

the Army Space Journal



Winter/Spring 2003
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A Professional Journal for Army Space Operators
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The Soldier of the Future Connected to Space

We want you to know This Journal's for you

It just doesn't seem right to send the ASJ to the printshop without some mention of Operation Iraqi Freedom. All the articles assembled in this combined winter and spring edition revolve around one central topic: Capabilities that Space operators bring to the warfight. Read the articles and take a look. In fact, it's a safe bet that every article printed in previous editions all tie back to that same thought.

There's always a muddy boot bottomline. Right now, that's in Baghdad. Here's an example. Bo Dunaway, who leads our Spectral Operations Resource Center located in Colorado Springs, Colo., wrote in the second edition of the ASJ about the Center's ability to exploit multi/hyper spectral imagery from satellites. Then, in the early days of Operation Iraqi Freedom, U.S. Central Command's spokesperson BG Vincent Brooks shows a satellite image titled "Baghdad Oil Fires" during the command's daily press briefing in Qatar.

"Another example of disregard for the conditions of Iraq and the Iraqi people is the burning of oil trenches," said Brooks. He then used a satellite image of Baghdad taken the day before — March 31 — to point out some of the 50 oil trenches on fire at the time in the "defensive array of Baghdad." Now, the story behind this story is that the forward deployed team of soldiers and an airman from Dunaway's center produced that image in Qatar.

Here's another example, told in a much more earthy way written by the leader of our Army Space Support Team assigned with the 1st Marine Expeditionary Force. MAJ Dan Cockerham writes first of himself, SSG Gregory Singer and SPC Joshua Foye — the three team members assigned with the 1st Marines' main command post — in an email to his first sergeant.

"We live in small, two-person tents (or the back of a HMMWV) and have not had showers in over a week. Our bodies and our clothes are dirty. On the other hand, the (1st Marines) are on the outskirts of Baghdad, as is V Corps! We are all proud to be part of this effort." He writes of his team: "We are getting mail, email, and are in constant contact with the rest of (the team) at the 1st MEF rear CP — where they are working hard on the future ops planning ... and coordinating with other SMDC elements ..."

Before you begin reading our collection of articles we've put together in this edition, take a look at four images we've printed to help you focus on the theme of the role of Space in Army Transformation. The illustration on the front cover is our attempt to show that importance. But also take a look at the satellite image of Baghdad which Brooks spoke of — it is printed on the back cover. Now, look at Cockerham getting his haircut in the photo above the night before he and his team moved into Baghdad with the Marines. Finally, although you won't recognize him for the spacesuit, but the photo to the right is BG(r) Robert Stewart who is the Army's first astronaut in Space.

There's a connection. It's the pioneering spirit that is in the fabric of SMDC, represented not only by Stewart but by all the effort going on in Space right now in Iraq.

Keep your eye out for our ASJ Special Edition to come out later this year telling the story of not only these two brief stories I've told here, but on the other aspects of SMDC's involvement in Operation Iraqi Freedom — providing 24/7 support in force enhancement, satellite communications, early missile warning, blue force tracking and other space-based capabilities.

—Managing Editor



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Winter/Spring
2003 Edition

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LTG Joseph M. Cosumano Jr., Commanding General, United States Army Space & Missile Defense Command/Commanding General United States Army Space Command.

Space “key enabler” for Army Transformation

Before the war in Afghanistan, that area was low on the list of major planning contingencies. Yet, in a very short time, we had to operate across the length and breadth of that remote nation, using every branch of the Armed Forces. We must prepare for more such deployments by developing assets such as advanced remote sensing, long-range precision strike capabilities, and transformed maneuver and expeditionary forces. This broad portfolio of military capabilities must also include the ability to defend the homeland, conduct information operations, ensure U.S. access to distant theaters, and protect critical U.S. infrastructure and assets in outer Space.

— *National Security Strategy, Sep 2002*

By LTG Joseph M. Cosumano Jr.

The Army is and will remain the largest user among the Services of Space-based capabilities. The Interim and Legacy forces already leverage overhead constellations of military and civilian Space platforms for intelligence, communications, attack warning, weather and position, timing, and navigation. The Objective Force will exploit the full potential of these systems. Operational simultaneity, situational understanding, precise and tactically responsive intelligence, surveillance and reconnaissance, and assured communications are implicit in the Objective Force Operational Concept, and will depend on successful mid- and far-term development of overhead architectures, systems and platforms. The Objective Force will also rely heavily on the Joint Force’s ability to assure our access to Space resources while denying them to the enemy.

Space Enables Transformation

Successful transformation to the Objective Force is key to the Army’s battlefield dominance in the 21st century and to providing the most efficient, lethal land forces to the Joint Force Commander. Space is the Army’s key enabler for supporting those forces in any theater.

The contributions that Space systems already make in the near term will be continuously improved as the Army transforms. Army Space equities are primarily represented in two of the four Space mission areas: force enhancement

and Space control. Capabilities in these two areas, supported by the ground- and Space-based infrastructure of relays, ground stations and satellite control facilities, directly support the transformation of our Army to the Objective Force and enable Army operations in all phases of conflict in support of the Joint Force Commander.

Space and the Objective Force

Force enhancement embodies the Warfighter’s use of Space. It provides “value-added” to battlefield functions, enabling the land force to accomplish its terrestrial mission. As the Objective Force matures, the Army will ensure that upgrades to force enhancement capabilities address Objective Force requirements. Such capabilities include beyond-line-of-sight satellite communications; intelligence, surveillance and reconnaissance (ISR); position, navigation and timing; weather, terrain, and environmental monitoring; and missile warning.

Commanders require Space-based communications and intelligence capabilities as they move from CONUS installations to a theater of operations. Arrival in theater only increases the Joint Warfighter’s reliance on Space to facilitate reachback for strategic command and control, logistics support, database query, precision strike support and ISR support for efficient use of in-theater Reconnaissance, Intelligence, Surveillance, and Target Acquisition and deep

Force enhancement embodies the Warfighter's use of Space. It provides "value-added" to battlefield functions, enabling the land force to accomplish its terrestrial mission. As the Objective Force matures, the Army will ensure that upgrades to force enhancement capabilities address Objective Force requirements.

operations assets, among other things.

The Objective Force will comprise lighter but highly lethal, mobile and survivable formations that will arrive in an area of operations ready to fight and fully synchronized with other elements of the Joint Force. Objective Force operations will require superior situational understanding and a common operational picture to focus forces against critical enemy capabilities, real-time imagery to detect and locate identified decisive points, the real-time targeting data necessary for attack, and responsive long haul communications for effective command and control. The physical range and field-of-view limitations of surface-based command, control, communications and computer intelligence, surveillance and reconnaissance systems mean that the Objective Force will rely on enhanced mid- to far-term capabilities provided by Space and overhead platforms.

Pre-deployed and organic Space assets will also lighten the load of deploying forces by allowing many of the traditional planning and logistical tasks of main and rear command posts to be accomplished from home station. As forces deploy, Space systems integrated with computer network operations and Space negation capabilities will provide complete real-time battlespace awareness, assured global communications, en route mission planning and rehearsal capabilities, and assist in countering adversary anti-access strategies.

Today and in the near term, global position, navigation and timing capabilities provided by the Global Positioning System (GPS) represent our sole method of providing force-wide common location and timing essential for simultaneous, distributed operations (knowing where you are, where your buddy is and where the adversary is). GPS provides the "common grid" for precision engagement and, through systems such as Grenadier BRAT and its follow-on, linked to the maneuver force via the Blue Force Tracking Mission Management Center, it enables effective beyond-line-of-sight blue force tracking of friendly land forces. However, as GPS technology proliferates, so will the ability to interfere with or disrupt the signal and receivers. Mid- and far-term upgrades of the GPS and blue force tracking systems must

include anti-jam and anti-spoof modes to safeguard this capability.

The Defense Support Program satellites today, and the mid-term fielding of the Space-Based Infra-Red System, provide critical, time-sensitive early warning of missile attack. Launch detection data provided by these satellites allows the in-theater Joint Tactical Ground Station and its follow-on, the Mobile Multi-Mission Processor, to calculate missile launch points, trajectories and predicted impact points and times, and selectively warn potentially affected units and areas. In the far term, the Space-Based Radar will provide moving target indications from Space to track adversary vehicles, which when combined with highly accurate digital terrain elevation data will support precision attack of critical targets and nodes. Direct downlink will make timely, assured receipt of this and other information available to the tactical commander where and when he needs it.

As the Army grows more reliant on force enhancement capabilities, our vulnerability also increases. Rapid growth in commercial and international Space capabilities increases potential adversaries' ability to monitor U.S. forces and potentially negate U.S. advantages in Space. Space control takes on increased significance for land forces by ensuring dominant access to Space capabilities. Space control — whether accomplished through hardening of our own assets, direct attack of enemy Space capabilities by kinetic or directed energy weapons, electronic disruption or denial of his use of Space systems, or by other means — is how Space superiority will be gained and maintained ensuring friendly forces the use of Space while denying it to the enemy.

Space operations and capabilities are inextricably linked with and dependent upon supporting infrastructure. The maintenance and upgrade of Space infrastructure includes improvements to fixed site facilities such as permanent satellite communications ground stations, the Blue Force Tracking Mission Management Center and the Regional Satellite Support Centers. This infrastructure also supports the Space control mission areas of negation, surveillance, (See *Key Enabler*, page 44)

Army Transformation War Game: Insights Concerning Space Operations



**BG Richard V. Geraci,
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By **BG Richard V. Geraci**

In April 2002, Army's Space and Missile Defense Command (SMDC) participated in the third Army Transformation War Game (ATWG) at the Army War College. These wargames have highlighted the importance of including "Space play" so that commanders understand how Space enables their ability to conduct full spectrum military operations. We have demonstrated that it is increasingly important to have Space-smart soldiers participating with fellow warfighters in wargames such as the ATWG, as well as exercises and experiments. Our participation in this wargame provided valuable insights into the growing role of Space operations across our transforming Army.

