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Global Strike

Integrated Missile Defense

Space

C4ISR

Information Operations

How the Army's Strategic Role in Space is Changing

the Army Space Journal

Communicating Space to the Warfighter

The Army Space Journal is published quarterly by the U.S. Army Space and Missile Defense Command. 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 initiatives.

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What you didn't know ...

The word "change," I guess, tells many stories. We pride ourselves in our pioneering spirit — not only in our Space world but throughout the defense community. Take a look at the photos on the next page; read this publication. The whole idea that creative soldiers used modern day technology to help the warfight fascinates even casual observers. There's not much difference between a man with a large-format view camera in a hot air balloon to take pictures the other side of enemy lines during the civil war, and an Air Force master sergeant using high-tech cameras in commercial satellites to produce spectral images in Iraq to locate mass graves. The same is true for a soldier-scientist launching rockets in the early 1900s and soldiers today prepping to provide missile defense to our nation.

That word — and this pioneering concept — also best carries the originating thought behind the articles that come together to discuss the focus of this edition of the journal.

I remember two brief stories about change. In one, researchers introduced something very new and different into an undeveloped society in order to study reaction to new, modern concepts. What they introduced was an empty Coke bottle. At first the people used the soda bottle in many unusual ways — as a hammer, football, magnifying glass. They began using it for drinking only after they were shown and, even then, there was reluctance to the new way of doing things. In the other story, England wanted to do business with China. The king sent over an entourage with gifts to the emperor. The intent was to establish a longlasting relationship, but it all went south when the English group leader bowed to the emperor in a way unfamiliar to the emperor. The visitors were turned away and the trade initiative failed until another century.

Even remembering the commotion stirred over changing the headgear in the Army to a black beret in 2001, we all know that sometimes new ideas are tough to introduce and make happen. The thrust behind these stories, as I remember them now, had to do with our natural reluctance to change even to things that could be better for us, and that we could be blinded by the fact that we don't know what we don't know. The stories surfaced in the 1990s in human resource and business management journal articles discussing the challenges of introducing change in the workforce.

This all comes to mind today considering the meat of our own journal articles we've put together in this edition. Probably 9/11 changed everything in many ways well beyond the scope here, but the truth is that change is coming to our Army, military and nation at a pace that none of us have seen before. Look anywhere and listen to any leader talk about our military today. You'll see and hear about rapid change.

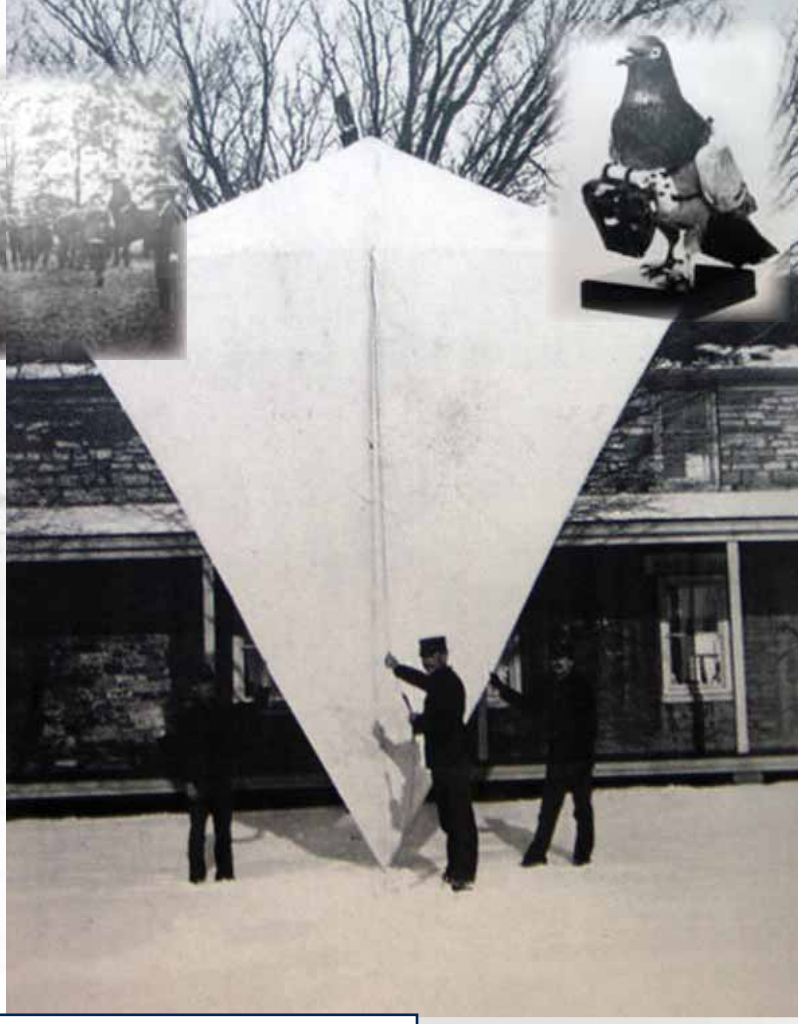
That all, I think, provides a backdrop to our thoughts behind the articles that focus on our five mission areas that the command accomplishes for the Army in its role with U.S.Strategic Command. And, as you read the articles, I hope you'll hear two additional subtle points. The first is that our Space-based capabilities enable warfighters across all mission areas and, probably equally significant, experts in this command are pioneering brand new mission areas.

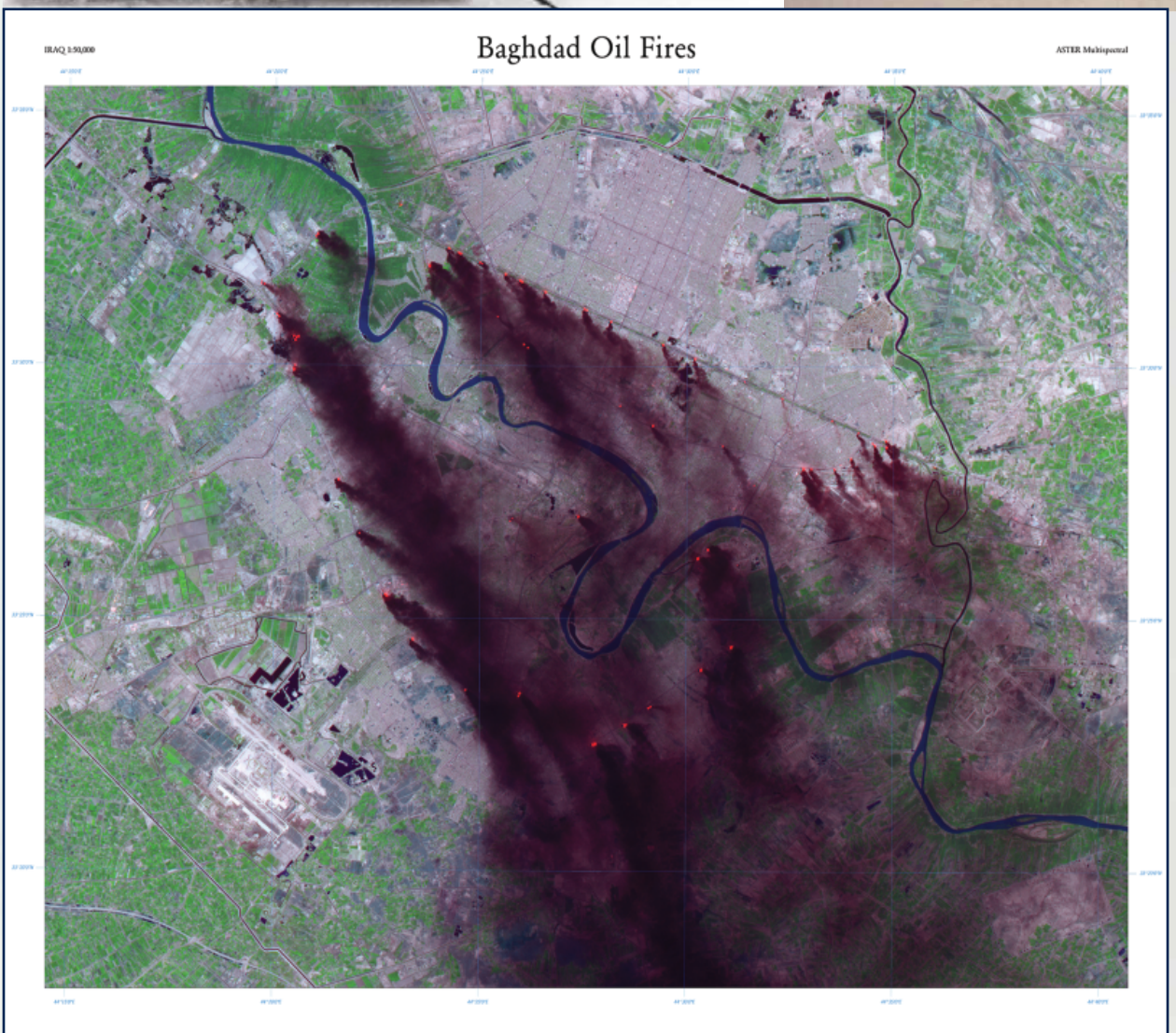
One final thought. We're experimenting here on the journal staff. We've renamed the back section "the Flipside" with its own special cover and articles. Take a look! Most importantly, e-mail me with any article ideas you may have. We are looking for historical perspectives, technology developments, Space in operations, or even updates from the field.

Happy reading.

— Michael L. Howard
Editor in Chief

Comments and letters to the editor are welcome and encouraged. The Army Space Journal reserves the right to edit for brevity and clarity. Unfortunately all comments cannot be printed due to space. You may send letters to the editor in chief at michael.howard@arspace.army.mil





CHANGE

From balloons, kites and pigeons ...

From prototypes and test rockets ...

From yesteryear's daring innovations in reconnaissance — balloons, pigeons and kites braving the elements to record data — to today's sophisticated technology as portrayed by this Spectral Operations imagery, the only constant has been that change and creativity will always seek the highest level.

Army's Strategic Role in the Future Force

LTG Larry J. Dodgen
Commanding General,
U.S. Army Space and Missile Defense Command/U.S. Army Forces Strategic Command

By LTG Larry J. Dodgen

The U.S. Army is in the midst of perhaps the most remarkable changes since World War II — changes affect the very way that we think about, prepare for and conduct war. What we are witnessing is a clear paradigm shift, and the pace of this change is being driven forward due in great part to the extraordinary capabilities provided by Space-based products and services.

The strategic role the Army has had with Space has evolved considerably since its involvement with the nation's first successful missile launch into Space in February 1949. Today, Space is an integral and essential element of joint warfighting. Advanced communications; position, navigation and timing data; weather, terrain and environmental data; intelligence, surveillance and ISR data; and missile early warning data are now available to our joint forces through the use of Space.

Secretary of Defense Donald Rumsfeld recently noted this increased importance of Space. In his remarks to attendees of an Association of the United States Army-sponsored Space and Missile Defense Symposium in El Paso, Texas, in December 2003, the Secretary noted, "Over the past few years we have recognized that Space and information are not only enablers, but core warfighting competencies."

The Army views Space as a vertical extension of the battlefield and an integral part of the battlespace, one that has been especially instrumental during the ongoing Global War on Terrorism. The Army's transformation also integrates Space as a core element of that process. The Army's future force, serving as part of the joint force, will be even more adaptable and lethal, leveraging the capabilities of the ultimate high ground. Clearly, the very nature of warfighting is changing rapidly, and the Army's strategic role in Space is evolving as a result.

Warfighter's Evolving View

Looking only as far back as the 1970s, Space efforts were primarily oriented to supporting the mission requirements related to the nuclear and conventional threats posed by the former Soviet Union. The focus for the military uses of Space was to support strategic nuclear forces, the president and secretary of defense, strategic communications, serve as a conduit for reporting warnings of attack and strategic nuclear targeting, and for arms control and verification.

Warfighters at the operational and tactical levels viewed Space as an "intelligence community domain" that provided little or no utility, primarily because applications and procedures had not yet been put in place to access available products. Unfortunately, the products, when available, far too often were untimely or not relevant to their needs.

Over the years, the role of Space has evolved toward real-time enhancement of operational and tactical military operations, due in great part to a myriad of technological advancements. The changes have been most significant in the areas of communications, sensors and information systems.

In the early 1990s, Operation Desert Storm, often called the "first Space war," demonstrated the extraordinary value of this new medium as a combat multiplier. Despite the relative inexperience in integrating Space into other military operations, several reports indicated nearly every aspect of military operations depended to some extent on support from Space-based systems.

In the decade since Desert Storm, "normalizing Space" took center stage along with providing Space-based products and services to warfighters. Military, civil and commercial operations have transformed. Today, Space enables virtually everything we do, from missile early warning to long-haul communications for command and control of military forces. Space support is particularly valuable in remote and austere areas with insufficient or unreliable infrastructure, as in Afghanistan.

The combined effect of human decision-making and 21st century technology helped U.S. forces and the coalition dominate the battlefield during the early phases of Operation Iraqi Freedom. Satellite communications, or SATCOM, relayed commands for Tomahawk missile launches, supported communications relays with unmanned

The Army is at an important strategic crossroads, and Space-smart professionals are vital to forging the way ahead.

aerial vehicles (Predator and Global Hawk) and provided expanded bandwidth for dramatically enhanced situational awareness. Of note, the SATCOM bandwidth during Operation Iraqi Freedom was approximately 42 times the capacity that was available during Operation Desert Storm, reaching up to 800 megabytes per second; and yet, although operationally significant, it just served to whet the appetite for the future.

Satellite communications have also been vital to the support of both major Blue Force Tracking systems used in support of ground forces: the COBRA waveform signal compatible with national support systems (Grenadier Beyond Line-of-Sight Reporting and Tracking and Mini-Transmitter) and the commercial L-Band system, the Force XXI Battle Command Brigade and Below. Although Blue Force Tracking received public accolades for its use during highly reported military operations, (including the capture of Saddam Hussein in December 2003) its worth gained broad endorsement at the tactical and individual Soldier level for its effectiveness in helping to prevent fratricide. Blue Force Tracking is a capability here to stay, and considerable effort is ongoing in the Army to enhance its current role in tracking friendly forces and combat identification.

Integrating the capabilities of the Space-based systems to develop a common operating picture falls to the responsibility of the SMDC Mission Management Center in Colorado Springs, Colo. It provides warfighting combatant commands with near-real time Blue Force Tracking data gathered by Space-based systems. It is a critical link between warfighters, national agencies and a variety of dissemination architectures. It is the "one-stop-shop" for Space-based Blue Force Tracking troubleshooting and coordination.

Missile early warning improved substantially between 1991 and 2003, enhanced greatly by Space-based capabilities. In Operation Desert Storm, the missile early warning system was quickly developed. However, by 2003, an integrated missile defense and warning system was in place to support joint warfighters in Operation Iraqi Freedom. Contributing to that capability were the joint tactical ground stations receiving event data directly from DSP satellites covering the area of responsibility, and then processing the information in theater to disseminate it within minutes to both theater and worldwide users.

Commercial satellite imagery provided valuable digital terrain data and planning information. In fact, more than 42,000 imagery products have been made available to joint planners and warfighters. Resolution of the imagery improved from 10 meters during Operation Desert Storm to approximately one meter during Operation Iraqi Freedom. Images that used to take days are now available in only a few hours. Army Space Support Teams, equipped with the Space Support Element Toolset – Light, have been instrumental in providing this capability directly to their supported units. The Army Space Support Teams are but one of the many innovative approaches taken by SMDC to ensure our capabilities are relevant and ready for joint warfighters.

Protecting and Controlling the High Ground

Security of our homeland, the Global War on Terrorism and sustained engagement in multiple locations define today's complex and uncertain world. Advances in technology and the changing nature of the threat have made the use of Space essential to our success. We can see and act much more quickly, and our responses to situations can occur more rapidly and decisively than ever before.

Just as we can do more than ever before with recent advances in technology, our adversaries have also demonstrated the capability to use new, more lethal forms of threats. Most adversaries study and understand U.S. capabilities and strive to adapt their techniques to overcome their disadvantages. The global proliferation of commercial Space systems provides products and services to adversaries that rival those of the United States. Once only available to senior leaders of technically advanced nations, all state and non-state actors now have access to wideband bandwidth communications and high-resolution imagery.

Protecting our assets and continuing unfettered access to Space while precluding the adversary's access to this high ground is our vital military mission. Space control operations ensure our freedom of action in Space and, when directed, deny it to an adversary. Ensuring all the various components (satellites, ground stations, data links between the satellites and ground stations, and data links between satellites) are adequately protected is equally important to the conduct of network-centric warfare and protection of our national interests.

Space control is a mission shared by all services. The Army

(See Strategic Role, page 52)

Space Information: Key to Military Dominance

MG John M. Urias
Program Executive Officer for Air, Space and Missile Defense and Former Deputy Commanding General for Research, Development and Acquisition, U.S. Army Space and Missile Defense Command

By MG John M. Urias

Recent military operations in Afghanistan and Iraq have highlighted the importance integrated technology has had on the conduct of warfare as it is used to support joint warfighters on the modern battlefield. Nowhere is this change more significant than the contributions by Space-based systems and products. The changes in warfare's depth, breadth, simultaneity, speed and surgical nature have significantly increased the way we utilize Space to conduct warfare, from tactical to strategic levels.

Command decisions can be made and executed rapidly, aggressively and decisively because of our Space-based assets. Information relayed "beyond line of sight" distances by Space data links has demonstrated time and again a distinct additive value. The use of Space information sources and real time Space data links to support decision processes enhance our ability to plan and structure the most advantageous time and location to engage the enemy. Knowledge of the battlefield from a global perspective allows rapid movement of combat and combat support capabilities to ensure the right force is generated and sustained at the right place and time. Information from Space assets gives us accurate weather dynamics as we anticipate weather effects on combat operations. This knowledge allows us to adjust planning and operations to maximize our advantages and minimize our disadvantages. For focused surgical engagements, Space information supports delivery of the right munitions and force elements at the right place and at the right time to achieve maximum effects on the enemy while minimizing collateral damage. The resulting "shock and awe" can demoralize the enemy's will to continue, and thus shortens the time of conflict. These greatly shortened decision and execution times also contribute to reduced casualties, friendly and enemy.

We plan to maintain our decisive edge in combat, and that means staying on top of new technologies and capabilities embedded in the future force structure. Space plays a critical role in the way we fight; so many of the organizational, materiel and doctrinal changes help the Army maintain that dominance in Space operations.

Our missions and roles are expanding in missile defense, information operations, command and control and intelligence, surveillance and reconnaissance, or ISR. As these areas move from a legacy of tactical, operational and strategic levels of war to a global focus, new demands are placed on our ability to support this expanded role — making change inevitable. For example, in the past we treated theater missile defense and national missile defense as separate entities, having little or no dynamic interrelationship. In the new environment, we recognize the need for more integration, so we now have global missile defense. Both enemy capabilities and our responses to aggression necessitate the change, and we see the need for a global information grid, or GIG, information operations capability. The GIG will be technically challenging to implement and operationally transforming in the capabilities to execute war with a global reach.

Organizational changes are necessitated both because of recent changes to the Unified Command Plan and the Army's vision of what it needs in terms of Space support for future conflicts. These organizational changes supported the standing up of the new U.S. Strategic Command by defining the Army's roles, missions and relationships to that command. They also better streamline the Army for defining what it needs from Space, and how to get that capability embedded in processes used by the warfighter. Further, these changes not only ensure support to warfighters, but also gives them the necessary training, processes and capabilities to exploit

this support to better accomplish the mission.

Materiel changes are occurring at the macro and micro levels. The GIG is an example of a capability that will require significant new technology exploitation in the form of new materiel solutions. We are changing the command and control capabilities embedded in our operations centers, and how they relate to joint, interagency and multi-national organizations. These changes exploit the latest information technology developments, allowing greater interaction among multiple agencies. We can also make more rapid, informed and optimal decisions.

We are moving to a "system-of-systems" approach with information-centric architectures supporting greater warfighting effectiveness using fewer resources. We are also involved in pushing technology to overcome potential limitations, susceptibilities or vulnerabilities in fielded critical capabilities. The U.S. Army Space and Missile Defense Command is developing technologies that give warfighters the ability to use Global Positioning System equipment even as the enemy conducts denial activities against our current satellite grid and its communications services.

Organizational changes and new materiel capabilities necessitate new doctrine, tactics and techniques if they are to be fully exploited. The Army is working hard to evolve mission essential tasks, and define how these tasks will be accomplished to satisfy the exploitation of new materiel capabilities in accordance with revised organizational structures supporting our joint warfighters.

U.S. Space and Missile Defense Command is adjusting to the Army changes as we examine how we do business relative to Space. We are at the forefront of implementing organizational change to jointly develop advanced Space-centric technologies. We are exploring advanced Army Space concepts and evolving doctrine and tactics for the continued utilization of Space. Our focus ensures that we match materiel solutions with state-of-the-art Space training. The joint warfighter will be assured of Space information dominance regardless of the mission situation. To support this objective, SMDC/ARSTRAT provides the means to explore new concepts and capabilities through rigorous Space-oriented analysis, simulation and rapid prototyping to get those capabilities to the field as quickly and judiciously as possible.

Command Update

Space is the Platform for the Way Ahead

BG Robert P. Lennox
Deputy Commanding General for Operations, U.S. Army Space and Missile Defense Command/ U.S. Army Forces Strategic Command

By BG Robert P. Lennox

I have heard some recent rumblings about SMDC being solely focused on the initial deployment of the Ground-based Midcourse Defense, or GMD, system. FA40s and perhaps others are wondering, what has happened to Space emphasis? Well, that made me think that perhaps a Space update was in order.

Yes, we have been focusing a lot of effort on fielding the GMD system. President Bush gave us a deadline of September 30, 2004, to have the system up and ready for "initial defensive operations." That is two years ahead of schedule. We have stood up the 100th Missile Defense Brigade (GMD) and 49th Missile Defense Battalion. Our recruitment and training efforts are on track, and system and crew certification plans are developed and being test-driven. With the hard work of a lot of people, we will meet the President's deadline.

But, I want to assure you all that we have been equally involved in the dynamic role of bringing Space to warfighters, and I believe it is time we gave everyone an update. Let me start with the good news of Space organizations. As I write this, we are nearing final approval of the table of organization and equipment, or TOE, for our 1st Space Brigade and two Space companies, one of which is the Space Control Company. This follows on the heels of the approval of the Space battalion's TOE last year. As a result, we are beginning to flesh out these skeletal organizations that have done yeoman's work the past few years deploying Space forces around the world. This was not done without challenges. One of the questions we discussed was why an FA40 should command the Space Brigade and Space Battalion? After all, FA40 is in the information operations career field, not the operations career field, and those in the non-operations career fields should not command. Interesting argument. Our counter argument is that commanders must have a good understanding of their Soldiers' business. As such, it has to be an FA40. With the Army G-3 concurrence, we have developed a two-year study plan to determine the "right" way to command these units in the future.

As always, our small but energetic cadre of Space professionals on the SMDC/ARSTRAT staff has been safeguarding the warfighters' interests with respect to Space systems. For example, their vigilance has led to real consideration of direct downlink and theater tasking for the Space-based radar constellation. This has been complemented by some leading edge studies conducted by the SMD Battle Lab that demonstrate the powerhouse capability this system could bring to deployed Soldiers. Likewise, we are equally involved with the fielding of Space-based Infrared System, or SBIRS and the mobile multi-mission processor to ensure that the next generation of missile warning systems delivers the capabilities we need.

Our G-6 team has been overextended as usual. They are deeply involved in transformational communications efforts and are the system experts for the fielding of the Wideband Gapfiller Satellite. Just one of those satellites has the communications capacity of the entire Defense Satellite Communication System constellation. Our team has been putting their heads together with others in the field and on the staff to determine how to best expand satellite communications to the field today — from strategic to tactical users. All this ties in with "learning" our lessons from Operation Iraqi Freedom, and building on the Chief of Staff, Army's vision of rapidly infusing tactical units with capability in the near future.

The SMDC Force Development and Integration Center, or FDIC, has embarked on developing requirements documents for our first-ever solely Space-related systems. These are joint efforts, unique to the Army, which will deliver Space control capability to the theater in the future.

The SMD Battle Lab currently is managing the U.S. Strategic Command sponsored joint Blue Force Tracking situational awareness advanced concept technology demonstration. LTC Greg Palka's team is searching for a universal translator that will take the 15-17

We are not standing still. The Space Brigade has led a determined effort these past seven months for developing future concepts for deployable Space forces into theater.

sources of Blue Force data now shipped into a theater, and combine it into one tactically relevant picture that feeds the commander's common operating picture. Our Blue Force Tracking Mission Management Center still provides world-class support to deployed forces, and under Floyd Light's dynamic efforts, is seeking to expand the current role. Most recently, we have experimented with integrating Force Battle Command Battalion, or Force XXI Battle Command, Brigade-and-Below data for units within the continental United States into a command operating picture.

Additionally, the Battle Lab is managing the high altitude airship advanced concept technology demonstration. This effort could revolutionize our use of "near" Space by flying airships close to the edge of the atmosphere. The list of the potential uses of this system is long, and the success of the joint land-attack cruise missile defense elevated netted sensor system project office's multiple deployment of aerostats to Afghanistan and Iraq have helped overcome a natural bias against using airships. Maneuver commanders who have seen an inkling of the aerostat's contributions in Operation Iraqi Freedom and Operation Enduring Freedom have become fans. Today's ships have electro-optical/infrared sensors. Tomorrow's suite is limited only by payload and imagination: radars, ISR systems, communications relays, etc.

Your Space Soldiers have deployed during Operation Iraqi Freedom and Operation Enduring Freedom, and some are still overseas. We recently welcomed back Army Space Support Team 12 from Baghdad. These are great Soldiers from the 193rd Space Battalion, Colorado Army National Guard. Still deployed is ARSST Team 3 with Joint Task Force 7 in Baghdad. Our senior Space officer in theater is LTC Todd Day in Iraq. He has been doing a super job since he took the battle hand off from LTC Elizabeth Kuh who spent nearly a year in Iraq writing the textbook on Space support to Phase IV of combat operations.

We are not standing still. The Space Brigade has led a determined effort these past seven months for developing future concepts for deployable Space forces into theater. These concepts entail ensuring horizontal integration of Space throughout the theater by deploying an Army Space element from the Space Brigade or Battalion to the Joint Force Air Component Command in addition to adding more robust support to the Joint Forces Land Component Commander. These concepts will be experimented within the Joint Expeditionary Force Experiment (JFEX) '04 this summer and the Ulchi Focus Lens '04 exercise in the fall.

As the Army transforms today, Space forces are also transforming. The FDIC in concert with our liaisons at the Training and Doctrine Command and the Combined Arms Center are finalizing plans for Space Support Elements organic to the UEx and UEy — future employment headquarters. This summer we are manning our first Space Support Element in the 3rd Infantry Division. We are busy determining the type of equipment they will need to be successful when they show up.

This recap just touched the tip of the iceberg, and I readily confess it does not discuss much about the dynamite work our Space professionals are doing outside SMDC proper. FA40s in the National Security Space Architect office and the National Security Space Integration office are plotting the new National Security Space Office. We are making a difference with our FA40s around the world right now. We hope our FA40 conference scheduled for June in conjunction with the Long Beach AUSA session will give us an opportunity to share our own tales of Space support to warfighters.

The list of command-wide efforts goes on and on. I have barely addressed the work done by the SMDC Tech Center and Office of Technical Integration and Interoperability in building and developing a joint single integrated Space picture — a necessary advancement in situational awareness and command and control.

Every aspect of the GMD mission I mentioned at the top of this article is dependent upon Space today and the future for early warning, communications, surveillance and interception. Other warfighters are becoming more dependent on Space-based assets that affect their weapon systems. Those assets will play a critical role in winning our nation's wars and you dedicated Space professionals will ensure that the warriors have access to them.

The View From (Army) Space...

By COL James R. Pierson

Change is all about us. The theme of this quarter's *Army Space Journal* is "How the Army's Strategic Role in Space is Changing." The "new" U.S. Strategic Command was created from the Unified Command Plan of 2002 that merged U.S. Space Command with U.S. Strategic Command. U.S. Strategic Command's mission set now includes Space, global strike, global integrated ballistic missile defense, command, control, communications, computers, intelligence, surveillance and reconnaissance and information operations in addition to its nuclear deterrence mission. U.S. Army Space and Missile Defense Command/U.S. Army Forces Strategic Command's or SMDC/ARSTRAT's mission focus also was enlarged to plan, integrate and coordinate global strike, integrated missile defense, C4ISR and information operations. The constant in all this change is that the responsibility for conducting Space operations has not changed. As we organize for newly assigned missions, we must keep our eye on the ball as it pertains to Space operations.

We see significant change pertaining to Space operations. What's exciting is that almost each and every one of us — FA40 Space Operations Officers — will be somehow involved in shaping these changes. Let me take the time to highlight just a few of the changes that I see from my foxhole.

