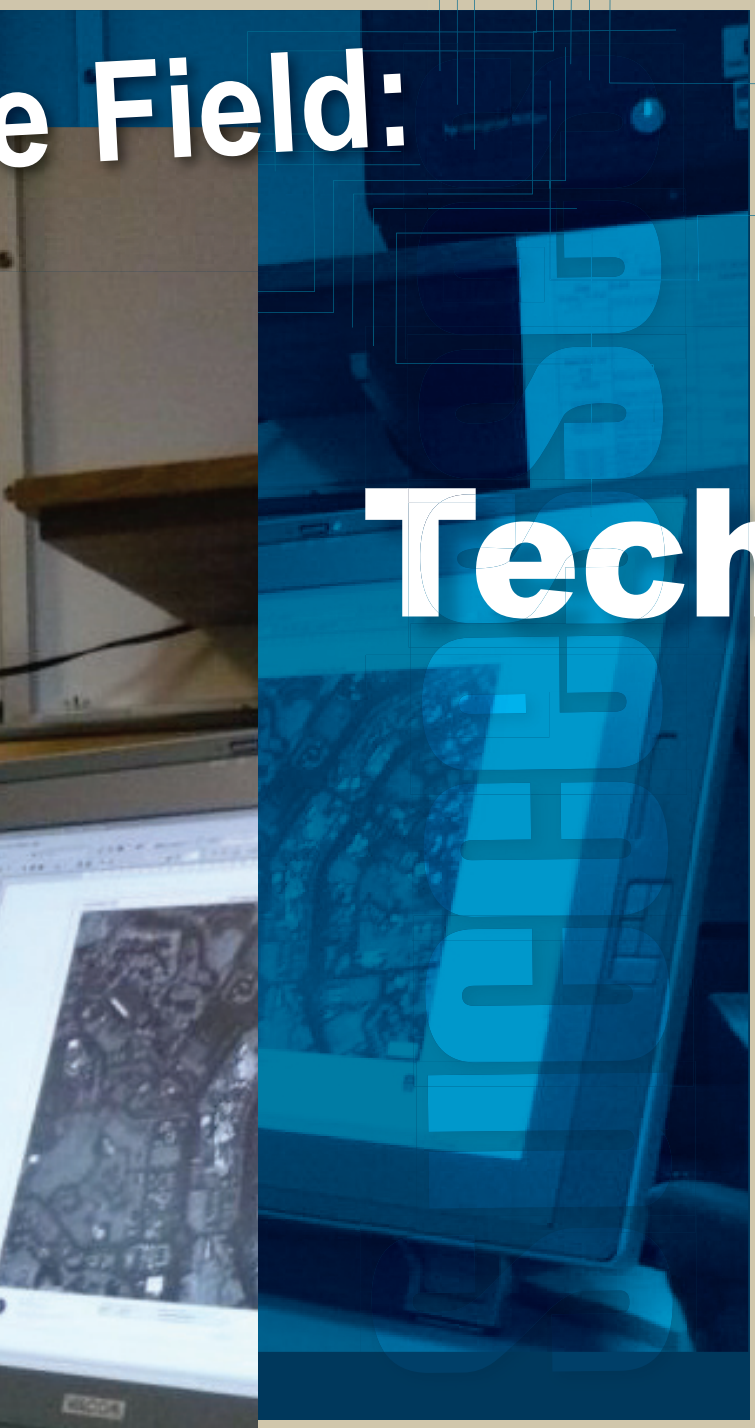
Successes from the Field:

Successes from the Field: 4th Infantry Mechanized

e Field:

Space Technology

The role of commercial satellite imagery



SSG Erik Gaines (21U Topographic Analyst) Performing a QC (Quality Check) on two recently created map products.
Army Courtesy Photo

Since Central Command directed the move of the Commercial (Imagery) Exploitation Team and its Eagle Vision II shelter to the National Security Agency Bahrain in 2004, the team has worked together with the National Geospatial-Intelligence Agency, Middle East Geospatial Support Team in Bahrain to provide support to the Warfighter. This partnership between U.S. Army Space and Missile Defense Command/Army Forces Strategic Command and the National Geospatial-Intelligence Agency has developed through the years and serves as a model for what can be accomplished when organizations worked together. The Commercial Exploitation Team, which disseminates commercial imagery throughout the Central Command Theater, has seen its mission support for Request for Imagery products grow from a yearly total of 92 requests fulfilled in 2004 to over 900 requests fulfilled in the first three months of 2008. This accomplishment would not have been possible without the support from the Mid-East Geospatial Support Team.

Teamwork with National Geospatial-Intelligence Agency Support Team Bahrain has helped the Commercial Exploitation Team to weather the February 2008 transition of the primary commercial imagery collection deck from Quickbird to Worldview.

In January 2008, the National Geospatial-Intelligence Agency Support Team Bahrain Team Chief, Craig Donovan, helped the Commercial Exploitation Team secure a new workplace in a hard-site Central Command building on the base. This building acquisition enabled the Commercial Exploitation Team to replace its Eagle Vision II shelter and equipment, which had been ravished by the harsh desert environment, with a more advanced and more capable processing system. The installation of the new equipment in a hard-site gave the Commercial Exploitation Team access to more reliable power as well as shelter from the elements. Currently, this building just houses the Commercial Exploitation Team, but later this year, the rest of the National Geospatial-Intelligence Agency Support Team Bahrain team will move from their current warehouse location to occupy the building. This collocation of teams is sure to provide even more opportunities for teaming.

Teamwork with National Geospatial-Intelligence Agency Support Team Bahrain has helped the Commercial Exploitation Team to weather the February 2008 transition of the primary commercial imagery collection deck from Quickbird to Worldview. The significance of this transition to the Commercial Exploitation Team cannot be understated. The transition to Worldview impacted the Commercial Exploitation Team's workflow supporting U.S. Central Command elements, since the Commercial Exploitation Team's only direct access system is the QuickBird Application Server, which provides direct from the vendor ingest of QuickBird imagery. In order to maintain continuity of support to the theater elements, the Middle East National Geospatial-Intelligence Agency Support Team provided the Commercial Exploitation Team access to their Global Broadcast System. The Commercial Exploitation Team has downloaded over 600 images via the Global Broadcast System over the last two months. Just recently, the Commercial Exploitation Team, which includes Soldiers with experience setting up and operating satellite systems, volunteered to complete the installation of the Mid-East National Geospatial-Intelligence Agency Support Team's new Global Broadcast System in the Central Command building. This installation will enable the Commercial Exploitation Team to integrate the Global Broadcast System into its equipment set, which will improve its ability to support the Warfighter. In turn, the Mid-East National Geospatial-Intelligence Agency Support Team will avoid the cost of sending a survey team and an installation team from the United States to complete the installation. In addition, the new Global Broadcast System will be ready for use when the rest of the Mid-East National Geospatial-Intelligence Agency Support Team collocates with the Commercial Exploitation Team in the fall of 2008.

This would be a good teamwork story if it ended with just the logistical support piece mentioned above, but the additional operational impact of these two teams working together is powerful and was exemplified in a recent Coalition Maritime operation. An increasingly significant part of the Coalition Maritime Forces' overall mission of maritime security in the U.S. Central Command area of operations has become fighting piracy on the high seas. The waters off the coast of Somalia, connecting the Red Sea and the Indian Ocean, have become a prime hunting spot for pirates. According to the International Maritime Bureau, a division of the International Chamber of Commerce, thirty-one acts of piracy were reported off Somalia in 2007, more than anywhere else in the world and a 10 percent increase from the previous year. The Commercial Exploitation Team has been proactively working with the U.S. Navy and other Coalition maritime forces to protect mariners from piracy in the region.1

SPC Michael Summers (25B Information Technology Specialist) Performing a search for imagery (left screen) utilizing NGA's WARP and on the right, monitoring and administrating the (CES) Commercial Exploitation System.

For this particular operation, the United Kingdom Maritime Component Command required imagery of a location in Somali. They found that they only had hand-drawn maps from early 1900s land surveys so they requested assistance from the Commercial Exploitation Team to obtain recent imagery. The Commercial Exploitation Team, a team of eight U.S. Army reservist from the 1st Space Battalion, 1st Space Brigade in Colorado Springs, quickly pulled the needed imagery from its archive of over 8,000 U.S. Central Command images. The Commercial Exploitation Team created a 3-D fly-through imagery product, and then enlisted the support of the Remote Replication Team, a part of the Mid-East National Geospatial-Intelligence Support Team to produce 30" custom maps which detailed the suspected pirate locations. The Commercial Exploitation Team delivered these products the same day they received the request. The United Kingdom Maritime Component Command used these products for initial operation planning.

As the operation progressed, the United Kingdom Maritime Component Command expressed a desire to get an even more recent image of the

SPC Megan Valentine (35F Intel Analyst) Working with a World View Image to create a specific map composition product to satisfy a recent RFI (Request for Information).

location. Once again, the Commercial Exploitation Team/Mid-East National Geospatial-Intelligence Support Team provided immediate on-demand support. The Commercial Exploitation Team ordered a new collection of the area of interest and the commercial satellite imaged the pirate location on its next pass over the area. Later that day, the Commercial Exploitation Team pulled the imagery data via the Mid-East National Geospatial-Intelligence Support Team's Global Broadcast System Receive Suite. With this imagery, the Commercial Exploitation Team was asked to provide an analysis in support of the United Kingdom Maritime Component Command's operation. For this task, the Commercial Exploitation Team employed skills developed during pre-deployment training with the National Geospatial-Intelligence Agency mobile training team in Colorado Springs to provide a product that answered many questions posed by the United Kingdom Forces. With this knowledge of the location, the United Kingdom planners were able to refine their plans and focus their efforts. Feedback from the United Kingdom commander expressed that the Commercial Exploitation Team products were critical to the operational planning process.

The Commercial Exploitation Team could not have supported this mission without the great teamwork of all members of the National Geospatial-Intelligence Agency Support Team Bahrain. SMDC/ARSTRAT and National Geospatial-Intelligence Agency, recognizing the synergistic impact of working together, recently discussed plans to expand their partnership. The expansion talks centered on the creation of a Combatant Command Geospatial Campus, where the Commercial Exploitation Team and National Geospatial-Intelligence Agency would work together to maximize National Geospatial-Intelligence Agency's investment in the commercial satellite industry, which in turn will enhance support to the Warfighter. This partnership also aims to minimize duplication of efforts, provide an implementation platform for a direct from commercial vendor access solution and maximize out-reach and education capability. Lastly, the partnership hopes to leverage existing resources such as the Commercial Exploitation Team -Tactical Set, the Global Broadcast System and Wideband Global Satellite.