Insights from the ATWG indicate that transformation cannot succeed without leveraging Space capabilities. The Objective Force must see, understand, and act first — then finish decisively. Space systems, as a part of the Joint Information Architecture, will play a significant role in providing the requisite capabilities outlined in the battle command, precision fires, intelligence, surveillance, and reconnaissance, dominant maneuver, and sustainment concepts.

LTC Dave Reese, SMDC Force Development and Integration Center, and I wrote an article on the ATWG for publication in the February 2003 issue of *Army Magazine*. The insights in the Space operations arena are instructive enough that I want you to know about them, especially in light of our recent Army Space support to Operation Iraqi Freedom. Our insights at the ATWG will form the basis for investigating lessons learned. Below is an abbreviated version of that article focusing on Space operations. I encourage you to read the full article to understand the insights into Integrated Missile Defense and Information Operations.

Background

TRADOC designed ATWG to examine future global conflict and assess the strategic value of land power in a Joint, combined, and interagency context. ATWG also

looked closely at the strategic role of the Army's post-Transformation, or Objective Force, units in a Joint context. In the game's strategic setting, U.S. forces were extended across a series of conflicts around the world, including the U.S. homeland. The game's scenario was set in the 2019-2020 timeframe — a period when proliferation of and access to Space technologies and capabilities among our potential adversaries is inevitable. Accordingly, aspects of these threats — and our ability to counter them — were incorporated into the game's design.

Realizing Desired Objective Force Characteristics

We want the Army's Objective Force of the future to be strategically responsive, deployable, agile, versatile, lethal, survivable, and sustainable. Attaining these qualities requires a thorough examination of the required technological, doctrinal, and organizational changes, as well as their interdependencies and political impacts. ATWG looked closely at these Objective Force concepts. Our conclusion was that decision superiority, much of it Space-enabled, will play a key role in realizing required Objective Force capabilities. Objective Force units will be smaller, lighter, and faster than their legacy force counterparts. Such characteristics are a prerequisite to a more deployable, agile, and sustainable force. Further, timely access to key information can multiply the effectiveness of Objective Force units, enabling them to become more lethal and survivable. For example, Intelligence, Surveillance, and Reconnaissance (ISR) information helps us to see, understand, and act first within the battlespace. Reliable computer networks that process and carry this information provide Objective Force units with a remote processing and reachback capability that enables smaller, more versatile forces that we can sustain more easily. Conversely, by denying enemy access to information and sensors we significantly reduce his capabilities.

Given that many of our adversaries will gain access to similar capabilities over time, we must be forward thinking about the need to plan and invest adequately in Army Space capabilities.

Space Operations and the Objective Force

The ATWG made clear that achieving Objective Force characteristics is highly dependent on Space operations. Space operations provide ISR, missile warning, position, navigation, and timing services, as well as communications, weather prediction, and Space control capabilities to the Objective Force. Space-based ISR is often the primary source of ISR information available during pre-hostility, early entry, or transition phases of operations. Our missile warning systems rely on Space-based sensors to detect launches and provide information necessary for friendly force warning and queuing radars of our air defense weapon systems. The Global Positioning System (GPS) provides information that enables accurate delivery of precision-guided munitions, tracking of friendly force locations, and a variety of other position, navigation, and timing-dependent capabilities. Satellite communications enable direct communications to remote areas, wide area or focused broadcast options, and a large capacity for message traffic, all without the need for ground relays. Weather satellites provide information critical to operational planning. Finally, Space control ensures our unimpeded access to Space systems while we simultaneously maintain a capability to selectively deny our adversaries use of, and access to Space.

ATWG Insights

Our Army cannot achieve the goals of Army Transformation without understanding Space operations and leveraging the capabilities they bring to the fight. Army requirements must be identified and integrated into the National Security Space priorities and receive appropriate funding.

As we plan a multi-decade transformation effort, other factors must be considered. First, our adversaries will eventually develop capabilities to counter or emulate many of our Space systems. Technology continues to advance, making access to these systems (and ways to counter them)

more widely available. Commercial concerns today make a wide variety of Space-based imagery and communication services available to anyone able to pay for them. Second, our projected investments in Space may not be sufficient to enable the Objective Force portrayed in ATWG's 2020 scenario. Current acquisition programs are being designed to produce only a small number of Space control equipment suites by 2020.

Our experience at ATWG suggests that such constrained numbers will severely hamper our ability to conduct simultaneous Space control operations across large geographic areas in support of multiple combatant commanders. Other insights of note follow.

Space-Based ISR

Space-based ISR is a prerequisite to domination of the battlespace by the Objective Force. In many areas of the world, Space-based ISR will serve as the primary "eyes and ears" of future combatant commanders — particularly during early entry and other "transition" operations or periods. Satellite constellations of the Objective Force era will provide commanders with the all-weather, 24/7 view of the battlespace that commanders need to enhance situational awareness and optimize our chances for success.

Employing Elements of National Power

Space capabilities are critical to effectively employing all elements of national power. We've just discussed the importance of Space-based ISR to our military. The advantages of being able to monitor activities of our adversaries, particularly during pre-hostility periods, can be equally important to our political leadership and State Department. Similarly, our Commerce and Treasury Department officials can make more informed decisions with the aid of Space-based ISR related to crops, weather, port activity, or the status of key infrastructure within other nations. (Examples
(See Army Transformation War Game, page 44)

The View From (Army) Space ... How Space Contributes to Transformation

By COL Glen C. Collins Jr.

How many of us who were in the Army about 10 years ago and are now reading this Army Space Journal would have ever considered the theme “the Role of Space in the Army Transformation” that marks this edition?

Transformation is not new for the Army. Most of us have experienced new equipment or new organizations. The role of the reserve components has changed significantly. But the key element of this theme is how Space contributes to transformation and will play an even bigger role than it does now in our great Army.

How the Army can see first, understand first, act first, and finish decisively are challenging requirements.

We need thoughts, ideas and most importantly, after-action reports from the field. What works? What needs to be lighter, smaller and more rigid? What will make the information and Space products easier to request and obtain?

Your input is the key to developing the right Space equipment and organizations to meet those requirements.

Units of Employment and Units of Action are being designed with Space-based capabilities in mind. Army Space Command will be activated as a table of organization and elements (TOE) brigade with TOE battalions.

A Ground-based Missile Defense brigade is also standing up this year in U.S. Army Space and Missile Defense Command. Additional positions for Army Space Operations Officers are being considered throughout the Army. Army Space Support Teams are being modernized and Space Support Elements are in planning the stages. The Joint Tactical Ground Station will be replaced with Multi-Mission Mobile Processor. The Objective Force will be a superb fighting force using Space to win quickly and decisively. Modernization is ongoing right now for the Army.

Sounds good doesn't it? Well, it is to a great extent. However, the path is long and uphill for us in the Army Space field. We must all help educate and train the Army and other Services in what we are capable of doing today. Many Department of Defense personnel don't know what capa-

bilities we have or are planning. Some don't know we have Space Operations Officers in all of the corps now. So what are we doing to educate the community on Army Space?

Let's tell them about our efforts to institutionalize a Space Planning Process in the Army that will capture all of the Space programs, regardless of which proponent is doing the work. This will enable the Army leadership to quickly understand what future Space technologies the Army will use to see, understand, act and finish decisively.

We have a new combatant commander, Northern Command, to support in homeland defense. Defending the homeland is the Army's top priority. Space support and new technologies to detect weapons of mass destruction are necessary. Space assets might be the answer to this overwhelming problem. Civilian agencies will certainly have better information and situational awareness with our Space assistance. Another transformation activity where Army Space is very important is U.S. Army Space and Missile Defense Command becoming the Army component to U.S. Strategic Command. Don't think that just because this new mission is being finalized this year that the work is over! This is an effort the Army must work on for years to come. Global Strike and information operations are just two pieces of this new mission area recently given to U.S. Strategic Command where Army will play increasingly larger roles. If this doesn't get you excited enough, just reading the article by Jeffrey Becker and Gary Trinkle will!

Rail guns, slingatron, and Space elevators might seem a little “Star Wars” but are serious ideas to future Space officers. Transformation includes new doctrine, organizations, and facilities, as well as, materiel solutions. So the bottom line ... send your great ideas, concepts and experience to us in the Force Development Integration Center. Our wargames are playing scenarios in 2015 and beyond. Perhaps a slingatron will be key to success! Secure the High Ground!

Commentary: Be a bandwidth nibbler, not a Kobayashi

By LTG Peter Cuiello

Given two options for eating hot dogs at lunch, we can take the refined route and nibble on them one bite at a time. Or, we can emulate Japanese professional speed-eater Takeru “The Tsunami” Kobayashi, who crammed 50 hot dogs down his throat in 12 minutes at a competitive-eating contest last July at New York’s Coney Island.

Kobayashi’s maneuver clearly repels us. And yet, when it comes to stuffing huge amounts of data into the e-mails we send, we’re imitating Kobayashi’s feat — except that the 113-pound self-proclaimed “Tsunami” kept his meal down. Our huge e-mail attachments so upset the flow of available bandwidth, that our computer networks swiftly regurgitate them back at us as undeliverable.

Bandwidth, of course, is just a fancy way of describing how fast information can be carried through a phone line, cable line, satellite feed, and so on. When we choke our bandwidth with the file equivalent of 50 hot dogs, we clog, and in some cases, obstruct, our systems. In contrast, we can easily swallow a bite of one hot dog better than we can 50 barely chewed ones at the same time.

This is no idle consideration. Soldiers deploying today need every bit of bandwidth for their network-centric operations.

The old method of attaching large files to an e-mail and broadcasting it via sequential chain-mail to entire garrisons, major commands or the Army-wide work force requires huge chunks of bandwidth and brings networks and in-boxes to a crawl. Unless we do our part to preserve the smooth operation of the Army’s bandwidth, we will be putting our warfighters’ security and success at risk.