Starting at the top, there are two concepts that are critical to the warfighter's future, and these are Joint Operations Concept and Joint Operating Concepts. If you have not had a chance to read and study these documents, I highly encourage you to take the time (www.dtic.mil/jointvision/secdef_approved_jopsc.doc, www.dtic.mil/jointvision/joc.htm). These joint concepts that are shaping many of our future capabilities, are also followed closely by the Army's focus areas. These focus areas are a major way in which the Army links its current and future force. One of these focus areas, modularity, is already having a major impact on Space operations. The Army has decided that the 3rd Infantry Division will be refitted as a Unit of Employment (UEx) by the summer of 2004. SMDC/ARSTRAT is actively involved in determining the correct mix of Space support to the refitted division, and it is highly likely that FA40s will be embedded within the division force structure on a permanent basis. These changes will necessitate revised doctrine, tactics, techniques and procedures, and new force structure.

Additionally, as an outgrowth of Operation Iraqi Freedom lessons, we are planning to use the Joint Expeditionary Force Experiment '04 and other upcoming exercises, experiments and wargames as a venue to explore the Army's contribution to the Space Authority for coordination of theater Space operations. As an outcome of Total Army Analysis-11, we fully expect that the force design for the 1st Space Brigade headquarters, Space control companies and additional Army Space Support Teams will be approved. This force structure, set to begin in fiscal year 2006, will allow for a deployable brigade headquarters to support or lead the theater Space coordination authority, manning of Space control systems as they become available, and additional manning for Space support to armies, corps and our future force.

During the Army's latest Program Objective Memorandum build cycle, we successfully briefed Army senior leadership on the Space control mission and future Army capabilities, that will be required over the next decade. However, in an environment of highly constrained resources, while continuing to conduct Operations Enduring Freedom and Iraqi Freedom, and transforming to a future force, it will be an uphill

CPT Daryl Breitbach and SGT Andrew Vorhies from Army Space Support Team 2 are setting up the 1.8 m dish of the Space Support Element-Toolset Lite, the primary communications package of the ARSS Teams. ARSST 2 supported RSOI from CP Oscar, Korea and ARSST 1 supported the exercise from CP Tango, Korea. *Photo by SGT Seung-mo Jang*

fight to obtain the necessary resources required for this critical mission area. It is incumbent on every FA40 to continue to communicate the value of Space (and the emerging Space control mission) to the leaders across our vaunted Army.

Tomorrow's Space Cadre

Who should make up the Space cadre of the future? Currently, the cadre is comprised of FA40s, but we are researching and redefining the make up of the Space cadre of the future, and it will likely include Soldiers other than FA40s, as well as civilians. In reference to FA40s, I recently participated in the signing of an agreement between SMDC/ARSTRAT and Webster University to give graduates of the FA40 Space Operations Officer Qualification Course 15 hours of graduate credit. These hours from Webster University can be applied towards a Space Operations graduate degree. Toward the end of this fiscal year, we will begin conducting installation, logistics and environment in addition to other coursework.

Upcoming Developments

Stay tuned for information on the High Altitude Airship, or HAA, a concept that is beginning to emerge as a near-Space platform capable of performing a variety of conventional Space missions. Other developments to keep an eye on are the growing importance of Blue Force Tracking and spectral imagery, and the fielding of Space-based infrared system, multi-mission mobile processer and Space-based radar later this decade.

In closing, I look forward to seeing each and every one of you at the FA40 training conference in early June 2004. I anticipate that this event will be highly educational and fulfilling based on the formal agenda and networking that will occur.

Let's keep our eye on both the 25-meter and 300-meter Space target.

How the Army's Strategic Role in Space is Changing

This edition of the *Army Space Journal* reviews the manner in which the roles of the U.S. military in general, and the Army specifically, are changing as a result of the modifications set forth by the Department of Defense in the fall of 2002. The overarching changes to U.S. Strategic Command's organizational structure and mission have produced accompanying changes in roles and responsibilities for its service components.

Primary goals of U.S. Army Space and Missile Defense Command/U.S. Army Forces Strategic Command or SMDC/ARSTRAT, continue to be: to deter and defend against enemy attack, enhance operations of U.S. and allied forces by employing Space systems, and ensure that the enemy cannot impede or prevent our use of Space. But the missions and major functions have increased as the command assumes new roles as the Army service component to U.S. Strategic Command. This edition explores the various work initiatives currently under way to enhance the Army command operations through improved integration and execution of the U.S. Strategic Command's five new mission areas.

First, some background information. In 2002, the President of the United States approved major changes to the Unified Command Plan. Now the U.S. Northern, Southern, Pacific, European, Central and Asian Commands are a part of the new Unified Command. The Secretary of Defense initiated significant changes to better reflect and plan for the new realities we face in protecting allies, friends and ourselves. These changes included new missions and responsibilities for all the combatant commanders. U.S. Space Command and U.S. Strategic Command merged into an expanded U.S. Strategic Command, which is now responsible for Space operations, information operations, computer network operations and strategic defense and attack missions.

U.S. Strategic Command's original responsibilities were to conduct global nuclear strike operations, which included nuclear deterrence as well as nuclear strike operations. But now the command is tasked with global planning and operations that include conventional weapons. This change also made it possible for all of U.S. Strategic Command to become more effective across the entire operational spectrum. This expanded focus mandated robust capabilities be afforded to its service components.

Now the commanding general of SMDC is the dual-hatted commanding general for U.S. Army Forces Strategic Command as well as for SMDC and all Army global missile defense forces. As the Army Forces Strategic Command, SMDC/ARSTRAT fully supports the missions as directed by the Unified Command Plan. Key command responsibilities include:

- Operational task, coordination and integration of Army resources and requirements into the U.S. Strategic Command's plan and operations.
- Serve as principal adviser on Army forces and capabilities.
- Conduct operations.
- Plan, integrate, control and coordinate Army forces and capabilities.

In contrast to the command relationships prior to Sept. 11, 2001, the recent conflicts in Afghanistan and Iraq clearly demonstrate the manner in which the traditional lines between strategic and regional or theater operations are blurring. U.S. Strategic Command now assumes a much-expanded role in the entire spectrum of military conflict. The roles are transregional in focus as it establishes both a supporting and supported combatant command. These roles are especially important during early entry and shaping operations, as they help create the conditions to ensure success for Army forces.

U.S. Strategic Command Leadership

What's SMDC/ARSTRAT's Role?

The U.S. Army Space and Missile Defense Command/Army Forces Strategic Command is now responsible for performing the following basic strategic and operational level missions:

- Maintain vital links as we coordinate with the joint force and service component commands of the U.S. Strategic Command.
- Plan, prepare, execute and assess supporting operations and exercises.
- Conduct support operations to sustain assigned Army forces.

SMDC/ARSTRAT mission areas:

- Space
- Global Strike
- Integrated Missile Defense
- Information Operations
- Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance.

In summary, SMDC/ARSTRAT and U.S. Strategic Command are becoming both supporting and supported commands. This is evidenced by the following support SMDC/ARSTRAT offers the command:

- Army ground forces are task organized or given missions in support of Strategic Command's in-theater missions.
- Signal (i.e., U.S. Army Network Enterprises Technology Command) forces are tasked to provide signal support for global command.
- Kinetic and nonkinetic fire support.
- In-theater as well as full task ISR (i.e., U.S. Army Intelligence and Security Command) support.

Recently we have seen Army Space integrated global support demonstrated in Operations Enduring Freedom and Iraqi Freedom. In these situations, military operations were no longer limited to forces in the immediate area of operations. Strategic assets such as B-52 and B-2 bombers flew what amounted to close air support missions for ground operations. Regional Combatant Commands and joint forces provided in-theater support for strategic operations.

Is Space Changing?

By Stephen Overton, LTC George Gorishek and LTC Todd Wang

When approached to do this article, we were asked, "Is Space changing?" As we considered this point, we asked ourselves if it is Space in the military that is changing, or is our organization changing? We submit that it is the latter.

When Army Space Command was the operational arm of the U.S. Army Space and Missile Defense Command and the Army Service Component Command to U.S. Space Command, our missions were related specifically to Space and the Army's support to Space-related information operations. But, with the reorganization of U.S. Strategic Command came a similar reorganization of our responsibilities. We now assume a larger role as the Army service component to the U.S. Strategic Command.

The specifics of the new mission areas and the change process have been addressed in other articles within this edition of the journal. As we continue to change, we will keep the following mission statement in clear view.

SMDC/ARSTRAT Missions

- Conduct Space control, Space support, Space force application and Space force enhancement.
- Plan, integrate, advocate, and coordinate Army capabilities in support of U.S. Strategic Command's global strike, global ballistic missile defense, information operations, C4 and ISR missions.
- Serve as Army operational integrator for global missile defense in support of Army Title 10 responsibilities.
- Serve as the specified proponent for Space and ground-based midcourse defense (GMD).
- Conduct experimentation, research and development for missile defense, Space, and other assigned mission areas.

In support of the missions, we identified and developed the mission-essential tasks. Because of our position as the Army service component to U.S. Strategic Command, as well as our missions in support of other commanders (e.g., North American Aerospace Defense Command and U.S. Northern Command), we established a joint mission essential task list to identify our most important tasks. As we continue to change, we keep the following tasks in view.

Provide Space Capabilities

To plan (including integration and synchronization), initiate, and direct activities and operations associated with Space combat operations, Space support operations, and combat support operations. Such operations are conducted from Earth to Space, Space to Space, and Space to Earth. These operations include Space control (enforcing Space superiority through protection, prevention, negation, and surveillance); force enhancement (supporting the warfighter with communications, weather, navigation, ballistic missile attack warning, and intelligence products); force application (application of combat power against terrestrial/orbital-based targets by military weapon systems operating through, from, and to Space; i.e., global ballistic missile defense and force projection); and Space support (placing systems in Space and operating them). Strategic Space capabilities include national, Department of Defense, civil and commercial Space systems, and associated infrastructure. *(Space)*

Operate & Manage Global Strategic Communications and Information Systems

To receive information and data on the strategic situation worldwide, including: combatant command, theater component command, operational level command missions, disposition of friendly and enemy forces, strategic centers of gravity, and characteristics of the theater areas (worldwide). This task includes translating the information and decisions into a usable form as it is promulgated, retained, and disseminated. The task includes obtaining information and advising on the worldwide situation, national security and national military strategies, and theater strategies and campaigns. Information and decisions will be

acquired from and communicated to the president and all other appropriate elements of the Department of Defense and government agencies as required. This task also includes coordinating with friendly civilian government authorities. *(Command, Control, Communications, and Computers or C4)*

Plan, Integrate, Coordinate, and Support Global Ballistic Missile Defense

Protect all designated assets from missile attack in accordance with the approved Defended Assets List. This task includes planning, integrating, coordinating, and developing capabilities for global ballistic missile defense operations and support. Coordinate national and multinational surveillance, detection, identification, tracking, and interception systems. Integrate and recommend apportionment of global air and missile defense forces to protect against cruise missiles and surface- and sea-launched ballistic missiles. It includes executing ground-based midcourse defense operations. This task centers on the protection of national centers of gravity, critical facilities, strategic reserves, population centers, and industrial capacity and infrastructure. *(Global Ballistic Missile Defense or GBMD)*

Plan, Integrate, Advocate, and Coordinate Intelligence, Surveillance, and Reconnaissance (ISR) in Support of Strategic and Global Operations

Plan, integrate, advocate, and coordinate ISR in support of strategic and global operations. Plan, integrate, advocate, and coordinate Army ISR activities (including SRO) to support the global plans and operations identified by U.S. Strategic Command. Provide intelligence and security support to the planning and execution effort, including all-source intelligence analysis for situation assessments, intelligence preparation of the battlespace, and targeting. *(Intelligence, Surveillance, and Reconnaissance or ISR)*

Conduct Strategic Information Operations

Conduct offensive and defensive information operations in support of the U.S. Strategic Command's global operations. This task includes planning, synchronization and use of operations security, military deception, psychological operations, electronic warfare, and computer network attack and defense, mutually supported by intelligence, to deny, influence, degrade, or destroy adversary information and information systems and to protect friendly information and information systems. *(Information Operations or IO)*

Develop Courses of Action and Staff Estimates for Global Strike

In conjunction with an analysis of the geo-strategic context and of the enemy situation (including capabilities and vulnerabilities), define multiple, feasible employment options to carry out the U.S. Strategic Command's concept for global strike operations. These options should be formulated in light of the friendly situation, restrictions, assumptions, and estimates of relative combat power. Each course of action should be adequate, feasible, and acceptable. When directed, control Army forces. *(Global Strike or GS)*

We identified three other tasks that are indirectly related to the new mission areas. The requirements to accomplish these tasks are not necessarily spelled out in our mission to support the combatant commanders. They are, however, directed to us in other documents.

Educate and Train the Force

Educate and train individuals, leaders, and units (internal and external) to fight and win across the full spectrum of military operations as the Army service component providing Space and strategic support to U.S. Strategic Command. This task includes providing fully educated and trained personnel and units to current and future forces. *(Training)*

Conduct Research and Development

Conduct scientific studies and experiments in fields related to the SMDC/ARSTRAT mission areas and other related technologies in order to produce exploratory and advanced developments in militarily relevant technologies. Provide solutions to identified military shortfalls, and transition developments into militarily relevant capabilities. This task focuses on the creation of new or improved military functional capabilities and includes evaluating test results of advanced concept technology and other demonstration programs. This task assumes the authority to establish the research, development, test and evaluation programs necessary to support force modernization. *(Research and Development or R&D)*

Conduct Antiterrorism/Force Protection

Identify and reduce vulnerability to hostile acts, influence, or attack. This includes measures to protect from surprise, observation, detection, interference, espionage, terrorism, and sabotage. This task includes actions for protecting personnel and securing installations, facilities, and systems. *(Antiterrorism Force Protection or AT/FP)*

Expect Change

The nature of the overall mission makes the above list of tasks a living document, changing with every additional mission we are assigned or that we lose. It will never be a completed action. Every time we modify the Modified Table of Organization and Equipment or Table of Distribution and Allowance, we have the potential for a modification of the mission essential tasks. Expect change.

We constantly define the conditions and standards that

(See Changing?, page 57)

Contributions of Army Space to Homeland Security

By LTC Jeff Perkins and Jay Kirshenbaum

Space

SMDC/ARSTRAT supports Space operations in the areas of Space support, Space control, and force enhancement. It commands and controls Army Space forces in support of U.S. Strategic Command, regional commanders, Department of Defense, Department of State, and other government agencies. It plans, coordinates, integrates, and recommends the use of Army forces in support of Space operations. It is the advocate for Army Space systems and provides recommendations to support all Space operations and capabilities.

Since Sept. 11, 2001, there has been an increased focus and emphasis on homeland security and the role of the Armed Forces in accomplishing that mission. For the American people, and in accordance with Joint Publication, JP 3-26, "Joint Doctrine for Homeland Security," the Armed Forces of the United States ultimately guarantee our territorial integrity and protection against all adversaries — foreign and domestic. Space support is critical to that effort. The role of the nation's military power is to protect and advance U.S. national interests, deter aggression and, if deterrence fails, defeat threats to those interests. This responsibility now has a much greater sense of urgency and meaning, and the potential need to respond to requests for assistance from civilian authorities is correspondingly greater than ever.

Military power is further part of an integrated national strategy and will be applied in conjunction with other instruments of national power to achieve larger overarching objectives. The ends and military objectives upon which the execution of our national strategy is focused include: securing the homeland, deterring aggression, winning the nation's wars and ensuring military superiority. Fundamentally, the nation's first priority is homeland security and hinges on critical mission areas that require increased emphasis. *Figure 1* identifies those strategic objectives and corresponding critical mission areas below to fully understand and appreciate the significance of each component element.

Doctrinally, JP 3-26 defines the military role in civil support as Department of Defense support to U.S. civilian authorities for domestic emergencies, for designated law enforcement and other activities. In view of limited manpower resources and funding, however, it is and will become necessary for Department of Defense, federal, state and local government agencies to mutually support each other in a unified effort to effectively address and manage the myriad of tasks associated with homeland security. As we also come to grips with this expanded and somewhat confusing requirement, we ask ourselves, "How does Space contribute to a solution here?" While sometimes obvious and sometimes transparent, what we find is that Space support is critical today towards finding single and/or multiple solutions.

Threats

Historically, while two vast oceans have geographically insulated our nation, as the world gets smaller in response to technological advancements and today's asymmetrical threat environment, our approach to security must contain external and internal dimensions to preclude coverage gaps. Externally, the United States has classically sought to shape the international environment through strong global, political, economic, military, diplomatic and cultural alliances. Internally, we have

National Strategy for Homeland Security

- Strategic Objectives
  - Prevent terrorist attacks within the U.S.
  - Reduce America's vulnerability to terrorism
  - Minimize damage & recover from attacks that occur
- Critical mission areas
  - Intelligence & warning
  - Border & transportation security
  - Domestic counterterrorism
  - Protecting critical infrastructures & key assets
  - Defending against catastrophic threats
  - Emergency preparedness & response

Figure 1

Homeland Security Operational Framework		
Mission Areas	**Mission Sets**	**Incidents**
Homeland Defense (HLD)	Air & Missile Defense Sovereignty Protection Defense Critical Infrastructure (DCI) Protection	Air Attack Ballistic & Cruise Missile Attack Hostile Invasion of Territorial Waters and Borders CBRNE Attack Power Projection Capability Attack
Civil Support (CS)	MACA MSCLEA MACDIS	Natural & Manmade Disasters CBRNE Incident Support Combating Terrorism Drug Trafficking Illegal Immigration NCI Protection Riots Insurrection Unlawful Obstruction of Assembly

Legend
MACA: Military Assistance to Civil Authorities
MSCLEA: Military Support to Civilian Law Enforcement Agencies
MACDIS: Military Assistance for Civil

Figure 2

relied upon civilian law enforcement and the statutory justice system to provide for domestic peace and tranquility. Recent homeland attacks and threats, however, both from within and outside our borders have circumvented both traditional external and internal approaches. "War" to the United States never included such things as aircraft commandeered by terrorists, ICBMs, cruise missiles, bombs, unmanned aerial vehicles (UAVs), chemical, biological, radiological, nuclear, and high-yield explosive attacks, suicide bombers, cyber attacks, illegal immigrants, drug smuggling and threats to U.S. critical infrastructure targets (i.e., information and communication, vital human services, energy, physical distribution networks such as waterways, dams and bridges), plus integrated banking and finance systems. The growing number of regional powers, state and non-state actors and transnational terrorist cell groups motivated by radical ideology, religion, revenge and extortion, has furthermore threatened our ability to protect our interests both at home and abroad.

Homeland Security Operational Framework

To deal with these external and internal threats, JP 3-26 presents an overarching homeland security operational framework consisting of two mission areas — homeland defense, or HLD and civil support — where overlapping activities and synchronization/integration of specific HLD and civil support missions may be required and prove essential. Sovereignty Protection collectively brings Space operations — force enhancement, force application and Space control — into the equation to effectively prosecute Homeland Defense Operations. Military Assistance to Civilian Authorities, as one of three specified mission sets grouped under civil support, deals with natural and man-made disasters, as well as, high-yield explosive attack incident support. Both are noted above in *Figure 2*.

Relationships and Responsibilities:
Homeland Defense and Sovereignty Protection

Within the context of homeland defense, the Commander, U.S. Northern Command will conduct military operations (homeland air and missile defenses) to deter, prevent, pre-empt and defeat threats and aggression aimed at the United States, its territories, and interests within the assigned area of responsibility (active and passive defense measures) and as directed by the president or secretary of defense to provide Military Assistance to Civil Authorities. Consistent with existing laws and policy, the services will provide joint force capabilities to support combatant command requirements against a variety of air, land, sea, Space and cyber incursions that can threaten national security.

Focusing in on Sovereignty Protection as the mission set specifically designed to assure access to Space and information, the joint force must be prepared to respond, deter and preempt attacks in Space and cyberspace. As in past conflicts, our abilities to defend assets (United States and allied, as appropriate) operating in Space and cyberspace will be key to successful defense of the homeland. Military, civil and commercial sectors of the United States will also be increasingly dependent on Space capabilities — a fact that adversaries may view as a vulnerability. Nevertheless, while the United States doesn't own territory in Space, the U.S. government's policy in this area is that purposeful interference with U.S. Space systems will be viewed as an infringement on our nation's sovereign rights. To deter or pre-empt attacks and also defend our military Space assets, JP 3-26 directs that the joint force will protect our sovereignty in Space by conducting Space operations — force enhancement, force application and Space control — specifically

(See Homeland Security, page 55)

DEMYSTIFYING GLOBAL STRIKE

By LTC Richard Wolfe

Global Strike

SMDC/ARSTRAT plans and integrates Army forces for full-spectrum global strike missions. This includes effects-based targeting, analysis, planning, and recommendations for the use of Army forces to strike or assist in striking high payoff/high value targets. All tasks are to support national objectives and/or to assist regional combatant commanders in achieving theater objectives.

What is global strike? By now we have all heard the question or asked it ourselves, but the answer to that questions depends on whom you ask. Some think global strike is nothing more than a passing fad in defense ideology. Others say it's the assimilation of existing capabilities into an expedited mission. Ask more people and they say it's the future of American defense.

Global strike is a new mission given to U.S. Strategic Command in 2002 with the major changes in the Unified Command Plan. The mission statement for global strike reads: *"Global strike will deliver kinetic and non-kinetic effects on targets with a minimum of planning time and for limited duration."*

But what does global strike mean? In essence, global strike integrates several critical elements of future warfighting. These elements include powerful, deep strikes, across great distances, with conventional rather than nuclear weapons (conventional strategic strike), and using Space to disrupt enemy information systems including computers and satellites (information disruption). Together, these elements form the core of a "global strike" capability. Ideally, global strike can carry out military action designed to preempt an enemy from attacking the United States or our allies. Global strike could prohibit the enemy from taking actions that are counter to our interests, such as engaging in the support or aid of terrorists or making weapons of mass destruction.

Global strike is an essential part of the doctrine of preemption issued by the Bush administration in Sept. 2002 in the National Security Document. In a speech made to West Point in the summer of 2003, President Bush said, "If we wait for threats to fully materialize, we have waited too long."

As U.S. Strategic Command began planning for the global strike mission area, it grappled with the myriad of issues surrounding how to proceed, with pre-emptive strikes being one issue. With initial strike capabilities having been centered on bomber strikes and Tomahawk Land Attack Missile missions, some of the regional combatant commanders, or RCCs, asked why they needed Strategic Command's direction. This led to some confusion on the part of the RCCs. While it is true that the RCCs have formidable arsenals at their disposal and know the troops under their command best, this is not a case of capacity. Global strike is all about speed.

Speedy strikes mean we must have plans and systems thought through ahead of time and appropriately documented and accessible. It means the joint forces must be trained in advance. The need to take swift and decisive action upon the identification of a threat is paramount.

In cases when the threat is identified before the enemy acts against us, diplomatic, informational and economic courses of action are made with increasing speed because we now have information access and situational awareness at a moment's notice. But how fast is fast enough for our military options to act?

In the weeks that followed Sept. 11, 2001, planning timelines frustrated the Department of Defense as they often spanned several months. Global strike is designed to eliminate these delays by preplanning multiple target sets

with joint, fully integrated transregional mission sets, each designed to deliver precise and immediate effects on target. Global strike allows the president or the secretary of defense to rapidly review the range of global strike missions and select the one or ones, which, in light of the current diplomat, economic and international situation provide the most appropriate response. These global strike options are maintained at U.S. Strategic Command and developed in conjunction with the service components. The plans are coordinated through each service component to the RCCs and may be requested by the RCC in whole or in part.

So, what is the Army's role in global strike? As U.S. Strategic Command rolled out its first impressions of global strike, SMDC/ARSTRAT began to determine its ability to provide forces in support of the global strike mission as its Army Service Component Command. Additionally, it appeared that the non-kinetic effects of Space and information operations missions with support of C4 and ISR missions were all that the Army could contribute, given a timeline of hours rather than days. It was considered that an Army postured for long duration missions, large-scale wars and self-sustaining staying power could not react quickly enough. But given the swift reactions and rapid deployment of many combat units during the first days of Operation Iraqi Freedom, the world saw that the Army's changing forces do play a role. In discussions with SMDC/ ARSTRAT leadership and U.S. Strategic Command, it became evident that the Army could lend a level of dexterity to global strike allowing for capture, exploitation or even the provision for blocking or cordon force.

In order to present a definitive recommendation to senior Army leadership, the global strike team at SMDC/ ARSTRAT met with planners from every Army major command. These meetings lead to a consolidated working group of the Army Service Command, U.S. Strategic Command and SMDC/ARSTRAT action officers. Upon its completion, the group presented its recommendations to BG Robert Lennox, Deputy Commanding General for Operations, SMDC/ARSTRAT. The workgroup concluded that Army Tactical Missile Systems, or ATACM, attack aviation, light infantry (airborne or air assault), unmanned aerial vehicles, and some specialty units (engineer or chemical) have applicability to this global strike mission. As these recommendations are passed through the chain of command, we hope to continue to clarify the Army's contributions in this growing mission area. Moreover, as the Army transforms it's organizational structure under the Units of Employment and Units of Action (UE/UA) concept, the possibilities for specially constructed UAs, specifically adapted for global strike missions may become a serious consideration.

Despite the obvious limitations and employment restraints of each of these Army capabilities, their inclusion in the planning process is critical. Even if Army assets are only used for a fraction of total U.S. Strategic Command targets, their inclusion in the planning process forces the Army to give a critical look at the effectiveness of its transformation, the direction of its research and design, the evolution of its doctrine and it's force structure. If we are truly to embrace a culture of innovation, then a focus on this mission area is a key step in actualizing that culture. Including Army conventional forces in global strike planning and mission area development at its infancy allows us to assimilate its rapid joint integrated transregional focus into all that we do. This focus helps us more accurately and completely understand and realize the Chief of Staff's vision of a relevant and ready Army, both today and in the future.

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Integrated Missile Defense
Changing the Way We Think and Fight

By Heather J.S. Macias

Integrated Missile Defense

SMDC/ARSTRAT plans for, integrates, and coordinates Army missile defense forces. It provides theater early warning and assessment of missile attack with organic capabilities, and recommends coordinated offensive and defensive options and rules of engagement. It coordinates Army requirements and operates the ground-based midcourse missile defense system. Additionally, SMDC/ARSTRAT may deploy joint tactical ground stations with theater high-altitude air defense (THAAD) and Patriot assets.

In the past, ballistic missile defense focused on efforts to counter a theater threat. Each theater and region deployed organic missile defense capabilities to defeat and deter that threat. Now, expanding enemy capabilities range from an increased array of short-range missiles to intercontinental ballistic missiles. SCUD missiles can be fired from offshore platforms against the United States. Available sensors and defense systems are inter-service and multi-tasked. This evolving threat requires a shift in focus from a theater perspective to a global perspective — the mission now demands integrating missile defenses across and between theaters, including the United States.

Effective integration requires the synchronization of all the operational elements of missile defense (attack operations, passive defense, active defense, and battle management, command, control, and communications) to deter and defeat the enemy threat. As joint friendly capabilities develop, these systems must be integrated into global plans to optimize their contributions to missile defense — while continuing to meet strategic objectives.

Even a cursory review of this notional scenario illustrates that global ballistic missile defense is no longer theater-centric. Effective prosecution of a global ballistic missile defense strategy requires the integration of theater, regional and homeland objectives to optimize limited resources and meet strategic priorities.

A New Perspective

Synchronization of ballistic missile defense from a global perspective requires tools to provide real time access to common, current situation information and support products for distributed coordination of plans and the synchronization of actions across multiple headquarters. A joint structure that collaborates with the geographic combatant commands throughout deliberate and crisis action planning is essential to synchronize requirements and resources. Finally, a process to effectively synchronize the requirements and resources (active defense, ISR resources and attack operations) across and between regions to optimize offensive and defensive operations in accordance with strategic priorities must be institutionalized.

Framework Concept

Since U.S. Strategic Command has the responsibility and acts as the coordinating authority for planning, integration and coordination of global ballistic missile defense, the Standing Joint Forces Headquarters proposes a structure and process to enhance those responsibilities. The framework is modeled on Joint Forces Command's concept for the Standing Joint Force Headquarters, or SJFHQ, and provides a full-time, trained and equipped, joint staff directorate to integrate the cross functional operational elements of integrated missile defense, or IMD.

Global missile defense synchronization requires a joint structure focused on offensive-defensive integration, requirements for pervasive ISR, and collaborative planning with the regional combatant commanders. In support of the regional combatant commander, SJFHQ-IMD provides the strategic level integration of friendly capabilities to counter the global threat, thus allowing the theater to focus on the prosecution of the tactical and operational fight. SJFHQ-IMD does not replace the regional Army Air and Missile Defense Commands; rather, it provides the strategic structure to optimize inter-theater capabilities in support of the missile fight.

The Joint Forces Headquarters is designed to maximize the benefits of the collaborative information environment to synchronize the operational plans of the regional combatant commanders at the strategic level. It provides a missile defense-focused structure providing mission-area expertise in support of U.S. Strategic Command's Global Operations and Integration Centers. This organization represents Strategic Command's missile defense priorities to global joint targeting boards, recommends priorities to the global defended asset list and integrates global strike and ISR capabilities to maximize strategic and operational effects.