Footnotes

1 Perry, Tony; "Low-key war on Pirates become more perilous", Los Angeles Times, 28 Mar 08.

Bandar Abbas Port in Iran utilizing the new WorldView Imagery collected by Digital Globe. The WorldView satellite was launched September 18, 2007 from Vandenberg. Image courtesy SMDC/ARSTRAT Commercial Exploitation Team

Then and Now
from page 43

Then: The Study advocated Army program to develop a kinetic-energy anti-satellite by combining Miniature Homing Vehicle with the Army Pershing II.

Now: Joint Program started but unfunded in early 1990s

Space-Based Munitions Guidance (Mid-term FY93-FY03):

Many conventional munitions (including hundreds of thousands of artillery shells) can be retrofitted with GPS guidance.

Then: The Study advocated used of Space systems to provide laser designation of targets and second to incorporate GPS into munitions.

Now: Laser designation from Space never happened. GPS has been incorporated into many munitions.

Autonomous Collection System (Mid-term FY93-FY03):

Description: Like other Artificial Intelligence related ideas the Study was premature in estimating when this technology would be available.

Then: The Study advocated development of autonomous control and collection systems for intelligence, surveillance and reconnaissance sensors on unmanned aerial vehicles and Space systems.

Now: No capability currently exists

Space Station (Mid-term FY93-FY03):

Station was de-militarized and in any case the resources vice benefit equation did not excite Army leadership. Instead for a time there was a military component to the International Space Station and through the Terra Scout program the Army Intelligence community investigated potential for human observation from Space.

Then: The Study advocated Army resources (people and funds) be used to develop a Space-based technical control facility for Space communications.

Now: Never happened.

Atmospheric Monitoring System (Mid-term FY93-FY03):

Budget limitations have precluded such an operational sensor flying so far. Much of the data it would collect can be obtained with sensors that consume far less power.

Then: The Study advocated the development of Space Doppler radar to sample winds and other meteorological data over the battlefield.

Now: Never happened. Army did support requirement for such a sensor on National Oceanic and Atmospheric Association/U.S. Air Force polar orbiting satellites.

Power Generation & Transmission System (Far-term post FY03):

Cost versus benefit trade-off has never supported Space-based system. Space and Missile Defense Command continues to forecast military utility to the U.S. Army if technology becomes available making the Space segment cheaper. Some forecasts indicate feasibility by 2025. (Opinion — until Space lift cost per pound is significantly reduced, this will not be economically feasible. A further consideration has to be the popular myth that overhead power lines and cell phones cause cancer – that protest will be nothing to outcry against Space systems beaming radiation at the earth.)

Then: The Study advocated the research and development of Space power stations converting sunlight into micro-wave energy which could be transmitted to ground receivers.

Now: Never resourced by anyone other than some very preliminary basic research.

Tactical Weather Support System (Far-term post FY03):

Energy budget does not make sense. Politics is unlikely to support weather modification much less weather modification from Space.

Then: The Study advocated using Space-based platform to modify the weather by using directed energy.

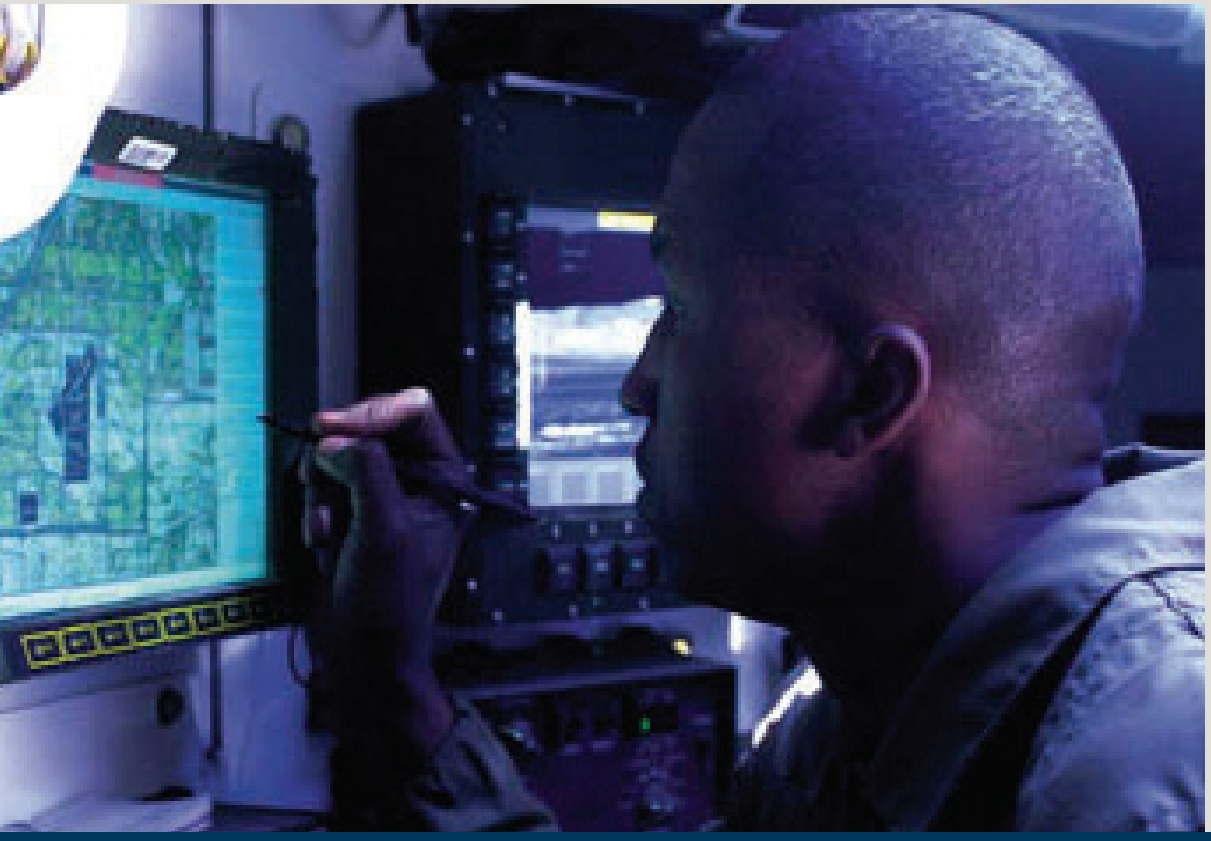
Now: Never happened.

Advance Technology Weapons (Far-term post FY03):

Too undefined to survive budget/requirement reviews.

Then: The Study advocated for funding to support advanced concept development as technological advances in aerospace developed.

Now: Never happened.



Tracking: SFC Kenneth Dawson of Fort Lewis, Wash., checks the map of his Force XXI Battle Command Brigade and Below (FBCB2) system, a widely used but limited blue force tracking system that is being improved.

U.S. Army photo by CPT Timothy Beninato

Part of the Advanced Concept Technology Demonstration, the Tactical High Energy Laser (THEL) at the High Energy Laser Systems Test Facility (HELSTF) has successfully demonstrated the Army's ability to intercept rockets and artillery pieces. On June 6, 2000, the THEL intercepted its first Katyusha rocket. Since then, testing in November 2002 has illustrated the THEL's increased abilities with intercepts of smaller and faster moving artillery pieces.

Only Time Will Tell

CONCLUSION

Few documents that purport to look out 40 years survive the passage of time. The Army Space Initiatives Study does better than most. When you consider that an ad hoc group thrown together for six months produced this document, they did extraordinarily well in their predictions. Their recommendations forecast the basic organizational structure, personnel management, requirement/demonstrations/concept development processes and many of the materiel solutions that have actually come to pass. It will be interesting to see how well it stands the light of day in 2025.

To quote one team member who I think displays undue modesty, "Maybe, ASIS recommendations in fact shaped and planted seeds which have blossomed over the years. Maybe not. But, we did present an action plan to the Army – if many aspects of our plan have come to fruition, it may validate the process we used for the recommendations we made." From my perspective, ASIS, the effort as opposed to the report, caused a large number of officers to look at Space and its ability to enable the Army to better perform its missions. In turn these officers convinced many others of the value of Space and the need for the Army to be a participant in Space operations. That got the ball rolling leading to the creation of FA40, the Space Brigade (and its subordinate units), and a more robust role in Space requirements and experimentation through the creation of what is now the Futures Warfare Center of U.S. Army Space and Missile Defense Command/Army Forces Strategic Command. Truly the Study team has every right to be proud of their job and the fact that this is one report that did not just fill up Space on a shelf in the Training and Doctrine Command library.

ABOUT THE AUTHOR

JOHN MARRS

John Marrs retired from civil service after 29 years on Aug. 22. His wife Sharon placed his retirement pin on him during the ceremony. Photo by Roberta McDonald

John Marrs was born Jul. 14, 1950 in Monahans, Texas, and lived there until going to Texas A&M University in the fall of 1968 where he majored in physics, was a member of the Corps of Cadets, and played cornet in the Fightin' Texas Aggie Band. He graduated in 1972 and was the U.S. Air Force Reserve Officer Training Corps Honor Graduate.

After training as a weather officer, 2LT Marrs was assigned to U.S. Air Force Global Weather Central in August 1974 at Offutt Air Force Base, Neb., where he fell in love with severe weather forecasting, became a storm chaser, and decided to pursue a meteorological career. In 1978 he went to work for a private weather forecast company and finished his Masters of Meteorology remotely in 1979.

In 1979, Marrs began his civil servant career at the U.S. Army Atmospheric Science Laboratory (ASL) at White Sand Missile Range, N.M. Professionally, he found his niche at ASL creating a concept called Tactical Weather Intelligence — taking weather data and forecasts and automatically translating them into effects on Army or Threat equipment and operations. This concept evolved and became the basis for the weather system called Integrated Meteorological System. From 1986-1988, Marrs went on a developmental assignment as the Army Materiel Command Science Advisor at the National Training Center, Fort Irwin, Calif., where among other things, he oversaw (with the help of ASL) the installation of a local area network of meteorological stations which led to better forecasts for helicopter flight planning and an average of three additional aviation training days per month during January, February and March.