Fortunately, there’s an easy fix, simply by restricting what we send out as attachments to e-mail.

Instead of e-mailing large files, such as slide charts,

announcement flyers and video clips, among others, we should simply upload them to a collaboration area on Army Knowledge Online, the Army Portal located at www.us.army.mil.

Once posted on AKO, we can send out to all concerned a brief AKO message that contains a link to the item. This way, instead of sending millions of bytes of data, only a few thousand are sent.

This AKO method minimizes the burden on bandwidth, networks and in-boxes, and allows us to use limited bandwidth for those essential operational-mission requirements. It also eliminates the need for thousands of people to resend and/or store the same large files on their computers’ hard drives or file servers all over the Army.

That’s because AKO’s Knowledge Collaboration Center, or KCC, essentially is now your hard drive, accessible to the whole Army, and with just one copy on one server.

The KCC areas can also be limited to just a few persons that you select yourself. AKO has a full set of self-teaching tutorials, and we’ve backed it up with round-the-clock help-desk support.

The Army has invested heavily in the AKO portal and portal technology. We believe the KCC offers everyone a smarter and better way to achieve the same end results, while enabling all to be good stewards of limited bandwidth resources.

So, do your part. Stop sending large enclosures via e-mail and start using the AKO portal to the maximum. Be a bandwidth nibbler, not a Kobayashi.

LTG Peter Cuiello is the Army’s Chief Information Officer/G-6. He received his Bachelor of Arts Degree in Political Science from Canisius College and his Master’s in Business Administration (Operations Research and Systems Analysis) from the Florida Institute of Technology.



Yesterday's Pioneer BG Robert Stewart U.S. Army retired

Brigadier General (retired) Robert Lee Stewart, astronaut and Space pioneer famous for being one of the first two men to walk untethered in Space, has a long list of other achievements that also mark him as a pioneer, most notably being the test pilot who assisted in bringing the Apache helicopter into the Army inventory. Retired from the Army, he spoke to Army Space Journal's MAJ Laura Kenney at his home in Woodland Park, Colo. He spoke about the role of Space in current events, the tragedy of the Space Shuttle Columbia and how Space will assist in Army Transformation.

Transformation of any sort requires people who aren't afraid to step out, to take chances, who possess the pioneer spirit. Anyone who's worn the title of astronaut definitely fits that description. But you've had some other job descriptions that mark you as a pioneer, General. Test pilot, Vietnam veteran and combat helicopter pilot. Can you tell us what first drew you to flight, first in the air and then in Space?

Actually, I think the primary attraction for me has always been, first and foremost, wanting to be a soldier. Everything else came from that. My whole family had been military, and my father was a private first class during WWII, as an artilleryman. At the age of 11, I was camping out with the National Guard during summer camp, serving as their mess boy.

Flying — well, that's the way I worked my way through college. I attended ROTC at the University of Southern Mississippi. While there, I flew as a commercial pilot and as an instructor. About the only

thing I didn't do was crop dusting. By the time I joined the Army, I had over 2,000 hours of flying, and they STILL branched me Air Defense Artillery. I didn't get branched Aviation until a year and a half later.

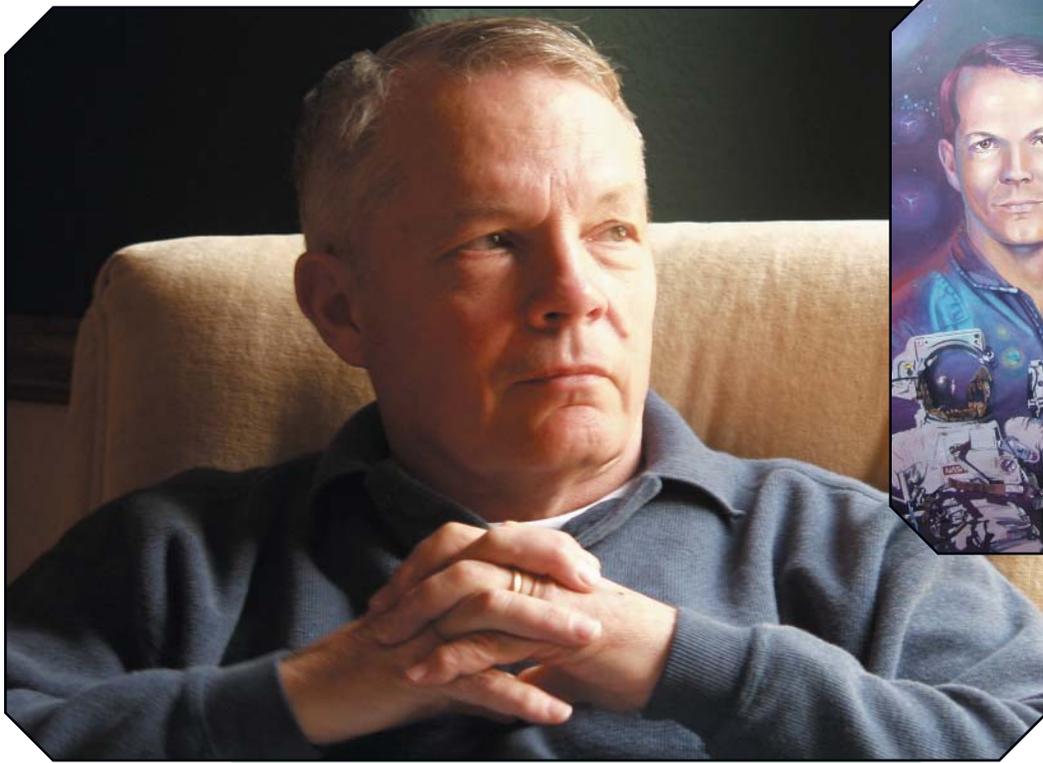
Flight was always something that appealed to me. But even though I read science fiction as a kid, and still enjoy a Star Wars movie, I see those as fantasy. There are enough real things to do in Space to make it fascinating.

Of all the many hats you've worn, Vietnam pilot, Air Defense Artilleryman, the test pilot who brought the Apache into the Army inventory, astronaut, and general officer, which one was the most personally rewarding, and why?

Hands down, my service in Vietnam was the most personally satisfying. To be in combat with a bunch of guys that you feel closer to than anyone else in the world ... and then to lead those men into combat — now THAT'S responsibility. I always joke that I had more responsibility as a gun platoon leader/first lieutenant than I did as a general officer.

What was it like, to be testing a totally new piece of equipment (the Apache) and are you proud of its performance since it became the combat helicopter of choice?

I'd call my efforts with the Apache the most gratifying of my military experiences. Flying an awesome machine like that before it was housebroken? The Apache is the best-armed helicopter in the world — nothing else even comes close.



What drew you to Space and how and when did you decide to become an astronaut?

That's actually kind of funny. It wasn't as if I'd been planning and praying for it all my life. I just happened to notice what was basically an advertisement seeking astronauts on the bulletin board at Edwards Air Force Base. That was back in 1977. I applied, and ... got the job.

What role do you see Space playing in current operations, such as war with Iraq?

I know that we've got some very sophisticated hardware, but I'm not privy to exactly what we have now. I do know that we have excellent strategic level intelligence due to Space assets. Other Space-based or related products will improve our ability to move, shoot and communicate, all critical functions of the Army. The Global Positioning System is a phenomenal benefit to be used in a multitude of ways, not least in helping us make friendly fire casualties a thing of the past. In the first Gulf War, we won a stunning tactical victory — but not a war. I'd like to see us win the war, and Space and the Army will play crucial roles in that.

And in the future? Are there boundaries? What sort of future do you see for the Army's role in Space?

Well, in one sense, the old cliché of "the sky's the limit" is true, because the potential is enormous, but in others, well, boundaries are set by what is realistically possible. By that I mean, I can envision colonizing Mars, building an underground outpost for civiliza-

tion, but doubt we'll go past our own solar system, at least not for hundreds of years, because the means to do so have not yet been invented. It would require a fundamental breakthrough in physics. But bringing it in closer, Space has vast potential. Anything that helps the Army move, shoot and communicate, as I said before, is a good thing, and Space can aid us enormously there. But do I see actual battles taking place in Space? No, I (smiling) think that's an Air Force vision. We live on Earth, and that's what matters to us as human beings. And anything worth fighting for, no matter how sophisticated we get, requires boots on the ground, which is where the Army comes in.

To narrow the focus of the last question, do you envision a role for the enlisted soldier in Space? You've worked with CW3 Tom Hennen, the first warrant officer in Space ... when do you think the first enlisted astronaut could "come on board?"

That was actually a vision of mine, to bring an enlisted photo interpreter with us. I wanted to see an enlisted man wearing astronaut wings — and it will happen, but can't give you a timeline.

Was your untethered walk the most exciting thing you accomplished in Space? If not, why, and what was?

I'd have to say the most exciting event in going to Space is always the liftoff. Nothing beats that. But the walk was definitely a thrill. Another astronaut, John Young, who was, without a doubt, known throughout his distinguished career as a daredevil almost without



peer, actually said to me “That (my untethered walk) was the craziest and bravest thing I’ve ever seen.” I looked at it that, as a test pilot, I was now flying higher and faster than I’d ever flown before.

In your opinion, why hasn’t, to date, an Army astronaut piloted the Shuttle?

Let’s just leave it at — politics. But I do think that NASA got a kick out of asking me, “the helicopter pilot” as they called me, to write the flight re-entry manual for the shuttle, instead of any of the jet pilots. I was simply chosen because I was the test pilot with the most experience.