Structure and Process

Leveraging successes from the Army Air and Missile Defense Command theater missile fight and the existing Joint Forces Command concept for the SJFHQ, the proposed structure optimizes planning for missile defense through the organization of its staff and the integration of its capabilities into the operations of U.S. Strategic Command.

Under the direction of a flag officer (the SJFHQ director), the organization is staffed with joint, mission-area experts who are organized into four cross-functional teams to accomplish daily mission requirements. These teams operate within the knowledge-based environment to maximize integration and synchronization between the teams, the regional combatant commands and other external military and civilian agencies.

Team Functions and Tasks

Planning Team: The planning team is the primary interface between the regional combatant commands and the Strategic Command Global Operations Center. It is tasked organized with joint members demonstrating expertise in the various operational elements of missile defense. This team, in conjunction with regional combatant command planners, develops and integrates global missile defense plans to achieve maximum protection in accordance with strategic priorities.

Operations Teams: The operations team monitors ongoing operations through the collaborative information environment to provide situational awareness, monitors friendly force readiness and assesses achieved effects against desired effects.

(See IMD for the 21st Century, page 53)

Guarding the New Frontier

Information Operations

By Jeff Harley

Information Operations

SMDC/ARSTRAT plans, integrates and coordinates Army information operations as it provides deliberate and crisis-action planning support all mission areas. It identifies Army information operation capabilities and characteristics for inclusion into joint and Army development programs such as plans policies, capstone requirement documents, and the integrated priority list. It directs Army support to the entire Department of Defense computer network defense by synchronizing those efforts with Army G-3 specified operational requirements and priorities. It conducts Army computer network attack in support of assigned missions, and integrates Army capabilities to support U.S. Strategic Command. When directed, SMDC/ARSTRAT provides control and coordination of Army information operational forces and capabilities.

"Guarding the New Frontier" is the title of Don Stiver's painting commissioned for the 1993 graduating class of the Command and General Staff College. The painting features Soldiers keeping the peace at the frontier after the Civil War. From their mounts, they keep watch on a cold, snowy day, forgoing their comforts to protect others. The Soldiers were uncertain of what the future would hold and had to adapt to a changing Army and nation. After the collapse of the Soviet Union and the end of the Cold War, the class felt they were also entering a new era with a need to adapt to a new Army and a nation looking forward to a "peace" dividend. Few military minds envisioned that within 10 years, the frontlines that followed the Iron Curtain would shift to the buildings, networks, and infrastructure of our own shores.

The information operations, or IO mission area has undergone many changes as the result of changes to the Unified Command Plan. To support the U.S. Strategic Command in its newly assigned mission to direct Department of Defense IO, the Army identified U.S. Space and Missile Defense Command/U.S. Army Forces Strategic Command as its service component.

Information Operations – It's About Will

Information operations provide the U.S. Department of Defense with the ability to influence an adversary's will to fight, while protecting our forces and ensuring the integrity of the information used to make vital decisions that support our interests. The Defense Department IO consists of five core competencies: computer network attack/computer network defense, operations security, psychological operations, electronic warfare, and military deception. These core competencies, in concert with other specified and related capabilities, allow us to "influence, disrupt, corrupt, or usurp adversarial human and automated decision-making, while protecting our own."

The five areas of IO each perform a particular function as they work together supported by operations security. Computer network operations and electronic warfare capabilities affect and defend the electromagnetic spectrum, information systems, and all information that supports decision-makers, including weapon systems, command and control, and automated responses. Psychological operations and military deception support IO efforts by influencing

"Guarding the New Frontier" is the title of Don Stiver's painting commissioned for the 1993 graduating class of the Command and General Staff College.

adversarial groups in the appropriate manner needed to protect American citizens.

Our Higher Headquarters

Other articles within this edition explain the missions and objectives of U.S. Strategic Command located in Omaha, Neb. As the headquarters for the command, its IO is responsible for fully integrating Space control into DoD operations, thereby enabling combatant commanders to affect behavior of adversaries through IO and Space control. The commander of the information operations headquarters also serves as deputy commander, U.S. Strategic Command.

The internal divisions of the headquarters have the same IO purposes explained above: to ensure that the areas of responsibility of the command and the supporting systems work together in support of combatant commander plans and operations. These divisions work with combatant commanders to integrate strategic IO objectives and plans into theater plans and operations. The goal is to provide holistic target characterization and serve as the center for integrated planning and analysis.

Several external commands share the IO mission.

- Joint Information Operations Center (located in San Antonio, Texas) provides IO planning and execution support to joint force commanders, the joint staff, and the secretary of defense.
- Computer Network Attack (Planning and Integration) is responsible for identifying and offering effective advice on the capabilities and characteristics needed to integrate and support strategic and operational plans and operations. The director of the National Security Agency serves as deputy commander for the Computer Network Attack.
- Joint Task Force — Global Network Operations is a newly formed command formed to plan and direct the execution of global network operation missions. The director of the Defense Information Systems Agency will serve as its commander.

Army Service Component Command

Both the theme article and Bill Furr's article within this edition go into detail about the way SMDC/ARSTRAT

(See IO, page 57)

Satellite Communications
Operating Together for National Defense

By CW2 Garth R. Hahn,
CW2 Anthony Kellar & CW2 Steven Stubblefield

C4ISR

SMDC/ARSTRAT plans for and executes the integration of Army C4ISR forces and capabilities. This area for command, control, communications, computers, intelligence, surveillance and reconnaissance is responsible for developing interoperable command and control systems to integrate, synchronize, coordinate, assess and convey necessary information for the employment of Army forces.

Walking up to the wideband satellite communications station at Fort George G. Meade, Md., one immediately notices the signs announcing the presence of two separate units, Bravo Company, 1st Satellite Control Battalion and Bravo Company, 302nd Signal Battalion. These signs give an immediate clue to the type of missions performed at the satellite station on top of the hill: satellite control and satellite communications. Despite the similar outward appearance of large buildings and several huge antennae of these two companies, the missions being executed within their respective areas are separate and distinct. The six co-located wideband satellite communication Earth Terminals operate in symbiotic relationship with the Wideband Satellite Operations Centers located around the world. They perform separate missions and answer to a different chain of command.

The relationship between the Wideband Satellite Operations Centers and the co-located Earth Terminals is defined in a Defense Information System Agency circular as, "Operations and Control of the Defense Satellite Communications System." This document is known as the bible for satellite controllers because it outlines specific roles and responsibilities for each area. The Defense Satellite Communications System, or DSCS is a major subsystem in the global information grid, or GIG, providing high-throughput, long-haul communications to Department of Defense and other special governmental users. It provides a portal into the grid for services and government users around the world through its widespread collection of satellite Earth Terminals and geosynchronous satellite constellation.

There are three segments of the DSCS system: Space, ground and control. These segments interact to provide access to the many products available on the GIG to critical users, such as SIPRNET, NIPRNET, video teleconferencing, Defense Red Switch Network and many other information services. Because access to these services is critical to the warfighter, the system enables access from anywhere on the globe. Each of the three segments plays such a vital role that removing any one of them would jeopardize our ability to serve the warfighter.

Space Segment

The Space segment of the defense satellite communications system provides worldwide coverage by maintaining the satellites in a geostationary orbit above Earth. In doing so, it would appear to someone on the ground that the satellite is in the exact same location all of the time. This is accomplished after launch by matching the satellite's orbital period with the Earth's sidereal day and maintaining distances daily along specific X, Y and Z axes. During a 24-hour cycle, a satellite (based upon its position) will normally possess the same orbital characteristics that are caused by solar pressure and gravity effects. Through onboard electronics and station-keeping maneuvers provided by the 3rd Space Operations Squadron, the satellite maintains its same location for its users.

Complete coverage is maintained by placing the satellites

at specific locations around the world. Each satellite is able to visibly "see" only certain portions of Earth on account of the fact that the planet is round. As a result, five discrete satellite locations provide Earth-wide coverage. The satellite locations are the East Pacific, West Pacific, East Atlantic, West Atlantic and Indian Ocean. Each location has both a primary and a residual satellite, which provide redundancy and additional communications payload support.

At any time, each satellite provides hundreds of separate voice, data and video links to users. Most users communicate by transmitting and receiving on separate frequencies. Each satellite allows for 500 megahertz of bandwidth support in the Super High Frequency/X-band frequency range, tunable at the user's location. Bandwidth on the satellite is usually determined by the data rate and coding at the user location. The satellite only accepts a user transmit frequency range from 7.9 to 8.4 gigahertz; a frequency translation transfers that signal back to the distant end user at 7.25 to 7.75 gigahertz. It accomplishes the frequency translation through a transponder, which is why the program is known as a "transponded" system (frequencies are changed on the spacecraft, respectively). Satellite frequencies are not user-selected. Since the frequency range is finite, satellite managers provide the user with the appropriate transmit and receive frequencies on their satellite authorization document.

Each satellite provides the 500-megahertz of support through six discrete amplification units and channels. Only a fixed amount of power and bandwidth is supportable by each satellite amplification unit on each channel. It is the responsibility of the applicable satellite controller to manage the power and bandwidth of the satellite to ensure that all users can communicate effectively and protect the spacecraft's assets. Satellite power is individually allocated based upon the user's terminal type, antenna size and location.

Each satellite provides communication support through an array of amplifiers and antennae. The amplifier and antenna connectivity can be modified for mission accomplishment. This onboard equipment gives the satellite both flexibility and redundancy as it satisfies ground user requirements. It further provides jammer location and nulling capabilities so control stations can continue communication support even under hostile actions.

Clearly, the system provides outstanding wideband coverage for warfighters around the globe. Its combination of steerable, configurable antennae and robust constellation gives users access to the GIG regardless of location. However, its transponded nature and finite resources require close coordination between the ground and control segments of the system to maximize assets available to all users.

Ground Segment

The ground segment (also known as the terminal segment), oversight of the control segment. It interfaces authorized users from around the world with the GIG. Using the Defense Satellite Communications System satellite, the ground segment provides access to information services needed to protect and defend the United States and its allies. The system has the flexibility needed to satisfy the many different requirements and equipment configurations of the various users.

The DSCS Earth Terminals come in many shapes and sizes, conforming to the needs of the users it supports. There are two general types of terminal categories in the ground segment that are directly related to the type of user: strategic and tactical (also known as fixed and mobile, respectively).

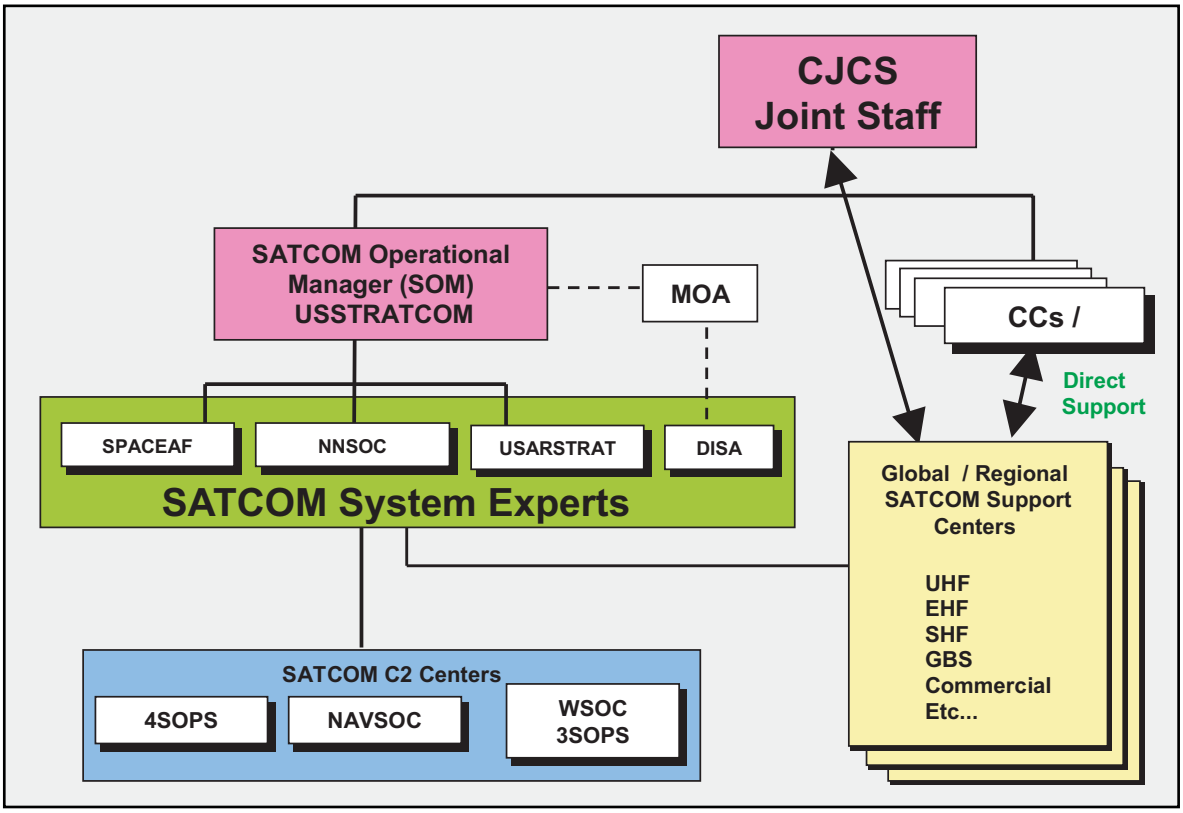
The U.S. Army is a major operator of the Earth Terminal units. The U.S. Army Network Command operates many fixed Earth Terminals around the world, including most of those co-located with the operations centers. The 21st Signal Brigade, a subordinate unit to Network Command, runs many of the fixed units in the United States. The 1st and 7th Signal Brigades have tactical satellite companies supporting U.S. forces in Korea and U.S. Army units in Europe. Every service has fixed or mobile sites spread around the world supporting various national or service-affiliated commands. These can range from shipborne Navy terminals, to airborne Air Force terminals, to the tactical satellite terminals of the Army and Marines.

Regardless of the type of terminal used to access the system or service affiliation of the operators, Earth Terminal units are responsible for the operation and maintenance of their equipment. Each unit is responsible to maintain approved satellite operational parameters and ensure optimum performance. Proper maintenance of satellite communication equipment is important because that equipment must meet stringent military standards of operation. Improperly aligned or defective equipment may cause problems on the satellite that prevent other users from communicating.

DSCS Operation and Certification Centers

- A Company — Fort Detrick, Md.
- B Company — Fort George G. Meade, Md.
- C Company — Landstuhl, Germany
- D Company — Camp Roberts, Calif.
- E Company — Okinawa, Japan
- Headquarters and Headquarters Company — Schriever Air Force Base, Colo.

The Earth Terminals are a vital part of the system connectivity for the ground, the sea or in the sky with the GIG, thus enabling critical command and control throughout our forces and our government. Operators and maintainers keep their equipment operating within established parameters to facilitate the sharing of scarce satellite resources. The control segment establishes those parameters and monitors compliance of Earth Terminals around the world.



Control Segment

The control segment of the Defense Satellite Communications System is a multilayered organization of management offices, from the Joint Chiefs of Staff to the satellite command and control centers. It ensures the proper apportionment of limited satellite communication resources. The Chairman of the Joint Chiefs of Staff Instruction 6250.01B outlines the responsibility for military satellite control in the above diagram.

The diagram identifies three levels of control. Level one is oversight of the system and is performed by the joint staff. Level two is the system staff and management level performed by the satellite operational manager, U.S. Strategic Command, and the assigned satellite system expert or SSE. U.S. Strategic Command recently assigned SMDC/ARSTRAT as the consolidated wideband SSE for DSCS. The SSE directs action at the Satellite Command and Control Centers, which for DSCS are the 3rd Space Operations Squadron, located at Schriever Air Force Base, Colo., and the geographically located Wideband Satellite Operations Centers of the 1st Satellite Control Battalion. U..S. Army Space and Missile Defense Command/U.S. Army Forces Strategic Command, through the 1st Satellite Control Battalion, performs command and control, as well as operational direction.

The control aspect is a vital part of ensuring continued access to all authorized users of a critical national asset. It gives the chairman of the Joint Chiefs of Staff the capability to rapidly plan, adjudicate and execute apportionment of satellite communications resources. It provides the supported combatant command and other users the ability to dictate resource utilization of their apportioned resources.

The various operations centers provide the 24-hour control of the platform, payload and networks. They provide the direct link to the satellite for control purposes as they conduct the day-to-day activities that keep the satellite constellation and the networks operating effectively.

The health and welfare of the satellite platform is part of the responsibility of the 3rd Space Operations. Squadron. They utilize the Air Force Satellite Control Network to do this. This responsibility includes the duties of satellite station keeping, on-orbit testing and anomaly resolution to monitor activities directly related to the satellite. This command and control is done in "windows" — short blocks of time when commands optimize satellite performance. These windows are coordinated through the Air Force Satellite Control Network using a network of satellite Earth Terminals to communicate with orbiting satellites.

The five wideband satellite operations centers are geographically located to provide 24-hour coverage of all assigned satellites. Each lettered company is strategically positioned to provide command and control for one or more satellites. The satellite control is dispersed as follows:

- A Company — Fort Detrick, Md.
- B Company — Fort George G. Meade, Md.
- C Company — Landstuhl, Germany
- D Company — Camp Roberts, Calif.
- E Company — Okinawa, Japan
- Headquarters and Headquarters Company, located in Colorado Springs, Colo., has a contingency mission in support of U.S. Northern Command, U.S. Strategic Command, as well as administrative support for the battalion.

In addition to primary satellites, many operations centers are responsible for control of residual satellites and for providing backup control capabilities to other centers. This collection of geographically dispersed operation centers provides the critical control needed for U.S. military and government communications around the world.

The Wideband Satellite Operations Centers around the world control a total of 12 defense satellite communication payloads. Payload control is performed as power levels, frequency assignments and antenna beam focus is controlled. The centers constantly monitor the health and welfare of assigned satellites, primary and residual, by watching for anomalies or problematic trends on the spacecraft.

The centers act as the "honest broker" by implementing the rules of access, bandwidth and frequency allocations laid out by the Joint Chiefs of Staff. Through this system, the centers provide continuous worldwide support to the Commander in Chief, Joint Chiefs of Staff, Department of State, intelligence communities, combatant commanders and the services in their various communication missions. They monitor electronic counter-countermeasures networks, frequency division multiple access networks and several different sub-networks.

The Soldiers that operate and maintain these systems spend almost a year at Fort Gordon, Ga., learning the technical information that is vital to their successful operational capabilities. Each Soldier receives further instruction in satellite payload control and undergoes a thorough process of training and certification. This multiyear process is necessary to ensure that highly trained individuals are available to operate and maintain the high-tech equipment at the centers.

Co-location makes sense

The situation of the wideband satellite operations centers and co-located Earth Terminals is a fine example of the close integration of two of the three system segments. Both areas have unique missions of control and communications, but are able to use synergies to better achieve those individual missions.

Although they can certainly work from separate locations, having them co-located makes sense because of the ability to share resources. The primary shared resource is the antennae. Each station has multiple antennae capable of seeing two or more different satellites. For instance, the Landstuhl satellite station has access to four of the Earth Terminal's antennae, looking at the IO and West Atlantic primary and residual satellites. These antennae are used for communication links with other Earth Terminals, both strategic and tactical. The satellite operations center at Landstuhl, Germany, uses these same antennae to control the satellites and their associated networks. This configuration saves millions of dollars by eliminating the duplication of assets as it simplifies maintenance.

Access to ground communications is another reason for co-location. Typically, the Earth Terminal is part of a communication hub that allows convenient access to the GIG. At the Landstuhl satellite station, there is a technical control facility that houses asynchronous transfer mode and integrated data network exchange switching hubs, allowing the terminal to seamlessly merge satellite communications with the GIG. This also allows the wideband satellite operations center to access the GIG to pass its terrestrial and other command and control circuit links. Once again, this is a money-saving situation because the center does not have to construct a facility to access the GIG.

Co-locating an operations center and Earth Terminal saves the cost of acquiring land and the difficulties associated with securing frequency clearance. Having both units occupy the same location essentially negates the need for large, separated and expensive Earth stations with all the inherent force protection issues that a single unit faces. Furthermore, sharing the same frequency spectrum simplifies the need for frequency clearance in comparison to two separated stations using the same frequencies. By co-locating these two organizations, they can conduct their different missions of communications and control with the use of shared resources.

Conclusion

The Defense Satellite Communications System is a highly managed and effective subsystem of the GIG. It uses three segments to achieve wideband access for users to the GIG: Space, ground and control. These segments allow joint staff-authorized units to access the GIG regardless of geographic location.

There are synergies gained by having the wideband satellite operations centers co-located with Earth Terminals. The sharing of resources ensures the most cost-effective delivery of world-class services to the warfighter.

Chief Warrant Officer Garth Hahn serves as a Satellite Network Chief in the 1st Satellite Control Battalion, 1st Space Brigade. He served with the 44th Signal Battalion performing voice and data switching, and wide-area network management in Germany and Bosnia-Hercegovinia. During his 12-year tenure as an enlisted satellite systems operator-maintainer, he held various staff and operations positions in tactical and strategic satellite stations. This includes a tour at Fort Meade, Md., as a satellite controller.

CW2 Steven Stubblefield is serving as an operations officer at the DSCS Certification Facility in Colorado Springs, Colo. His previous satellite assignments include High Wycombe, UK., Camp Roberts, Calif., Fort Richardson, Alaska, Fort Detrick, Md., and RAF Menwith Hill, UK.

CW2 Anthony Kellar is serving as a maintenance officer at the DSCS Certification Facility in Colorado Springs, Colo. His previous satellite support assignments include Berlin, Camp Roberts, Calif., and Coltano, Italy, culminating with his first warrant officer assignment as a battalion operations officer in Seoul, Korea.

INTELLIGENCE, SURVEILLANCE, AND RECONNAISSANCE

By LTC Mike Powers

The former commanding general of the U.S. Army Space and Missile Defense Command, LTG (Retired) Joseph M. Cosumano Jr. once told me, "Branches in the Army are our biggest strength, and our greatest weakness." Branches offer strength because they foster esprit de corps, provide for professional development, and expertise in each mission area, and ensure a cohesive and sustainable force. But branches can be the Army's weak point when they cause issues to get "stovepiped," which limits integrated access to the information. This can create bottlenecks that slow things down as well as result in unhealthy competition for limited Army resources.

So how do you keep issues from becoming stovepiped? Two words — integrate and communicate. Let others know what you're doing, how you plan to do it, and the areas where you need help. In the area of intelligence, surveillance, and reconnaissance, we are forced by our mission to integrate and communicate. ISR crosses several Army branches, career fields, and proponencies, including military intelligence, armored cavalry, special operations, dismounted patrolling (scouts), and Space.

From a combat developer's perspective, any ISR capabilities have to be in alignment with the overarching, integrated, and synchronized strategy concepts used to support our future force. With that in mind, it is critical that U.S. Army Space and Missile Defense Command's Space ISR combat development efforts are teamed with the U.S. Army Intelligence Center. All ISR concepts developed need to be in full support of the Soldier.

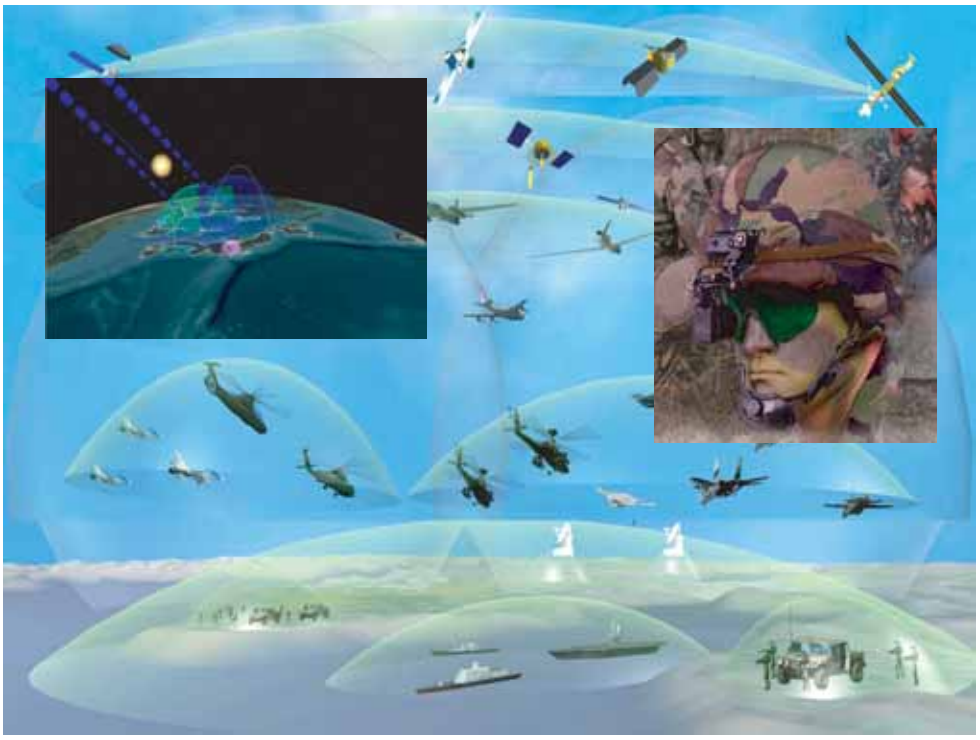
In order to facilitate integration and communication in the ISR Space force enhancement mission area, we developed the Home-on-Home program along with the Army Intelligence Center. This program leverages the capabilities of each organization to bring about the best possible doctrine, organization, training, materiel, leadership, personnel, and facilities solutions. This is a relatively new program designed to encourage communication resulting in a better understanding of the ways our ISR and related mission areas and the Army Intelligence Center could work together.

Home-on-Home Objectives

- Efficiently leverage each organization's capabilities and contributions.
- Support Army's future force Space ISR-required capabilities.
- Build and sustain a solid relationship between Space and intelligence combat directorates.

Many combat developers with the Army Training and Doctrine Command are hosting forums to discuss how to best integrate new technologies with doctrine, organization, training, materiel, leadership, personnel, and facilities. Forums have included discussions and briefings on the operational capabilities of the Army service component's support to U.S. Strategic Command missions. SMDC/ARSTRAT's unique organization and broad missions reach across research, development, operations and acquisition, so it is important to discuss and define how that carries over in support of the Army service component to U.S. Strategic Command. Defining this role to combatant commanders in the Training and Doctrine Command is important to the combat development community. Potential friction points can develop if the responsibilities and missions are not understood.

Another unique aspect of the Home-on-Home program is the broad participation of organizations across the Army and intelligence community. Realizing that decisions and issues in the Space ISR combat development area are much larger than just SMDC/ARSTRAT and the Army Intelligence Center, participants come from many areas. Participating organizations include the Army Space Program Office, which is part of the Program Executive Office for Army Space and Missile Defense, Army Intelligence and Security Command, Program Executive Office for Intelligence, Electronic Warfare and Sensors, Department of the Army Staff, G-2, Unit of Action Maneuver Battle Lab, Combat Development



Directorate, Maneuver Support Center, Objective Force Task Force (now part of Training and Doctrine Command's Futures Center), National Reconnaissance Office, National Geospatial Intelligence Agency, and the National Security Agency.

Within the ISR mission area, several missions (common to us and the Army Intelligence Center) require continuous integration and coordination to avoid redundancy as we maximize the use of resources. Although not all inclusive, some of the key areas are spectral imagery (commercial and government), Space control and electronic warfare, national Space ISR collection capabilities, tactical exploitation of Space ISR data, and Space ISR training. Organizations are encouraged to take a step back to gain a broader perspective as they jointly assess existing strategy, progress made, and possible future paths. Action items are reviewed at the end of each event and worked during the months in between. These same action items are then reviewed at the beginning of the next Home-on-Home meeting to chart progress and bring issues to closure as soon as possible. Those action items that are not solved in the process may be forwarded to existing integrated concept or process teams, or items may require the establishment of new work groups to address broad areas (such as spectral imagery).

Home on Home Supports Missions of U.S. Strategic Command

How will SMDC/ARSTRAT, as the Army service component of U.S. Strategic Command, support the missions of Strategic Command? The Home-on-Home process helps us determine how we can provide and leverage Army capabilities to support the five mission areas of global strike, C4ISR, integrated missile defense, information operations, and Space. The Army Intelligence Command is key to developing those capabilities across doctrine, organization, training, materiel, leadership, personnel, and facilities solutions. Recently our G-3 (Plans and Exercises) and G-2 provided an overview of its missions and ISR concepts to the group. The global ISR aspects and requirements of these missions pose unique challenges and changes to traditional regional combatant command ISR support missions. We plan to offer innovative solutions to ensure that the Army is successful in supporting U.S. Strategic Command.