In 1988, Marrs changed paths to Space full-time, working for COL Ronan Ellis at the U.S. Army Space Institute (ASI) at Fort Leavenworth, Kan. While there, he focused on weather, terrain, navigation, and theater missile warning aspects of using Space to support Army operations. He was instrumental in developing the Army Space Demonstration Program

approved by GEN Maxwell Thurman. His biggest contribution was guiding the creation of the Small, Light-weight GPS Receiver (SLGR) which facilitated the movement of Army forces across the desert during Desert Storm. In 1990, Marrs joined Army Space Command as the principal architect and developer of the Army Space Exploitation and Demonstration Program. Over the next 17 years, he assisted in all sorts of functions to include acting as the technical interface to the Air Force, Navy, NASA, and commercial Space communities. Marrs had a major part or led the development of: Training and Doctrine Command recognizing the command as its surrogate for Space-related combat developments; creation of the Space and Missile Defense Battle Lab; creation of Space area as an Army Proponency; and the design and creation of Army Space Support Teams, the 1st Space Battalion and the 1st Space Brigade. He was a driving force in early development of all sorts of new capabilities, e.g., blue force tracking and commercial imagery exploitation.

In 2003, he joined the Office of the Secretary of Defense-chartered Joint Space Control Operations — Negation Joint Test & Evaluation as the Technical Director. This effort resulted in major improvements in Space control tactics, techniques and procedures and command and control processes at the Air and Space Operations Center, Joint Task Force and Combatant Command levels of operations. In 2007, his work was recognized with the Office of the Secretary of Defense Civilian Exceptional Service Award.

Last year, Michael Schexnayder, deputy for Research, Development and Acquisition, and Dr. Mark Swinson, the command chief scientist, asked Marrs to be the Command's liaison to the U.S. Strategic Command J8 at Offutt Air Force Base. His career has gone full circle … closing where it began — at Offutt.

Got S_pace?
www.smdc-armyforces.army.mil/ASJ
e-mail: space.journal@us.army.mil

FA40 Proponent/ Army Space Cadre News

BY LTC CHRISTOPHER A. LIVINGSTONE

LTC Christopher Livingstone is an FA40 Space Operations Officer dual-hatted as the Chief, FA40 Personnel Proponent Office and Chief, Army Space Cadre Office. Livingstone previously served with the U.S. Army Space and Missile Defense Command/Army Forces Strategic Command in the 1st Space Battalion. He also served as an Ordnance Officer in the 1st Infantry Division, 1st Armor Division, 1st Cavalry Division, and First U.S. Army prior to entering the Space Operations Career Field in 2003. Phone: (719) 554-8753; Fax 8764; DSN 692.

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FA40 Proponent Office Personnel

We are currently managing 209 FA40 coded billets throughout the Army, Joint Organizations and Agencies. Although we have a population of 229 FA40 Officers, 21 percent of those billets are currently vacant. As we move into FY09, we will be re-looking our priority of fill and work closely with MAJ Ed Anderson (FA40 Career Manager) to balance our distribution throughout the force structure.

As we continue our transition from a defense contractor supported organization to one fully manned by Department of the Army Civilians, two new individuals have joined our ranks. Jerry Pepin and Al Hughes have both recently started working in support of the FA40 Community. Jerry has assumed the duties of Military Analysis and Al the duties of Military Human Resources Technician in the FA40 Personnel Proponent Office.

Jerry previously worked in the defense contracting arena where he supported training and exercises in the Cheyenne Mountain, North American Aerospace Defense Command and U.S. Northern Command Centers. Jerry is a retired Air Force Space and Missile Officer. His active duty Space experience includes serving as a Commander, Minuteman III Combat Crew, an assignment in Cheyenne Mountain as a Missile Warning Center Commander, Deputy Chief, Standards and Evaluation Division, and a stint at Headquarters Air Force Space Command as Chief, Command and Control Requirements. Lastly, he served as Chief, Space and Missile Operational Testing and Flight Commander, Current Operations at the Space Warfare Center.

Al recently retired after 25 years active duty Army service. Prior to his retirement, then Chief Warrant Officer 4 Hughes was a Human Resources Warrant Officer (420A) and served as Strength Manager in 1st Cavalry Division, III Corps Headquarters, and 1st Armored Division. While in Germany he also served four years as the Deputy Executive Officer for the Commanding General, U.S. Army Europe. Al came to Fort Carson, Colo., in 2003 and finished his military career as the Fort Carson Strength Manager.

Both Jerry's and Al's vast knowledge and past experiences will greatly contribute to the overall success of the FA40 Proponency Office and FA40 community.

Also, this will be the last edition of the Army Space Journal that will be published with John Nelson and Kevin Janes providing support to the FA40 Proponency Office/Army Space Cadre Office. There are very few words that can express the sincere appreciation that I have for both of these gentlemen. Without their tireless support and professional dedication we would not have been able to succeed in providing the level of support to the FA40 Community that we did. John is known to many of you through his work in managing Space 300 allocations, confirming Air Force Space Badge eligibility, awarding the 3Y Additional Skill Identifier, advanced civilian schooling and Training With Industry. Although you may not have liked the answer you received, you could always be sure that when John answered a question it was thoroughly researched and spot-on. To many, Kevin became the face of the Proponency Office because when you called, he answered. His willingness to help with any issue you may have earned him the reputation of a "jack-of-all-trades" and he contributed to the successful completion of numerous issues and tasks that otherwise may not have been done. The entire community has benefited from the work of both of these men, we are better off for having served with them.

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Education/Training

Although the United States Air Force has been sending senior non-commissioned officers to the Space 300 course for a number of years, the Army has not followed suit — until now. With the concurrence of his organization, SGM Ralph G. Martin, Headquarters, 1st Space Brigade, was selected to be the first enlisted Soldier to attend this demanding and professionally enhancing course. Based on his over 159 months of Space related experience and his current position as the Brigade Operations Sergeant Major, Martin exemplifies the type of student expected to succeed in Space 300: a thinker and leader who in the future is expected to solve problems of Space bearing on national security. Once complete, he will meet the requirements for awarding of the Air Force Master Space Badge, another first for an Army Noncommissioned Officer. Martin is truly leading the way for other Noncommissioned Officers to follow and we all should be proud of his accomplishments.

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Selection Board Results

Congratulations to LTC Robert Kimbrough and LTC Robert Klingseisen on their Senior Service College selection.

Congratulations to our FA40s that were selected for promotion to Lieutenant Colonel: Bill Beck, Matt Burrow, Chris Crawford, Cliff Hodges, Ken Kock, Kevin Laughlin, Mike McKay, Annie Merfalen, John Moberly, Dave Price, Jerry Shay, Brian Soldon, Mike York and Rick Zellmann

Congratulations to our FA40s that were selected for promotion to Major: CPT Tammy Aguilar, CPT Michael Bancroft, CPT Thomas Bloomfield, CPT Todd Book, CPT Donald Brooks, CPT William Davis, CPT Jason Favero, CPT Charles Harmon, CPT Charles Hayes, CPT Bryan Juntunen, CPT Eric Marion, CPT John Marley, CPT Jason Nunnery, CPT Yaqui Oselen, CPT Dennis Slaton, CPT Cecil Strickland, CPT Anthony Tingle, CPT William Wright and CPT Elizabeth Helland

Think About It!

The theme of this edition of the Army Space Journal is Space Technology. Although we manage FA40 Billets where the individual assigned is involved with the technological aspects of Space, we do not manage the billets any differently from one assigned to a tactical unit, all are FA40As. The question then is this, should we consider expanding our designations such as FA40A (Tactical Space), FA40B (Space Control), FA40C (Astronauts), FA40D (Technical Space)? There is precedence for having multiple specialties within a Branch; Aviation for example assigns different designators based on aircraft qualifications and Military Intelligence officers attend additional training based on their technical designator. The implications of this discussion require that it be both open and well thought out. We are interested in hearing your thoughts/opinions as we continue to posture the community to better serve the needs of today's Army.

According to DA PAM 600-3 "To be fully considered fully developed in the FA, officers will optimally serve for 24 months in a FA40 or Space-related position (to include Space-related schooling or training) at each rank, beginning at MAJ. Twelve months experience is desired for CPT. Success will depend not on the number or type of positions held, but rather on the quality of duty performance in every assignment." Although this definition of "fully developed" served the community well during its growth, it is time that we begin to look at defining/identifying Key Development (KD) positions that more closely align with the requirements of other Branches. Not only will this provide officers with a clear definition of what assignments and education they should seek, we believe it will make them more competitive with their peers in other Functional Areas and Basic Branches. Expect to see more on this topic in further editions of the Army Space Journal as well as postings on the FA40 Proponency Office Army Knowledge Online Web site.

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How Do We Stay in Contact With You?

In order to maintain contact and stay up-to-date on all of the FA40 and Space Cadre issues, personnel, news and announcements you are highly encouraged to frequently check your Army Knowledge Online account. The Proponency Office/Army Space Cadre Office will use this common address as the primary means to provide you useful and pertinent information.

Larry Mize, Chief of Space and Ground-based Midcourse Defense Education Training gives a presentation to students during the Space and Missile Defense Conference Education Day.

Space and Missile Defense Conference Education Day

BY LENNY GEHRKE, FWC DCD TRAINING

The Eleventh Annual Space and Missile Defense Conference and Exhibition took place at the Von Braun Center in Huntsville, Ala., from Aug. 11 – 14, 2008. During the Conference, an Education Day was established for 7th and 8th graders from the local community. The afternoon venue featured a competition where four teams competed in a robotics competition. This demonstration identified the different responsibilities of each member of the team in order to make their individual robots competitive. There were many different facets of the competition not only with the students but also with their teachers and mentors. The winning robot wasn't necessarily the best or the toughest, but success depended mostly on the winning strategies.

A variety of exhibitors participated in morning session or Education Day which was held in the Von Braun Complex Arena on Aug. 13. Exhibitors included Space and Missile Defense Command Future Warfare Center Directorate of Combat Development (FWC DCD) Education and Training Division, NASA, UAS (Unmanned Aerial Systems), UGV (Unmanned Ground Vehicles), Rocket Boys, Space Camp, Lego Robotics featuring "Damsels in Charge" team, the U.S. Army, Raytheon featuring "Math Moves You" exhibit, and the four local FIRST (For Inspiration and Recognition of Science and Technology) Teams. The morning activities involved students rotating throughout the exhibitors. Education Day exhibitors demonstrated a 15-20 minute presentation of their programs — some had hands-on, interactive exhibits. Students also had a chance to walk through and visit the main exhibits in the South and East/West Halls of the Von Braun Complex.