And piggybacking on that last question ... as you know, and serve as one of the many illustrious examples of, the Army is very proud of its lineage as being “first in Space.” Now, when most people hear the phrase, “Army Space,” their first reaction is “Huh, the Army in Space? The Army is about ‘ground’ warfare, what’s it doing in Space?” Does this mean we’ve lost that edge, given it up to the Air Force, or is this just a problem of perception, are we still as valid now as we were when you took that historic trip outside the Challenger in 1984?

“First in Space” is right. We have the lineage going all the way back, as you know. But, I think we lost ‘ground’ in Space during Vietnam. We were simply too busy. Congress has always leaned toward the Air Force for the “high tech” aspect, and, truthfully, we are “muddy boots.” But I’ll remind you that the

rocket that put men on the Moon was an Army rocket, and, if not for political reasons, we, the Army, could have beaten the Russians into Space. We were ready before Sputnik. We did beat out both Navy and Air Force with a rocket that worked.

As for today, of course we’re viable. The best “muddy boots” in the world, made even faster and more efficient with Space technology? Unbeatable.

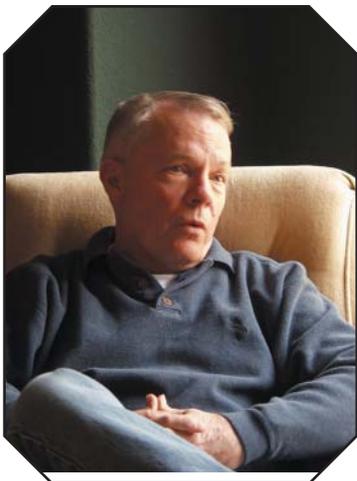
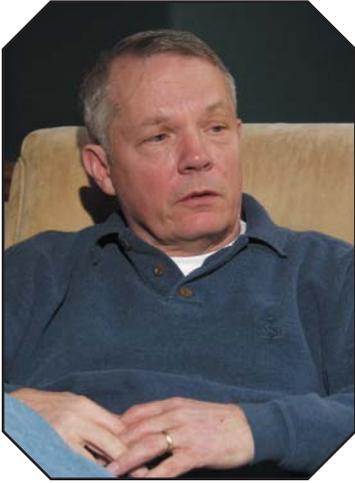
When people think about pioneers today, those pioneers wear the faces of those lost on the Columbia. That must have been a very hard day for you, as indeed it was for the nation and world. We know you can’t speculate about possible causes of the disaster, although you’ve flown on two shuttle missions yourself, with STS 41-B (Challenger) and the STS-51J, Atlantis’ first flight, as well as having written the manual for flight re-entry control procedures, but can you tell us whether you foresee a future for the Space shuttle as it is configured today, and, overall, for a Space exploration program?

The Space shuttle needs to be retired. It’s done great things, but it’s time to move on. NASA should be thinking about the exploration of Space. We should already have something self-sustaining on the Moon, as practice for Mars. Replace the shuttle with something more sophisticated, such as a single stage, re-usable orbiter, or even let that part of the program go commercial.

What words would you say to young people considering a future as an astronaut? Or any possible career involving Space? We know your daughters taught at the U.S. Space Camp, which issued a statement after the Columbia disaster to the effect that “the mission continues, the mission of preparing the scientists, explorers and leaders of the future.” Would you still recommend such a future to today’s young person?

It’s funny, one of my daughters actually didn’t really know much about my career until she heard about it in Space Camp. In Houston, astronauts (smiling) were a dime a dozen, and I guess we never went into it much at home. But, I think the Space Camp has a great program. I would certainly encourage young people to consider it, but, instead of targeting a career as an astronaut, I would rather say that they should prepare themselves to be capable, so that if that day ever comes when you see a notice on the bulletin board... you can play your part. There isn’t enough interest in science or math today, which is sad. I’d say the most important characteristic for anyone who has dreams of Space is — to be a self-starter. Everything else would follow from that. Again, the sky’s the limit.

BELOW: Then LTC Robert Stewart makes his historic space walk during the 1984 Challenger space shuttle mission. Using the Manned Maneuvering Unit, he and Navy CAPT Bruce McCandless II became the first two human beings to 'walk' untethered in Space. The MMU utilized small nitrogen-gas jets to maneuver, enabling the astronauts to venture approximately 300 feet from the main ship. Photo courtesy NASA



BG (Ret.) Robert Stewart during an interview at his mountain home in Colorado Springs, Colo. Photos by SFC Dennis Beebe



A Word from the Chairman: Understanding Transformation

By GEN Richard B. Myers, Chairman
Joint Chiefs of Staff

When the bombs fell on Pearl Harbor in 1941, they shattered more than the silence of a peaceful Sunday morning; they destroyed the illusion that U.S. military forces were safe at home. During the three and a half years that followed, a world war transformed the U.S. armed forces into a first-rate military. The urgency of fighting a global conflict propelled the genius of Americans to make this transformation a reality.

In a similar manner, September 11th shattered the illusion that Americans are safe at home. Today, we have the same imperative to transform our military forces in order to defeat the new threats of the 21st century and protect our nation. Transformation cannot wait — it must take place as we wage the War on Terrorism. President Bush summed up this challenge: “It’s like overhauling an engine while driving 80 miles per hour. Yet we have no choice.”¹

If the U.S. Armed Forces are to meet the President’s expectations, those in uniform must have a common understanding of what transformation is and what it is not. Understanding transformation requires appreciating past transformation efforts and the current security environment. This article does not replace the detailed description of our approach to transform the Joint Force found in the new Joint Vision. Instead, it offers insight into the foundation of transformation and its corresponding intellectual, cultural and technological aspects.

Insight from the Past

The history of the U.S. military is a history of the nation’s Armed Forces evolving to meet new threats and opportunities. During the Civil War, Generals Grant and Lee exploited the telegraph for theaterwide

information-sharing and the railroad network to give their forces theaterwide mobility. During World War I, General Pershing incorporated the airplane to benefit U.S. ground maneuver units and gain information on enemy formations and positions.

A more contemporary example of transformation is how President Eisenhower refocused the nation’s defense establishment as the United States entered the Cold War. He adopted the New Look strategy to meet the dual risk of deterring nuclear war and containing communist expansion. His administration fielded strategic nuclear forces to deter a Soviet nuclear attack on the U.S. homeland. His administration also developed tactical nuclear forces, like the Army’s Honest John missile, to counter the Warsaw Pact’s massive armies aimed at the heart of Europe. For four decades, U.S. military planning, organization and training focused on this dual threat of the Soviet Union and Warsaw Pact. As the threat did not change much, the U.S. military’s mental agility to anticipate other challenges remained underdeveloped.

With the collapse of the Soviet Union and the fall of the Berlin Wall, the U.S. military sought to redefine its focus and strategy. The Base Force and Bottom-Up Review of the early 1990s guided U.S. forces away from the “Fulda Gap” mentality. Defense planning, however, remained threat driven. U.S. military forces were organized, trained and equipped to handle the task of conducting two nearly simultaneous regional conflicts against predetermined, conventional, predictable adversaries.

21st Century Security Environment

The 2001 Quadrennial Defense Review (QDR)

Transformation is a process and a mind-set — not a product.

Adopting a transformational mind-set means applying current fielded capabilities — in the current environment — to accomplish any assigned mission. In today's fluid and dynamic world, no Service's core competencies can accomplish the mission alone. Transformation is about creating Joint competencies from the separate Service capabilities.

marked a complete departure from Cold War planning. In this document, the Defense Department articulated a more sophisticated appreciation of the 21st century strategic environment, the challenges to U.S. interests, and what military capabilities are needed. Today, the threats to U.S. interests go beyond Iraq and North Korea. During the past decade, political, ethnic, social, and historical factors have given rise to a range of conflict and crisis — from ethnic fighting to mass starvation to massacres. Disparities in economies, resources and populations remain powerful motivators for future intrastate and interstate strife. Likewise, religious and cultural differences may arise that reflect ancient hatreds and cause additional crises around the globe.

Belligerents motivated by this wide array of influences now have access to modern conventional arms markets, a sophisticated industrial production infrastructure, and advanced communications. Advanced production capabilities also mean that hostile nations and agents may have access to weapons of mass destruction — chemical, biological, radiological, and nuclear. In addition, the global \$3 trillion communications network allows previously isolated groups to communicate instantly on a worldwide scale. It also gives them access to a wide array of information and intelligence, at little relative cost. The past U.S. monopoly on the latest and most sophisticated capabilities is gone.

The current and future security environment is further complicated by the presence of non-state actors who frequently transcend political borders. As such, they confound conventional diplomacy. Some of these non-state organizations are cooperative and sympathetic to U.S. security objectives — such as humanitarian aid organizations. Others, such as al Qaida and terror-

ist organizations, are hostile and directly threaten U.S. interests.

In the 2001 QDR, the Defense Department recognized that U.S. defense strategy must emphasize capabilities-based forces to meet such challenges. These forces must be able to rapidly project forces, and sustain them, over great distance into inhospitable and adverse environments. U.S. forces must be capable of rapidly developing intelligence on enemy capabilities, vulnerabilities, intentions, and centers of gravity. U.S. forces must be capable of precision engagement. U.S. command-and-control networks must direct dispersed U.S. and coalition forces to gain massed fires and effects.

Secretary Rumsfeld summed up the task ahead when he said the U.S. military must be prepared “to defend our nation against the unknown, the uncertain, the unseen, and the unexpected.”² To meet this broad and all-encompassing task, America's Joint team must transform into a capabilities-based force.

Transformation ... What It Is NOT

First, transformation is not just about technology. It's not about wheeled or tracked vehicles, stealthier aircraft, or the types of missiles on submarines. It's not about 20th century forces being renamed with 21st century titles. Such approaches risk reducing important concepts into a budget drill. These mind-sets inspire Service program managers to declare their program as “transformational” and therefore safe in the budget process. This singular mentality reduces transformation efforts into rear-guard actions to defend rice bowls.