The next Home-on-Home meeting is scheduled for July 2004 in Fort Huachuca, Ariz. Although the agenda is still being developed, it will focus on many of the issues described previously in this article. In the past year, there has been great progress in understanding missions and priorities of each organization, especially between the respective battle labs and in the area of technology integration. SMDC/ARSTRAT and Army Intelligence Command must focus their capabilities and resources in coordination with the larger ISR community to best meet the needs of the warfighter. The Deputy Commanding General for Operations, BG Lennox, noted recently that events such as these are critical in breaking down "rice bowls" and keeping us from "stepping on each other's toes."

In our primary role as FA40s to ensure integration and "normalization" of Space throughout all aspects of Army operations, programs such as the Home-on-Home are great tools in meeting that objective.

LTC Mike Powers is an FA40 officer, currently serving as Chief, Space capabilities branch, and previously served as Chief, ISR division, Force Development and Integration Center, SMDC/ARSTRAT. His professional experience includes 17 years as an MI officer, having served in various intelligence staff and command positions from platoon to national level. His Space-related MI assignments include commanding V Corps' TENCAP company and national imagery operations and exploitation chief at the National Ground Intelligence Center, Washington D.C. He is a graduate of the National Systems Development Program, and has operational deployments to the Sinai (MFO), Kuwait/Iraq (Desert Shield/Storm) and East Timor (Operation Stabilize).

The Way Ahead

SMDC/ARSTRAT performs many missions beyond the basic strategic and operational levels that support the mission areas of U.S. Strategic Command. These missisons are addresssed in articles on the following pages.

Integrate Army capabilities into the OPLANS/CONOPLANS of U.S. Strategic Command and Regional Combatant Commanders and the associated training exercise programs.

Integrate, coordinate, and advocate command missions with other Army Service Component Commands of the Unified Command Plan.

Serve as the Army proponent for Space and Missile Defense as the operational integrator of theater missile defense. The command coordinates, integrates and /or executes combat development, materiel development, technology base, and advance research and development activities for Space and Missile Defense.

Conduct development, fielding, validation and mission support of new systems.

Support the Global War on Terrorism.

As the Army Service Component Command to U.S. Strategic Command, continue planning, coordinating and integrating Army capabilities in each of the command's five mission areas.

Be prepared to operate Initial Defensive Operations capability by Oct. 1, 2004.

Support Army Transformation with trained and ready Space officers to the Space Support Elements of Unit of Action/Unit of Employment, or UAx/UEx, elements.

Provide robust reachback to forward deployed forces from the SMDC Operations Center. This operations center conducts continuous operations supporting SMDC/ARSTRAT assets and operations worldwide. It will be the focal point of providing Home Station Operations Center reachback support to deployed forces under the UA/UE concept.

Conduct active component/reserve component integration and ensuring Army Reserve and Army National Guard integrated forces are ready and trained.

Provide service input for force planning, joint policies, and review purposes. Develop and maintain that support in accordance with the U.S. Strategic Command planning cycle.

New Missions for the 21st Century

By William G. Furr

As COL Patricia Baxter says in her article included in this journal, everything changed after our nation was attacked on Sept. 11, 2001. This article addresses the manner in which the Army service component supports the five new mission objectives presented by U.S. Strategic Command. Refer to COL Baxter's article for more detail and history of this process.

It's a Whole New World

As the United States wages war on terror, the mission areas for every branch of the military has been expanded and become more integrated. The word "joint" is now in everyone's vernacular as all Department of Defense (as well as other areas of government such as Homeland Security, Intelligence, and local government organizations) branches meld their work together to meet the targeted mission areas. For example, no longer can one military branch "handle weaponry." Now weapons involve not only the physical instrument, but also the firing power, global positioning, timing, integration capabilities. Even the very manner in which we communicate to the ground and air troops utilizing weapons has been redefined. It truly is a whole new world, and it is much more complicated.

In early 2001, the Center for Strategic and Budgetary Assessments proposed a new defense strategy to respond to a changed world that would ensure the military superiority needed to underwrite a long peace. *A Strategy for a Long Peace* authors Andrew Krepinevich, Michael Vickers and Steven Kosiak proposed revolutionary military changes, major geopolitical shifts and identified an existing strategy that was ill suited to confront the challenges posed by new developments. This publication was the centerpiece for the transformation of the American military.

Among the challenges identified were trying to protect our forces in an anti-access environment, homeland defense against missile and covert weapons of mass destruction attacks, Space control, and information warfare. The authors support:

- A warfare vision to impart direction to transformation efforts.
- Position senior leaders based on their ability to effect transformational change.
- Fund leap-ahead technologies and sustained experimentation.
- Ensure utilization of resources for innovation and institutional reform while eliminating those poorly fitted for the emerging environment.

The new strategy looks at how to best develop the prepared forces and supportive services needed to meet the types of emerging challenges noted above. This means forces that can strike with precision from extended range, incorporate stealth into their design, emphasize mobility vice armor for defense, and maintain a robust, comprehensive command, control, communications, computers, intelligence, surveillance and reconnaissance, or C4ISR architecture. We recognize that we must be capable of defending against a range of electronic and information attacks, avoid reliance on large, vulnerable fixed bases and avoid overly concentrating combat power in a few platforms.

The response has been to assign SMDC/ARSTRAT to act as the service component to U.S. Strategic Command in this transformation effort. These geopolitical, international security and domestic trends point to a period of unbounded strategic challenges for the joint force, to include the Strategic Command and SMDC/ARSTRAT. Therefore, supporting the security of U.S. interests and objectives, despite the challenges of the future security environment, is

Army Service Component Command to U.S. Strategic Command

a fundamental requirement for SMDC/ARSTRAT as the supporting entity. Several areas are critical defense requirements:

Full Spectrum Capabilities

To ensure continued military dominance, we want full-spectrum capabilities that allow our forces to counter adversarial capabilities. We must be able to rapidly transition between missions with an appropriate mix of forces and capabilities. We must balance near-term requirements as we transform.

IO for the New Character of War

In order to address more diffuse and networked adversaries, we must integrate our own elements of power — diplomatic, military, economic and information — to respond both unilaterally, as well as in concert with our friends and allies. Operationally, SMDC/ARSTRAT must likewise integrate its capabilities — global strike, integrated missile defense, information operations, Space, and C4ISR — both internally and in support of Strategic Command and supported regional combatant commands.

Integrated Regional and Global Command

Countering threats to U.S. interests in a more interconnected security environment requires mutually supporting regional actions integrated within a global strategy. Regionally tailored activities allow us to leverage the capabilities of regional partners and integrate their capabilities and activities with our own in other areas to achieve national objectives.

The United States will continue to require a world-class land force capable of strategic responsiveness and maneuver dominance across the entire spectrum of military operations. The Army must adequately address these challenges to achieve the national security and defense strategic goals and objectives.

Centers of Gravity — Enemy and Friendly

Because America's potential enemies are unlikely to possess centers of gravity in the traditional sense, they are perhaps better understood with redundant and complementary centers of gravity. At the most fundamental level, these centers of gravity include the ability of leaders to control and direct the people and resources of either a state or movement. This includes the means by which hostile leaders communicate their intent to their followers, and the means (such as armed force and police) by which they coerce their citizens.

The main goals of U.S. Strategic Command are to assure friends and allies of U.S. capability and commitment; dissuade potential military competitors; deter aggressors; and, if necessary, decisively defeat them. The new national military strategy requires our command, as the support component, to: 1) defend the United States; 2) deter forward in four critical regions; 3) swiftly defeat the efforts in two theaters; and 4) achieve decisive victory in one of the two theaters.

Our national strategic center of gravity is protecting the American homeland from terrorist attack or attack through weapons of mass destruction. Failure to secure the homeland will drastically limit our ability to act on the international scene and secure other policy goals.

Additionally, our ability to quickly engage, support and enable our worldwide allies is crucial to positive theater engagement. The critical requirements to protect these centers of gravity are sufficient

(See New Missions, page 56)

An Insider's Perspective

By COL Patricia A. Baxter

Do you wonder how the United States knew how to respond to the attacks of Sept. 11, 2001? How did we determine the most effective response to the threats our nation now faces? How did we react so quickly and capably to these current threats? Attacks now transcend the globe, independent of geopolitical boundaries. The Global War on Terrorism brings new and diverse challenges, and to best meet and defend against any and all future attacks, the United States developed the Unified Command Plan in 2002 to assure that we could respond differently — reaching across geographic and political boundaries, integrating the way our entire military plans, operates and strikes. The U.S. Strategic Command, reorganized in the fall of 2002, formed a new portfolio of missions that likewise transcends the boundaries.

U.S. Strategic Command's reorganization is more mission focused and cross functional as it assumes a headquarters construct. This approach yields great operational and strategic dividends, yet gives us the ability to adapt and remain flexible. The command is defining unique associations among service components and mission partners, while successfully leveraging these relationships, expertise and capabilities to strengthen mission areas. These activities have been performed without significant personnel growth.

New Directories

The headquarters of the U.S. Strategic Command is organized into several directories. These directories consist of Strike Warfare, Combat Support, Policy/Resources/Strategy, Operations and Joint Force Headquarters for Information Operations. Space, command, control, communications, computers, intelligence, surveillance and reconnaissance and global missile defense are incorporated into each of these mission areas. The traditional staff intelligence directorate has also been integrated into each of these mission areas, thus eliminating a "stove-piped" joint staff intelligence directorate.

Another mission area proposed for integration into each directorate is information operations. Even though the Joint Force Headquarters for Information Operations was established and placed under command of the deputy commander, U.S. Strategic Command, the intent is that it will soon be integrated into other mission area directorates. Although the staff organization continues to mature, the reorganization promotes a global focus as the command broadens the classic definition of "strategic." Strategic Command now goes well beyond nuclear defense planning.

Reshaping National Defense

A capabilities-based strategy has been adopted to better equip our forces to play to our nation's strengths as we build and maintain the ability to counter a wide range of potential adversaries. Global threats necessitate a global strategic plan as we build capabilities to defend our national interests. These capabilities are the driving force for the direction of the command. Admiral James O. Ellis Jr., as the commander of U.S. Strategic Command, has identified four opportunities that have the potential to reshape the future of our national defense. They are to:

- Advance and defend the global integration of Space capabilities.
- Refine our strategic capabilities for the 21st century.
- Horizontally integrate our intelligence assets.
- Develop a comprehensive global missile defense system.

A quick synopsis of these opportunities provides a basic understanding of the command's focus.

The focus on global integration of missions brings the need to integrate the full spectrum of defense capabilities with other elements of national power to provide an increased responsiveness to global threats. Dr. Stephen Cambone, undersecretary of defense for intelligence, stated

The focus on global integration of missions brings the need to integrate the full spectrum of defense capabilities with other elements of national power to provide an increased responsiveness to global threats.

the need to "achieve universal situational awareness" or the "ability to know something about everything all the time." U.S. Strategic Command is working hard to realize this vision. Its goal is to integrate Space and intelligence into every element of the force. We want a seamless integration of (command, control, communications, computers, intelligence, surveillance and reconnaissance) C4ISR as we pursue the necessary capabilities for warfighters to successfully execute operations.

How do Space Capabilities Fit in?

The United States is increasingly (some say critically so) dependent on robust Space capabilities. Space capabilities are integrated into nearly every aspect of military activity and are critical enablers for mission accomplishment. We conceptualize Space control in the same manner that land, sea and air mediums have been utilized. Reshaping capabilities requires the development of enhanced strategic capabilities, which includes offensive and defensive, conventional, nuclear, kinetic, non-kinetic (including information operations) and Special Forces. The horizontal integration of intelligence collection requires rapid analysis of data as it is combined, analyzed and transmitted into actionable intelligence for the warfighter.

Finally, global missile defense requires coordination with the Missile Defense Agency as we plan for a layered global missile defense system to protect the homeland, deployed forces and our allies. This includes blending new missile defense capabilities with existing offensive capabilities to form a new deterrent strategy. The command will continually assess the degree to which delivered capabilities support the warfighter's ability to execute the missile defense mission with a focus on three key areas: effectiveness, interoperability and suitability.

How do Space capabilities contribute to these global missions? By ensuring that friendly forces can continue to use Space in support of national security and economic objectives while denying the use of Space to the enemy. Strategic Command executes this mission by:

- Developing and maintaining an enhanced Space situational awareness to include a Space common operating picture.
- Developing a Space concept of operations for black and white Space, and associated operation plans/concept plans.
- Planning and executing defensive Space control operations to protect blue, select gray and red force capabilities.
- Planning and executing offensive Space control operations to deny, degrade, deceive, disrupt and destroy targeted Space forces and capabilities.
- Providing attack warning and assessment.
- Providing tailored global Space support to commanders and agencies.
- Supporting civil, commercial and foreign Space operations.
- Planning and advocating for increased, cost-effective access to Space and Space launch.

Focus on the Future: Space

What will be developed for the future? As U.S. Strategic Command builds strong relationships with the national intelligence community, newer, faster and more integrated capabilities will be needed. The command believes that Space-based infrared systems and Space-based radar will become as revolutionary for ISR and actionable intelligence as the global positioning system has been for position, navigation and timing.

Admiral Ellis and his staff continue to advocate for satellite communications, including all elements of the transformational communications system. The command pursues new developments and use of advanced communications. It identifies methods to streamline the devel-

(See Insider's Perspective, page 54)

SMDC Operations Center

By LTC Joseph S. Dreiling

Colorado Springs, Colo., has long been known as the home of the North American Aerospace Defense Command, the mission control center for warfare of a global and highly technical nature. Not commonly known is that this city at the foot of Pikes Peak is also home to U.S. Army Space and Missile Defense Command/U.S. Army Forces Strategic Command and its high-tech Operations Center that offers command and control of all Army Space assets around the world. The SMDC Operations Center is the information integration center for Army Space, the 1st Global Missile Defense Brigade, the 32nd Army Air and Missile Defense Command, and affiliated active duty and National Guard elements.

When U.S. Strategic Command made changes and assigned new missions in the fall of 2002, the title and requisite responsibilities of the Operations Center also changed. It changed from being the Army Space Operations Center to the Operations Center for all of the command and its new mission areas. It now provides worldwide support to all elements of the command, not just for the Colorado Springs element of that command. It is now the control hub for the commanding general of SMDC/ARSTRAT. As such, it is now responsible for tracking the operational status of assigned elements, and for accountability of all personnel (including civilian government employees and contractors). While the overall mission of the Operations Center is unchanged, there has been a notable increase in operations tempo as well as a need for integrating new technology. The center is involved in a continuous process of upgrades. The goal of these upgrades is to ensure that it has the functional capability to provide world-class connectivity to the command. The mission is to fully integrate and provide the network-centric support necessary to remain relevant and ready in the Army's future force.

This centralized command and control hub continually communicates with command centers at U.S. Strategic Command, Department of the Army, 14th Air Force, Cheyenne Mountain Operations Center, Naval Network Warfare Command and Air Force Space Command on a variety of mission-related subjects. The command staff in Colorado Springs can contact any fielded element or other major command through the Operations Center.

Along with the new upgrades came a systemized operator-training program. A training and evaluation curriculum was instituted to make sure the new technological capabilities were fully utilized. The program tracks each crewmember from basic introductory level performance through crew-level certification. The 90-day certification program assures that each new member is capable of operating all technologies present. These certified officers continue to recommend upgrades to the certification program in response to the changing mission of the Operations Center. Because of the changing nature of the operations and the fact that the mission is "real world" every day, the certification file is a living document.

A component of the upgrade that must not be overlooked is the ongoing and developing training program. In order to insure that the command receives the most from all of the new systems installed in the Operations Center, a training and evaluation curriculum was instituted. The program tracks each crewmember from basic introductory level performance through crew level certification. The NCOs from each shift continue to recommend changes to the certification program in response to the changing mission needs of the Operations Center. As part of the recognized need for MOS-targeted and trained personnel in the Operations Center, each shift has at least one expert who understands the major systems of the command. In the past, the Operations Center had been manned only by 31S1C Satellite Controllers but now includes a trained 14J to answer JTAGS-related technical questions. This ensures that, should a question arise concerning a system problem with either of these systems, there is a soldier on duty who can answer the majority of

those questions. The goal is to have an experienced soldier available to help work technical issues as they arise.

Collaboration across and among various command areas required quite a bit of new technology. It is important that the Operations Center maintain situational awareness for command and control of SMDC/ARSTRAT forces. This means that all new communications tools are all secure, secret-level systems that operate with messaging and/or chat capabilities across a secure net platform. All of these platforms have been tested in real world operations or recent exercises. As an example, one of the chat capabilities provided information verification during Operation Iraqi Freedom.

None of the above-mentioned new technologies could have been installed without the help of the SMD Battle Lab also located in Colorado Springs. Its mission is to match new technologies to mission requirements when support to the warfighter is the prime concern. Frequently, its cooperative effort and ability to think outside the box ensured that the Operations Center maintained world-class operations with a relatively low cost to taxpayers.

The crew is now efficient and more available because of such new internal systems as a video feed for the Operations Center floor and the Crisis Action Center from any or all of the communication systems. These video systems are used for briefings and situational awareness. World events are monitored to provide world situational awareness with a set up of six national and international news feeds. A pair of computerized white boards gives the command the ability to collaborate and plan without ever leaving the office or field. This system of boards acts much like a dry-erase white board, but has its own hard drive. Associated software that resides on laptops allows downloading from the "smart" board to the laptops for editing by any member of the team. Completed work is already in a digital format, making distribution to command elements much faster.

In order to provide our commanding general with total accountability of his Soldiers and civilian employees, a computerized phone alert system has been installed. This system uses 24 phone lines that can call every person in the command continuously until all have been reached to dispense necessary command-wide or targeted information. In addition, the system can produce a report at any time during the process to give the commander an update on the progress of the information call.

With the next round of upgrades, the Operations Center will function even more closely with U.S. Strategic Command's Global Operations Center. This will enable us to work in real time as the Army Space operations expert in support of operations for the entire command. It is expected that the center will soon upgrade a number of physical and electronic measures to facilitate handling documents and information at the Top Secret compartmented level. This will allow for a higher-level coordination with Strategic Command.

These new systems are coming onboard to keep pace with new missions. Growth in these mission areas dictates development of additional subordinate commands, which are being aligned with SMDC/ARSTRAT or being created from within the present organization. The capacity of the Operations Center has increased tremendously as it is expected to support the new SMDC/ARSTRAT elements such as the 1st Global Missile Defense Brigade and the 32nd Army Air and Missile Defense Command, along with its affiliated active and National Guard elements. The enhanced configuration, increased systems capacity, realigned manning structure and ergonomic redesign will provide the full toolset necessary for the center to support the growing needs of this global command.

LTC Joseph S. Dreiling is a mobilized reservist currently serving as the Director of the SMDC/ARSTRAT Operations Center. He has past Space and operations center experience working for the former U.S. Space Command and NORAD from 1992-99. When activated he was the commander of the 101st Military History Detachment. He served five years of active duty from 1981-85 working for 4th Division as an Artillery officer.

Space Soldiers meet president

By MAJ Laura Kenney

FORT CARSON, Colo. — The wait was long — five or six hours — the majority of that time spent standing, shifting from foot to foot. The crowd was tightly packed into the hangar. Music ranging from rock to country to patriotic alleviated the discomfort somewhat. Any and all concept of inconvenience, however, disappeared the instant the silver haired gentleman in an Army flight jacket sporting Fort Carson patches stepped to the podium.

Waves of sound erupted, American flags waved frantically, as Soldiers, family members and civilians stood on tiptoe to view the President of the United States.

In the crowd, and on the podium behind George W. Bush, were Soldiers wearing the U.S. Space and Missile Defense Command patch on their left shoulder. Ten SMDC-Colorado Springs Soldiers attended an earlier luncheon in his honor.

Bush came to address post Soldiers and others from the many local bases November 24, 2003. He also spent two hours afterward with family members of Soldiers who had lost their lives in Iraq, one hour more than scheduled.

At the luncheon, two Space Soldiers — SFC Robert Miller and MSG Tammy Coon — sat at the head table with the president. The others sat at surrounding tables.

"I would have to honestly say that, except for getting married, meeting the President of the United States was one of the greatest things to ever happen to me," said Miller.

"I sat right across the table from him, and the man was remarkable. Whenever he talked to you, you were his sole purpose. He looked you straight in the eye, and never broke contact. He shook hands with every single person in that room, from the people who served the food to every Soldier."

Miller had more than just a handshake. When the President came to him, Miller had something special to give and say.

"Sir, I have something for you," Miller said as he pulled out the coin he had earned on his second deployment to the Middle East.

"I told him that the coin was special for two reasons, and that I wanted him to have it. The first reason was that I'd earned it while serving in Operation Iraqi Freedom, and the second was that it had his own words on it. At that, I handed him the coin. He pulled out his glasses to read the words," said Miller.

The words were "Bring them to justice or we'll bring justice to them."

After the President read that sentence, said Miller, the smile he'd been wearing disappeared. With a solemn look, Bush said, "We'll get them, Sergeant Miller, we'll get every last one of them," and pocketed the coin.

With a last handshake, Bush thanked Miller for the coin, and for his courage.

Arriving at the packed hangar to talk to the estimated 5,000 Soldiers and civilians who'd waited, some since early morning, Bush acknowledged the cheers with a big grin and a waving hand. Then he became serious.

"This war began more than two years ago, on September the 11th, 2001, when America was attacked, and thousands of our fellow citizens were murdered. The events of that morning changed our nation. We awakened to new dangers and we accepted new responsibilities. That day we saw the harm that our enemies intend for us. Today America, Britain and all responsible nations are united in a great cause: We will not rest until we bring these committed killers to justice."

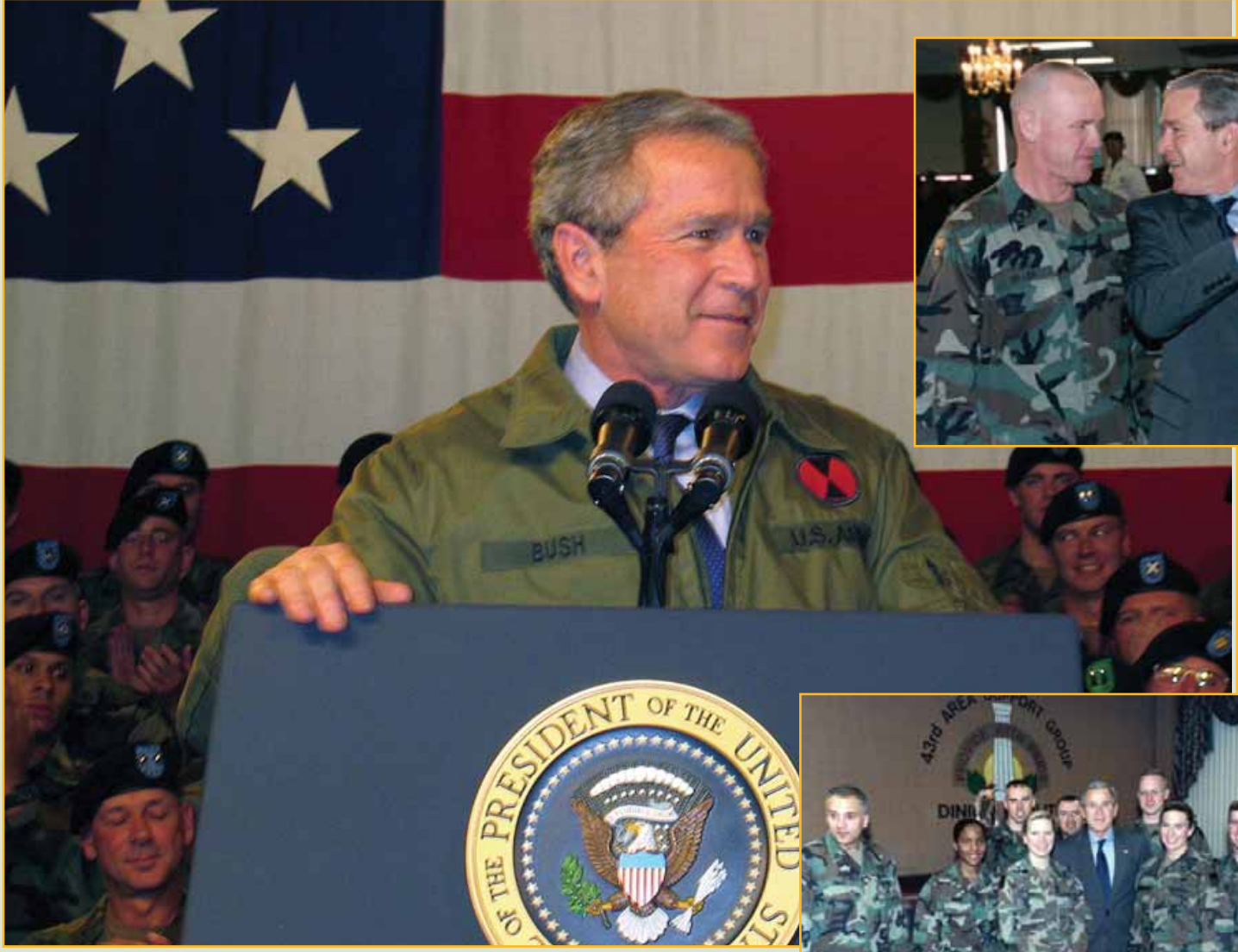
Affirming hooahs responded.

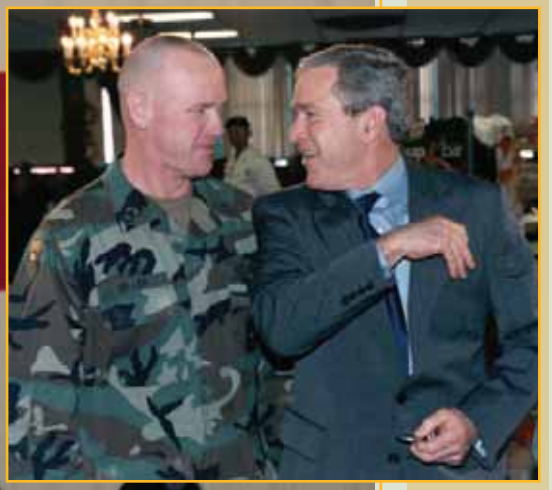
"In Iraq, where a dictator defied the world, cultivated ties to terror, armed with deadly weapons, America led a mission to make the world safer, and to liberate the Iraqi people. And that brutal dictator's regime is no more. Thanks to our great military, Iraqi citizens do not have to fear the dictator's secret police or ending up in a mass grave. Thanks to our military, the torture chambers are closed and the prison cells for children are empty. Thanks to our military, we have captured many members of the former regime, and the rest of them have a lot to worry about.

"America's military is fighting to help democracy peace and justice rise in a troubled and violent region. And because we're fighting terrorist enemies thousands of miles away, in the heart and center of their power, we are making the United States of America more secure.

"Today, American forces in Iraq are joined by about 24,000 troops from 32 other countries. Together, we're helping the Iraqi people move steadily toward a free and democratic society. As Iraq joins — rejoins the world, it will demonstrate the power of freedom and hope to overcome resentment and hatred. And this transformation will help make America more secure.

"The work we are in is not easy, yet it is essential. The failure of democracy in Iraq would provide new bases for the terrorist network and embolden terrorists and their allies around the world. The failure of democracy in those countries would convince terrorists that America backs down under attack. Yet democracy will succeed in Iraq, because





Above, President George W. Bush addresses troops at Fort Carson, Colo., in November 2003. *Photo by MAJ Paul Madsen*; top right, SFC Robert Miller presents a coin he received during his last deployment in Iraq to President Bush; right, Soldiers from SMDC/ARSTRAT and Fort Carson have their picture taken with President Bush. *White House photos*

our will is firm and our word is good. Democracy will succeed because every month, more and more Iraqis are fighting for their own country. People we have liberated will not surrender their freedom.

The President paused for a long, pregnant moment. His next comment came with great force and increasing volume.

"Democracy will succeed because the United States of America will not be intimidated by a bunch of thugs!"

Cheers greeting that defiant promise echoed loud and long. Bush praised all present and said public words of comfort for the losses the post had suffered, promising private ones with family members later.

The President then waded into the crowd, trailed closely by ubiquitous Secret Service men, shaking hands with all he came in contact with. His passage was marked by thunderous "U.S.A.s!" and more quiet "God bless you, Mr. Presidents."

SGT Jennifer Meadows, a Space operations NCO, was one of those chosen to sit on the podium behind the President.

"It was quite an honor. I've never met a President before. And at the end, when he was shaking hands with the crowd it looked like he wouldn't get to us and the group of people I was with started yelling "Mr. President, Mr. President!" He looked around, saw us, smiled and headed in our direction. People were so eager to shake his hand I almost got knocked over. He saw it, and said, "Whoa, let's not get anybody hurt!" and made sure to shake my hand. The whole experience, especially his speech, was very, very motivating," said Meadows.

The crowd filing out proved her point — pumped, motivated … and proud to serve.