The FWC DCD exhibit provided a video vignette of what it takes to get a satellite in orbit, how to maintain the satellite while in orbit, power, station keeping and pointing considerations. A hands-on practical demonstration activity was provided for students on satellite spin stabilization. Students were turned into a human gyroscope using a rotating platform and a bicycle wheel. The satellite overview DVD vignette was provided to the students along with a CD which included an orbital mechanics Computer Based Training module and other helpful educational material.

The focus of Education Day was to visit the different booths and technologies to spark interest in students to examine careers in the sciences, math and or technology. Any of these students could be our next astronaut, scientist or inventor of an innovative futuristic technology. All middle school students invited to Education Day received a bag full of exhibitor tokens and memorabilia including some educational material.

In talking to some of the students, it was discovered that several said they plan to change their majors to a math or science field simply from being inspired by Education Day. It was amazing to see how smart, talented and mature today's students are. Our future lies on what the next generations do with their lives and with the decisions they make.

Lenny Gehrke is a retired U.S. Air Force MSGT. He previously was the Course Director for the Space Fundamentals Course with the 533 TRS in Colorado Springs and now is a staff instructor within Future Warfare Center Directorate of Combat Development.

Tip of the Sphere

Training Insights

BY LARRY MIZE

2008 Space Operations Officer Qualification Course Schedule

– S00QC 08-02 Sept. 15 – Nov. 21, 2008
Contact Larry Mize, SMDC FWC DCD Chief of Training at: larry.mize@smdc-cs.army.mil
(719) 554-4545 for more information.

Larry Mize graduated from Xavier University with a Bachelor of Science in Mathematics in 1973. He entered active service in the United States Navy serving a career specializing in Naval Intelligence, Aircraft Carrier Operations, Naval Special Warfare (SEALs), and Space Operations. He attended French language training at the Defense Language Institute and Subsequently served as the U.S. Navy Liaison Officer to the Commander French Forces Indian Ocean/French Foreign Legion/ Commandos Marine in Djibouti. He attended Naval Postgraduate School and was awarded a Master of Science in Space Systems in 1986, subsequently serving at U.S. Space Command and U.S. Strategic Command. Mize is currently Chief of Space and Ground- based Midcourse Defense Education Training.

SMDC FWC DCD
Training to Joint and Army Forces

The Space and Missile Defense Command Future Warfare Center Directorate for Combat Development (FWC DCD) Training Branch continues to support Army efforts to educate the force through support to the U.S. Army Command and General Staff College. For the Command and General Staff School class of 2008-01, the Army gained 55 Majors with the Additional Skill Identifier of 3Y. Also graduating with this class were 11 Air Force officers, seven Navy officers, and one Marine, thereby giving the joint force Space expertise, and the ability to interface with the Space Cadre, in ensuring effective integration of Space capabilities for military operations. The course continues to provide 24 hours Space Orientation secret elective regarding the capabilities and limitations of Space systems to include: orbital mechanics; Space environment; law, policy, and doctrine; Space mission areas; and detail about each Space force enhancement area. This class is followed by a 48-hour top secret elective of Space Operations that brings in experts from the field to provide information and instruction relative to integrating and using Space capabilities.

The Joint and Combined Integration Directorate of the Army Fires Center of Excellence at Fort Sill, Okla., continues to bring FWC DCD Training Branch representatives to integrate and instruct Space capabilities in the Joint Operational Fires and Effects Course as well as the Army Operations Electronic Warfare Course. This effort continues to grow as the instruction is now also integrated in the new Electronic Warfare Qualification Course for the new Electronic Warfare Functional Area.

The instruction provided in these courses is focused on the Space capabilities related to the effects and how the Space officer can support the different disciplines within targeting, effects and electronic warfare. This effort increases Space capability awareness throughout the force as more mainstream Army Soldiers gain understanding.

Tactical Space Operations Course 08-05 Graduates

Directorate of Combat Development Training Branch conducted Tactical Space Operations Course 08-05 Aug. 18-22, 2008. This course trained 13 students from the Active Army, the National Guard, and the Air Force. Most of them will deploy to combat in the next 12 months as a part of Space Support Elements or Army Space Support Teams. In the Tactical Space Operations Course the students were given instruction in Tactics, Techniques, and Procedures that Army Space Forces use today in Central Command. With this knowledge, they will be better prepared to plan, integrate, and coordinate Space force enhancement and Space control.

Front Row from left to right: MAJ Steven D. Moseley (3rd Infantry Division Space Support Element), SGT Adam Tripses (Army Space Support Team #2), CPT Thomas J. Bloomfield (2nd Infantry Division Space Support Element), CPT Jason P. Nunnery (Army Space Support Team #2), CPT John H. Stone (1st Armored Division Space Support Element). Back Row: MAJ Rodger Pitt (1st Infantry Division Space Support Element), MAJ Mindy A. Kimball (1st Cavalry Division Space Support Element), MAJ Terrence J. Connolly (Army Space Support Team #2), MAJ Troy H. Wincapaw (Army Forces Strategic Command Training and Exercises), LTC Travis Voels (34th Infantry Division Space Support Element), CPT Andrew Unwin (117th Space Battalion), Capt Paul Keddell (50th Space Wing). Not pictured MAJ Joe Harrison (U.S. Strategic Command J31).

JTAGS CLASS 08-05 GRADUATES

Congratulations to Joint Tactical Ground Station Initial Qualification Training class 08-05. On Aug. 28, 2008, five new warfighters became qualified JTAGS operators. After completing a rigorous seven week training schedule on JTAGS capabilities and operations, the five finally graduated. Graduates will be going to sites in Germany and Korea. Once they arrive at their new locations they will receive additional training to unit certify them as JTAGS operators.

Graduates and instructional staff from JTAGS IQT 08-05 from top to bottom and left to right: SFC Kwain Stovall, SSG Michael Pugh, SFC Todd Avery, SPC Michael Dufresne, SGT Justin Linnemon, SPC Erik Slott, SGT Alan Soderberg, David Futty, SPC Amanda Henderson and SGT Bertha Bell.

JTAGS IQT Trainers are given recognition by SMDC/ARSTRAT CSM Ralph Borja. From left to right SFC Kwain Stovall, SFC Todd Avery, Michael Hersh, CSM Ralph Borja, David Futty, SSG Michael Pugh and SGT Bertha Bell.

CSM RECOGNIZES JTAGS SCHOOLHOUSE EXCELLENCE IN TRAINING

On a return visit to the Joint Tactical Ground Station Initial Qualification Course schoolhouse in Colorado Springs, Colo., U.S. Army Space and Missile Defense Command/Army Forces Strategic Command CSM Ralph Borja recognized the training staff for their excellence and dedicated service by presenting staff members his Command Coin of Excellence.

Space Operations Officer Qualification Course 08-01 Graduates

Congratulations to Space Operations Officer Qualification Course 08-01. On Aug. 15, 2008, thirty new Apace warfighters became qualified graduates of their formal training. The 10-week program of instruction included four weeks of mission, systems and organizations training at the National Security Space Institute followed by six more weeks of intense Army and Joint focused Space operations training, practical exercises and field experience tours. These thirty graduates now join a cadre of 294 Space Operations Officer Qualification Course graduates over fourteen courses since 2001.

Teaching Sensor Managers How to Reach Out and Touch Something

By Chip Graves, SMDC FWC DCD Training Division

block 1 >>

The world continues to evolve with theater and strategic ballistic missile technology and the associated threats have grown over the years with the continuing development of ballistic missiles. Government and Non-Government actors can use Weapons of Mass Destruction carried on ballistic missiles to blackmail and intimidate the United States and our allies, and having the potential to hold hostage hundreds of thousands of people. Iran continues their pursuit of ballistic missiles and poses an evolving threat to the United States and our allies. Meanwhile, the combination of its recent nuclear and long-range missile tests makes North Korea a real threat to international peace and security.

As a result, missile defense organizations must keep up with the demands of a changing world by creating a missile defense system that will see the threat further, identify the threat location faster, and have the ability to send this data to our missile defense systems to eliminate the threat quicker. (Picture-1)

<< block 2

One of the key pieces of equipment that allows us to do this is a cutting edge radar system whose nomenclature is the AN/TPY-2 Forward Based Mode (FBM) Radar

The AN/TPY-2 (FBM) is high-resolution, X-band, phased array radar based upon the Terminal High Altitude Area Defense Radar hardware and software design. This commonality allowed for the accelerated procurement and development of a forward based capability. AN/TPY-2 (FBM) includes modified software algorithms for

tracking and discrimination from a forward-based perspective. The radar has a direct interface with the Ballistic Missile Defense System command and control system. The radar will perform surveillance autonomously or as cued by other sensors and it will acquire, track and discriminate threat missiles and missile components, and pass this information to other BMDS tracking, discrimination, and fire control radars downstream.

The AN/TPY-2 radar (FBM) (Picture-2) is designed to first detect a ballistic missile as close to the country of origin as possible. This maximizes the capability of the Ballistic Missile Defense System to identify, assess and engage ballistic missile threats to U.S, deployed forces and allies. The role of the Army Sensor Managers is to remotely operate the AN/TPY-2 (FBM) radar, in addition to providing situational awareness of other Ballistic Missile Defense assets to multiple combatant commands. The Army's Sensor Manager Qualification Course is new to the Ballistic Missile Defense System community and is intended to train Army Sensor Managers to manage and control the radar.

Training Development, the TRADOC way

Like any qualification course taught by the Army, Space and Missile Defense Command (SMDC) Future Warfare Center Directorate of Combat Development Training Division was given the requirement of lead service on Feb. 11, 2006. This led to the development of the Sensor Manager Qualification Course. This course required SMDC to meet the U.S. Army Training and Doctrine Command standards. The first step in the course development process was to identify the Sensor Manager critical tasks. This step was completed by holding a Critical Task Selection Board in February 2007 using soldiers from the 94th Army Air Missile Defense Command. These Soldiers were also part of SMDC's 1st Space Brigade, and they sat as voting members on the board. The Critical Task Selection Board started with a large total task list, and after two days, selected the 23 most important tasks. These 23 tasks became the critical task list by which the Qualification Course was developed.