(See Chairman, page 48)

The Role of Space in Army Transformation

By Michael Howard,
Managing Editor



In the 21st century, the battlefield will extend vertically into the region of Space. Achieving Space dominance will be critical to gaining and maintaining the information superiority required for the advanced full-spectrum operations described in the Army Objective Force Concept (TRADOC Pamphlet 525-3-0). The Concept for Space Operations in Support of the Objective Force (TRADOC Pamphlet 525-3-14) supports and enables the Army's vision described in the Objective Force concept. The Space operational concept is intended to focus the Army's effort to exploit the high ground of Space in its contribution to land forces and the Joint dominance of this dimension.

Army Space operations will focus on five essential tasks to ensure the Objective Force will successfully achieve decisive victory. These essential tasks are:

- Support increased deployability and reduced theater footprint.
- Achieve situational understanding "Off the Ramp" during entry operations.
- Support precision maneuver, fires, sustainment and information.
- Enable continuous information and decision superiority.
- Protect the force during all phases of the operation.

Seamlessness will be the signature characteristic of well-integrated Space and land force operations. From the user perspective, Space support must be reliable, timely and conducted with minimal operational friction. During operations at the tactical or operational level, undue delays or discontinuities will quickly make Space support irrelevant. For this reason, the central thrust of Army Space operations is to reduce technical and procedural seams in the system of systems. In effect, many of the actions outlined here will bridge, bypass or remove seams that would otherwise lessen or nullify the effectiveness of Space support to land force operations.

The Army has been, is and will continue to be a prominent player on the Joint Space team. Preparations are now under way to develop new Army contributions to the Space surveillance and negation functions of Space control operations. Army forces will also provide support to Space forces, such as those conducting Space satellite control operations. Some of this support will be tied to the Army's role in homeland security with an emphasis on global missile defense operations.

This concept also touches on several advanced Space operations for the short- to mid-term. Space control capabilities to enhance information operations will continue to be a high priority. Procedures to enable direct tasking of satellites by tactical commanders and expanded employment of direct downlinks from satellites to tactical users will remain an ongoing initiative. In the long-term, this capability will be achieved through the global information grid.

The infusion of Functional Area 40 Space Operations Officers into existing headquarters will ensure that current and future Space force enhancement tools and products are integrated into Objective Force operations. Space awareness and analysis provide a necessary combat multiplier to achieve information superiority. Whether at home or abroad, short- or long-term, Army Space operations will be consistent with the Army's responsibility to conduct prompt and sustained land combat to win the nation's wars.

As the Army moves forward in its transformation and achieves Objective Force qualities, we must ensure, in all our mission areas, that we are truly "transformational" and not just "reforming." The words of J.F.C. Fuller, expressed in the early 1930s, should serve as a constant reminder: "Rather than refighting the last war, we should instead ask, 'Given an emerging technology, how can we fight war more rationally?'"

Don't Forget "Access" Space Launch Critical for Military Transformation

By Jeffrey Becker and
Gary Trinkle

The Secretary of Defense has identified the strengthening of Joint Warfighting capabilities and the transformation of Joint forces as among his top priorities. United States Joint Forces Command is dedicated to providing Joint context for Service-developed capabilities and to exploring transformative military capabilities. Recently, Joint Force Command's Joint Experimentation Directorate (J9) completed a study that is especially relevant to Space operators in the Army and throughout the other Services. This analysis, titled "Space Access as a Critical Enabler for Future Joint Warfighting" examines Space lift requirements for the future Joint force and considers alternatives to current chemical propulsion Space access strategies.

Project Alpha was established by Joint Experimentation as a "rapid analysis" group designed to scout the future and identify high-impact ideas in the area of Joint force transformation. The ideas and technologies examined by the Project Alpha analysis team are often unconventional and rarely mature; therefore, the purpose of a Project Alpha rapid assessment process is to endorse and refine an idea's potential rather than to establish an acquisition program.

This article will highlight the findings of Project Alpha's Space access report, including several potential solutions to the challenging technical problem of placing militarily significant payloads in orbit. The United States relies so heavily on a wide range of Space capabilities that access to the medium must be regarded as a "strategic center of gravity." Space planners must ensure that the correct mix of investments is found so that this reliance on Space capabilities does not become a vulnerability. The six-month Project Alpha "Space Access" rapid assessment process studied current and programmed Space access capabilities and evaluated whether these pro-

spective Space lift capabilities will be sufficient to support future Joint operations.

A National Challenge

U.S. strategic-level guidance, including the Space Commission report, describes Space as a "vital national interest." In light of this guidance, a large number of concepts and technologies that rely on Space or exploit its unique characteristics have been developed. However, current launch technology is expensive, less responsive than it could be, and is often prone to costly errors. Compounding these drawbacks are unsuccessful reusable launch vehicle efforts that have been thwarted by the difficulties inherent in mastering the required technologies and a lack of programmatic and budgetary will. There is a disconnect between our military's need to access Space and our ability to get there cheaply and reliably. Our need for cheap and reliable access to Space and the lack of diversity in our systems means that the United States runs the risk of ceding asymmetric Space advantages by relying on quarter-billion dollar disposable launch systems. We do not sink our ships or crash our airplanes after each mission, yet we regularly do just this with Space launch vehicles.

Most military concepts of operations — both present day and experimental — assume the availability of Space for U.S. purposes. Communications, navigation, intelligence, and — increasingly — force enhancement and projection capabilities are usually considered an "assumed future reality" in planning and operations. Indeed, most future-oriented concepts such as the Army's Objective Force "sensor to shooter" grids, "common relevant operational pictures" and "network-centric warfare" all rely on these significant assumed Space capabilities to be success-

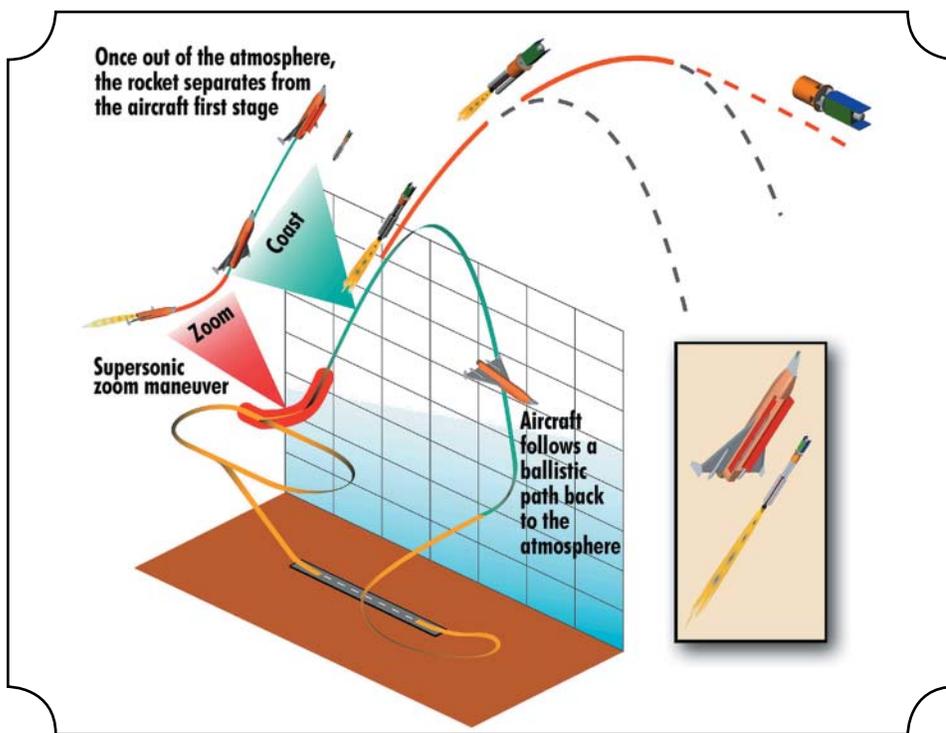


Figure 1

ful. One cannot assume, however, that the assortment of government and commercial launching mechanisms planned to be available in the 2015-2020 timeframe will be vastly more affordable, reliable, and responsive than those available today. The Space access report found that planned Space launch capabilities will rely heavily on the “evolved expendable launch vehicle” series of boosters to provide incremental improvements over today’s capabilities. However, many concepts for Space force enhancement, Space control, and Space force application often rely on assumptions of vastly better Space access capabilities than the expendable launch vehicle program can provide.

Growing U.S. reliance on reliable access to Space must be squared with the fact that, in many ways, the current model for staged, disposable chemical propulsion rockets (such as the evolved expendable launch vehicle) has reached near-peak efficiencies. The Project Alpha Space access study found that current U.S. orbital access strategies should better accommodate the examination and development of alternatives to chemical rockets as the single method to reach orbit and that alternative Space launch capabilities should be given larger prominence in developmental efforts and experimentation venues.

To illustrate the wide range of alternative Space access capabilities, the rapid assessment process looked at five representative scientific initiatives in this area. The five alternatives were designed not as prescriptive recommendations, but rather to exemplify the varying stages of maturity and scientific complexity of ideas that exist outside of the current launch paradigm. Some of these ideas make claims so radical and revolutionary as to require extraordinary evidence if they are to be implemented. Advocates of transformative military change, however,

are not doing their jobs if radical, yet plausible ideas remain unexamined. Indeed, today’s unlikely capability may be tomorrow’s assumed reality. The Project Alpha Space access report began the process of examining some of the revolutionary orbital access concepts that are under consideration in advanced technology labs around the world.

Alternative Space Access Capabilities

Reusable Exo-atmospheric Deployment

Future warfighting concepts, including the Army’s Objective Force, emphasize small, highly dispersed, yet interconnected units to minimize vulnerability, increase flexibility, and respond rapidly to unpredictable and changing situations. Current Space architectures, however, often rely on large, expensive single boosters to loft satellites. These large expendables may never allow the United States to achieve the responsive launch capabilities that future military operations will require. One solution to this issue is to rely on larger numbers of mini-satellites, micro-satellites, and other smaller satellites launched from specialized aircraft capable of exo-atmospheric flight. The use of advanced reusable aircraft is a relatively straightforward method to achieve more responsive Space access by a hybridization of reusable and expendable vehicles designed to achieve orbit for small, yet highly capable payloads.