MAJ Laura Kenney is a mobilized reservist serving in the SMDC/ARSTRAT Colorado Springs public affairs office in support of Operation Enduring Freedom. She served five years active duty as an enlisted journalist with Air Defense Command in Germany. As a commissioned Reserve officer, she performed in public affairs in the Gulf War theater, and served as deputy public affairs officer for the American sector in Bosnia-Hercegovinia in 2001.

First of its kind
Missile Defense Space Battalion activated

By MAJ Laura Kenney

FORT GREELY, Alaska — A critical component of the nation's emerging missile defense system "stood up" here Jan. 22 when the Missile Defense Space Battalion was formally activated by its parent organizations, the U.S. Army Space and Missile Defense Command and the Alaska National Guard.

LTG Larry J. Dodgen, SMDC/ARSTRAT commanding general and Air Force BG Craig E. Campbell, adjutant general for Alaska's National Guard hosted the ceremony which centered on the unfurling of the new battalion's colors. Governor of Alaska Frank Murkowski was the keynote speaker.

"I am intensely proud of the role our state will play as the first line of defense for our nation," said Murkowski. "Having served as a senator, and on the Intelligence Committee, I am very well aware of the need for a missile defense system to defend our nation and our allies. To the Soldiers of this battalion, I say that you have the highest calling possible, and I pledge to you Alaska's full support for your vitally important mission."

The battalion is part of the 100th Missile Defense Brigade (Ground-based Midcourse Defense) headquartered in Colorado Springs, Colo. The battalion, which at full-authorized strength will number 110 Soldiers, will provide operational control and security over ground-based interceptors located in Alaska. The brigade operates the first part of the integrated Ballistic Missile Defense System, which, in concert with sister services, is designed to protect the nation from accidental or intentional limited ballistic missile attacks.

Alaska National Guard Soldiers will man the battalion as part of the homeland defense mission. Similarly, the brigade is staffed largely by Colorado Guardsmen, with a small contingent of active Army Soldiers. The units have dual reporting chains — operationally to SMDC/ARSTRAT, and, for personnel issues, to their respective state Guard channels.

"Today's activation marks an historic event. Using the National Guard is a good fit for this mission — in keeping with their centuries-old role of defending the nation. The only difference is the technology," said the brigade commander, COL Gary Baumann.

Symbolizing the Alaska Guard part of the equation, Campbell held the staff of the new unit's colors as the battalion's CSM David Masullo ceremoniously unsheathed the new flag, then slowly unfurled the blue and gold colors emblazoned with the unit's name and the SMDC eagle.

Dodgen said, "I have stood guard in Germany and Korea, as I'm sure every person in this room who's ever worn a uniform has stood guard. The mission of the unit we're activating today is to stand guard on the frontline of homeland defense. I know they will do us proud. Theirs is

Top, the Missile Defense Space Battalion, part of the 100th Missile Defense Brigade, Ground-based Midcourse Defense, will operate interceptors based in Alaska. Above, at the ceremony activating the nation's first missile defense battalion, CSM David Masullo unfurls the new unit's colors while Air Force BG Craig E. Campbell, adjutant general for Alaska's National Guard, holds the staff. LTG Larry J. Dodgen, commanding general of U.S. Army Space and Missile Defense Command, stands to Campbell's right. *Photos by MAJ Laura Kenney*

an uncompromising mission — they cannot fail. I know they are up to the task."

The system is scheduled to be operational this fall, by Presidential directive. The time line was expedited due to the events of Sept. 11, 2001, and officials expect to meet the accelerated deployment date.

GMD is designed to attack and kill any incoming missile in the "middle" phase or "midcourse" of its trajectory, after the boost or launch, and before it reaches reentry to impact, therefore destroying that missile in Space. Working closely with early warning architecture, provided in part by the Air Force and the Navy's Aegis missile cruisers, GMD will launch a booster missile toward a target's predicted location releasing a "kill vehicle" on the path of an incoming target. The kill vehicle uses data from the ground-based radars and its own onboard sensor to collide with the target.

Currently, the system's operators are involved in intensive training in Colorado, and plan to move to Alaska this summer. Military policemen are currently on post protecting the developing site, and have been "on guard" since September 2003. The National Guard men and women who comprise the battalion are all volunteers on three-year active Guard tours. The majority were not Alaska natives, but they face the rigors of the remote site with a mixture of excitement and fortitude.

"Our mission is in many ways similar to those of the Soldiers in Iraq. We are not facing the enemy directly, but he is out there, be it through terrorism, subversion, espionage or direct attack. Our mission is just as critical, if not more so. We take our job of securing this site and protecting our nation, very seriously. If the remoteness of this site lends to its protection, and it does, then that's a good thing. There are many things to enjoy in Alaska, and our families for the most part are looking forward to facing the adventures with us," said military policeman and platoon leader 2LT Phil Turner. Turner has 15 years of prior enlisted service in the infantry before volunteering for this mission.

The commander of the new battalion, MAJ(P) Greg Bowen, said, "We have long days behind us, to have gotten this far, and long days ahead. Standing up any new unit is a significant challenge, but standing up a first-of-its kind unit is an even bigger challenge. We have the excellent services of Boeing and other contractors — thousands of people working to help us in the mission of defending our nation. Be assured, we are on watch. We will not fail."

Operators graduate from first ever Ground-based Midcourse Defense Advanced course

By MAJ Laura Kenney

PETERSON AIR FORCE BASE, Colo. — Buoyed by a purpose as visceral as one can get — defense of the homeland — 31 Soldiers graduated Dec. 19 from the first ever Ground-based Midcourse Defense Operator Advanced Course. They belong to the 100th Missile Defense Brigade (GMD), which was activated here Oct. 16, 2003. Some graduates will move to the battalion in Alaska that will provide operational control over the GMD system's interceptors.

The graduation ceremony marked the formal recognition of the group's accomplishment. The 12 preceding weeks had often been grueling, but all students worked and learned with a firm sense of purpose — that of being the essential line of defense between great harm and their nation.

MG John W. Holly, program director, Ground-based Midcourse Defense, presided at the graduation.

"This is an important system — critical to the defense of your nation. The new system means defense of your families and loved ones. Never before have we had this capability, so it truly is a hugely historic moment," said Holly.

The seven-week advanced course followed on the heels of an intensive five-week basic course, which introduced the students to the basic fundamentals of the GMD system.

"The basic course was very challenging," said Distinguished Graduate CPT Amy Riggs.

"There was a great deal of terminology to learn, and the tests were very comprehensive."

The advanced course qualified graduates on the fire control system, taking them through day-to-day crises, and combat and recovery operations. As in most military courses, the school ended with a demanding practical exercise, made as true to life as possible.

"They put us into every possible scenario — what to do in response to this particular situation, what to do in case of failure; it certainly kept us on our toes," said SPC Joshua Wheeler, a communications operator in the battalion.

"The course is designed to teach students

three things," said lead contractor and instructor E. Paul Semmens.

"First, we teach them how to use the system. Second, we teach them the tactical principles such as the threat, and peculiarities of the system. Most importantly, we teach them how to think, to analyze, to develop appropriate courses of action to get the job done … which is defense of the nation," said Semmens.

"When they leave here, students will have mastered the system and foundations of tactical thinking. At the unit, they will learn their positions, and how to operate effectively as a crew."

The learning definitely didn't stop with the handing out of diplomas.

Operational procedure investigations follow, working with all components of the system, throwing out different threats, what ifs … teaching the crews how to function cohesively.

The goal, according to Presidential directive, is for the system to be operational by Fall 2004, on a timetable sped up by the attacks of Sept. 11, 2001. The brigade will be staffed largely by active National Guard Soldiers, with a small contingent of active Army Soldiers. Colorado Guard Soldiers will man the brigade here, while Guard Soldiers serving at the battalion in Alaska are members of that state's National Guard.

"I came back into the Army — after a break in service of some years — partly due to Sept. 11," said Honor Graduate SSG David Smith. "I was serving as a recruiter when I saw the nation-wide advertisement for the GMD positions. It offered an opportunity to get into something great at the ground level. How much more important a job can you have than defense of the homeland?

"I have a lot of faith in the system. Out of the many classes I've had in the Army (I have five military occupational specialties) this is without a doubt the toughest and most challenging to date," said Smith, who will be the Readiness Operator for the 100th Missile Brigade.

"The instructors did an incredible job of formatting an extremely technical subject into something both interesting and learnable."

CPT Mike Edwards, who is slotted as a current operations officer for the brigade, was interested in the job due to a lifelong fascination with missile defense.

"I'm prior service infantry, but also had a lot of experience with forward area air defense. I've always been interested in Space, and while doing some research on it, saw the job vacancy announcements, and applied. I'm really glad to be involved, it's a great field, and there's a lot to learn," said Edwards.

Riggs and Wheeler were both attracted to the job by the lure of the Alaskan location, although both are professed city types, and their future duty station — Fort Greely — is considered remote.

"I've only seen pictures of Alaska, and I know it'll present challenges … but this is the perfect time in my life to take up such a challenge. I'm very proud to be part of the homeland defense operation, and Alaska just makes it that much more interesting," said Riggs, sensors operator in the battalion.

Wheeler, newly married and hailing from the far sunnier climes of Florida, is looking forward to the new experiences offered by the arctic regions of his upcoming duty assignment.

"I love the military, primarily because it's always offering something different. This is a great unit and program, and although my wife and I know we'll have to make adjustments, we're looking forward to it."

Semmens classified the graduates as "… an amazing group of Americans. They've uprooted their lives, come from across the country to train in a difficult and highly technical mission, to defend us, the nation. They have done a tremendous job of learning, and are really on the ball, taking everything we've thrown at them.

"I've never been prouder of a group of students — they will truly do well at what MG Holly rightly called the most critical mission of all, defending our loved ones and our nation."

SGT Ralph Fresquez, Readiness NCO for the 100th Missile Defense Bde., accepts his diploma marking his graduation from the Ground-based Midcourse Defense Operators Advanced Course from MG John W. Holly, Program Director, Ground-based Midcourse Defense. BG Robert P. Lennox, deputy commanding general for operation, SMDC/ARSTRAT, waits to congratulate Fresquez. *Photo by Dennis Plummer*

SMDC honors pioneering astronaut with induction into 'Hall of Fame'

By MAJ Laura Kenney

COLORADO SPRINGS, Colo. — "I remember watching that astronaut on television, attached to absolutely nothing, circling the Earth at 17,500 miles an hour, a million feet up, and thinking that it was the bravest thing I'd ever seen. It is now my honor and privilege to induct that same astronaut into Space and Missile Defense Command's Pioneer Conference Room Hall of Fame."

So spoke then-MG Larry J. Dodgen, commanding general of SMDC, referring to the historic, 1984 untethered Space walk of then astronaut Robert Stewart, as Dodgen prepared to induct the now retired brigadier general into SMDC's equivalent of a "Hall of Fame," in a ceremony Jan. 27.

The Pioneer Conference Room in SMDC's branch headquarters building here is dedicated to honoring men and women who have furthered the efforts of the Army in Space.

Stewart was an Army astronaut when he, along with Navy Capt. Bruce McCandless, stepped into Space during the 1984 Challenger mission. The extravehicular activities were used to conduct evaluations of the Manned Maneuvering Units — one man propulsion backpacks that snap onto the back of a Space suit's life support system. An MMU allows an astronaut to work outside a spacecraft in flight without a tether.

Although those missions undoubtedly are the most famous of Stewart's career, and earned him the "Hall of Fame" spot, Stewart made many other notable contributions to the military during his 28-year career. He was the senior test pilot for the Apache helicopter, and wrote the Flight Re-entry manual for the shuttle program. When asked what were his own personal highest moments, Stewart didn't hesitate.

"Flying combat operations in Vietnam. The time I spent serving with the men I flew with form the proudest moments of my life," Stewart said.

Dodgen commented on that time period when he praised Stewart's long and varied career.

"I asked General Stewart what that untethered walk was like, and he responded with, 'It was a walk in the park next to combat.' This is a man who bled for his country, and was a Soldier long before he began the career for which we honor him today. It is fitting that we will hang his picture in our Pioneer Conference Room. If you look up the word 'pioneer' in the dictionary, it usually says something to the effect of 'one who goes somewhere for the first time' or 'someone who has led the way.' General Stewart is truly one who both went first, and who has led the way.

"He is our second inductee into this Hall of Fame recognizing those who began the dream of the Army in Space — his portrait will hang next to someone who built rockets, MG John B. Me-

(See Pioneer, page 56)

Then-MG Larry J. Dodgen, left, and BG (Ret) Robert L. Stewart unveil the portrait that now hangs in the Pioneer Conference Room of the SMDC/ARSTRAT Colorado Springs headquarters building. *Photo by Joe Fischer*

Soldier a stranger in a strange land

By CPT Jason Held

Editor's note: CPT Held is a Colorado National Guard Soldier assigned to the 193rd Space Support Battalion. He has deployed numerous times during recent combat operations in support of Space missions. A computer engineer as a civilian, Held worked hardware-software integration on the Wide Field Camera 3 portion of the Hubble Space Telescope, as well as biomedical engineering projects. He was a lead instructor at the Interservice Space Fundamentals Course teaching satellite design theory, propulsion theory and orbital dynamics. As a member of the Mars Society, an organization composed largely of scientists devoted to the goal of reaching Mars, Held recently participated in an experiment, funded partly by NASA, in which those involved lived and worked in a simulated Mars environment.

MARS DESERT RESEARCH STATION, Utah — With President Bush's announcement of a human Mars program, accented by the stunning successes of Opportunity and Spirit landings, Mars is in the hearts and on the minds of many Americans today.

Mars sparks the imagination, moves the mind and creates images of humanity normally seen in science fiction and dreams, rather than the reality it may become. There is a lot of engineering we need to do before we go, as well as sound politics and sound science. Many questions exist — how would one live on Mars? How would you eat? How would you live and work?

It is with those questions in mind that I took a vacation from my holiday vacation and drove an old, beat-up pickup truck into the heart of the Utah desert for an exploration of my own.

I'm a member of the Mars Society; a group of Space advocates and engineers from all over the world lead by former Martin Marietta Mars Lead engineer Robert Zubrin. Dr. Zubrin invented a human Mars mission plan, which was radically different and logistically much more sound than the NASA plan published for then-President George Bush (senior) in the 1980s and early 1990s.

The original plan, requiring over a thousand tons in orbital construction, years of advanced scientific engineering work, and tons of supplies was an ambitious idea. But priced at $500 billion, the plan sent Congress into sticker shock faster than you can say "Low Earth Orbit Forever."

Dr. Zubrin's plan, called "Mars Direct," required less than $50 billion. How? Create the resources we need to live on Mars "In-situ." All of the usable resources, from fuel to precious oxygen, can be produced on the surface before explorers even arrive, reducing the multi-ton "Battlestar Galactica" to a much more modest and manageable version. It is this plan, or a version of it, that the current President Bush and NASA intend to send to Congress for ratification.

So let's go back to Utah. The Mars Society has two research stations refining the tactics, techniques and procedures astronauts will need to live and work on Mars. These stations are crewed by volunteers and scientists from all over the world. One station, located in Devon Island in Canada and on the Arctic Circle, is a perfect location to test Space weather phenomenon. The desert station in Utah has a perfect sky for an observatory. They are funded by a wide variety of organizations, from PayPal dot-com guru Elon Musk to the Discovery Channel, to the Plumbers and Pipefitter's Union, to NASA (whose "Crew Exploration Vehicle" bears a striking resemblance). At these stations, crews conduct research that helps develop both the technology and operations of living on Mars, but often has Earth applications as well.

LTC John Blick, a Defense Advanced Research Projects Agency engineer, used the station to test robots, which were eventually used (and destroyed) during the Sept. 11, 2001 rescue at the World Trade Center. It was not the first time that the Mars Society conducted joint research with the U.S. Army, and I can tell you, it will not be the last.

My job with them was to combine both scientific skills with military management experience to create a training plan to assist new crews integrate with the habitat. It's a complex structure, two stories high, with its own internal wiring, plumbing and Ethernet, as well as satellite and weather telemetry. There is a greenhouse (connected to partially recycled water wastes) and a professionally constructed observatory. As such, many crews enter this environment for the first time, and have to re-learn from scratch all of the lessons I was going to learn first-hand over the next two weeks.

Driving up to the place, I could see right away why they chose this location. The Utah desert, just 10-minutes west of Hanksville, Utah, is one of the most desolate places on Earth. Nothing grows there — the ground hued a deep red from the volcanic structured soil. The habitat itself you almost miss driving by, as it's nestled between two of the 20-foot high berms dotting this foreign landscape.

Entering the habitat, the bottom floor consists of two air-

CPT Held, left, and Daimon Sheets troubleshoot a GMRS remote radio used to communicate with a retrans site 10km to their west. Unfortunately, the weather had its way with the radio and it was too rusted to be of use. *Photo by Jonas Jonsson*

locks, a laboratory for biology and geology experiments, and a shower and toilet facility. The toilet, by the way, was of an Incinolet variety, a steel contraption designed to burn waste at a healthy 4000 volts. (Keep this in mind; we will speak of it again.) Upstairs is where the crew lives and works, with six closet-sized staterooms (for a six-person crew), as well as a modest kitchen/living area.

Crews stay at the desert station for two weeks in field condition, which means that whenever you leave the habitat, you simulate working on Mars. Meaning, you leave, you wear an analog Space suit. At first glance, that's not as bad as it sounds. It was certainly easier living than I've had on other, more military deployments. With the kitchen and a shower every two days (to conserve water), it was certainly not a difficult deal by Army standards. This, I thought at the time, was going to be easy. Needless to say, I was in for some surprises.

The first surprise happened upon arrival. The electric power runs on a 20K-watt generator, which powers all of the systems, from cooking to the laboratory, to the observatory, to yes, our notorious Incinolet, which caused all the lights to flicker when used. The generator, however, was gone. It was back in Grand Junction, Colo., for repairs, and all we had was a 7K-watt generator. I now had to develop a training plan, which included low power use. With myself as the crew's engineer, the team leader (an accomplished environmental engineer from Canada) and the assistant engineer (an aerospace grad student from Sweden) managed to rewire systems to allow us to communicate with Mission Control headquarters in San Diego, Calif., light the upstairs floor and keep some appliances running. We certainly could not use the Incinolet, and had to resort to burning wastes the "old fashioned way" — Mogas, which certainly brought back memories of those more military deployments.

But this was only for a few days before the large generator returned, so we made the best of it. Systems, naturally, were quirky for the rest of the two weeks, and I had my share of repair and upgrading tasks. There was much to do for this training plan, and most of it I was determined to experience for myself. As such, I decided to go on Extra-Vehicular Activity (EVA) to both validate the navigation portion of the training and assist the crew geologist take soil samples from areas about 8-kilometers north. So we both donned our Space suits…. not as simple as it sounds. Although the habitat's Spacesuits are not pressurized (they are analogs, after all), they still have their complexities, with communications system and water, as well as electric powered air intakes, and a specific procedure to don them. It took us almost 45-minutes to put them on, test the fittings and make radio checks, before we could even enter the airlock.

Part of the simulation of living on Mars meant we must wait five minutes to "depressurize" prior to leaving for the surface. The tradition with the crew was to tell very bad jokes during this time but that did not last past the first few departures. Five minutes of "grosser than gross" jokes, after all, can be a very long time.

We departed the habitat, mounted our ATVs and left for the Great Unknown.

Navigation in simulated Mars conditions, would, I knew, have its challenges, although as an Army trained person,

my confidence was high. Yet with no magnetic field around Mars proper, using a compass is forbidden, as it would be useless on an actual Mars mission. We had a GPS, mainly for safety and for accuracy of the science (which requires accurate locations for geologic experiments), but once again, the first crews on Mars will probably not have an autonomous navigation system as precise as GPS, so I opted to use the challenge of terrain association to get to our destination and back.

As is true with the rest of this journey, the trip provided more challenges than you can at first imagine. To begin with, understand the nature of the suit itself. Wearing thick gloves and a suit severely limits your motion and vastly reduces your tactile sensations. Simple tasks, such as taking the surveyed map from the bag, required a surgeon's diligence. The helmet has a large bubble providing a solid 180-degree field of view. We hit the road, with ATVs screaming down dirt trails, arriving at our destination in short time. Destination — a bluff overlooking a canyon with an incredible desert view.

Opposite page, top, view of the habitat from on top of one of the overlooking berms. Observatory is to the far left on the hill, with the Greenhab just to the right of the habitat; opposite page, center, CPT Held on an EVA, pre-storm. The faceplate is not fogged but the wind and gloves made handling the map difficult; above, the crew having Christmas dinner on the upper floor of the habitat. Crew, from left to right are, CPT Held (Chief Engineer/XO), Daimon Sheets (Biologist), Allan Morrison (Canadian, Team leader), Jonas Jonsson (Sweden, Engineer), Jonathan Drew (Biomedical Engineer), and Chalbeth Reynolds (Geologist); *Photos by Jonas Jonsson*

Taking our soil samples (as well as a few pictures) was awkward because of the bulkiness of the suits, but not impossible with two people working as a team. We wanted to linger and enjoy the scenery, but could not spend much more time—there was a storm front moving in and desert winds were picking up. Storms can prove dangerous on either planet.

And that's when the navigation became difficult. It was not easy to begin with — the maps dated from 1980 and many of the features, volcanic in nature, were not on the map. New features were hand-drawn in pencil and locations were suspect. Reading the map was becoming difficult, as the helmet started to fog from the inside, a layer of dust and mud formed on the outside, and visibility was drastically reduced.

The storm was coming closer and the map flapped in my thick gloves in 30-knot winds. The terrain, rolling berms of sand and clay, was looking the same in every direction. Looking two kilometers back, the canyon we just came from was under a flash deluge. I didn't want to think of trying to navigate in that. If things became real world dangerous, I thought, we could always remove our helmets…. we aren't here for anachronisms, after all, and there are no deluges on Mars proper. Nevertheless, we decided instead to press on, in simulation, racing ahead of the storm to get home.

We made it home in time, in simulation, and with quite a few lessons learned. The navigation, we were pleased to learn later, was only 100-meters off from GPS spottings, so the soil samples taken were sound. One of the hand-drawn map corrections was placed a whole three-kilometers too far south, and will have to be corrected. Allan Morrison, our Canadian team leader, cooked for us a fine meal of, to my surprise, Army issue Meals Ready to Eat, which we wolfed down greedily. This was not the only surprise of the day, as it turned out, the new generator had arrived, and the once silent Incinolet was alive again, but for some mystical reason would not shut off. As the crew's engineer, I drew the task of fixing it.

What can I say? Some jobs are dirtier than others. All for the advance of science, my friends. All for the advance of science. The Incinolet, too, has made it in to the Mars Desert Research Station's training plan.

As I write this, I note the cover of Time Magazine — the red face of Mars with an astronaut, an American astronaut, on its surface. Will we do it? Who knows, but I was happy to be a cog along the way.

COMMAND IN BRIEF

Being all that he can be

Battalion commander on guard in military and civilian world

By Sharon L. Hartman

PETERSON AIR FORCE BASE, Colo. — The intensity in the voice over the police radio was only too obvious. Backup was needed, and fast … and back up was on its way in the form of one of Space and Missile Defense Command's own.

LTC Scot Cuthbertson, commander of the 193rd Space Battalion, hasn't quit his day job, but has somehow found time out of his busy schedule to serve as a Reserve Unit Deputy with the El Paso County Sheriff's Office.

Growing up in his hometown of Barrington, R.I., Cuthbertson was a friend to many of the policemen there. In college, he worked for a security company and ran a detox center at the city hospital. Near the time he was commissioned into the Army, the police department in Providence offered him a job — leaving him with a difficult choice.

Fortunately for the Army he chose to wear green, but in the end the cops made out too. With the Army bringing him to Colorado Springs, Cuthbertson joined the El Paso County Sheriff's Office Reserve Unit in 1997.

"I always wanted to be a cop. It was always my other career choice," said Cuthbertson.

"This was an opportunity to fulfill my goal of being a cop and still continue my military career."

An Active Guard/Reserve officer with the Colorado Army National Guard, Cuthbertson, originally the executive officer when the 193rd Space Battalion stood up more than two years ago, was a key player in the accelerated training and deployment of Soldiers necessitated by the tragedy of Sept. 11, 2001.

Having taken command of the battalion in November 2003, Cuthbertson is responsible for 71 Soldiers, 18 of whom have deployed to combat theaters to provide Space support capabilities to the warfighters.

Working on his days off, and sometimes in the evenings after putting in a full day with the Army, Cuthbertson usually works 80-100 hours a month with the Sheriff's Office.

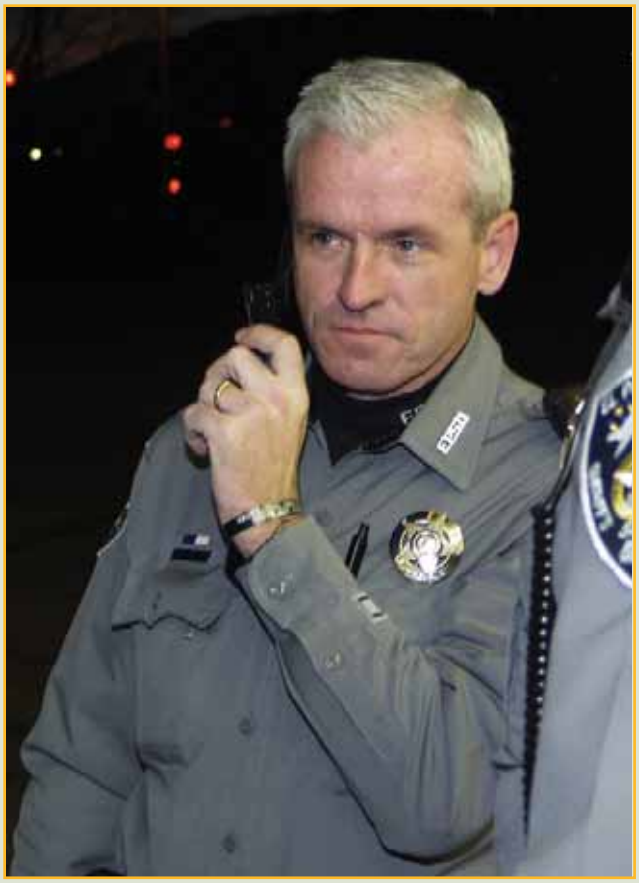
When questioned as to why he would go to such lengths, and to do so without compensation, Cuthbertson answered —

"What we as Reservists do out here is provide assistance and cover for full-time officers. We provide backup that they would normally have to pull someone off another call to get, and sometimes that can make the difference between life and death for a deputy, or even a citizen," said Cuthbertson.

"I went out on a call one night, and there was a guy choking his wife in front of the kids. We came on scene and once we'd figured out what happened, we arrested him and he ended up getting charged and convicted for attempted murder. He was not the least bit remorseful, but once we put him in custody, just the relief on the wife's face made it all worth it. The relief on the kid's faces … knowing that we took a guy off the street that would have killed his wife and maybe even his kids, that means a lot.

"Other things like, on a traffic stop, if you take a drunk

Above, Reserve Deputy Scot Cuthbertson questions a driver during a routine traffic stop. Opposite page, top, Cuthbertson calls information into dispatch. *Photos by Sharon L. Hartman*



driver off the road, you may have saved lives. That sticks with you."

In addition to being the Reserve Unit Leader, Cuthbertson also provides assistance to the Sheriff's Office Special Weapons and Tactics (S.W.A.T.) unit.

"Occasionally, if they know ahead of time, the S.W.A.T. unit will call me for backup on one of their operations and I'll help," added Cuthbertson.

"I'll go and help them with search warrants, suspect transports, those kinds of things.

"What really makes this all worth it is the acceptance by the full-time officers. Here we are as volunteers out doing many of the same things they are, and they appreciate the support we bring to them. There are nights where we are their only cover. We are the only backup that they have. That means a lot to them and they treat us as equals."

Back to the voice on the radio, Cuthbertson was one of four deputies who responded to a pursuit of a stolen vehicle. The vehicle chase ended with the stolen car crashing into a parked vehicle and a mailbox, the suspects then fleeing on foot. Two of the three suspects were caught and taken into custody, and after setting a perimeter, coordinating and assisting K-9 units with the search for the third suspect, Cuthbertson transported one of the suspects in for questioning.

Whether in Army green or in a blue and gray deputy's uniform, it's all in a day's work for Cuthbertson — who truly epitomizes the meaning of dedication and service to his country.

The few, the proud — but not a Marine

By Sharon L. Hartman

CAMP VICTORY, IRAQ — Army Space and Missile Defense Command is definitely proud of one of its own. CPT Daryl Breitbach — a member of Army Space Support Team 2 stationed at Camp Victory, Baghdad — was the first to cross the finish line during a 10k run there, honoring the 228th birthday of the U.S. Marine Corps.

Breitbach, a competitive runner since he was 14,

Australian Army Capt. Dan Weber, left, and U.S. Army Space Support Team 2 member, CPT Darryl Breitbach run almost neck and neck during a 10K run honoring the 228th birthday of the Marine Corps. The run took place at Camp Victory, Iraq. Breitbach came in first at 00:36:53, with Weber a close 23 seconds behind. *Photo by SFC Ken Hudson, 319th Mobile Public Affairs Detachment*

ran cross-country and track in high school and college. He now runs or works out at least six times a week and runs on average 35-40 miles per week.