Following the Critical Task Selection Board, SMDC and Soldiers from the 94th Army Air Missile Defense Command developed the performance steps and measures (conditions and standards) for each task. At the time, the only subject matter experts were 94th Army Air Missile Defense Command personnel. As the development of the course progressed, more assistance was needed. SMDC approached the Missile Defense Agency, and in February 2008, Missile Defense Association's Ballistic Missile Defense System Training and Education Center provided two instructors to assist with course development and instruction. Clem Morris and Bruce Betts dedicated themselves to providing countless hours of training development, course material preparation and instruction. They together with the U.S. Strategic Command and Missile Defense Agency hosts, the FWC DCD team of Chip Graves and Mike Madsen guaranteed the success of this training initiative.

In April/May 2008, the course was offered for the first time at Offutt Air Force Base, Neb. The purpose of the first course was to validate the course material, and make appropriate changes based on instructor observations and student recommendations. The attending students came from the 94th Army Air Missile Defense Command, Joint Functional Combatant Command-Integrated Missile Defense and Future Warfare Center-Directorate of Combat Development. Following improvements to the course material, the second offering of the course was given to warfighters at Offutt Air Force Base in July 2008. Those students came from the 94th Army Air Missile Defense Command and Joint Functional Combatant Command Integrated Missile Defense. Future course offerings are being considered and planned at this time, with assistance from a number of people and organizations. Future students could come from the again the 94th Army Air Missile Defense Command and Joint Functional Combatant Command Integrated Missile Defense, as well as several different combatant commands (U.S. Pacific Command, U.S. Northern Command, U.S. European Command and U.S. Strategic Command).

Myriad of Online Space Training Available

By Thomas Coleman, Chief
Space Cadre Training Development Team
SMDC/ARSTRAT Future Warfare Center DCD

The Directorate of Combat Development Cadre Training Development Team has been assigned the responsibility to formulate a strategy and execute a plan that identifies gaps in Space training and to fill those gaps by providing appropriate training to the Army Space cadre. This training can be in the form of resident training, online training, distributed learning (dL), computer-based training, Web-based training, books, or other Space training literature or modules. By Jan. 1, the DCD Cadre Training Development Team had delivered some Space training consisting of dL modules, and had requested feedback from these users on the utility of the training in helping Cadre members perform their jobs better. The dL modules that were distributed before the beginning of 2008 included two basic courses, "Space Awareness" and "Army Space Cadre Basic Course" as well as some dL courses offered by the National Reconnaissance Office and the National Security Space Institute.

The DCD Training Branch Space Awareness Course lessons consist of an introduction and overview, characteristics of Space systems, force enhancements, contributions to the warfighter and foreign Space systems. The Army Space Cadre Basic Course contains lessons on the global positioning system, orbital mechanics, the Space environment and Satellite Communications fundamentals. Both of these courses are on the Army Learning Management System Web site. To get to the site, log into Army Knowledge Online (AKO) then click on "My Training" under the Self Service drop down Menu or use the link, http://www.lms.army.mil/ and you will be directed to log into your AKO account. Once on the Learning Management System site, on the right side of your screen click on the "catalog search" box and type the full name of the lesson you want to take (such as listed above). It is important that you type the full name of lesson otherwise your search will not return any lessons. The lesson information will appear on your screen. Click on "Register," this will register you into the lesson. After you are registered you can click on "Launch Content" and you can begin taking the lesson.

If you need to leave and come back to the lesson, you can. Once logged back into the Learning Management System Web site your lesson enrollments will appear in the "Current Enrollments" area of your welcome page (lower right side). Click on "Launch Now" for the lesson you want to continue and go to the next module of the lesson. The courses can also be found on AKO and can be accessed by going to the Directorate of Combat Development Training branch web site at: http://www.smdc.army.mil/2008/FWCTraining Div.asp. Once at the site scroll down, the links to the lessons are under the "AKO Folders" section in the middle of the page. Click on the lesson or course desired. You will be prompted to log into AKO. Once logged into AKO you will be at the lesson folders. You must SAVE each individual file to your hard drive, and then unzip the file. The files are made to play in MicroSoft Internet Browser 5.5 SP1 and later. Click on the index.html file to start the program. You should take the lesson in the order of the "Read me First.txt" located with the lesson files.

The lessons and courses can be accessed 24/7. Courses taken on the LMS system can be tracked for completion. In late summer of 2008, it is expected that both of these courses will be available through the Army Blackboard learning interface. Blackboard is an enhanced Learning Management System and provides more tools for the user as well as an easier interface for students.

In addition to the Directorate of Combat Development dL courses, a variety of other basic-level and advanced-level Space courses are available via dL and computer-based training through the National Reconnaissance Office and National Space Security Institute.

Online

The National Space Security Institute is offering 16 hours online and the courses are located on NIPRNET: https://halfway.peterson.af.mil/nssi/cbts/index.htm

The courses offered are as follows:

Space History – SPI 270	~ 2 hours to complete
Orbital Mechanics – SPS 271	~ 3 hours to complete
Space Environment – SPS 270	~ 3 hours to complete
Global Positioning System – GPS 270	~ 3 hours to complete
SATCOM – COM 271	~ 2 hours to complete
Introduction to DOD Acquisition – ACQ 270	~ 3 hours to complete

The National Reconnaissance Office is offering 18 hours online. More information can be found at http://cleon.NRO.smil.mi - SIPRNET

The courses offered are as follows:

The National Systems Information Course (NSIC)	~ 6.5 hours to complete
Joint Tactical Exploitation of National Systems (JTENS)	read manual
Space 300 (National Systems Overview) Course	~ 3 hours to complete
Space Enabled Warfighter Operations (SEWO) Course	~ 1.5 hours to complete
Commercial Remote Sensing Overview (CRS) Course	1 hour to complete
Introduction to IMINT Course	~ 20 minutes to complete
Introduction to ELINT in Fusion Analysis Course	≈ 3 hours to complete
Mini Transmitter (MTX) Overview Course	~ 30 minutes to complete
Compact Disk-Space Education Tool (CD Set)	~ 2 hours to complete

The Directorate of Combat Development Cadre Training Development Team will continue to solicit course feed-back and establish a continual feed-back mechanism and interaction activities that take place between Directorate of Combat Development Training Branch and the cadre members in the field, as well as other offices working on similar issues (such as FA40 Proponency Office and Army Space Cadre Office).

If there are any questions regarding on-going Space Cadre Training Development efforts please contact Tom Coleman (thomas.coleman@smdc-cs.army.mil) at (719) 554-4541, DSN 692.

"Emerging Missions and Requirements for Tactical Army Space Forces"

By Bill Coffey and Robert Zaza

Space operations, by its nature, is a global endeavor. Planning and integrating Space in a combat zone requires a global perspective matched with an equal understanding of the inherently global architectures which support each satellite and their respective constellations. Nonetheless, it is the role of each deployed Army Space Soldier to first possess an understanding of his unit's respective Area of Responsibility and his commander's intent in order to integrate the global Space architectures when and where it is needed. This global perspective, with unit responsibilities is the genesis of the art and science behind the tactical and operational integration of all available Space capabilities and effects.

Since Sept. 11, the U.S. Armed Forces, especially the U.S. Army, have greatly evolved and expanded their understanding of how best and most innovatively to apply the existing global satellite architectures to the current and ever-changing wartime requirements of offensive operations, defensive operations, and stability operations in a joint, interagency, intergovernmental and multinational environment.

The following discussion points are not intended to reiterate the basic, and still valuable, traditional Space force enhancement capabilities, but rather to address the new, emerging and innovative applications of Space operations to the current war, with an eye on near-future Space capabilities and effects.

Prior to any combat deployment it remains imperative for all Army Space Soldiers to appreciate that expertise remains a personal decision to better oneself in one's chosen profession of Space. The authors have found, through examining both the Space community and the intelligence community, that expertise is self-taught. Personally initiated professional development within the Space community relies heavily on a variety of Distance Learning sites and curricula as well as resourcing one's own time and securing Army funding to attend the multitude of Space and Space-related courses available throughout the military and academia. It is likewise imperative to read and study all the existing Space journals, publications, articles, After Action Reports, newsletters, and the like, which collectively offer current insights and recommendations into

new and emerging issues that will impact your ability to integrate Space throughout our active combat zones.

As you prepare yourself and your team, or prepare others for their deployment, the authors recommend that you consider the following as you decide how best to allocate your extremely limited time, funds, and energy to your Space-related combat preparations:

– The Army's efforts to develop a wide variety of Geospatial Intelligence products has accelerated in importance and value-added to land combat operations. There are currently at least 25 Continental United States-based Geospatial Intelligence production facilities that directly support U.S. Central Command operations. Geospatial Intelligence products combine multiple layers of fused information to graphically depict activities, patterns, trends and analysis. Space products can at times contribute greatly to the overall development of such analysis and products. Army Space Soldiers should ensure that Space-based imagery, radar, environmental monitoring, infrared, blue force tracking, Moving Target Indicator (MTI) and other Space-based products are fully considered in the planning for the development of Geospatial Intelligence products.

– Army Space Soldiers should be fully aware of how to apply all available Space capabilities and effects to the ongoing and ever-dynamic Counter Improvised Explosive Device fight. It has been noted by several Army Space Soldiers that "Space support to C-IED is the only Space work you can do that helps kill the enemy and save American Soldiers' lives."

– Find the closest Air Force Space Officers (13S or W13S coded career management tracks), buy them lunch and start working closely with them. They provide a level of Space-related technical expertise that is rarely found among Army Space Soldiers since they begin as Space professionals as Second Lieutenants. Conversely, the Air Force Space Officers are usually very reliant on Army Space Soldiers for their understanding of how the Army operates, how it conducts the Military Decision Making Process and how the Army "moves, shoots and communicates."

– Coordinate and integrate with all the augmentation teams attached to your headquarters and collaborate with them on how best to integrate Space capabilities and effects into your unit's operations. It is fair to assume that many of these non-organic augmentation teams do not understand the roles and missions of Army Space Support Teams or Space Support Elements. Educate them on your roles and missions and also get smart on their unique skill sets. Some of these augmentation teams in Division, Corps and Marine Expeditionary Force headquarters include Counter Improvised Explosive Device teams; Geospatial Intelligence Support Teams from the National Geospatial-Intelligence Agency, Geospatial Analysts from Continental U.S. Military Intelligence units; Air Force Intelligence, Surveillance, and Reconnaissance Liaison Officers from the Air Force's Distributed Common Ground Station units; Cryptologic Support teams, liaison personnel from the National Reconnaissance Office (both TDY personnel and Field Service Representatives) as well as a plethora of personnel from a variety of interagency organizations, Special Forces and Coalition partners. How best can each of

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these augmentation teams and personnel benefit from your expertise in the tactical and operational applications of Space?