As depicted in Figure 1, one Defense Advanced Research Projects Agency technology initiative being studied is the efficiencies gained in cost to orbit when a very high-speed aircraft “zooms” to exo-atmospheric altitudes, then releases a small rocket and payload that burns as a second stage to place the small payload in orbit. A

(See *Don’t Forget “Access”*, page 45)

Space Operations in Support of the Objective Force

By Dave Carrithers

The Army's Objective Force is designed from the ground up to be part of the Joint, interagency and multi-national team in support of rapid deployment and operations against a range of threats, including defense of the homeland. The Objective Force concept and design is nested within the strategic guidance outlined in the current National Security Strategy, National Military Strategy, Defense Planning Guidance, Joint Vision. It supports the larger Department of Defense Transformation efforts that include the six 2001 quadrennial defense operational goals, the four transformational pillars and the emerging Joint capstone concept of full spectrum dominance.

The Army will fight in the future operational environment as part of the nation's Joint military forces. To maintain supremacy in this future environment, the Army must be more strategically responsive, deployable, agile, versatile, lethal, survivable and sustainable across the full spectrum of conflict. These seven characteristics, outlined in the Army Vision, are the foundation for the development and evolution of Army organizations, its operational concepts, required capabilities and missions.

The Army must have the ability to generate overmatching combat power by leveraging the synergy of maneuver, firepower and protection in combination with mentally and physically prepared leadership that is empowered by superior situational understanding. At the same time, Army forces must contribute directly to the Joint force capabilities for dominant maneuver, precision engagement, full dimensional protection and focused logistics.

The Objective Force will conduct sustained combined arms air-Space-ground operations within the Joint campaign to establish land force dominance, wrest the initiative from

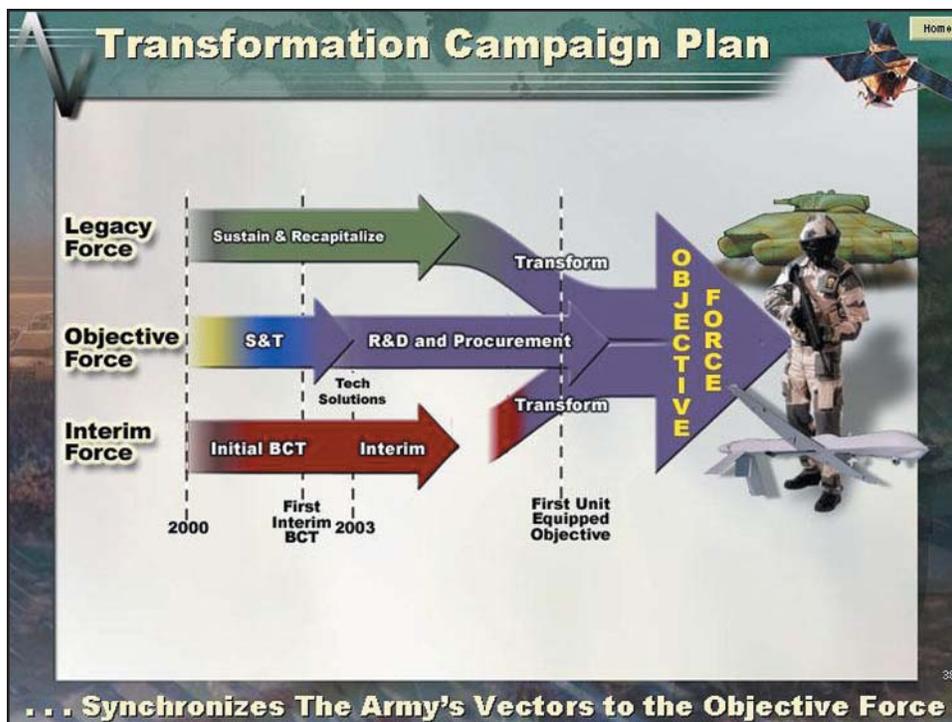
the enemy, force him to the defensive and defeat him in detail. Objective Force units achieve their power through the ability to see first, understand first, act first and finish decisively at the strategic, operational and tactical levels of war. Superior situational understanding, based on networked command, control, communication and computer intelligence, surveillance and reconnaissance capabilities at all levels, enables ground commanders to operate on their terms, at the time, place, and method of their choosing. The ability to see and understand first must be enabled by reliable, redundant, networked, jam-resistant, high bandwidth communications; user-friendly information displays; and advanced tactical decisions.

The Objective Force operating environment is more complex than today's environment. There is a growing requirement for information superiority across battlefield functional areas. Because the enemy will be less predictable, operations will be conducted in a distributed manner, in a 360-degree radius, and over non-contiguous uncontrolled terrain. This complex terrain will place a premium on integrated Space, air and ground sensors, and communications.

Threat forces are knowledgeable of how U.S. forces use and rely on Space capabilities to support precision engagement and situational awareness and understanding. Degradation of these Space-based capabilities serve to level the playing field by degrading situational awareness and understanding, thereby weakening the system of systems synergy and slowing the pace of "see first, understand first and act first."

Today, the enemy also occupies the high ground and has access to Space-based capabilities.

The wide use and increased capability provided by



commercial Space systems have altered the definition of the Space environment. Commercial capabilities provide unique challenges for U.S. forces and represent an alternative for leveling the playing field by the enemy.

As a Space-empowered force, units of employment and units of action will routinely exploit the overhead constellation of military and civilian Space platforms for intelligence; focused surveillance; area reconnaissance; long-haul communications; early warning; position, velocity, time, navigation (PVNT); missile defense; weather/terrain/environmental monitoring; and access to the global information grid. The layered redundancy and improved capabilities provided through Space will sharply improve development of situational awareness at all levels, help resolve many current operational challenges (e.g., fleeting target engagement or limits on range and mobility of terrestrial communications) and strengthen the commander's confidence in the knowledge backbone that supports him. The deployed capability to cross-cue intelligence and nonintelligence platforms will lead to more responsive and comprehensive targeting information. Space enhancement will extend from national to tactical level (Space to mud) and prove particularly indispensable in immature theaters where existing communications infrastructure (e.g. absence of fiberoptic cable networks) may be insufficient or unreliable. Overall, Space-based capabilities are critical enablers for implementation of the fundamental principles of the unit of employment concept, particularly with respect to achieving information superiority, creating situational awareness and operating within the high tempo, non-contiguous, simultaneous framework of distributed operations.

Superior knowledge will enable all phases of the land campaign, beginning with the reliable identification of

key enemy forces and capabilities, and permit the unit of employment and its subordinate elements to:

- Differentiate and prioritize enemy forces, capabilities and targets for attack, enabling the unit of employment to conduct dominant, precision maneuver against those objectives that will have the most overpowering effects on the enemy's forces, capabilities and integrity.
- Conduct precise, continuous battle damage assessment.
- Sequence, weight and apportion supporting assets more effectively with respect to fires/effects, maneuver support and maneuver sustainment.
- Conduct highly synchronized, precise sustaining operations.
- Identify threats and means that must be neutralized to support operational maneuver by ground or air.
- Fully synchronize dominant maneuver with organic and external precision fires.
- Enhance force protection at all levels.

The medium of Space is the "high ground" for the Objective Force. As such, our Joint Space forces must seize this ground if we are to dominate the terrestrial battlespace. Army Space operations will focus on five essential tasks to ensure that the Objective Force successfully achieves decisive victory. Unless achieved, Objective Forces will be impaired or possibly unsuccessful. These five essential tasks are:

- Support increased deployability and reduced theater footprint.
- Enable situational understanding "off the ramp" during entry operations.
- Support precision maneuver, fires, sustainment and information.

The Objective Force will conduct operations to, from, in and through Space in support of national interests. This trend will continue; not only will commanders of Objective Force units be able to better maneuver in the vertical dimension, but they will also leverage other Joint combat capabilities hundreds of miles above the Earth.

- Enable continuous information and decision superiority.
- Protect the force during all phases of the operation.

Support increased deployability and reduced in-theater footprint

Space provides many resources that support increased deployability and which reduce in-theater footprint. Some of those resources include Space-based communications that provide global access and Space-based intelligence, surveillance and reconnaissance that enhances situational awareness. Space control capabilities ensure our freedom of action in Space while denying an adversary the same capability. Global reach to the home station operations center and home station support nodes is critical when conducting operational maneuver from strategic distances.

Enable situational understanding “off the ramp”

Understanding all aspects of the battlespace environment becomes increasingly difficult when the threat has the “home-court” advantage. The threat’s intimate knowledge of urban areas, infrastructure, cultural and political areas, and complex terrain are critical enablers to threat operations. These operations may be further enhanced by the effects of weather on the physical environment, forces and sensors.

Continuous situational understanding of the battlespace is the key enabler to offset the enemy’s home-court advantage. The information supporting this understanding must be available in real-time, actionable and tailorable to meet the unique needs of commanders at all echelons, and create the level of understanding to enable the Objective Force to gain the information initiative. Dynamic re-tasking and direct downlink capabilities must be coordinated with the Joint provider to ensure immediate access to information.

Enable information and decision superiority

A CONUS-based Army must have theater access to project combat power. Deployments may be into areas with poor infrastructure, limited ports of entry and little host-nation support. Entry operations will create “gray space” in which Objective Force commanders will be able to maneuver freely to fully develop multiple PODs (Points of debarkation). Threat forces will attempt to deny access by applying a wide range of anti-access strategies to include indirect attacks by asymmetric means and direct attacks using special purpose and terrorist forces. Threat forces will attempt to determine what forces will be deployed and when and where they will enter.