"Here in Iraq running and working out provides an excellent way to relax and take your mind off work between shifts," said Breitbach.

"Camp Victory has ample Space to run although you're always watching out for rounds or mortars coming over the perimeter wall, or the lion rumored to roam the remote part of the camp.

"Luckily thus far, the only excitement while running in Iraq involved being pursued by stray dogs."

The only pursuit during the race itself was that of other runners chasing Breitbach who led the race from the start and finished with a time of 00:36:53.

"Although it was not a personal best for a 10K, I was happy with the time given the windy conditions, and I was pleased with my finish," said Breitbach.

"I ran stride for stride with Australian Army Capt. Dan Weber for almost the entire course.

"It was great to have someone to run with and push one another during the race."

Weber finished just 23 seconds behind Breitbach with a time of 00:37:16.

The top three finishers in each age and gender category were awarded medals, and all participants received U.S.M.C. T-shirts to remember the event.

JTAGS on point in the Pacific

By CWO Maury Hayes

OSAN AIR FORCE BASE, Korea — It's 2 in the morning in South Korea and while most people are in a deep, deep sleep, there are three U.S. Army Space and Missile Defense Command – Colorado Springs Soldiers or Sailors wide awake and alert to the "hot spot" goings-on throughout Asia.

These three Soldiers or Sailors sit comfortably in front of the colorful displays inside a Joint Tactical Ground Station or JTAGS within the Korean Combined Operations and Intelligence Center. They are providing Tactical Ballistic Missile or TBM warning for Soldiers, Sailors, Airmen and Marines alike throughout the Pacific Command theater of operations. Their crew is a mix of Soldiers and Sailors — hence the "J" in JTAGS, and they work very well in this "Joint" environment. Each shares with the others the skills that their years of training within their respective branch has given them. They rely extensively on each other for mission accomplishment.

Naval Operations Specialist Jay Howard, a crew chief, said, "Even though Army and Navy come from different backgrounds, we come together as one to protect America's forces on the battlefield."

TBM warning is a tremendous mission responsibility these days. With the increasing number of countries possessing TBMs and their numbers within each country growing, this important mission is at the forefront of the theater commander's mind on a daily basis. But this crew can handle it. They take pride in what they do and they ensure that they get the mission done in a very professional and precise manner. No, it is not exciting and yes, it does almost seem boring at times, but just maintaining a multi-million dollar shelter and all the associated systems, communications links, and mission requirements is no easy task. They do it without complaint.

Elsewhere, depending on which day of the week it is,

the operations section will be providing TBM exercise injects throughout Asia and the Pacific theater via the exercise suite. This allows all theater personnel to exercise and critique their passive ballistic missile defense tactics, techniques and procedures. JTAGS is the only peninsula or theater system that provides these exercise missile injects. This is but one of the selling points that keeps the JTAGS system and personnel within theaters. With the upgrades to various U.S. Strategic Command's TBM warning systems, and additional technologies available for that mission today, relevance is something that JTAGS and the 2nd Space Company do not take for granted. Relevance is something that is closely monitored from the section officer-in-charge all the way up through the various commanders within Army Forces Strategic Command.

PVT Jeffrey Englert, a primary operator, said, "As a first duty station, I couldn't be more pleased with the values my unit has instilled in me. Being a JTAGS operator requires a large amount of responsibility which in turn has allowed me to mature quickly as a Soldier and an operator and I look forward to progressing to the position of crew chief as soon as possible."

Ultimately, the JTAGS system with its unique capabilities and personnel will remain in theater for years to come. With the JTAGS upgrade on the horizon, the multi-mission mobile processor will further define how warfighters exercise and receive tactical ballistic missile warning, even down to the foxhole level.

Battlefield Calls Go Through MacDill

By 2LT Erin Dorrance, 6th Air Mobility Wing public affairs

MACDILL AIR FORCE BASE, Fla. — American military commanders in Iraq and Afghanistan reach for their satellite phones when they want clear, secure and fast communications. More often than not, the operator who patches through their calls is sitting in a building here.

People at the one-stop-shop Regional SATCOM Support Center here process requests for satellite phone time and schedule the required bandwidth to commanders all over the globe.

The joint support center is one of three regional support centers. The other two are in Germany and Hawaii. Headquarters for the three is the Global SATCOM Support Center at Peterson Air Force Base, Colo. By using satellites located over the equator line, 23,000 miles above Earth, operators receive satellite access requests and grant satellite phone time in three frequencies — ultra high, super high and extremely high.

The support centers' main users are Special Operations Command, Central Command, Southern Command and Joint Forces Command.

"Since MacDill has two of the four biggest users within an arm's reach, and Southern Command is only several hundred miles away, it only made sense to have an RSSC here," said Tech Sgt. Jay Steele, EHF chief of Central Command operations, who has been with the center for more than three years.

The RSSC staff also works closely with the joint communication support element here. The satellite phone technology was not used as much during Operation Desert Storm, but during Operations Enduring Freedom and Iraqi Freedom the satellite phones have been in high demand, according to Army SFC Greg Denton, RSSC noncommissioned officer in charge.

"It is unbelievable how fast and big satellite communications is growing," SGT Denton said.

"Even the career field is growing quickly because of the technology's popularity."

"Because of the prominent use of satellite communications and the large amounts of bandwidth needed to use this type of communications, support center technicians carefully plan satellite phone time," said David Miller, chief of UHF cell.

Exercises help the staff ensure that planning is efficient and that military commanders have the time and bandwidth they require for satellite phone calls.

Although team members start planning six to eight months in advance of a war, they are very flexible and ready to deal with rapid changes.

"War is unpredictable," Miller said.

"If plans change and a group is sent to a different country, we need to change the originating location of the satellite phone call, which may even mean sending it through a different satellite altogether.

"Based on the popularity and efficiencies of satellite communications, it appears the technology will be a preferred means for exchanging intelligence."

That means support center specialists will be kept busy in their role as high-tech operators to U.S. military commanders and by an ongoing schedule of exercises and training to improve the system.

conducts ground-based Space control, which provides the joint commander a responsive and tactically relevant capability. Actions are ongoing to develop new Army contributions to the Space surveillance and negation functions of Space control operations.

Restructuring for New Strategic Role

Significant organizational changes have occurred as the Army's — and the nation's — view of Space has evolved. Implementing recommendations from the Report of the Commission to Assess United States National Security Space Management and Organization, Secretary of Defense Donald Rumsfeld, in 2001, directed a number of organizational changes within the Department of Defense to consolidate and streamline Space operations. The functions of the U.S. Space Command were divided between the new U.S. Strategic Command and the U.S. Air Force Space Command. The Unified Command Plan was subsequently changed, and in October 2002, the U.S. Army Space and Missile Defense Command was designated as the Army Service Component Command to U.S. Strategic Command.

As such, SMDC/ARSTRAT conducts Space operations and provides planning, integration, control and coordination of Army forces and capabilities in support of U.S. Strategic Command missions: Space, global strike, integrated missile defense, information operations and command, control, communications, computers, intelligence, surveillance and reconnaissance, or C4ISR. Each of these missions depends heavily on the capabilities provided by Space-based products and services.

The Space Commission also emphasized the need to develop a cadre of well-trained Space professionals in order to encourage innovation and secure proper management of Space systems. The Commission recommended the military departments enhance Space professional military education at all levels to ensure increased integration of Space activities into all military operations.

The Army, in fact, recognized the value of a cadre of Space-qualified officers with the Office Personnel Management System XXI, which established the FA40 Space Operations Officer career field in December 1997. Since then, 149 Army officers have received the FA40 career field designation, contributing significantly to development of an Army Space cadre to enhance warfighting capabilities.

A robust Space professional military education program has also been incorporated into all Army service school curricula, providing a relevant, fundamental level of Space knowledge to officers, NCOs, Soldiers and civilians. As a result, Soldiers are increasingly knowledgeable, skilled and confident working with Space systems and products. Importantly, because of continuous review of the capabilities required to support combatant commanders and their staffs, a rigorous process has been put in place to update and assure relevance of the FA40 course program of instruction.

Future Force Transformation

"… a future force that is defined less by size and more by mobility and swiftness, one that is easier to deploy and sustain, one that relies more heavily on stealth, precision weaponry and information technologies."

President George Bush
25 May 2001

The Army's strategic role in Space, although significant over the past couple of decades, is but a glimpse of where we are going in the future. We see a future where the Army, seamlessly integrated into the joint force, will exploit the "new high ground." As the most technologically significant paradigm shift in the Army's 228-year history, the future force will be capable of operating on land around the globe, throughout the entire spectrum of conflict to achieve decision dominance and victory. According to Joint Vision 2010, the emerging synergy of Space, land, sea and air superiority will enable the Army "to dominate the full range of military operations from humanitarian assistance, through peace operations, up to and into the highest intensity conflict."

The Army is transforming its units to tailorable forces with improved deployability and increased lethality. The future force will consist of lighter but highly lethal, mobile and survivable modular formations that fight as self-contained units in non-linear, non-contiguous battlespace. These units will have the ability to arrive at multiple austere points of entry via air and sealift, and possess "off the ramp" capabilities to strike the enemy's centers of gravity simultaneously. The focus of warfighting will evolve to an effects-oriented operation. It will be delivered by joint platforms that enable creating an overmatching imbalance of synchronized combat power against the enemy.

Improved strategic responsiveness and seamless access to Space-based technology will be defining characteristics of the well-integrated Space and land force operation. This symbiotic relationship characterizes the concept of joint interdependence in support of combatant commanders' requirements.

The future force units will be equipped with the Future Combat System, comprising manned and unmanned platforms, and will be integrated into a global C4ISR network. Every platform will have integrated communications systems, making it both a network and communications device. Significantly, the Soldier, rather than the command center, will be the primary focus for the future force.

As a Space-empowered force, the future force will routinely exploit the overhead constellation of national, commercial and military Space platforms. The Internet-based global information grid, or GIG, a state-of-the-art global communications network designed to provide real-time information to joint warfighters, will provide intelligence, focused surveillance, area reconnaissance, long-haul communications, missile early warning, position, navigation and timing, as well as weather/terrain/environmental monitoring.

The GIG will provide situational awareness for all levels of forces so they can establish, maintain and distribute a relevant common operating picture to the joint warfighters. The GIG will have more than 100 satellite-supported worldwide communications sites to enable worldwide operations. This single information network will serve all users and uses. This means the Army will provide communications in conjunction with other joint components. Likewise, the GIG will be dependent on the Army's networks and communications being available and

operational, a great example of service interdependence.

Command and control, communications and ISR networks will significantly enhance the lethality, survivability, agility and versatility of the joint force. The layered redundancy and improved capabilities provided by Space-based assets will prove particularly valuable in immature theaters where existing communications infrastructure may be insufficient or unreliable.

Space operations, Space control and Space systems will be incorporated into all of the Army's future force land operations, and will focus on:

- Increased deployability, facilitation of immediate employment of forces arriving through austere entry points, reduced logistics structure and reduced footprint enabled through reach-back and distribution-based sustainment.
- Enhanced SU "Off the Ramp" during entry operations and local, robust, near-real-time interdependent networks integrated from Space-to-mud.
- Precision maneuver, fires, sustainment and information on a non-linear battlefield. Enemy centers of gravity will be attacked with overmatching effects and defeated through disintegration.
- Continuous information and decision superiority. Joint-integrated, network-centric battle command will enable decision superiority and synergy of integrated joint operations.

Parting Thoughts

Recent experience has clearly shown that combat power is rooted in capability, not quantity. Space has demonstrated it is a major component of that concept. However, while the integration of Space in ongoing operations in Afghanistan and Iraq has received wide accolades during lessons learned reviews, we must realize those scenarios will not likely serve as conditions for future combat.

Even as we rely on Space-based products and services to support ongoing combat operations, our strategic challenge now is to leverage Space during transformation to the future force. Technological advances have enabled the ability to strike, maneuver and generate effects in determining enemy composition and disposition. We can target and measure effects, but more information is not always better intelligence. Analysis and dissemination are currently the areas with the greatest shortfall. Efforts must focus on developing a global information architecture that is able to provide relevant and actionable intelligence to the planner and warfighter in a timely manner. Making the pieces fit within a joint context is an imperative.

The next few years will be an exciting time in the Space mission area. Key future force capabilities and technologies will see accelerated fielding to enhance the effectiveness of the current force and our joint forces engaged in the Global War on Terrorism. We will also see greater joint force interdependence as the Army gives up redundancies to gain other capabilities.

As you read the articles in this edition of *the Army Space Journal*, I hope you will think about what you can do to leverage what Space can provide for our joint warfighters. The Army is at an important strategic crossroads, and Space-smart professionals are vital to forging the way ahead. Secure the High Ground!

IMD for the 21st Century ... from Page 21

Information Superiority Teams: The information superiority team is tasked with coordinating requirements and synchronizing activities for the operational net assessment, joint ISR and effects assessment. This team is responsible for the baseline operational net assessment and fusing information from various organizations into the updates.

Knowledge Management Teams: The knowledge management team is responsible for managing the knowledge and information management requirements for the SJFHQ. It provides communication and computer technical support and implements processes to meet essential information needs. Ensuring the effective functioning of the collaborative information environment platform is essential to SJFHQ operations and planning.

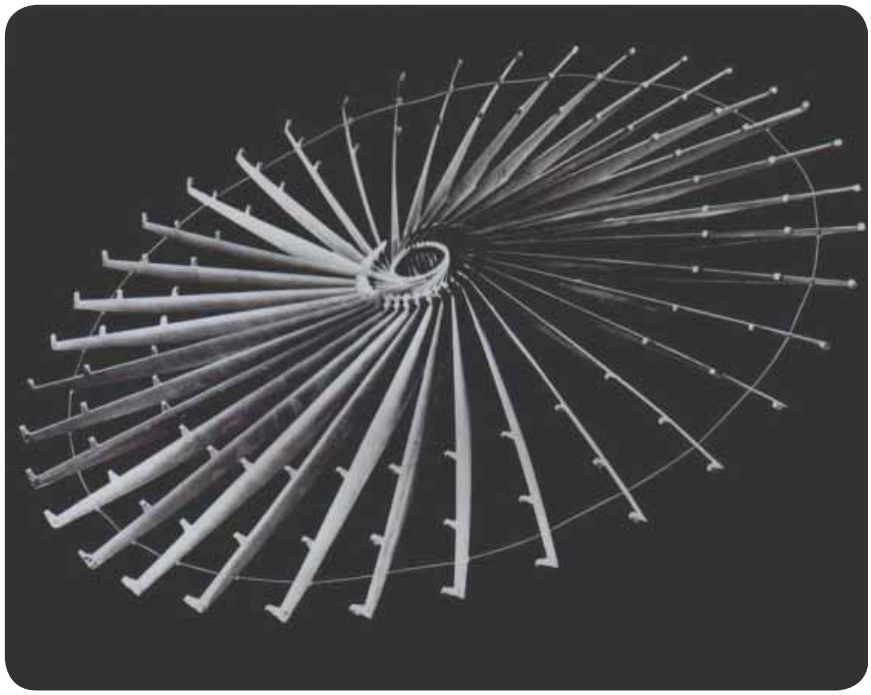
Transformational Change

The SJFHQ-IMD concept is about transformational thinking in how we approach and execute the challenge of global integrated missile defense. This innovative structure optimizes the planning, coordination and integration efforts of the regional combatant commands with U.S. Strategic Command's mission for integrated missile defense and SMDC/ARSTRAT's mission as the Army service component command to plan, coordinate and integrate Army missile defense forces. SJFHQ-IMD enhances the joint integration of missile defense and provides a transformational solution to achieve mission success — now and in the future.

Heather Macias serves as the Senior Systems Analyst supporting ARSTRAT working tactical, operational and strategic integrated missile defense. She is a retired lieutenant colonel after 20 years of service; 12 years as an Air Defense Officer, five in the Acquisition Corps, and three as a Space Operations Officer. She was the High to Medium Air Defense Branch Chief at the Air Defense Artillery School and Air Defense Center, Fort Bliss, Texas. She developed PATRIOT weight sets as a Software Analyst for HIMAD systems, Directorate of Combat Developments at the Air Defense Center, Fort Bliss. She designed and taught the Army's only graduate level Space Operations course to certify Army officers as Space qualified (3Y).

opment process as it ensures the funding and management of commercial satellite communication capabilities. The command continues to work with other services and agencies to assure that future satellite systems are designed, funded, fielded and sustained as an end-to-end warfighting capability. Additionally, the staff has identified the need to streamline electromagnetic interference resolution efforts as it advocates for its new on-orbit geo-locating capabilities.

U.S. Strategic Command has moved from a threat-based planning methodology to capabilities-based planning in order to support national/theater objectives. Effects-based operations integrate the broad spectrum of command capabilities to expose and attack the key vulnerabilities of an enemy. A new level of collaboration and coordination is required to integrate Space capabilities with these operations. Timely and detailed Space situational awareness is critical. Expanded capabilities to exploit Space and terrestrial networks (links and nodes) are needed to develop kinetic and nonkinetic courses of action to protect, defend or deny red, gray and blue Space-based capabilities. As such, the command promotes the integration of Space control with information operations to provide full-spectrum alternatives to the warfighter.



Since Space operations are critical to the task of integrating regional areas of responsibility, the focus on such core capabilities as electronic warfare, computer network defense and attack, military deception, operations security and psychological operations are of utmost importance. Within these capabilities, the command identified Space and cyberspace as areas that must now be treated as battlespaces in much the same manner as land, air and sea have been considered. Recent operations in Iraq demonstrated that adversaries can challenge our ability to use Space assets. Although the Iraqi attempt to jam our GPS and degrade the accuracy of our precision-guided munitions was amateurish, it was nevertheless a harbinger of the future.

The vulnerabilities of our Space and cyberspace systems are under investigation to develop plans and procedures to ensure that both capabilities are sufficiently robust to insure assured access to both Space and cyberspace. Additionally, U.S. Strategic Command will soon be drafting a Space control joint operational concept to describe how the joint force will integrate control capabilities to assure access to Space while denying access to our adversaries.

Because assured access to Space and cyberspace is critical, numerous avenues to obtain and reinforce capabilities in these mission areas are essential.

The U.S. Space Commission identified vectors for change within the national security Space arena in its 2001 report. It included the recommendations to merge disparate Space activities, adjust chains of command and modify policies to achieve greater responsibility and accountability. While Strategic Command implemented many of the report's recommendations, major opportunities remain. Efforts continue to realize the full vision of the Space Commission's report.

Conclusion

The way ahead is challenging. Mission accomplishment will mean stretching our capabilities and our reach as all branches of the armed forces learn to move and work together toward common goals. Assignment of SMDC/ARSTRAT as the Army service component to U.S. Strategic Command gives ADM Ellis the "capabilities-based componency" necessary to provide access to (versus ownership of) supportive assets so essential to the global missions.

The future areas of focus for U.S. Strategic Command and its components are defined by these four major opportunities. They include the nuclear posture review, the solutions for our known Space vulnerabilities to obtain assured access to Space, management and integration of intelligence, surveillance and reconnaissance, and missile defense operations — including preparing for a broader missile defense capability. With the support of SMDC/ARSTRAT, U.S. Strategic Command is ready to act and think anew to accomplish these global missions.

COL Patricia A. Baxter is the Chief of Plans and Exercises for SMDC/ARSTRAT. Prior to this she was Commander of the U.S. Army Strategic Command's Detachment co-located with U.S. Strategic Command at Offutt Air Force Base, Neb. COL Baxter and her detachment provide liaison, facilitation, and coordination between the U.S. Strategic Command and SMDC/ARSTRAT. She is LTG Dodgen's (commanding general, SMDC/ARSTRAT) personal representative at U.S. Strategic Command. Prior to this assignment, COL Baxter attended the U.S. Army War College at Carlisle, Pa., and is a graduate of the Space Operations Officer Qualification Course for FA40 Space Officers.

Homeland Security ... from Page 17

for HLD purposes. Space operations that may be conducted in support of HLD are listed in *Figure 3*.

• Space Force Enhancement: Intelligence surveillance and reconnaissance support to other HLD operations and Tactical Warning Attack Assessments.

• Space Force Application: Offensive operations to deter, preempt or respond to an adversary's attack on defense Space systems.

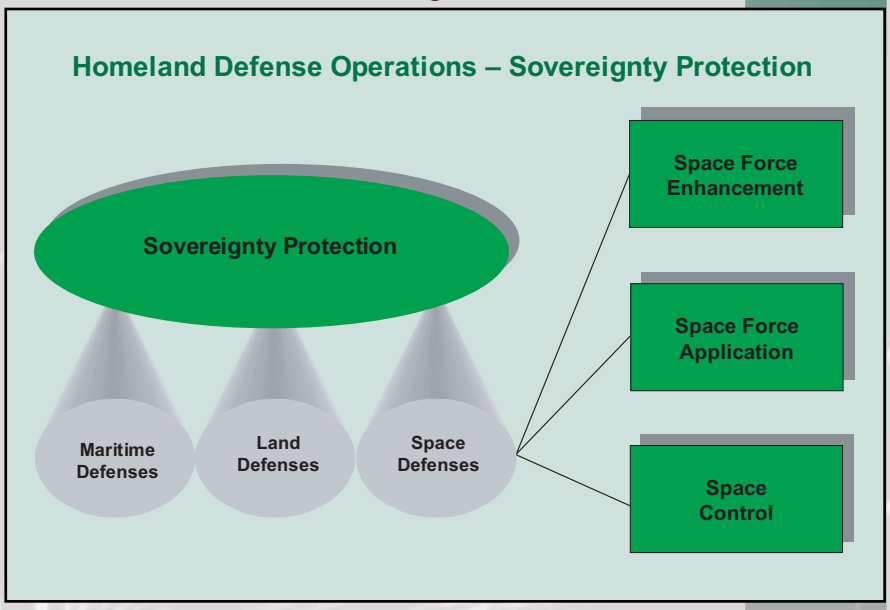
• Space Control: Surveillance — Detect, identify, assess and track adversary threat to HLD.

Protection — Active and passive defense measures.

Prevention — Preclude an adversary's use of Space to attack the homeland.

Negation — Deceive, disrupt, deny or destroy adversary Space systems that pose a threat to the homeland.

Figure 3



Relationships and Responsibilities:

Civil Support Operations and Military Assistance to Civil Authorities

U.S. Northern Command is responsible for civil support operations as well, and (when directed) will supplement local, state and federal relief efforts to save lives; to protect property, public health, and safety; or to lessen or avert the threat of a catastrophe in any part of the United States. U.S. Northern Command works with the Federal Emergency Management Agency, or FEMA to support lead federal agencies, through Northern Command, that have primary emergency support function responsibility in the Federal Response Plan.

Conclusion

As stated above, the newly created Office of Homeland Security is tasked with three primary missions:

1. Prevent terrorist attacks within the United States;
2. Reduce America's vulnerability to terrorism;
3. Minimize the damage from potential attacks and natural disasters.

This is the challenge and no single agency can go it alone. How we (the Army) meet our piece of this challenge will be based on how well our teaming arrangements are established with all of the players. There are several opportunities within homeland security and MACA to provide Army Space support for pre-event, post-event, counter-terrorism and environmental operations. It is imperative that Army Space operations maintain a significant role in MACA to provide on-site, dynamic and relevant Space operational support to any crisis. This is one Space support mission that cannot be accomplished from a fixed, static facility and without "boots on the ground" at the point of operations. The very nature of MACA, and the inherent Space operational support opportunities, tie in nicely to the Army's ability to provide on-site Space support. And while this "skill set" for Army Space support to MACA may at first seem limited to Northern Command, it is actually well suited to operations outside of the United States under the title of "Humanitarian Assistance" for all combatant commands.

There are many examples where our military's assistance is key to the stability of a given situation and where that assistance is put to the test. A term that best describes the nature of this test is "para-political." Space operations is a part of the para-political aspects of tremendously complex stability operations. Possibly, the best recent example remains our ongoing military operations within Bosnia. That said, it's easy to see how the concept of Army Space support operations to MACA during operations within the United States equals Humanitarian Assistance outside off the United States. It is, therefore a relevant Space operations mission option for current and future Army Space forces.

LTC Perkins is the Space Division chief of the Force Developments and Integration Division leading developments within Space control, missile warning and doctrine, organization, training, materiel, leadership development, personnel and facilities. He served as crew commander and the Officer in charge of the Operational Intelligence Watch within the Cheyenne Mountain Operations Center (CMOC), North American Aerospace Defense Command (NORAD) as well as crew commander within Space Operations Center (SPOC) of the former U.S. Space Command. He is a qualified FA40 and earned the Air Force Space Operations badge in 2003.

Jay Kirshenbaum is a Military Analyst (Space Systems) supporting the U.S. Army Space and Missile Defense Command's Force Development and Integration Center in Colorado Springs, Colo. He retired from the Air Force in 1996 after completing space operations tours as Det 4 Air Force Operational Test & Evaluation Center 's Director of Operations for the Cheyenne Mountain Upgrade Program, as a USJ5B Long-Range Strategic Planner and as Space Defense Operation Center's Deputy Crew Commander in Cheyenne Mountain, both with U.S. Space Command. Prior to attending Undergraduate Space Training and cross-train out of Intelligence in 1990, he held other key command and staff positions as an Air Staff POM builder at the Pentagon, as an Intelligence Targeting Officer assigned to Allied Air Forces Central Europe (NATO-AAFCE) in Germany and as a Intelligence Targeting Officer assigned to the 544th Strategic Intelligence Wing at Offutt Air Force Base, Neb.

New Missions ... from Page 33

funding and adequate technology. Any dramatic escalation of current operational engagement will significantly impact our ability to transform.

Our operational center of gravity is projecting the force and providing global strike, global ballistic missile defense, information operations, C4ISR and Space operations capabilities anywhere in the world, in either a supported or supporting role. Our critical vulnerability would be any inabilities to rapidly and effectively respond. We need to apply a capability to any area of the globe with no technological limitations, communications shortfalls or impediments in acquiring, processing and applying information from the global information grid.

As the new mission areas are integrated with existing ones, we continue to adapt as we take on increased responsibilities and a broader perspective. At the operational level, the fielding of the Ground-based Midcourse Defense marks a significant insertion of capability based on technological developments. Future enhancements to our warfighting capabilities in all mission areas will continue as we continue to focus on the objectives at hand.

Army Support Plan

The Army, as the service component for U.S. Strategic Command offers the following campaign plan:

- Aggressively fill the 64 positions authorized by the Department of the Army to conduct deliberate and crisis action planning across all Strategic Command mission areas. Organized by mission area in the command's G-3 Plans and Exercises Division, these additional personnel (comprised of active component, reserve component and civilians) will plan, coordinate and integrate Army capabilities.
- Develop concepts of operations for each of the newly assigned mission areas, which will clearly define how this command will provide capabilities as the Army service component to U.S. Strategic Command.
- Implement the required connectivity architecture to perform the new missions. Full mission capability requires reliable and comprehensive connectivity across the entire band of communications and connectivity systems. Actions are ongoing to ensure that operations center command and control systems, restricted access facilities, additional clearances for required personnel, etc., meet new mission requirements. This includes updating architectures and systems to ensure the integration of Army capabilities worldwide.

Conclusion

The mission requirement is to build, maintain and sustain a fully capable support command with a trained and ready Army force able to plan, coordinate, integrate and execute all aspects of its assigned missions, functions and responsibilities from U.S. Strategic Command. Challenges exist, but the performance of SMDC/ARSTRAT is critical to the nation's defense.

William G. Furr serves as the Deputy Director, Interagency Coordination for Law Enforcement and Security at NORAD and U.S. Northern Command. He previously was the Deputy Chief, G-3 Plans and Exercises Division with SMDC/ARSTRAT in Colorado Springs and was directly responsible for the evolution of Space plans to a multifaceted plans and exercises office which now provides support to U.S. Strategic Command. Mr. Furr served in the active duty Army for 8 years in various leadership and command positions. He began his Civil Service career in 1989 as a Counter Drug analysts supporting NORAD. He was cited for Exceptional Meritorious Service in November 2003.

Pioneer ... from Page 43

daris, the first commander of the Army Ballistic Missile Agency. General Stewart rode those rockets," said Dodgen.

Stewart took the podium with characteristic vigor, promising the large audience comprised of his family, friends and SMDC/ARSTRAT Soldiers and civilians that, if they didn't already know just what the Army did in Space, he was about to educate them. And he did, tracing the Army's development of the first satellite to answer the Soviet Union's Sputnik, and the Army's rocket that put the first astronauts into Space through today's support of the warfighter with high-speed communication and imagery.

"We have a long and proud history in Space, and I'm privileged to be a part of it. But first and foremost, I was a Soldier."

(Earlier, Stewart told tales of tagging along with National Guard units during their annual summer training when he was 11, serving as their water boy just so he could do "Army things.")