– Prior to your deployment, as well as throughout your entire deployment, make a dedicated effort to document Space-related issues, requirements, challenges, insights, and recommendations on how to better evolve materiel capabilities as well as documenting emerging or evolving Space Tactics, Techniques, and Procedures. A few questions you may ask yourself: what have I learned that can benefit those who will follow in my boots? What recommendations have I developed that can assist Program Managers to improve the systems they have already fielded? What are those new Tactics, Techniques and Procedures on how best to task, receive, and integrate Space capabilities and effects? The old Army adage of "if it's not documented, it never happened" applies here.

– In more cases than we like, some of our Army Space Soldiers (especially the organic FA40s) are appointed additional duties which do not directly exploit their Space expertise. Anticipate these and attempt to secure those additional duties that will keep you on the staff (as opposed to being a Liaison Officer with another headquarters) and ideally those which keep you aligned with cutting edge technologies. Recent examples of additional duties supported by, or led by, our Space Soldiers within staffs include being integrated into compartmented programs, supporting Fires and Information Operations, performing Knowledge Management Officer duties, supporting Blue Force Tracking operations, serving as a Battle Major or shift officer as Chief of Operations. Division and Corps headquarters continue to be resourced with negligible to no "extra" officers to perform the numerous additional duties and taskings that the leadership still has to satisfy. Some of the first officers they look to appoint with additional duties are the functional area officers, to include FA40s.

– Just after you think you've properly integrated and "normalized" all available Space capabilities and effects throughout all your staff sections, you need to visit your subordinate Brigade Combat Teams or Regimental Combat Teams and battalions. In some cases you will be pleasantly surprised at how well they are accessing and integrating select Space products and services, but in many more cases you will find that these brigade and battalion level staffs are not knowledgeable on what Space capabilities, products, services and effects are fully available to them, just for the asking. Each FA40 possesses a higher level of Space training and expertise than can be found on the vast majority of brigade, regimental and battalion headquarters staffs. Many Space Soldiers who have returned from combat supported their subordinate customers by practicing "Space support by walking around", and have made a real difference at the most tactical of the tactical echelon.

– Stay engaged in the day to day war; watch the Current Operations, monitor the Common Operational Picture, sit through the daily Commander's Update Briefs, read the Significant Activities reports, talk with the shift Battle Majors or Chief of Operations and sit through as many boards, working groups and planning meetings as you need to until you are convinced you can in no way provide Space support. You cannot integrate Space capabilities and effects into combat operations you do not understand. Remember, for FA40s, it has often been stated that, "you are a combined arms staff planner first, with an expertise in Space." Be that well rounded combined arms staff planner for your headquarters, then plan, coordinate and integrate Space when and where it is most appropriate in support of your commander's intent.

– Know Global Positioning System (GPS) better than anyone else on your staff. Time and again our FA40s note that the one of the few areas of Space expertise that cannot be found (doctrinally or otherwise) anywhere on the staff is with GPS, its applications and its vulnerabilities.

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"Space support to C-IED is the only Space work you can do that helps kill the enemy and save American Soldiers' lives."

FA40s with expertise in this area are quickly recognized as the "go to guy" for any and all GPS related issues. The authors recommend that FA40s understand GPS signals, receivers, orbits, inherent system errors, satellite command and control architecture, current and future initiatives, and how best to recognize and mitigate Electromagnetic Interference. FA40s have played a key role in developing GPS Electromagnetic Interference Battle Drills, collaborating with Air Force Space Officers. Also, FA40s should have a good understanding of how their respective units rely on GPS for their Unmanned Aerial Systems, Precision Guided Munitions, and the unit's reliance on GPS timing for Counter Remote-controlled Electronic Warfare devices and frequency-hopping radios.

– The other area of expertise that cannot usually be found anywhere on staff is an appreciation of the various aspects of Space Control. Army Space Soldiers should have a good working knowledge of all available Space control assets, measures, and processes prior to your deployment.

– Without exception, any data that moves to, through, or from Space is moved digitally through the electromagnetic spectrum. The electromagnetic spectrum, especially within the Central Command Area of Responsibility, continues to get more crowded with each passing day. This crowding causes interference on our two GPS signals, satellite communications, and other aspects of Space operations. All Army Space Soldiers need to increase their understanding not only of the electromagnetic spectrum, but also of Electronic Warfare principles and operations.

– Seven years into this war, the U.S. Department of Defense continues to greatly expand the type and quantity of "reachback" organizations to include many Space and Space-related reachback analysis and production centers. These reach back centers are not all created equal. Army Space forces need to fully appreciate the strengths and limitations of those key reach back assets that may provide support to their respective units. "Expectation management" is key to this entire process, in that no one can afford to oversell a reachback capability only to find out later that the "PowerPoint slide lied." Developing close working relationships with select reach back organizations is the one of the linchpins. Knowing each collection process for each reach back organization is also critical and finally, appreciating the associated and realistic time lines to receive support from any given reach back asset will allow you to better plan for such support.

Army Space operations remain a very dynamic, challenging and expanding field. Only by staying current on cutting edge technologies, Space Tactics, Techniques and Procedures, and deciding to train yourself to become an expert, will you be able to remain a valuable and recognized member of your staff. There's an old saying that "winning horses don't know they're in the race, they just love to run," and by extension, Army Space professional should push themselves to their intellectual limits by being the best in the race to fully integrate Space.

An artist's rendition of the Defense Satellite Communication System III.

BRAVO COMPANY LEARNS NEW WAY TO "CONTROL THE HIGH GROUND"

By SGT Matt Davidson

FORT MEADE, Md. — Performing control operations on DSCS III satellites requires a highly technical skill set, willingness to retain new information, and expedient mastery of new techniques and procedures. Recently, several Soldiers from Bravo Company, 53rd Signal Battalion took a major leap forward in adding a critical area of satellite control operations to their repertoire: the Replacement Satellite Configuration Control Element (RSCCE).

During the months of April and May, Josh Bonesz of ITT Industries provided four weeks of in-depth instruction and hands-on practical exercises. The RSCCE is a subsystem vital to the 53rd Signal Battalion's mission. It enables operators to monitor and control the satellite's telemetry, command crucial satellite processing, and ultimately ensure the DSCS III payload is able to reach its users at all times. Everything that Bravo Company's Wideband Satellite Operations Center (WSOC) does ultimately, in one way or another, depends on some function provided by the RSCCE.

Bonesz's course was a gradual immersion into the progressively complex RSCCE curriculum. It walked an optimal middle course between informative lecture and learning by doing. Each successive lesson built upon the student-Soldiers' existing blocks of knowledge. The course focused on important characteristics of a DSCS III satellite, operational equipment paths, and extensive coverage of the RSCCE's hardware and software interfaces. The Black Dragon warriors got hands-on training initializing the subsystem's equipment and even sent actual commands to a real-world communications vehicle. Later aspects of the curriculum entailed executing Command Pass Plans and resolving anomalies, to include anything from a hardware component failure to hostile Space weather conditions.

Pfc. Matthew Eckard of Bravo Company said, "I took a lot away from the RSCCE course. It's pretty overwhelming, actually. It's like learning a totally new job." Controlling and commanding the DSCS III satellite's payload and its many associated hardware systems, casually referred to as 'manning the pit', is essential to servicing any military communication network's end users: the Warfighter on the ground.

Be it a training exercise in Nevada or a real-world mission comprising part of Operation Iraqi Freedom, satellite controllers such as Bravo's Black Dragons make supporting the Warfighters of all branches of service possible. Although four weeks is not nearly enough time to grasp everything the Communications Payload Controller, it is the first and most important step towards doing so, and much more firsthand training lies ahead for the eight Black Dragons. The ability to learn and adapt to ever-expanding mission requirements and capabilities is but one more reason why Bravo Company continues to rise, in the parlance of the company's slogan, above the rest.

1ST SPACE COMPANY SOLDIERS TAKE PRIDE IN HISTORY

By SGT Jonathan Aultman

Soldiers from 1st Space Company, 1st Space Battalion participate in the Adopt-a-Missile workday at the Peterson Air and Space Museum June 11. The Soldiers, who participated in the event for the first time, gave a much needed cleaning to the museum's Nike Ajax surface to air missile display. The Nike Ajax was the U.S. Army's first operational guided surface-to-air missile, and saw Cold War service defending U.S. cities from air attack from 1954 to 1963. The museum has two other Army surface to air missiles on display, a HAWK system and a Nike Hercules. Photo courtesy Jeff Nash, Assistant Director/Curator, Peterson Air and Space Museum

PETERSON AIR FORCE BASE, Colo. — Soldiers and Noncommissioned Officers of 1st Space Company (Theater Missile Warning), 1st Space Battalion received a special honor recently, but it was unlike any they had received before. The honor was the opportunity to perform volunteer work on a piece of Air Defense history at the Peterson Air and Space Museum, June 11. The members of 1st Space Company volunteered for the museums "Adopt-a-Plane/Missile" program and spent a day cleaning the museum's Nike Ajax Missile, a symbol of the freedom and constant vigilance that is represented by our military today.

The Nike Ajax missile proved a great asset to the Air Defense community and the United States Army. The Nike Ajax was the world's first operational surface-to-air guided missile system. The military realized that the only way to provide air superiority was through the surface to air missile. These missiles were first fired in 1946. By The primary mission of this weapon system was to give coverage to personnel against fast high flying bombers. In order to do this, the people at Western Electric used a Bell liquid fueled rocket motor and the flight path was controlled by the four small fins on the nose of the weapon system. In 1958 there were nearly 200 Nike Ajax sites in the United States, but soon the first nuclear-armed Mobile Intercept Missile known as the Nike Hercules began replacing the Nike Ajax. By 1963 the last Nike Ajax missile was deactivated in the United States. The Nike Ajax continued to serve with U.S. overseas and friendly forces for many more years. In total, more than 16,000 missiles were built.