Superior situational understanding of the battlespace environment prior to deployment enables Objective Force commanders

to deploy the right force mix to establish multiple entry points. The employment of Space control systems will enable us to preclude the adversary from determining these points of entry. Space control systems will ensure that the deploying force can be protected from space observation from the time it prepares for deployment until the time it arrives in theater. Once the force arrives in theater, mobile Space control systems will continue to ensure that the adversary is denied information on friendly force operations from enemy Space assets.

Support precision maneuver, fires, sustainment and information

Adversarial forces will be more difficult to target as they conduct dispersed operations and use asymmetric responses to achieve operational objectives. They will also migrate to urban and complex terrain for hiding and shielding, disrupting command and control, and reducing the impact of Objective Force standoff situational awareness.

To increase friendly force advantage, the Objective Force commander must be able to leverage intelligence, surveillance, reconnaissance and PVNT resources to maneuver decisively and bring effective fires to bear on threat forces. Timely and continuous, jam-resistant PVNT is key to providing precision munitions on target. One-meter accuracy is the accuracy requirement. Combat identi-

fication and timely, accurate and responsive information are required to ensure that sustainment operations during every operational phase are conducted at the correct time and place.

Protect the force during all phases of the operation

Space capabilities play key roles in protecting the force during all operational phases. By attacking the adversary's Space systems, we deny him the information needed to detect and attack our forces. Satellite warning systems will cue missile defense systems with the location of missile launch and trigger passive and active defense reactions.

In summary, Space is a medium in the same way as the air, land or sea. The Objective Force will conduct operations to, from, in and through Space in support of national interests. This trend will continue; not only will commanders of Objective Force units be able to better maneuver in the vertical dimension, but they will also leverage other Joint combat capabilities hundreds of miles above the Earth.

The Objective Force will be equipped and trained to routinely exploit Joint Space-based capabilities. A responsive, integrated and interoperable command, control, communications and computer intelligence, surveillance and reconnaissance system — C4ISR — that collects, processes and disseminates information in a timely manner is critical to the development of situational understanding and awareness on the future battlefield.

In short, the Objective Force will be in position to exploit Space-based capabilities, while at the same time developing and executing protective measures for Space systems

as well as avoiding absolute dependency on them.

Seamlessness will be the signature characteristic of well-integrated air-Space-ground force operations. From the user perspective, Space support must be reliable, timely and conducted with minimal operational friction. During operations at the tactical or operational level, undue delays or discontinuities will quickly make Space support irrelevant. For this reason, the central thrust of Army Space operations is to eliminate technical and procedural seams in the system of systems to reduce friction and enhance information exchange.

from satellites to tactical users will remain an ongoing initiative. Initiatives are under way to develop new Army contributions to the Space surveillance and negation functions of Space control operations. Army forces will also provide support to Space forces, such as those conducting satellite control operations. Some of this support will be tied to the Army's role in homeland security with an emphasis on Army national missile defense operations.

The overall contribution of Space control capabilities cannot be overemphasized. U.S. dominance in Space is not guaranteed. Adversaries may probe our Space systems

and segments for vulnerabilities or they might alter the Space environment to disrupt or deny our Space operations. Space control, a mission shared by all Services, ensures freedom of action for the Objective Force units and, when directed, denies an adversary freedom of action in using Space-based systems and products.

Finally, Space-based intelligence, surveillance and reconnaissance capabilities will often be the first "eyes on target." The

Army has been, is and will continue to be a prominent player on the Joint Space team to "secure the high ground."



In the far term, this capability will be achieved through the global information grid. Space battlespace awareness and Space analysis provide a combat multiplier required for achieving information superiority. Whether at home or abroad, near or far term, Army Space operations will be consistent with the Army's responsibility to execute prompt response, mobilize the Army, conduct forced entry and conduct prompt and sustained land combat to win the nation's wars.

Procedures to enable direct tasking of satellites by tactical commanders and expanded employment of direct downlinks

David Carrithers currently serves as the U.S. Army Space and Missile Defense Command Liaison to Training and Doctrine Command. He retired from the U.S. Army in 1992 after serving in a number of command and staff positions in the continental U.S., Germany, Republic of South Korea, and Republic of Vietnam. After retirement, he provided support to the U.S. Army Space and Missile Defense Command, Department of the Army, and the National Ground Intelligence Center in a contractor capacity.

Space Modernization Strategy

By Karen Oliver

In the Army Space community, several of the stakeholders such as the signal, intelligence and engineer communities work their own separate set of priorities. When these priorities reach the Joint community, they arrive piecemeal and without a single voice that says this is the priority for the Army in Space. The development of a Space Modernization Strategy grew out of this need for the Army Space community to clearly articulate Army priorities for Space capabilities and how these capabilities will enhance the ability of the Objective Force across the full spectrum of future conflicts. The goal of the Space Modernization Strategy is to identify and prioritize current and future Space capabilities that will support Objective Force requirements and provide critical Space support to the Warfighter. The Objective Force will not only exploit current, planned and programmed Space systems, but evolving Objective Force requirements will also help shape the design of future Space systems and their architectures.

The Space Modernization Strategy is based on an integrated approach that reflects the commonality of Space interests and efforts found among Training and Doctrine Command (TRADOC) proponent schools and centers, and the U.S. Army Space and Missile Defense Command (SMDC). The role of SMDC, as the Army's proponent for Space, is to integrate research, development and acquisition efforts, modernization strategies and master plans into a single Army strategy that eliminates duplication of effort in leveraging Space capabilities and allows the Army Space community to speak with one voice within the Army as well as in Joint and national forums.

The foundation of the integrated strategy is constructed

of documents such as the 2002 Army Modernization Plan, Army Space Master Plan, Objective Force concepts and goals, Objective Force unit of action, Objective Force unit of employment, the former CINCSPACE Integrated Priority List, Defense Planning Guidance, Quadrennial Defense Review, Army Transformation and TRADOC seminar wargames, lessons learned and proponent modernization plans. The Space Modernization Strategy was developed through an analysis of key documents that included the March 2002 draft TRADOC Objective Force Capabilities, November 2001 CINCSPACE Integrated Priority List, August 2001 Defense Planning Guidance and the 2001 Quadrennial Defense Review. After analyzing these documents from a standard mission approach, we identified the specified and implied Space tasks from each document and compared them with the Space capabilities that were projected to reach maturity within the next 10 years. The results were placed into seven Space operational areas: satellite communications; intelligence, surveillance and reconnaissance; blue force tracking; missile warning; Space control: position, navigation and timing; and weather, terrain and environmental monitoring.

Space operation areas were then prioritized on the basis of their support of Joint Space priorities, how they reflected the Space priorities identified in the key documents named above, and the frequency with which they satisfied draft TRADOC Objective Force Capabilities. Figure 1 displays how each of the principal inputs to the strategy addressed the seven Space operation areas. For example, satellite communications was a high priority in the Integrated Priority List, Quadrennial Defense Review and Defense Planning

Prioritization of Space Mission Areas

	OFCs	CINCSpace	QDR	DPG
ISR	Y	Y	G	G
SATCOM	G	G	G	G
Missile Warning	R	G	Y	G
Space Control	G	G	G	Y
BFT	Y	Y	N/A	N/A
PNT	G	R	R	R
WTEM	R	R	N/A	N/A

G	= Top 3 priorities/Most Applicable
Y	= Priority/Applicable
R	= Lower Priority/Less Applicability
N/A	= Not Discussed

Figure 1

Priorities in SATCOM

<p>SUPPORT TO THE OBJECTIVE FORCE</p> <ul style="list-style-type: none"> Beyond Line Of Sight (BLOS) Battle Command On the Move Ability to Broadcast Large Volumes of Secure Information (Data, Video, and Imagery) Intra and Inter-theater BLOS Intra and Inter-Theater and In-Restricted and Urban Areas Enable Global Reach for Support Services - Logistics, IAW, Telemedicine Assured Access to Global Information Grid (GIG) and Commercial Systems Access on Demand Variable Bandwidth as mission requires Protected, Anti-Jam (AJ), Low Probability of Interception (LPI), Low Probability of Detection (LPD) Embedded Integrated SATCOM Systems Flexibility (Real Time Reconfigurable) 	<p>PRIORITY OF KEY ENABLING CAPABILITIES</p> <ol style="list-style-type: none"> Advanced Wideband Advanced EHF Mobile User Objective System (MUOS) MR STAR DSCS Wideband Broadcast Systems EHF Follow-on (HF O) Commercial  <p><i>GNR Tactical Multiband Terminal</i></p>
<p>CONSIDERATIONS</p> <ul style="list-style-type: none"> Access on Demand SATCOM Channels for Maneuver Forces, Asstair (Joint coordination) Need Extreme High Data Rate (EHDR) to Provide Real Time Video Interacted With Digital Data For Battle Command On-the-Move and Fixed BLOS Communications Space Control Necessary to Achieve Information Superiority Ground Terminals Must Be CCE Transportable 	<p>CURRENT SHORTFALLS</p> <ul style="list-style-type: none"> Secure Wideband Communications Architecture with High Data Rate Future Requirements for Adequate Capacity and Interoperability Protected (AJ/LPI/LPD) Survivable Communications Assured Access Access on Demand to Small Mobile and On-the-Move Terminals

FIGURE 2

Guidance, and satisfied the most draft TRADOC Objective Force Capabilities. Another example was the weather, terrain and environmental monitoring capabilities that enable many of those but were neither among the then CINCSpace priorities nor even discussed in the Quadrennial Review and Defense Planning Guidance. Figure 1 shows the priorities that resulted from the analysis were: satellite communications; Space control; intelligence, surveillance and reconnaissance; missile warning; position, navigation and timing; blue force tracking; and weather, terrain and environmental monitoring. This part of the analysis gave us the overall priorities for Space. However, in each one of those mission areas there are several programs under development. The need to identify what the priority should be in each of those separate mission areas drove us to conduct a second phase.