"I am humbled to have my portrait hang next to that of General Medaris, who personified the meaning of "audacity" — a key characteristic of any pioneer. But what I like most to remember about General Medaris is that, when he retired after serving his country so illustriously, he began a second career — as an Episcopalian priest. I think one of you all (addressing the audience) should someday put a plaque over his portrait, maybe bronze, saying "He served his country and his God." All I'd ask is a small one over mine, saying, "Me too."

With that, Dodgen and Stewart ceremoniously unveiled the portrait of Stewart, in NASA garb, that would hang in the Pioneer Conference Room Hall of Fame.

Changing? ... from Page 15

relate to each task. To identify the feasibility of a task, we must know what the specific requirements are, to what level they need to be accomplished, and we must identify the accompanying environmental conditions. However, until we know what tasks are to be accomplished, we cannot build the conditions and standards effectively. This process is ongoing, and is far from complete. As all of the tasks are better defined and the conditions surrounding them are identified, then we can accurately evaluate our progress and see whether we are accomplishing the tasks.

So what is the way ahead? The joint mission essential task list will soon be approved so that we can fully develop the conditions and standards as they apply to each task. Once approved, we can help the MSEs and the supporting commands define and build their own mission essential tasks. Those tasks, in turn, become the supporting/command-linked tasks to the joint task list. When that is accomplished, we will have an effective task list to focus on what needs to be done to support the Command and successfully accomplish its mission.

It is SMDC that has changed, not Space.

Steve Overton currently serves in the SMDC/ARSTRAT G-3 Training and Readiness Branch in Colorado Springs. He retired from the Army in 1996 after serving in a variety of leadership and staff positions with Infantry and Special Forces units, both in the active component and in the Reserves as a full-time Active Guard/Reservist.

LTC George Gorishek is a mobilized reservist currently serving under the G-3 Operations Division in SMDC/ARSTRAT in Colorado Springs. He has served 10 years of active duty in numerous aviation assignments, and held various training-related positions in both the active and reserve components of the U.S. Army.

LTC Todd Wang currently serves in the SMDC/ARSTRAT G-3 Current Operations Branch in Colorado Springs. Previous assignments include a variety of Corps of Engineer districts and troop units where he served in leadership and staff positions. Selected for battalion command, he will assume command of a Corps of Engineer District later this year.

IO ... from Page 23

supports U.S. Strategic Command's new missions. How does IO fit into this plan? Our IO plans, integrates, coordinates and advocates for the Army IO capabilities to support U.S. Strategic Command, the regional Army and joint force commanders. IO also develops and integrates Space capabilities in support of Army IO capabilities and missions.

Key responsibilities in support of the command are listed below. G-3 Plans and Information Operations will:

- Plan, coordinate and integrate Army IO capabilities and forces with the plans and operations of U.S. Strategic Command, and provide support to the operations center, the command's planning and operations area, global strike planning and the global strike planning elements.
- Provide support to special technical operations and relevant special access programs.
- Maintain situational awareness of Army IO resources and capabilities.
- Coordinate planning actions and operations with other Army support centers.
- Develop and brief command positions on joint and Army IO issues, as well as execute the staff supervisory role over the planning, coordination and command and control of Army IO operations as required.
- Coordinate directly with all inside and outside command areas to accomplish specified Army-wide operational requirements, and act as the SMDC/ARSTRAT mission area integrator for IO.
- Identify desired IO capabilities, characteristics, and requirements, and advocate them to U.S. Strategic Command.

Mission Area Interconnectivity

The IO mission is not conducted in a vacuum. It also provides support to other key mission areas, including global strike, missile defense, C4ISR, Space operations and special technical operation missions. It has a symbiotic relationship with Space control, which can sometimes lead to misunderstandings about the two mission areas. If a system or capability can potentially support both areas, the key discriminator in determining the mission area to support will be the primary intended effect. Space control contributes to our ability to achieve information superiority and gain dominant maneuver. IO contributes to information dominance by affecting the adversary's human and automated decision-making ability and, ultimately, his will to fight.

Conclusion

The IO mission continues to progress and mature as IO concepts and policies at the Department of Defense and joint levels change, then the Army IO vision and campaign plan will continue to evolve as it contributes its support of mission objectives. The main goal and challenge, however, is to remain flexible and keep focused on the ultimate objective: Guarding our new frontiers.

Jeff Harley serves in the G-3 Plans, Information Operations Branch in Colorado Springs, Colo. He retired from the Army in 2000 after serving in numerous command and staff positions in the continental United States and Germany; including Department of the Army Inspector General, 104th Military Intelligence Battalion S-3, and Commander, A Company, 204th Military Intelligence Battalion; and was also a member of the Command and General Staff College class of 1993.

Look for details from these two events in the next *Army Space Journal*!

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Space Support and Global Operations

JUNE 3 - 4, 2004

&

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The Westin Long Beach
Long Beach, California
Hosted by the Greater Los Angeles Chapter of AUSA
In cooperation with:
United States Army Space and Missile Defense Command
United States Army Chief Information Officer/G6
Unites States Army War College

The FA40 Space Operations Officer Training Conference will be held in tandem with the AUSA Long Beach event from June 2 - 4, 2004.

SOLDIERS OF VISION:

We Don't Stop When We Take off the Uniform

By Edward B. Kiker

The *Army Space Journal* recently presented a great piece on Edgar Allen Poe, the poet and novelist, who had served in the U.S. Army as a sergeant major. There have been many other service personnel who went on to great fame or influence, and some of them looked with great perspicacity into the dim fog of the future. Here are a few who served, then involved themselves with visions for the future.

Gene Roddenberry — "Star Trek" Creator

Gene Roddenberry, the creator of the "Star Trek" sagas volunteered for the U.S. Army Air Corps and was a flying cadet at Kelly Field, Texas as WWII began.

Second Lieutenant Roddenberry flew B-17 bombers out of Guadalcanal in the South Pacific. He flew missions against enemy strongholds at Bougainville and participated in the Munda invasion. He took part in 89 missions and sorties, and was awarded the Distinguished Flying Cross and the Air Medal.

This was also where he started his writing career, selling stories to aviation magazines, and later poetry. After combat, he became an air crash investigator for the Air Force working out of Washington, D.C. When the war was over, he joined Pan American World Airways, while studying literature at Columbia University.

On a flight from Calcutta, India one evening, his plane lost two engines and caught fire in flight, crashing in the Syrian Desert. As the senior surviving officer, Roddenberry sent two Englishmen swimming across the Euphrates River to find the source of a light he had observed just prior to the crash. While they were gone and his remaining party was very vulnerable, he parleyed with nomads who had come to loot the dead. The Englishmen reached a Syrian military outpost, which sent a small plane to investigate. Roddenberry and the small plane returned to the outpost, and he asked Pan Am to send a stretcher plane to the rescue. Roddenberry received a Civil Aeronautics Commendation for his efforts during and after the crash.

Roddenberry later went on to create the "Star Trek" television series and was a technical advisor for the Star Trek films. His grounding in the sciences was a basis for many aspects of "Star Trek" technologies, some of which have now come true, such as transparent aluminum, an aluminum ceramic. It is now under development as transparent armor for riot gear face and body shields, and may be used for HMMWV windshields and other applications.

James Doohan — "Star Trek" Star

In WW II Captain James Doohan landed on the beaches of Normandy with the Royal Canadian Army on D-Day and was wounded there. He then became a pilot-observer, and was known as "the craziest pilot of the Canadian Air Force," flying into dangerous situations to obtain intelligence. After WW II he went into acting, featuring in over a hundred films. He is today best known as "Scotty," chief engineer on the Starship Enterprise of "Star Trek" fame. When he first took the role of Scotty he thought it was a small part in a short-lived show. But it was during "Star Trek" that he met Gene Roddenberry. Doohan gained a strong personal appreciation for the potentials of Space exploration. He became a spokesman for Space exploration, often attending and speaking at conferences and schools without pay to encourage people to envision the unlimited possibilities available through Space exploration. I was fortunate enough to meet and talk with him at one of these conferences.

Dr. Peter E. Glaser — Inventor of the Solar Power Satellite

As I interviewed Dr. Glaser for this article, he told of his escape from the Nazi takeover of Europe in 1939. He was born in Czechoslovakia, but fled to England where

Recommendations for topics or submissions for the Historical Feature segment of the Army Space Journal are welcomed and encouraged. Submission may be sent to the Managing Editor via e-mail to richard.burks@arspace.army.mil

he attended Leeds College of Technology. He then enlisted in the Free Czechoslovak Army, and became a PFC in an armored battalion crewing British-built tanks. As the Allies raced across France his unit was attached to a unit of the U.S. Army, and participated in the victory parade in Prague with the permission of the Red Army.

"They inspected us to make sure we had no ammunitions in our tanks and trucks. This convinced me that we were under USSR occupation, and that I had better leave as soon as possible or be subjected to working in coal mines or other plush jobs which the USSR had in mind for members of the Free Czechoslovak Army." Dr. Glaser managed to come to the United States, and earned his Ph.D. at Columbia University in 1955.

Today he has become a world-renowned Space technologist. He designed the solar-powered laser device taken to the Moon on Apollo 11. It precisely measures the distance between the Earth and Moon. Today it is the only piece of Apollo 11 equipment still functioning on the Moon.

Dr. Glaser invented the Earth-orbital Solar Power Satellite, or SPS, and the Moon-based Space Solar Power System, or SSPS, that may become major sources of electrical energy for Earth in the future. The SPS is a very large photo voltaic structure (miles on a side) designed to be built in geosynchronous orbit to produce electricity from sunlight and beam it to Earth by low-density microwave to a ground receiving antenna, then into existing electrical grids. The SSPS is a similar structure, but built on the Moon of Lunar materials. SSPS is the preferred system as it is more easily built, expanded and serviced.

He became vice president for Space Operations at the Arthur D. Little Company, Massachusetts, and in cooperation with Raytheon Company and others, developed, built and demonstrated the actual hardware microwave transmitting and receiving antenna technologies. His SPS work was the inspiration for the U.S. Army Space-based Theater Electric Power System, or STEPS, a smaller version of the SPS, proposed by the U.S. Army Space Institute (TRADOC) to DARPA in 1989. The SPS idea is being actively developed today in Japan, Russia, China, India, and Europe. Dr. Glaser advocates using the International Space Station for a proof-of-principle experiment to transmit microwave energy from its solar photo voltaic arrays to a receiving antenna on the ground as it passes over. He is also thinking of having the receiving antennas floating in the ocean.

Dr. Glaser regards the Army as more forward-looking than some of the other services, and follows Army technology developments with interest, particularly the High Altitude Airship, or HAA Advanced Concept Technology Demonstration. He has suggested beaming power to the HAA from the ground with microwave energy to replenish its energy storage systems, and from an HAA to provide early entry electricity support

Bob Keeshan – Captain Kangaroo

Bob Keeshan, children's television performer was a U.S. Marine in World War II. He served on Iwo Jima, and was awarded the Navy Cross for valor. After the war he worked as a receptionist at NBC Radio in Manhattan, taking on small acting parts. His next job was as a stage assistant on the "Howdy Doody Show." He soon gained national acclaim on the show as Clarabell the Clown, a mute clown who communicated by honking a horn. He is best known as Captain Kangaroo on the children's television serial by the same name, where he changed the future course of children's education by introducing them to science, literature, and music in a manner that was exciting and enjoyable. His entertaining educational methods have been widely copied on television and in schools.

Arthur C. Clarke -- Novelist and Futurist

During World War II, as a Royal Air Force officer, Arthur Clarke was in charge of the first radar talk-down equipment during its experimental trials. His only non-science-fiction novel, *Glide Path*, is based on this work. In 1945 he published the technical paper "Extra-terrestrial Relays" laying down the principles of the satellite communication with satellites in geostationary orbits -- a speculation realized 25 years later. His invention has brought him numerous prestigious honors. Today, the geostationary orbit at 42,000 kilometers is named The Clarke Orbit by the International Astronomical Union.

Among his many writings are *2001: A Space Odyssey, 2010: Odyssey Two, 2061: Odyssey Three, The Promise of Space, Reach for Tomorrow, Islands in the Sky, The Sands of Mars, The Hammer of God, Tales from Planet Earth, Report on Planet Three, Imperial Earth, The Exploration of Space, Master of Space, Rendezvous with Rama*, and many more.

Samuel Langhorne Clemens — Mark Twain

Most readers know Clemens by his nom-de-plume, "Mark Twain," creator of *Tom Sawyer, The Adventures of Huckleberry Finn, Tom Sawyer Goes Abroad*, and many more popular stories set before, during, and just after the Civil War.

As a Mississippi riverboat pilot, Samuel Clemens fulfilled a childhood dream when he apprenticed to this job. After 18 months of training he navigated the Mississippi with its ever-changing mud banks and sand bars. When the Civil War closed traffic on the river in the spring of 1861, Clemens volunteered for the Confederate Army. Not finding this to his liking, he deserted to join his brother who was an abolitionist territorial secretary in Nevada. He moved to Carson City, tried his luck with timber, then mining, then finally found a measure of success in 1862 as a feature writer for the *Virginia City Territorial Enterprise*.

His personal interests in celestial navigation, astronomy, manned powered flight, cartography, and other sciences were shown in *Tom Sawyer Goes Abroad*. In the story, Tom Sawyer and two friends travel from New Orleans to Egypt in a powered balloon.

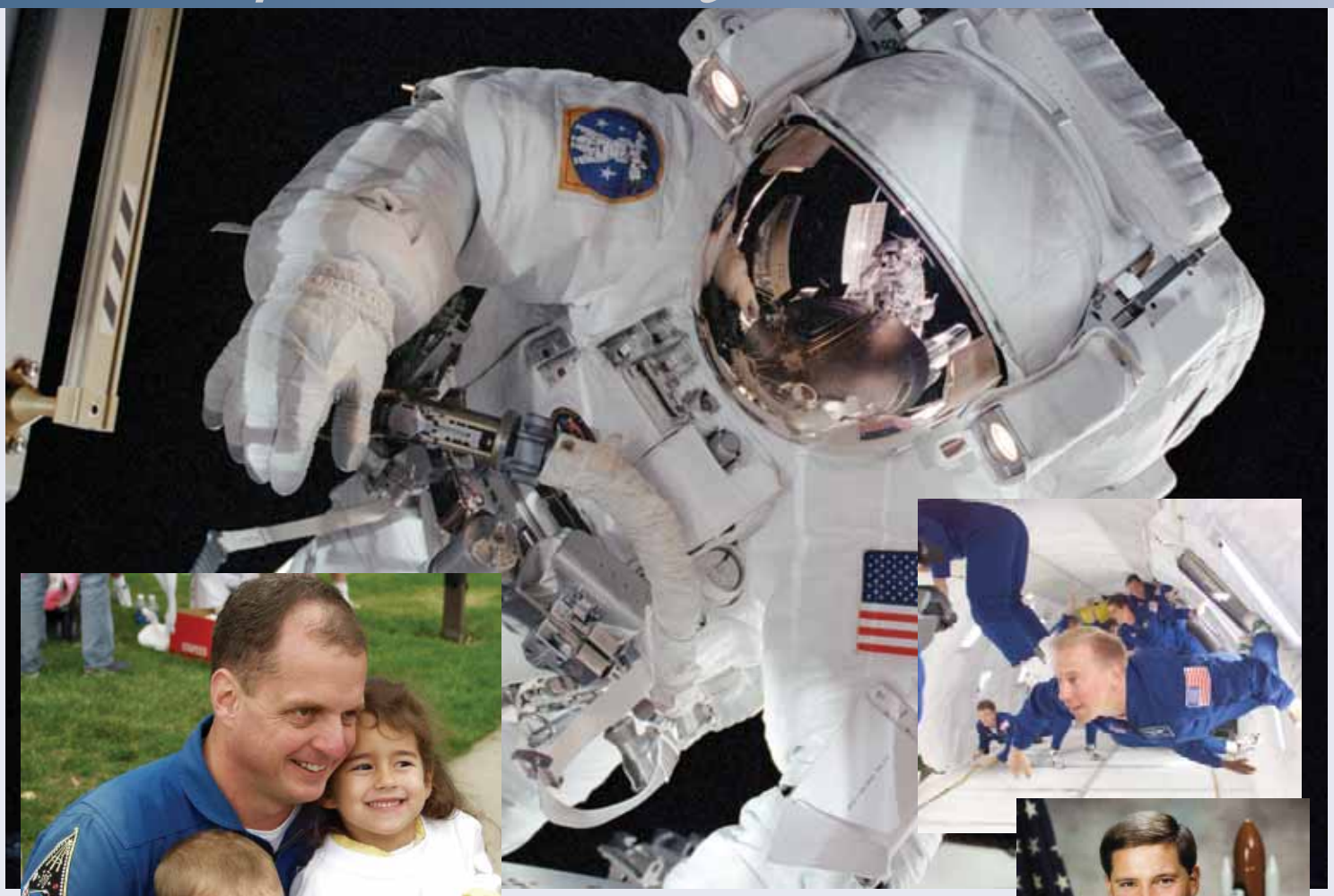
Clemens humorously predicted that Halley's comet would next return at the time of his own death, since his birth coincided with the comet's 1835 appearance. This prophecy was fulfilled in 1910 when he died at his home in Redding, Connecticut.

Power to Create the Future

I encourage all readers to use the knowledge gained throughout life to inspire future generations. You can imbue them with an appreciation of the potentials of Space exploration and Space enhancement of future military and commercial technologies. Whether you are a Soldier, Airman, Marine, or civilian, you can have an impact on the future -- just like Private First Class Peter Glaser and the other notable people profiled above. All of us have the power to create the future.

Edward Kiker is a project engineer and technical specialist serving as a team leader in the SMDC Operational Support Office in Colorado Springs. He evaluates potential space capabilities for applicability in addressing ARSTRAT operational requirements. He supports the Assistant for Operational Support in advisory activities for SMDC and U.S. Strategic Command.

The Flipside — Army Astronauts



There are now seven astronauts in the U.S. Army Astronaut Detachment. They are clockwise from top, COL Patrick Forrester, LTC Timothy Kopra, LTC Doug Wheelock, COL Jeff Williams, COL Nancy Currie, LTC Timothy J. Creamer and on the opposite page, the newest astronaut, MAJ Shane Kimbrough.

New Army Astronaut Named

Peterson Air Force Base, Colo. — Another Soldier will join the ranks of NASA Astronauts and the Army Astronaut Detachment. MAJ Shane Kimbrough will be among 14 individuals — three Japanese, four military and seven civilians — announced as the 2004 class of astronaut candidates during the Space Day celebration at the National Air and Space Museum Steven F. Udvar-Hazy Center in Chantilly, Va.

"Service to this nation has always been important to me," said Kimbrough who has been a Space operations officer at the Detachment since 2002.

"The benefits to society as a result of NASA's discoveries are phenomenal. That's what motivated me to want to work here. I'm very honored and happy to represent the Army in this capacity."

The Detachment — part of the U.S. Army Space and Missile Defense Command/U.S. Army Forces Strategic Command based in Colorado Springs, Colo., element — currently includes six active-duty Army astronauts and is located at the Johnson Space Center, Houston, Texas. Three of these Army astronauts have already flown aboard Space shuttle missions.

"Those Army astronauts who have gone before me are obviously outstanding — so I've got big shoes to fill, but I'm just honored to be associated with this right now," said the 36-year-old Army pilot.

Prior to being tapped for astronaut training, Kimbrough served as a flight simulations engineer.

"What I do is fly on a shuttle training aircraft, which is a modified Grumman Gulf stream jet that is used to train the astronauts on how to land the Space shuttle. We call it a simulator, but it is a real airplane and the only vehicle we have to train the shuttle pilots how to land the shuttle."

Kimbrough joins other classmates consisting of pilots, engineers, researchers and educators who will begin their training at the Johnson Space Center this summer setting their sights on the new Vision for Space Exploration.

"Once I finish my first year of astronaut training," he says, "I hope to be assigned to several technical jobs so I can improve myself professionally. But then I'd be thrilled to take on any Space mission — even to the moon or Mars."

Space Notes

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

Defense Chief Maps Military's Needs For Transformation

By Greta Wodele, National Journal's Technology Daily, 4 February 2004

Defense Secretary Donald Rumsfeld on Wednesday mapped for lawmakers how much money the military believes it needs in fiscal 2005 to continue its efforts to transform U.S. forces in the face of 21st century threats. He said the fiscal 2005 proposal includes $29 million to meet transformational goals identified in a 2001 defense review. The review also highlighted the need to improve the military's Space-based surveillance technologies, such as satellites, protect military networks from attack and disable the enemy's information networks, among other goals. To continue communication and intelligence projects, Rumsfeld said the budget requests $408 million for Defense's Space-based radar system to monitor targets behind enemy lines "in any kind of weather." The request also includes: $775 million for a satellite system to decrease from minutes to seconds the time it takes to transmit images and information among the armed forces; $600 million to develop wireless Internet capability to transmit information among joint war-fighters; and $700 million to consolidate the military's various unmanned aerial vehicles.

Lockheed Martin and Northrop Grumman Team Up for Space Satellite Radar Bid

Denver Post, 9 February 2004

Lockheed Martin has selected Northrop Grumman Corporation as a teammate in the competition to develop the Space Based Radar (SBR) system for the U.S. Air Force. The Space Based Radar mission will provide worldwide, on demand, persistent surveillance and reconnaissance for Department of Defense and national intelligence users. Scheduled for initial launch in 2012, the SBR system will grow to a constellation of spacecraft to provide rapid-revisit coverage of the entire Earth's surface. Lockheed Martin Space Systems will lead the effort as the systems prime contractor, while Northrop Grumman will serve as Lockheed Martin's primary teammate and subcontractor. Space Based Radar is a transformational system being developed for the U.S. Department of Defense to provide global intelligence, surveillance and reconnaissance (ISR). The SBR system will provide persistent real-time intelligence on adversary activity through the identification and tracking of moving targets, high-resolution synthetic aperture radar imaging, and collection of high-resolution terrain information.

USAF Aims To Neutralize Anti-Satellite Weapons

By Jeremy Singer, Defense News, 2 February 2004

The U.S. Air Force is studying ways to protect American military satellites from enemy anti-satellite weapons, including such potentially controversial concepts as armed spacecraft escorts. Destroying other satellites is not the effort's primary focus, but the military will likely need a system to neutralize anti-satellite weapons sometime between 2018 and 2030, said Col. William Doyle Jr., chief of the plans division at Air Force Space Command. The plan, released in early January, is intended to outline the capabilities that will be critical to military Space operations, rather than specify particular systems, Doyle said. The plan says defensive measures will be "twice as important" as offensive measures for protecting U.S. satellites. Defensive measures can include moving a satellite to avoid collision with another object in Space, or shutting it down during a solar flare, Doyle said. The military will also hunt down and destroy ground-based satellite-jamming equipment, as it did in Iraq, he said. The Air Force will equip its satellites with onboard sensors that can locate and characterize potential threats, such as the Rapid Attack Identification, Detection and Reporting System, already under development. Separate spacecraft will likely be required to neutralize anti-satellite weapons designed to collide with or otherwise attack U.S. spacecraft, according to the master plan. The concept of escort satellites is not mentioned in the plan, but Doyle said they could be used.

Row Over GPS Jamming Still Divides U.S. And Europe

Will Knight, NewScientist.com news service, 3 February 2004

Talks to resolve a dispute between the European Union and the U.S. over how the EU's new satellite navigation system Galileo will provide its signal have ended without agreement in Washington. Galileo is scheduled to start operating in 2007 and the EU would like the standard, publicly available signal to use a modulation known as Binary Offset Carrier (BOC) 1.5, 1.5. But U.S. officials argue that this would interfere with its use of an encrypted military signal from its satellite network, the Global Positioning System (GPS). This signal, known as the M-

code, is planned for deployment in 2012. During a military conflict, the U.S. would try to jam all public satellite signals so that its enemy could not use satellite positioning. But jamming Galileo's signal would also disrupt the M-code, the U.S. says. An alternative modulation, called BOC 1.1, has been suggested for Galileo by the U.S. But this would provide a slightly less accurate signal, prompting some observers to suggest that the U.S. is trying to degrade Galileo for commercial reasons. Another meeting between the EU and U.S. will be held later in February when officials will try to resolve the outstanding issues. Whichever modulation is finally chosen Galileo should provide a more precise service than GPS as it exists now. Europe has argued it needs a satellite positioning system that is independent from GPS, to ensure a sound footing for development of commercial capabilities. Nonetheless, EU and U.S. officials have agreed to make the Galileo and GPS interoperable and Galileo will also provide an encrypted signal for use by European military forces.

Canadian Forces To Tap Into U.S. Satellite System

By David Pugliese, Victoria, British Columbia, Defense News.com, 10 February 2004

The Canadian Forces will receive access to the U.S. Department of Defense's Advanced Extremely High Frequency (EHF) satellite system by the end of the decade, giving it a dedicated satellite communications capability for the first time. Canada will receive access to the satellite constellation for a 12-year-period starting at the end of 2009, said David Meeds, manager of the Canadian Forces Protected Military Satellite Communications Project. The Advanced EHF satellite program is managed by the U.S. Air Force and provides the next-generation follow-on capability to the Milstar system. The Advanced EHF program will consist of three to four cross-linked satellites with increased communications capacity and coverage. The first satellite is scheduled for launch at the end of 2006 or in early 2007.

DoD Expects To Field Nine GMD Interceptors In 2004

Marc Selinger, Aerospace Daily, 4 February 2004

Defense Department officials, providing more specifics about their missile defense deployment plans, revealed late Feb. 2 that nine interceptor missiles for the Missile Defense Agency's Ground-based Midcourse Defense (GMD) system will be deployed by the end of 2004. DoD had previously estimated that it would field "up to 10" interceptors in 2004. Officials said the department will deploy the interceptors as they become available. The department continues to say it plans to field a total of "up to 20" interceptors by the end of 2005: 16 at Fort Greely, Alaska, and four at Vandenberg Air Force Base, Calif.In addition, DoD announced recently that it intends to deploy up to 20 more interceptors in 2006-2007, some of which could be located at an unspecified third site (DAILY, Feb. 2). The extra interceptors would bring the total to as many as 40.To defend against long-range ballistic missiles, DoD expects to begin putting GMD on alert with several interceptors in the fall of 2004.

Pentagon OKs Army Plan To 'Bridge' Expected MEADS Delay

Emily Hsu, Inside Missile Defense, 4 February 2004

The Pentagon has approved the Army's plan to address a "likely delay" to the start of the Medium-Extended Air Defense System development program, according to a Jan. 29 memo. Signed by the Pentagon's acting acquisition chief Michael Wynne, the memo directs the Army to begin plans to expand the MEADS risk-reduction effort to "bridge" a delay likely to occur before system development and demonstration begins. The SDD phase was slated to begin this spring following the signing of a memorandum of understanding by the United States and its European partners (Germany and Italy). This may change, however, as the nations continue to negotiate an agreement on how to accommodate the recent U.S. decision to merge MEADS with the Patriot Advanced Capability-3 program while meeting the needs of the Germans and Italians. The Army and Office of the Secretary of Defense, meanwhile, have been hashing out a formal agreement on how the service will move forward with the recently restructured programs, according to defense and industry sources.

Lockheed Martin Delivers Integrated Air and Space Command and Control Capability for Air Force, USSTRATCOM

PRNewswire-FirstCall, Colorado Springs, CO, Yahoo! Financial News, 30 January 2004

Lockheed Martin has delivered a prototype integrated air and Space command and control (C2) capability to the U.S. Air Force and U.S. Strategic Command (USSTRATCOM), taking the first significant step toward automated access and availability of Space information in Air Operations Centers (AOC) around the globe. Delivered to the C2 Transformation Center, Langley Air Force Base, the prototype capability integrates Global Positioning System (GPS) navigation accuracy and satellite overflight information directly into the air battle planning process. Through the integrated capability, Space battle management systems will also have access to the Air Tasking Order (ATO), while the AOC will have similar access to the Space Tasking Order (STO). This

move will enable more cohesive planning between air and Space command centers, and provides an initial but powerful machine-to-machine data exchange capability that will serve as the foundation for future integration efforts.

Air Force, NRO Paths Diverge on New Communications Satellites

Jeremy Singer, Washington, Space News, 19 January 2004

Divergent requirements have led the U.S. Air Force and National Reconnaissance Office (NRO) to pursue separate but compatible next-generation communications satellites rather than a common platform as originally planned, according to Pentagon and industry officials. In addition, the new Air Force system, dubbed T-Sat, is expected to complement rather than replace the X-band Wideband Gapfiller communications satellites that the service plans to deploy starting in 2006. The T-Sat satellites are expected to begin launching in 2012, and the NRO satellites are expected to launch on a similar schedule. Both the T-Sat and NRO Optical Relay Communications Architecture satellites will be equipped with laser as well as radio frequency payloads and are expected to provide at least 10 times greater capacity over today's systems, which rely exclusively on radio frequency.