Although the Nike Ajax was retired, it remains an important piece of Air Defense history and is displayed proudly at the Peterson Air and Space Museum. The honor of keeping and caring for it is a responsibility that is approached with great pride by the members of the 1st Space Company.

1ST SPACE BATTALION
Kudos for an Accident Free Year

By DJ Montoya, 1st Space Brigade

PETERSON AIR FORCE BASE, Colo. — Members of the 1st Space Battalion attended a safety event on the afternoon of June 26 – not for training purposes but for recognition as COL Timothy Coffin, commander of the 1st Space Brigade presented a safety certificate to LTC Thomas James, commander of the 1st Space Battalion, during a brief ceremony in Building Three.

"This is something that I'm privileged to present to you as an entire battalion," said Coffin.

"This is a certificate of recognition on behalf of LTG Kevin T. Campbell, commanding general of SMDC/ARSTRAT, to the 1st Space Battalion for 12 consecutive months without a Class A, B or C accident during that period. It is a tremendous accomplishment."

Coffin stated to the group of Space Soldiers that even though the certificate was being presented to their commander, the honor really speaks to the actions of each individual in the battalion.

"Every leader, every Soldier, has to participate in order to get this certificate. Because all it takes is one person to go out and do something stupid — one person to pull out on the Colorado roads in a rush to get home in a snow storm and do the wrong thing for the staff.

"And maybe he is just a lucky guy in some respects. There are some things that are really almost out of control, but sometimes we tend to excuse things being out of control that really we could have influence on.

"As leaders you influence people to stop and take a second thought about what they do before they do it. You have been effective in this battalion of making that happen and doing it for a sustained duration of time. So it is my great privilege to recognize you and honor you for the work all of you have done in this area."

"I ask that you not heave a sigh of relief, but to continue on with that great work and effort because every day we get new Soldiers in and you have got to train them. You have got to develop that culture within your organization that says we are gong to do things smart, we are going to things safe, and we are going to take that second look before somebody has that second or third drink in the evening."

Upon receiving the honor for the battalion James said, "You've all heard the phrase 'Safety is no accident.'"

"I've been in units that have great safety records and units that haven't. And the difference I've always seen in a general sense is that the units that do well with safety are the ones who have Soldiers and leaders that look out for each other and take care of each other. It is as simple as the buddy system you learn in basic training."

James concluded by saying, "The most precious asset we have in this battalion and the U.S. Army is Soldiers. And that is the first thing we have to learn to protect. So this award is a credit to the battalion. Hopefully in 12 months we will be getting our second one."

COL Timothy Coffin, commander of the 1st Space Brigade, presents LTC Thomas James, commander of the 1st Space Battalion, with a safety certificate on behalf of SMDC/ARSTRAT Commanding General, LTG Kevin T. Campbell. The certificate was presented to recognize 12 months without a Class A, B or C accident in the battalion. *Photo by DJ Montoya*

WELCOME HOME

By SMDC Public Affairs Office

COL Bruce Smith, Director of Combat Development, right, welcomes home LTC Tony Chavez from a year long deployment to Afghanistan. Chavez's sister, Christella and his girlfriend, Crista Benavidez were in attendance at the Jul. 31, welcome home ceremony. *Photo by DJ Montoya*

PETERSON AIR FORCE BASE, Colo. — LTC Tony Chavez was welcomed home from a year long deployment to Afghanistan in a ceremony at Building 3, Jul. 31. Chavez deployed in support of Operation Enduring Freedom Jul. 19, 2007, and returned Jul. 22, 2008. During his deployment, Chavez served as the Executive Officer/Operations Officer for the Deputy to the Commanding General for Police Development, Combined Security Transition Command – Afghanistan.

In this position, Chavez was responsible for standing up, training, and equipping the Afghan National Police forces consisting of the Afghan Uniformed Police, Border Police, Counterterrorism, Criminal Investigation Division, Counter Narcotics, Afghan National Auxiliary Police and Afghan National Civil Order Police. The total force structure was 82,000.

The training initiatives established to augment and enhance the training of the Afghan National Police included Focused District Development, In District Reform, Jump Start and Training Surge. Additionally, the Poppy Eradication Force was in the process of getting revamped and retrained prior to the poppy eradication season taking place next year.

Chavez also worked with the Minister of Interior, International Narcotics and Law Enforcement and DynCorp to train the Police. Specifically, he worked with INL and DynCorp to identify key leadership positions in the Ministry of Interior that would require mentoring either at the professional or executive level.

His work on Rank and Pay Reform, to include Pay transparency, proved vital in ensuring police get paid in a timely manner and receive the correct amount due them. Where wide-spread pay corruption once existed, through work involving Chavez, many police officers now get paid through electronic funds transfer. To date 18 provinces have Electronic Funds Transfer with the remaining 16 provinces scheduled to have the capability by July 2009.

Chavez also planned and coordinated numerous trips for the Minister of Interior, his staff and Deputy to the Commanding General for Police Development personnel to visit Provinces, Districts and Regional Training Centers throughout Afghanistan, and worked the Ministry of Interior restructure initiative.

This was Chavez's fourth deployment. He previously deployed to Desert Shield/Desert Storm with 3rd Armored Cavalry Regiment out of Fort Bliss, Texas, Joint Endeavor/Joint Guard with 7th Combat Support Group in Hungary and Bosnia and Operation Iraqi Freedom with 3rd Army in Kuwait and Iraq.

Chavez's sister, Christella, a 1989 West Point Graduate, from Tulsa, Okla., and his girlfriend, Crista Benavidez, from Albuquerque, N.M., were in attendance at the welcome home ceremony.

LEFT: Delegate, SGT Thomas Hernandez, Headquarters and Headquarters Company, 53rd Signal Battalion addresses the leadership during the 2008 U.S. Army Space and Missile Defense Command/Army Forces Strategic Command Army Family Action Plan Conference.

the benefits of a garage, carpet, much larger bedrooms and individually controlled heating and air."

"There's really no way to put this sir, other than it's just not fair. Some Soldiers are paying so much more for the same and some Soldiers are paying the same for so much less."

Responding to the issues presented, Campbell told the delegates, "I told the group last year, I don't make any promises because I don't control it ultimately, but I do promise you that we will tackle the issue, and we will push it until we get a satisfactory answer from the right level of command that tells us why."

At the end of the out brief, delegates voted on their top three issues to be sent to the Department of the Army AFAP Conference later this year. In first place was Discount for Substandard Privatized Military Housing, with Housing Waiting List Procedures for Inbound Soldiers and Medical Staffing Model for Military Treatment Facilities tying for second. Dislocation Allowance (DLA) for all Soldiers, and Federal Employee Retirement System (FERS) Sick Leave Conversion followed respectively.

Local issues also brought up to the SMDC/ARSTRAT command team included: Active Guard Reserve (AGR) Life cycle Management in the 100th Missile Defense Brigade; Peterson Air Force Base Child Care; Inadequate Inter-Service Support; Absence of a DeCA Facility on Kwajalein Atoll (USAKA); and "Reach the SMDC/ARSTRAT Family" Campaign.

In its 25 years, AFAP has lead the way in improving the quality of life for Army Families. To attest to this, Butler recounted a conversation she overheard where a delegate was being met with resistance on an issue, and was told they could not go in a certain direction with their recommended solution. The delegates reply, "We can go there; that is the power of AFAP!"

BELOW: Delegates research an issue during the 2008 U.S. Army Space and Missile Defense Command/Army Forces Strategic Command Army Family Action Plan Conference.

Photos by Sharon L. Hartman

ARMY FAMILIES DRAW ATTENTION TO ISSUES

By Sharon L. Hartman, SMDC/ARSTRAT Public Affairs

Delegates read over issues during the 2008 U.S. Army Space and Missile Defense Command/Army Forces Strategic Command Army Family Action Plan Conference.

COLORADO SPRINGS, Colo. — Adversity is a part of life. Every family faces adversity at some point, but for Army Families things can be more difficult. With Soldiers deploying to war and leaving their spouses alone to raise their kids for a year or more, or sometimes even both parents deploying leaving grandparents or older siblings raising their families, things can get really complicated. The Army Family Action Plan (AFAP) was developed to address these and many other additional challenges that are common with Army Family life. AFAP is a grass roots program that directs actions in an attempt to resolve issues that will improve the quality of life for Soldiers and their Families.

U.S. Army Space and Missile Defense Command/Army Forces Strategic Command conducted their local AFAP Conference June 16-20 at the Crowne Plaza Hotel. The conference, spearheaded by Karen Butler of the SMDC/ARSTRAT G1, had more than 30 delegates from around the command form into three workgroups to discuss issues of concern to the total Army, as well as local issues within the command. In addition to the delegates, each workgroup included a facilitator, a recorder and an issue support person. Each group discussed and debated issues over three days, often calling in a variety of subject matter experts when needed.

After the three days of discussions, the workgroups presented their issues and recommended solutions in an out brief to the SMDC/ARSTRAT leadership team of Commanding General, LTG Kevin T. Campbell and CSM Ralph Borja. Also present and participating in the out brief discussions were Deputy Commanding General for Operations, BG John E. Seward, Commander, 1st Space Brigade, COL Timothy Coffin and Commander, 100th Missile Defense Brigade (GMD), COL Michael Yowell. The spouses of command leaders who were also in attendance were Kathy Campbell, Nyuget Borja, Lisa Seward, and Cheryl Coffin, with Campbell and Borja also serving as observers throughout the conference.

During the out brief, workgroup 1 spokesperson, PFC Josh Redditt gave a personal account of why his group chose Discount for Substandard Privatized Military Housing as one of their issues.

"I myself am an E-3 who lives next door to a staff sergeant on Fort Detrick," said Redditt. "I pay $1,233 a month but the staff sergeant next to me pays $1,686 a month for the exact same units. This staff sergeant works everyday with another staff sergeant (who lives) on the other side of post in the new housing. They both pay $1,686 a month, but that other staff sergeant on the other side of post has

U.S. Army Space and Missile Defense Command/Army Forces Strategic Command's Commanding General, LTG Kevin T. Campbell (left), charges COL Jeffrey A. Farnsworth with responsibility of the 1st Space Brigade during a Change of Command ceremony at Peterson Air Force Base's Patriot Park on July 10. Farnsworth replaces COL Timothy Coffin, who had served as the Brigade commander since July 2006. *Photo by Craig Denton, USAF*

Afterward Coffin expressed his gratitude to the audience by saying, "These Soldiers here in front of you only represent a small part of the of the 850 Soldiers we have spread around the world, that are doing operations on a day-to-day basis supporting our Soldiers, our civilians, the president, secretary of defense, others in operations and missions around the world."