Surviving Space: Risks to Humans on the Moon and Mars

By Robert Roy Britt, Senior Science Writer, Space News, 20 January 2004

There is no "biggest danger" in setting up a permanent lunar presence or sending people to Mars, says John Charles, an enthusiastic proponent of both ideas and a NASA analyst of the costs and risks of human Space flight: "There are several." Launch, landing and re-entry are perhaps the riskiest moments of any Space venture, history shows. But on long missions, what would otherwise be minor threats could become at best serious limitations or at worst deadly disasters. Basking in the glow of President Bush's call for sending humans back to the Moon as early as 2015 and then eventually to the red planet, Charles, who works at the Johnson Space Center in Houston, offered up his danger list yesterday:

- Lack of a medical facility could turn a mundane injury into a life-threatening situation;
- "Psychosocial" pressure will be high in a small group isolated for months or years;
- Zero or reduced gravity causes bone and muscle loss;
- Dangerous radiation particles are abundant beyond Earth orbit.

Russia To Construct Its Own Global Navigation System

Pravda.ru, 28 January 2004

After completing its own global navigation system, Russia will become the second country, along with the USA, to have its own satellite navigation system. According to the Russian Aviation and Space Agency, this year Russia is going to launch three satellites of Uragan (Hurricane) class and to finish developing its own Glonass global navigation system. Successful launching the satellites scheduled for the end of the year will allow Russia to have the group of 16-18 satellites onto the orbit by the end of 2005. Glonass system is designed for continuously transmitting the coordinates of objects located in air, at sea, on the ground or in Space to within one meter. According to experts, launching the global navigation system is a critical component for effective military defense for Russia and protecting its national interests. Two Uragan satellites and one Uragan-M new generation device designed for 7 years of use will be transported to the geo-stationary orbit by Proton carrier rocket.

Koptev: Satellite Deal Will Be Signed Soon With India

By Simon Saradzhyan, Staff Writer, Moscow Times, 30 January 2004

Moscow and New Delhi will sign an agreement this year for India to help Russia develop its Glonass satellite navigation system, which needs more satellites to have a global reach, Russian Aviation and Space Agency chief Yury Koptev said. The Russian Space agency and the Indian Space Research Organization signed a memorandum of understanding in November for India to assist in designing and producing the satellites.

Air-Breathing Space Vehicles May Follow In USAF Wave Rider's Wake

By Jeremy Singer, Washington, Defense News, 26 January 2004

Pratt and Whitney and Boeing Co. plan to start flight-testing a scramjet rocket engine aboard an experimental missile around 2007. The tests, which are being funded by the U.S. Air Force, could set a speed record and also pave the way for air-breathing Space launch vehicles around 2020, service and industry officials said. In addition to helping improve satellite launchers, the technology, known as a supersonic combustion ramjet, could benefit a variety of other applications, including long-range strike vehicles. The laboratory awarded a $7.7 million dollar, one-year contract Dec. 12 for the two companies to work on their design for the expendable Endothermically Fueled Scramjet Engine Flight Demonstrator vehicle, which is also known as the Wave Rider because it resembles a surfboard. The Wave Rider contracts are part of an effort called the National Aerospace Initiative, which is intended to coordinate the military's work on both air and Space propulsion systems,

with an initial focus on hypersonic technology. Hypersonic vehicles fly at speeds of at least Mach 5. Scramjet engines rely on oxygen from the atmosphere, rather than onboard tanks, to mix with hydrogen fuel to produce thrust. By eliminating the need for oxygen fuel tanks on the vehicle, designers are able to reduce the vehicle's overall weight, which in turn increases its payload capacity. In the planned flight demonstration, the Wave Rider will be attached to an Army tactical rocket booster. The rocket will be carried to an altitude of about 11 kilometers by a B-52 bomber aircraft, then released. The rocket and the attached Wave Rider then will accelerate to a speed of about Mach 4.5 and fly to an altitude of about 20 kilometers. At that point, the solid rocket booster is supposed to fall away as the Wave Rider's scramjet engine kicks in, helping it accelerate to Mach 6.5. If the Wave Rider meets its goal of reaching Mach 6.5, that would place it ahead of the experimental rocket-powered F-16 as the military's fastest air-breathing vehicle. Operational vehicles flying at that speed could quickly carry sensors for reconnaissance or munitions to strike targets to areas located far from the United States. This technology also could be used for new Space launch vehicles that could operate in a way similar to aircraft.

GMD Successfully Conducts Flight Test With New Booster

Marc Selinger, Aerospace Daily, 28 January 2004

The U.S. Missile Defense Agency's Ground-based Midcourse Defense (GMD) program has successfully conducted its first system-level test using a new interceptor booster made by Orbital Sciences Corp., according to MDA. Launched on Jan. 26 at 9:23 p.m. Eastern time from the Kwajalein Atoll in the Marshall Islands, the interceptor was integrated for the first time with various GMD components, including the fire control system, which generated targeting information for the interceptor. During the test, known as Integrated Flight Test-13B (IFT-13B), the Orbital booster lifted off with a Raytheon-built mock exo-atmospheric kill vehicle (EKV). MDA spokesman Rick Lehner told The DAILY Jan. 27 that a computer simulation of a target launched from Vandenberg Air Force Base, Calif., showed there probably would have been an intercept in IFT-13B had a real kill vehicle and an actual target missile been used. The shoot-down would have taken place about 800 miles northeast of Kwajalein. The mock EKV "was in the proper position to make an intercept," Lehner said. For the GMD program, which is developing a shield against long-range ballistic missiles, IFT-13B was the second test with the Orbital booster. The Orbital rocket had its first successful launch during Booster Verification-6 (BV-6) in August 2003. Lehner said IFT-13B did not repeat a problem that arose in the GMD program's previous test, Booster Verification-5 (BV-5), in which a new booster made by Lockheed Martin Corp. failed to separate from a Raytheon mock EKV on Jan. 9. MDA is still trying to determine why the separation did not occur.

North Korea Offers Nigeria Missile Deal
U.S. warns ally to spurn pact

By Nicholas Kralev, The Washington Times, 29 January 2004

North Korea has offered to sell Nigeria advanced missile technology, the Nigerian government said yesterday, prompting the United States to warn its African ally that it might face sanctions if it strikes a deal with Pyongyang. Nigerian officials yesterday issued vague and contradictory statements about their intentions and the missile type on offer, although they acknowledged seeking ballistic-missile technology for "peaceful" purposes. A sale would mark the first time that such technology has been introduced into sub-Saharan Africa, raising the prospect of a costly new arms race among some of the world's poorest and least-stable nations.

Study Urges Addition of Space Weapons to Missile Defense Shield

By Randy Barrett, Space News, 19 January 2004

Space-based weapons should be a central component of the national missile defense shield, according to a new report authored by a prominent missile defense pioneer. The report, "Missile Defense for the 21st Century," was written by Los Alamos National Laboratory Senior Fellow Gregory Canavan and released by the Heritage Foundation late last month. The study argues that Space-based, kinetic kill vehicles using largely 1980s era brilliant-pebbles technology could provide the cheapest and most effective defense against enemy missiles in their boost and midcourse phases of flight. The position is not a new one for Canavan or the Heritage Foundation which have long supported the concept of weaponizing Space. According to the report, the Pentagon has overlooked viable Space-based technologies that could produce interceptors for as little as $2 million apiece within the next three years. "The main requirement is that Space-based intercept costs be competitive with those of other elements of the defense," said the report. To cover the full threat of both rogue-state launches and unauthorized firings of Russian or Chinese missiles, America would need about 2,500 kill vehicles in Space, according to the report. But the Missile Defense Agency (MDA) has shown little interest in Space-based missile defense, opting instead to put most of its $9.1 budget into ground and sea-based systems.

The Killing Fields of Iraq

A personal accounting of the discoveries of mass graves, and how SMDC located them

By Master Sgt. Richard Burch, USAF

SOMEWHERE IN IRAQ — The buses would arrive early in the morning; having driven all night from some small village; each packed with men, women and children. They would find themselves in a desolate, barren stretch of nowhere … their final resting-place. The Soldiers would empty the buses, lining up their victims, hands bound and — if lucky, eyes blindfolded — at the edge of a trench. The Soldiers would begin their long day's work of methodically slaughtering the families. At the end of the day, they'd bury their work, pack up and prepare for their next day of loyal duty to Saddam.

Since the overthrow of Saddam Hussien, there have been bone-chilling discoveries, almost on a daily basis, of the atrocities committed by the former Baath party. These grisly reminders come to us in the form of mass graves, dotting the landscape in more numbers than anyone would care to imagine. At last count, there are more than 270 reported mass graves with more than 50 verified by international forensic teams. The number of Iraqi and foreign victims of Saddam's regime is estimated anywhere from 100 to 400 thousand people. Kurds from northern Iraq, Shias from southern Iraq, Kuwaiti and Iranian prisoners of war … touching almost every person's life in the region.

I became involved with the Iraqi mass graves during my first stint of duty in Baghdad, from May through July 2003. I was assigned as a spectral analyst to the Coalition Provisional Authority Space Support Cell. One of the agencies we supported was the Ministry of Human Rights, which had been given the daunting task of assessing and verifying reported Iraqi mass graves. The Space Support Cell initially was tasked with providing high-resolution imagery and mapping support to the team for site survey planning. It became readily apparent that spectral imagery could play a valuable role in the mass grave assessment. My first attempt at using spectral to support the team was a success, in that I could determine the location of the site by highlighting the soil disturbances in the area, but since they already knew where the mass graves were located, the information was of minimal value.

Not willing to give up easily, I got in contact with Bruce Gerrick (Space and Missile Defense Command Spectral Operations Resource Center, SRA International Contractor), Senior Spectral Analyst/Geologist, for some ideas of how to use spectral data to highlight features that might indicate a mass grave. I gave him the background on what I had already provided to the Coalition Provisional Authority team and hoped that there could be something we could key on to find mass graves.

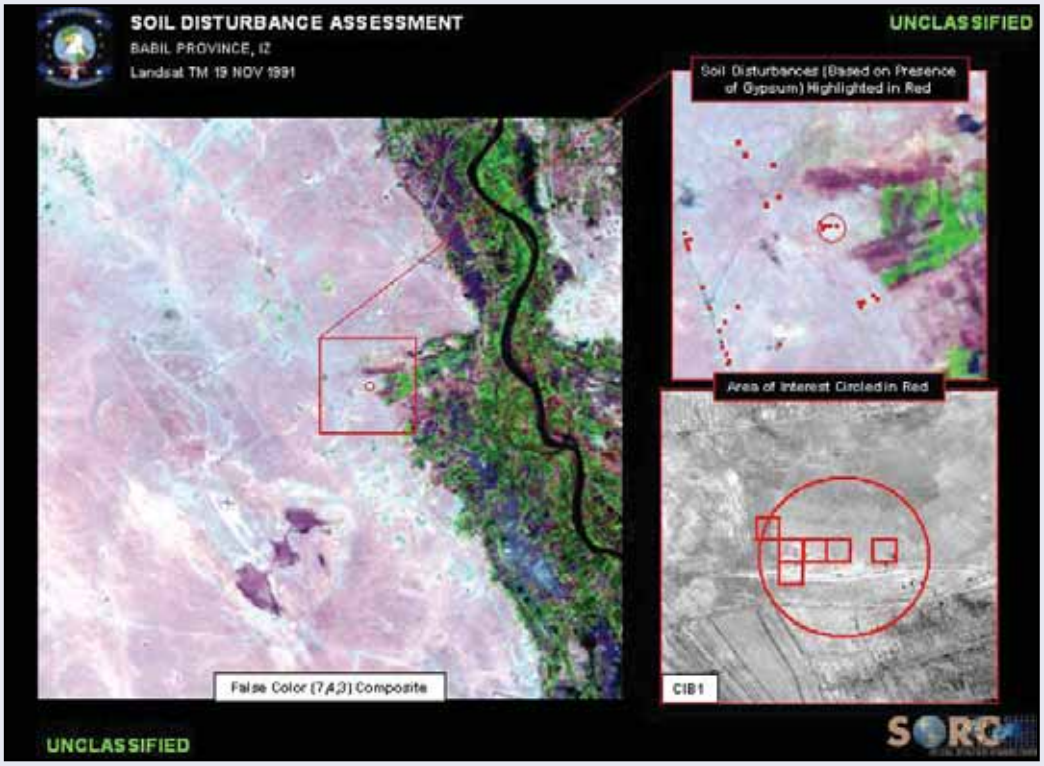
There is no such thing as a "mass grave finder," since there are no definitive indicators to differentiate a mass grave from any other soil disturbance. Gerrick did notice that my analysis was keying on a certain mineral, gypsum, common in the arid regions of the Middle East.

Gypsum is an evaporite mineral usually located on or just below the top few centimeters of the surface. Once the hard-pan, a highly resistant subsurface layer (caliche layer) is disturbed, elements mobilized by the influx of fluids allows the precipitation of gypsum to be expressed and it can then be identified on the surface using already proven methods.

Knowing we could find gypsum after the grave site had been initially dug, we could go back in the data archives to analyze spectral data over the same area to find when there was no gypsum present. Using that information, we are able to narrow down the time frame to when the event occurred.

With what I deemed as new, earth-shattering analysis in hand, I called the Coalition Provisional Authority assessment team together for a briefing of my results.

The response I initially received from my techno-



speak infused briefing was resounding … silence. OK, either I left something important out, or I'd just wasted two weeks of intense analysis.

Then, Ian Hansen (Assessment Team Leader) said, "So, mate, (he's British) what you're telling us is you can scientifically prove the date of the mass grave event?"

Well, within the time frame of the archived data, yes.

His reply was "Bloody outstanding!" He explained that if we could accurately analyze spectral data around each one of the verified mass graves and prove that the events took place during a certain time frame, the results could be used as evidence to prosecute the former regime, including Saddam Hussien.

Wait a minute; our analysis could be used to prosecute one of the most horrific dictators of our time … what an honor!

The SORC (FWD) had only two weeks left on our deployment orders, so I passed all my contact information to the Coalition Provisional Authority team, and guaranteed them the full support of the SORC. At the time, I really didn't know what I'd just volunteered to do.

Just over two months after my return to the States it became blazingly apparent, when the Director of the Human Rights and Transitional Justice Ministry sent a letter to Space and Missile Defense Command — Colorado Springs requesting support from the SORC, specifically Bruce and myself, with "on-site" mass grave assessment. They had been so impressed with the analysis that they wanted us to accompany the mass grave assessment team to some unverified, still pristine, mass grave sites to perform geologic and spectral analysis.

The assessment team wanted to prove that the indicators we were finding in the spectral data were definitely at the suspected sites and also to find other indicators that would help their case. Bruce and I volunteered without blinking; this would be a once in a lifetime chance to use our skills on an international scale. We packed our bags, support equipment and gigabytes of data — and began our adventure.

We'd hardly set our bags down in Baghdad when we were told to get ready to leave for a two-week site assessment. We were going to the southern desert near the border of Saudi Arabia to verify several suspected mass graves from the mid 1980s.

We flew from Baghdad to Basrah to catch our connecting flight, a low-level high-speed combat ride in a British CH-47 Chinook. At some points, so low-level were we that we actually kicked up dust from the desert floor. We arrived shaken but safe at a Dutch Marine security force base, our forward operating location, and began preps for our missions.

It was decided we would drive out into the desert each day before sunrise and return after sunset. We would need this "secrecy" to ensure our movements would be hidden from the local populace, hopefully keeping these sites as pristine as possible to afford the oncoming international excavation teams untouched forensic evidence.

We found out first-hand that information from reliable sources isn't always reliable. Some of the coordinates of suspected sites turned out to be nothing more than empty desert, but we soon found an area that looked as though it held promise. One site had heavy vehicular tracks into and out of the area, large-scale excavations, with no real rhyme or reason, and old sun bleached clothing. Bruce and I began the geologic analysis of the area, taking notes of spatial and spectral features that might help us

with site verification. We found that our previous analysis was exact and there were significant surface coatings of gypsum all over the suspected grave site, not characteristic of the surrounding area.

While we were doing our geologic analysis, the forensic archeologists were performing their own analysis of the site, consisting of a small trench dug across the suspected grave. Over the last 19 years in the Air Force, I've had a lot of odd jobs in some pretty obscure places, but none of that would prepare me for what I was about to see and do.

Bruce and I volunteered to help dig the trench, at the same time taking detailed notes on the stratigraphy of the backfill to support future analysis. As we got further in depth, we started noticing a definite change in the color of the soil, and a discernable odor … not stench, just a stale metallic smell possibly caused by the high concentration of localized iron-oxidation.

At that point, the archeologists took over the dig within inches of depth from where we left off; they started uncovering small bones and brightly colored clothing. They were painstakingly meticulous, using small paintbrushes and carefully removing the dirt with their bare hands. It took nearly an hour to clean out a one square foot area.

The results of their analysis came out as dry as a reading of the Sunday news, yet as clear as a bell to this day.

"One immature human femur, one immature human pelvis, estimate based on bone length approximately five to six years in age."

"WHAT?" I had a huge lump in my throat " You mean, a child?"

The answer came back as dry as the last.

"Yes, and based on the clothing, I'd say it's a female."

My head was spinning … a little girl, in a bright, purple flowered dress with gold ribbon … then more unwelcome information …

"Looks like they had her hands bound," the archeologist said, holding up what probably used to be her pink hair ribbon, which some ingenious Iraqi Soldier had turned into a makeshift binding.

That was it for me … I had to go for a walk. Luckily, they decided that they wouldn't disturb the site any further and started back filling the trench. I will never forget my feelings or the scenarios that still run through my head, if I live to be a hundred years old. But, we're professionals and we had other sites to analyze and our days in this area were numbered … so I stored that away and got back to work.

We finished up our surveys in the desert and made the return trip to Baghdad. We had a few days to rest, clean the sand out of our gear and prepare for our next trip. This time we would travel to northern Iraq, Kurdish territory, near the city of Irbil.

Unfortunately, we didn't get any frequent flyer miles on this mission. We got there the old-fashioned way … road trip. Fortunately, the British Ambassador had loaned us the use of a close protection team and two up-armored Toyota Landcruisers. We made the six-hour journey to Irbil, setting up shop in a former Baath party resort hotel.

But, we weren't there for a vacation; we had the same plan as before, visit as many of the suspected grave sites as possible, perform our geologic analysis and get back to Baghdad … safely.

Northern Iraq is tremendously different, geologically speaking, than southern Iraq. Rolling hills turning into mountains, stream fed valleys lead to green pastures. Not a place where you'd expect evidence of genocide and mass graves, but, to state the obvious, Saddam and his henchmen weren't exactly big fans of peace and tranquility.

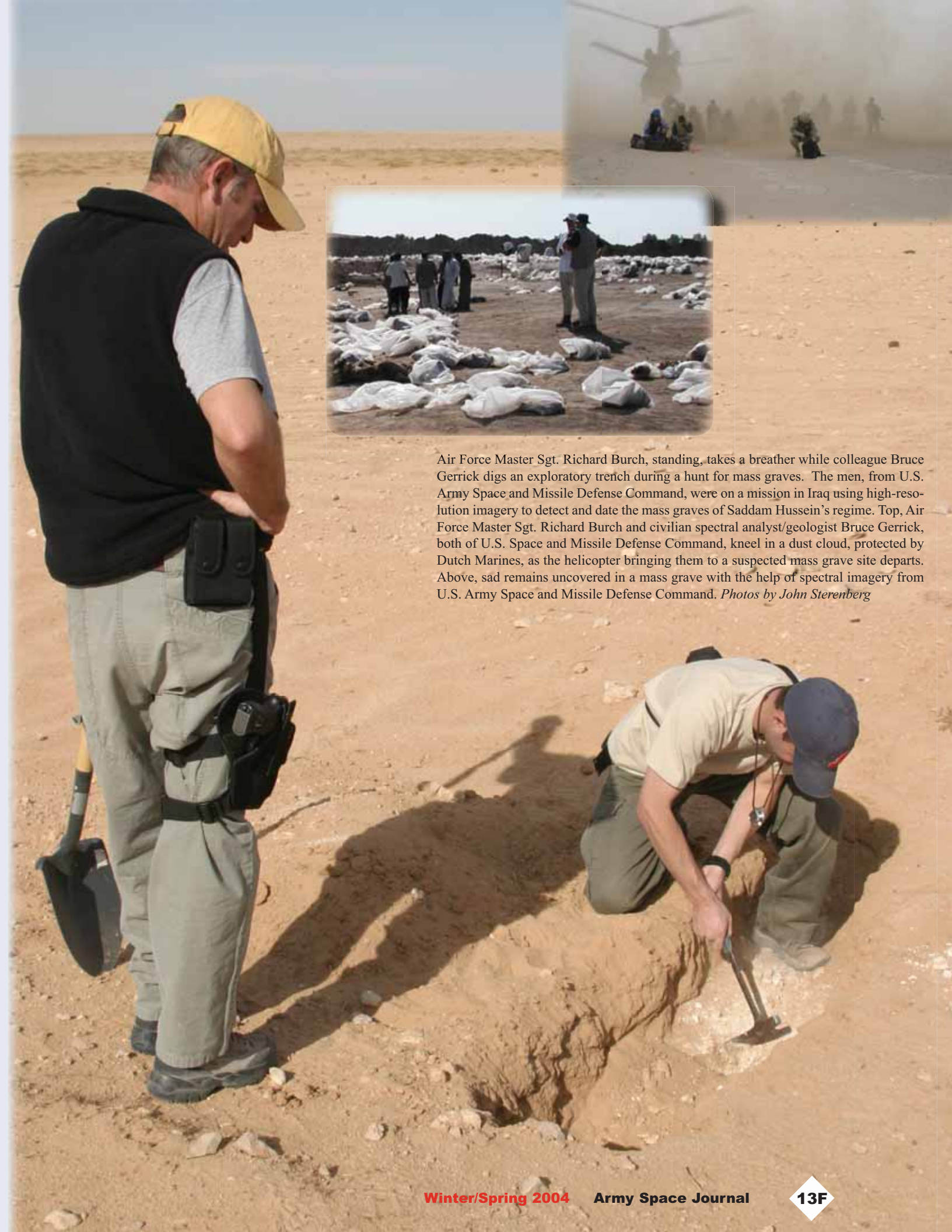
We were on an abbreviated schedule, so we had to investigate as many sites as possible in a seven-day period. That meant, we didn't have time to dig sample trenches (which was fine with me) at each site. The first few sites we visited held little promise in supporting our spectral analysis; they were in the middle of farmland with very little spectral features. The surrounding land had been tilled so much over the past decades that Bruce classified it as homogeneous.

The remaining sites in the area were better suited for spectral analysis, and contained the gypsum surface coating we were hoping to find. Unfortunately, most of the sites we visited in Northern Iraq had already been tampered with, either by the local populace or inadvertently by U.S. Soldiers that happened to set up camp near them, which made any post analysis difficult.

With all of the logistical planning involved in the anticipated arrival of a Finnish forensic excavation team, the remainder of the mass grave assessments were put off until late spring/early summer. We felt we had enough background data on the highest priority sites to continue our analysis and could provide ample support to the assessment team from the rear. So, again, I passed on my contact information, assured ongoing SORC support and prepared our equipment for redeployment.

I have a lifetime's worth of experiences and memories from this deployment, from the places I've traveled and sites I've seen, to the people I've met and the lasting friendships I'll savor.

The one memory I wish I could forget is that of the pretty little dress with the gold ribbon — buried in one of the many killing fields of Iraq.



Air Force Master Sgt. Richard Burch, standing, takes a breather while colleague Bruce Gerrick digs an exploratory trench during a hunt for mass graves. The men, from U.S. Army Space and Missile Defense Command, were on a mission in Iraq using high-resolution imagery to detect and date the mass graves of Saddam Hussein's regime. Top, Air Force Master Sgt. Richard Burch and civilian spectral analyst/geologist Bruce Gerrick, both of U.S. Space and Missile Defense Command, kneel in a dust cloud, protected by Dutch Marines, as the helicopter bringing them to a suspected mass grave site departs. Above, sad remains uncovered in a mass grave with the help of spectral imagery from U.S. Army Space and Missile Defense Command. *Photos by John Sterenberg*

A great day for Space education Graduate Credits for Master's Degree in Space Systems Operations Management for SOOQC Graduates

COLORADO SPRINGS, Colo. — Over the past 18 months, representatives from the Force Development and Integration Center, or FDIC, and Webster University have worked closely to fashion a program that will provide 15 graduate credit hours to graduates of the Army's Space Operations Officer Qualification Course given at the U.S. Space and Missile Defense Command, or SMDC, in Colorado Springs. The memorandum of agreement ensuring the awarding of those credits was signed on Feb. 18, 2004 at the FDIC-West facility in Colorado Springs.

"It all began about a year and a half ago, right here in our training shop," said Tom Coleman, chief of Training Development at FDIC. "We sent out our curriculum, program of instruction, and other associated education and training documents to six institutions. The colleges and universities conducted a thorough review of the curriculum to determine the appropriate number of graduate credits to award graduates of the course that wish to apply for entry into a master's degree program at a particular college or university," said Coleman.

Following several months of curriculum review, along with meetings between FDIC and local colleges, Webster University announced that they were willing to offer 15 graduate credit hours toward their Master of Science Degree in Space Operations Management.

How The Program Works

The agreement establishes a cooperative degree program between the U.S. Army Space and Missile Defense Command and Webster University. Graduates of the Space Operations Officer Qualification Course will have an opportunity to obtain a MS degree in Space Systems Operations Management with emphasis in either engineering and technical management, or in acquisition and program management through shared academic credits between Webster University and SMDC. Details of specific course requirements needed to complete the degree are outlined in the memorandum of agreement posted on the FDIC training division Web site at www.smdc.army.mil/FDIC/training/training.html.

Requirements for admission to this degree program for Space Operations Officer Qualification Course graduates are a bachelor's degree from a regionally accredited college or university, submission of an official transcript reflecting conferral of the degree, and completion and submission of the Webster University graduate school application form.

Participants in this program will not be required to complete separate graduate entrance exams such as the Graduate Entrance Exam, Graduate Management Admission Test, or the Millers Analogy Test. Additionally, letters of recommendation will not be required.

"This agreement between SMDC and Webster University provides an additional avenue for the Space Officer's Course graduates to obtain a master's degree in Space right here in Colorado Springs. I am delighted in what has happened and I anticipate the popularity of this important partnership with Webster University will grow rapidly in the future," said Marjorie Doyle, the senior director of Webster University Colorado Springs Campus.

The Space Operations Officer Qualification Course lays a foundation for Space training. It provides a variety of subjects ranging from coordinating Space asset tasking and utilizing Space analysis tools to participating in the joint operations planning process and analyzing course of action from a Space perspective.

"This degree program will serve as a next step in professional Space education and training for those who wish to take advantage of it," stated Larry Mize, chief of Space education and training at FDIC. "We have worked hard to make this agreement happen for

Randy Wright (left), Associate ice President for Academic Affairs and Director of Military Campuses, Webster University, and COL James Pierson, director Force Development and Integration Center, sign their respective portions of the memorandum of agreement between Webster University and SMDC on the degree program that allows graduates of the FA40 course an opportunity to complete a Master of Science degree through shared academic credits. *Photo by D.J. Montoya*

our current and future graduates."

"The FDIC training team continues to expand and enhance Space education and training for our Army. Space education will move forward with this and any other new initiatives that promise to provide quality Space training to the Space cadre. We are pleased and honored to have reached this milestone with Webster University, an institution with a long history of partnering with the U.S. military community in many locations around the globe," said COL James Pierson, director of FDIC.

To find out more about the program, go to the FDIC training division Web site at www.smdc.army.mil/FDIC/training/training.html. For questions about the program, contact Mr. Tom Coleman at (719) 554-4541, Thomas.coleman@arspace.army.mil, or Ms. Marjorie Doyle at (719) 590-7340, doylemc@webster.edu.

FA40 Training Conference in Long Beach

The FA40 Space Operations Officers have a unique training opportunity from June 1 to June 4 as an adjunct to the Association of the U.S. Army, or AUSA, Symposium.

The Greater Los Angeles Chapter Space Symposium in Long Beach, Calif., in cooperation with the U.S. Army Space and Missile Defense Command will host the 2004 FA40 Training Conference. The purpose for this training conference is to provide updates on Space support to military operations. It will give FA40 professionals an opportunity to get together and discuss the future direction of the Army initiatives and missions in Space.

As the Space cadre for the Army's future force, you are the leaders in this arena and will not want to miss this symposium. The theme for the Space Symposium and the FA40 Training Conference is "Space Support and Global Operations."

Combine the FA40 Training with the AUSA Space Symposium. A detailed agenda will be sent via e-mail to all participants and will be posted on the Space Officer Network, or SONET, and the FA40 Web site.

Special events, which are optional and may be built into the schedule, include industry tours, a baseball game, and a formal Army Ball.

This event is planned to support the Space Operations Officer's continued development. The command highly encourages all uniformed FA40's to attend. Therefore, the primary priority for attendance is to these officers and space available for all other participants. All participants must have a Top Secret, Sensitive Compartmented Information clearance.

This will be a grand event, so don't miss out …

The Flipside

A section dedicated to Space Operations

MAJ Shane Kimbrough

The Army's Newest Astronaut

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