"This brigade operates 10, 24-hour-a-day, seven days a week, operation centers that provide that kind of support to the warfighter."

"It has been a bit of a marathon, not only for this brigade, but for the entire U.S. military. We don't necessarily plan, organize or equip ourselves for long-duration wars. Ever since 9/11 though, members of this brigade have been forward deployed doing the nation's bidding. When one team comes back before they can return we send another team out in their place."

"It is a bittersweet moment to leave command, but I leave it knowing that I put in what I can and you have a great team that will support you Jeff as you go forward," said Coffin.

Upon taking command of the brigade Farnsworth stated, "General Campbell, I pledge my loyalty to this mission, this chain of command and I can't think of a better command climate to be part of."

"Members of the Space Brigade, I pledge to you that I will leave no stone unturned in the service of our Soldiers, our Families, our mission, our readiness. Together with your support, strong teamwork and leadership we will write the next chapter in this Space Brigade."

Prior to the official portion of the morning's activities a short awards presentation was made to Coffin and his wife Cheryl. Campbell presented the Legion of Merit Award to Coffin for exceptionally meritorious service from July 27, 2006 through July 1, 2008, as commander of the 1st Space Brigade. Coffin was also presented with the Honorable Order of Saint Dominic Silver Award.

Campbell then awarded Cheryl the Outstanding Civilian Service Medal for her contributions and efforts to the Soldiers and Families of the 1st Space Brigade.

Coffin's next duty assignment is as the J3 with the 14th Air Force, Joint Forces Component Command for Space.

ARMY'S 1ST SPACE BRIGADE GETS NEW COMMANDER

By DJ Montoya

PETERSON AIR FORCE BASE, Colo. — COL Jeffrey A. Farnsworth assumed command of the 1st Space Brigade from the unit's outgoing commander, COL Timothy R. Coffin during a Change of Command ceremony conducted on the morning of July 10 at Patriot Park.

LTG Kevin T. Campbell, commanding general, U.S. Army Space and Missile Defense Command/ Army Forces Strategic Command (SMDC/ARSTRAT) hosted the ceremony for the 1st Space Brigade, which is the operational element of SMDC/ARSTRAT.

After passing the brigade's colors to the new commander, Campbell in his remarks said, "Tim's Soldiers certainly allowed him to be an exceptional commander and that's because Tim gave everything he had to this brigade."

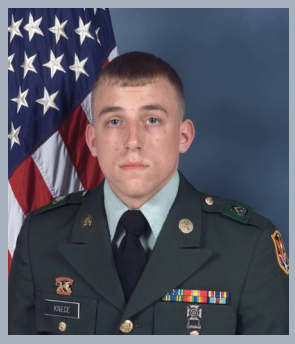
"He led them with a passion and he extended compassion to them. His tactical proficiency is unparalleled in the Army in this business of Space operations."

Commenting on the brigade's new commander Campbell stated, "He (Farnsworth) is imminently qualified for the job. He has had all the right positions leading up to this. He was a former 1st Space Battalion commander. He has done all the right things up in Washington, D.C., on the staff and knows the business inside and out. I expect great things out of him."

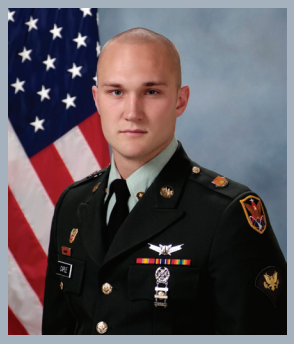
"This is a high performing unit Jeff. You have some tough challenges ahead but again you have got the right skills. And I challenge you to care for this unit's Soldiers, Families and civilians as you would your own family."

ARSTRAT ETITORS

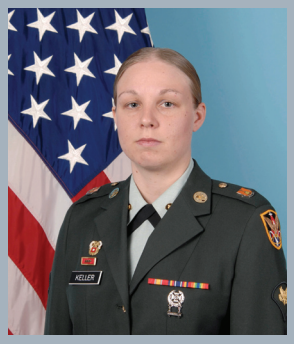
SPC Michael Moore —
SMDC/ARSTRAT European Region
Soldier of the Year



SGT Joseph B. Knece —
SMDC/ARSTRAT Pacific Region
Soldier of the Year

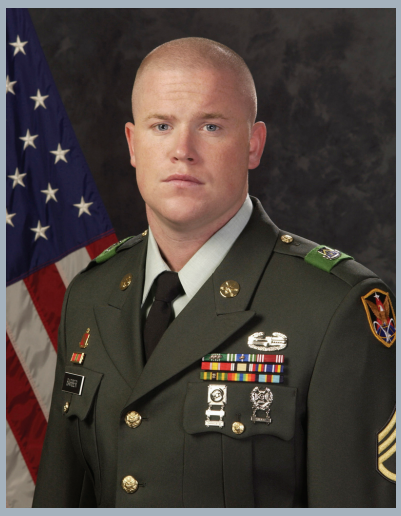


SPC Matthew Caple —
SMDC/ARSTRAT Western Region
Soldier of the Year



SPC Abigail Keller —
SMDC/ARSTRAT Eastern Region
Soldier of the Year

SMDC/A THE COMP



SSG Christopher L. Barber — SMDC/ARSTRAT Pacific Region NCO of the Year

SSG Charles Robinson III — SMDC/ARSTRAT European Region NCO of the Year

SSG Randolph Brown — SMDC/ARSTRAT Western Region NCO of the Year

SGT Matthew Davidson — SMDC/ARSTRAT Eastern Region NCO of the Year

SSG Randolph Brown plots out points during the urban orienteering portion of the Noncommissioned Officer and Soldier of the Year Competition.

Photo by Sharon L. Hartman

In the distance, a bullet creates a puff of dirt as a competitor works on zeroing his weapon.

Photo by Sharon L. Hartman

Soldiers enter a MOUT site under the leadership off SGT Joseph Knece, 2nd from left. Their objective was to search for a "prisoner of war" being held in the "village."

Photo by Michael Kahl

their team through vast rugged terrain and were graded on how they handled various combat-like scenarios. In the final phase of the exercise, the Soldiers had to lead their team through a MOUT (military operations on urban terrain) site in search of a U.S. "Soldier" who was being held hostage. As the teams navigated their way through the city, they encountered an occasional Iraqi civilian, but it was not long before they were exchanging gunfire with "enemy combatants" as they worked to free their comrade.

"Having the ability to have our Space Soldiers involved in this competition, as well as any other NCO or Soldier throughout the Army, just shows that our Space Soldiers here at SMDC/ARSTRAT definitely have the ability, the confidence, the physical stamina and the mental discipline to compete and hopefully be selected as this years DA level NCO or Soldier of the Year," said SMDC/ARSTRAT CSM Ralph C. Borja.

Borja chaired the administrative board, the final event of the competition, but for some it was the most nerve-racking event.

"I'm nervous and excited about the administrative board," Moore said. "That's one of the things that I'm looking forward to but also where I'm not so sure about, so I'm looking forward to the challenge."

Moore obviously had nothing to be nervous about. He and Barber will return to Colorado in mid-September to train for the Department of the Army Best Warrior Competition, which will be at Fort Lee, Va., Sept. 28 – Oct. 3.

"JTAGS gives confidence and security to the Warfighter by providing them with early warning. A Soldier who doesn't have to watch the skies can be more effective on the ground.

— SPC MICHAEL MOORE

"Countries have access and are using Theater Ballistic Missiles as a means of combat, so Space is important in that it is going to be relied on more frequently to provide not only early warning and detection, but also provide defense against impending missile attacks.

— SSG CHRISTOPHER BARBER

SOLDIER OF THE YEAR

SPC Michael Moore — SMDC/ARSTRAT
European Region Soldier of the Year

NCO OF THE YEAR

SSG Christopher L. Barber — SMDC/ARSTRAT
Pacific Region NCO of the Year

Barber and Moore both serve in Joint Tactical Ground Station Detachments with 1st Space Company, 1st Space Battalion. Barber is a member of Charlie Detachment, which recently relocated to Misawa, Japan, and provides Theater Missile Warning in the Pacific Area of Operations. Alpha Detachment in Stuttgart, Germany, provides Theater Missile Warning to the European Area of Operations and is where Moore is currently stationed.

"I chose to participate in this competition to be a good example for all Soldiers under my leadership," said Barber, who met his objective.

Moore decided to participate to "represent Alpha detachment and show the high standards of this unit." He too was successful in achieving his goal.

The competition, conducted from July 20-25, began with an Army Physical Fitness Test consisting of sit-ups, pushups and a two mile run at an altitude of more than 6,000 feet above sea level. The elevation gave some of the competitors a bit of a struggle, but each of them pushed through to the end. The candidates were then weighed and taped, and given time to clean up before heading to the Building 3 training rooms for a written exam. Later in the afternoon, the candidates and their sponsors gathered at Iron Horse Park, on Fort Carson, for training on the Defense Advanced GPS Receiver before heading out for daytime and nighttime urban orienteering courses.

On the second day, the competitors and sponsors were brought to a Fort Carson range to zero their M4s and then attempt to qualify by firing on pop up targets ranging from 50 – 300 meters downrange.

"I'm excited about being out in the field, going out and being able to qualify and shoot weapons, doing urban orienteering and land (navigation) and doing some of the hooah, hooah Army things that we typically do," said Barber. "In Space we don't get enough opportunities to do that so we really take advantage of it when we can."

The highlight of day three was the Situational Training Exercise. In this event, the competitors maneuvered with

SMDC/ARSTRAT

SMDC/ARSTRAT ANNOUNCES BEST WARRIORS

By Sharon L. Hartman

COLORADO SPRINGS, Colo. — Eight candidates — one Noncommissioned Officer and one Soldier from four different regions — arrived in Colorado aspiring to be the Best of the Best. Each had their own motivation, but in the end only two would walk away with the titles. After an exhausting week long competition, SSG Christopher L. Barber and SPC Michael Moore were selected as U.S. Army Space and Missile Defense Command/ Army Forces Strategic Command's 2008 Noncommissioned Officer and Soldier of the Year respectively.

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Moving Forward:

SMDC/ARSTRAT NCO & SOLDIER Compete to be named the Best