The second phase of the analysis involved linking current and projected Space systems or capabilities within each of the Space operation areas to each of the specified and implied Space tasks. By applying the same methodology that was used in the first part of the analysis, the systems that supported the greatest number of tasks received a higher priority over one that only supported a few tasks. Detailed analysis charts were developed for each Space operation area as shown in Figure 2. The charts depict at a glance the current shortfalls in capabilities, the priority of each key enabling Space system or capability, the support they provide to the Objective Force and the considerations that must be addressed in order to deliver a particular capability to the Objective Force. Because of the number of stakeholders in the Space community, the recommended priority is only a suggested listing of enabling systems or

capabilities based upon the SMDC underlying analysis. The prioritization within any domain is the responsibility of the individual proponent for that particular domain.

The results of the analysis for the Space Modernization Strategy were staffed to other SMDC major subordinate elements; the Army staff G2, G3 and G6; I Corps; and TRADOC schools and centers. The final results were presented in June 2002 to the TRADOC and SMDC co-chaired Space and Missile Defense three-star Senior Advisory Group, which approved the Space priorities. As the Army Space community conceives and develops capabilities to support the Interim, Objective and Legacy forces, the Space Modernization Strategy, through this prioritization process, helps to focus efforts and resources on the areas that will best enable the transitioning force. The Space Modernization Strategy is an evolving process that is linked in change to the annual revisions of its foundation documents. SMDC will continue to ensure that the strategy corresponds to the individual proponent's requirements and master plans as well as supporting Joint priorities. SMDC will update the Space Modernization Strategy in 2003 using a Space planning process currently under development. Bob Clarke's article, "SMDC Moves into Space Planning for Army Transformation" will discuss this new process.

Karen Oliver currently serves in the U.S. Army Space and Missile Defense Command, Force Development and Integration Center in Arlington, Va., managing the training program for the Multi-Mission Mobile Processor. Her professional experience includes 22 years at the Army Air Defense Artillery School developing and managing training for Command, Control, Computers, Communications, and Intelligence systems and Short Range Air Defense systems.

Army Space soldiers battle typhoon in Japan

By SSG Franklin Barrett, Unit Reporter

OKINAWA, JAPAN — Have you ever watched trees torn to shreds by the wind? Or, listened as the eerily somber voice of the tempest beats down on buildings without remorse? Look toward the shoreline! Those massive waves assaulting the beaches and seawalls — their brethren have killed many ...

Give your sympathy to the island of Okinawa, Japan, for this is its fate. The sub-tropical climate so coveted by homesteading soldiers and airmen grants no mercy, and can turn from paradise to vicious in a heart's breadth. The summer months and part of autumn bring forth the infamy and wrath of the western Pacific — the typhoon.

Bearing the name of a deity in Micronesian legends, Typhoon Sinlaku hammered Okinawa from September 4-6, 2002. The brunt of the storm reached winds in excess of 120mph. The impact on both the military and civilian communities was terrible. Dozens of civilian homes were destroyed. A great deal of damage was dealt to the island's land-based vegetation, as well as coral reefs just offshore.

At E Company, 1st Satellite Control Battalion, the damage was considerable. The soldiers on duty during the typhoon coined the affectionate phrase, "the darkest days of BOC," in reference to the complete loss of power experienced at the Buckner Operations Center. Never before had such a challenge been faced, but the efforts of the soldiers and leaders of E Co. to stand up to Mother Nature at her raging worst reflected great credit upon the unit, the 1st SATCON and the U.S. Army.

When Sinlaku challenged the resolve of the soldiers and the mission at the Fort Buckner Defense Satellite Communications System Operations Center, the soldiers stood defiantly as they expended every resource available to combat her fury.

The first sign of trouble was the loss of commercial

power. Fortunately, the host installation provides infrastructure support, including power, so standby generators were brought online to provide the DSCSOC Operations Building with its lifeline.

Unfortunately, the power feeders for the building eventually failed completely, rendering it useless, and severing the building's power input. The next step was to operate off the Uninterruptible Power Supply's Backup Batteries, which are designed to run for very short periods of time, less than 30-45 minutes.

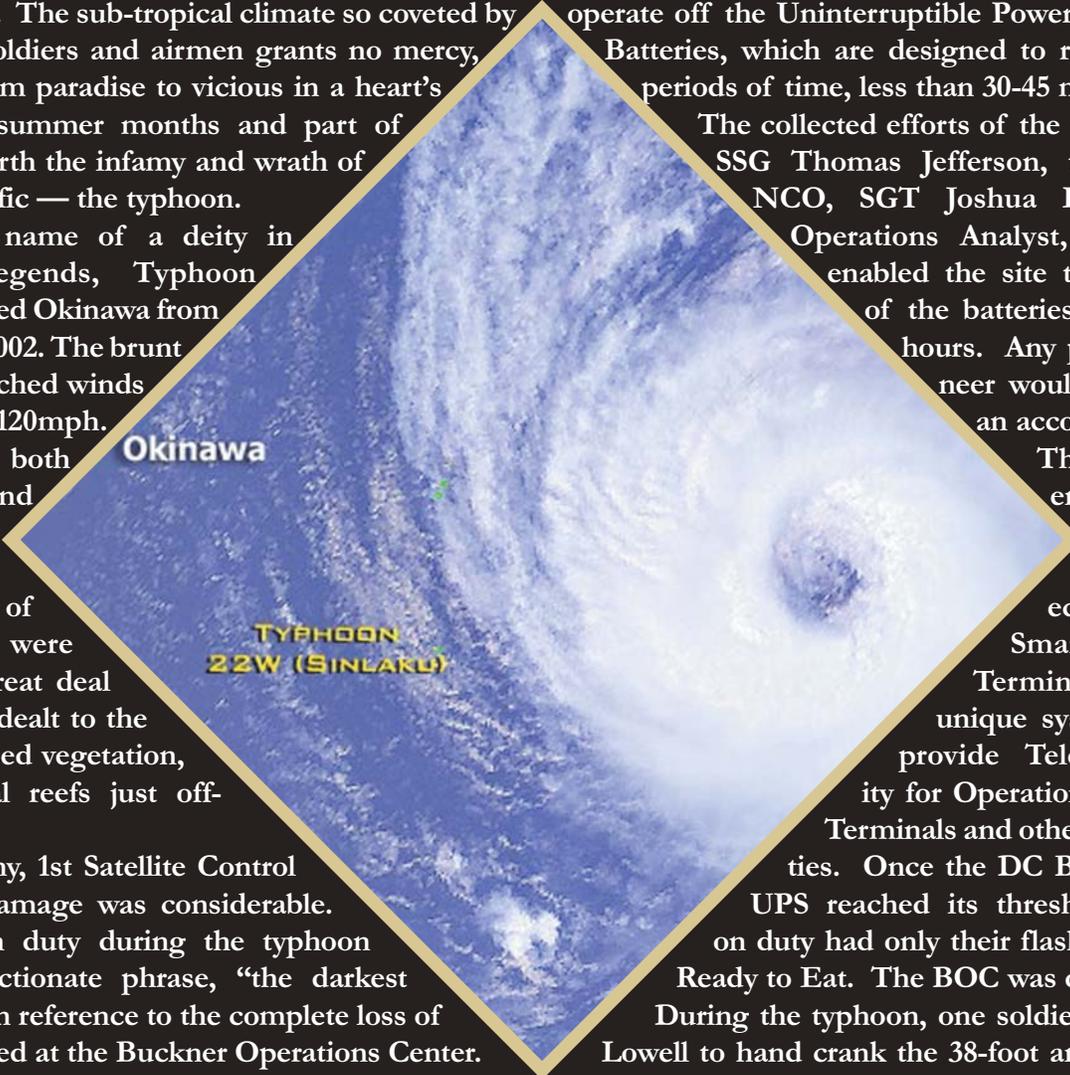
The collected efforts of the Operations NCO, SSG Thomas Jefferson, the Maintenance NCO, SGT Joshua Lowell, and the Operations Analyst, Frank Hughes, enabled the site to extend the life of the batteries to more than 11 hours. Any power-savvy engineer would marvel at such an accomplishment.

The last joules of energy were consumed by a single piece of equipment. The Smart Multi-Circuit Terminal (SMCT) is a unique system designed to provide Teletype connectivity for Operations Centers, Earth Terminals and other SATCOM facilities. Once the DC Bus voltage of the UPS reached its threshold, the soldiers on duty had only their flashlights and Meals Ready to Eat. The BOC was dark and silent.

During the typhoon, one soldier teamed up with Lowell to hand crank the 38-foot antenna utilized by the BOC Auxiliary Satellite Control Terminal, an AN/GSC-39B Medium Satellite Terminal.

SPC Robert Adanitsch volunteered for the unpleasant chore. Hand-cranking is no easy task. Normally, electronic drive motors in the antenna maintain the antenna's azimuth and elevation tracking of the satellite, but under emergency conditions, tracking has to be maintained by hand-cranking the antenna. Fortunately, he only had to hand-crank for less than an hour.

Lowell commented on the teamwork evident through-



out the long night. “Everyone was trying to do something, their part, without getting in anyone else’s way during a critical moment. Adanitsch really rose to the occasion, very eager to learn and to help,” he said.

Hughes and Lowell’s focus was on the site itself, restoring power, with Jefferson leading operations under emergency conditions. Without the well-calculated efforts of these three key personnel, the typhoon would have hindered operations far longer than it did.

The following day, the powerhouse team coordinated with a Marine Corps unit on the adjacent base, Camp Foster, and a 200-kilowatt mobile generator was provided to get the site back up. Jefferson’s efforts directly contributed to this unique emergency support, and BOC came back to life. However, it wasn’t until the main feeders were repaired, and normal power operations restored, that business started returning to normal.

The effects of the typhoon were felt for almost a week after the typhoon had passed.

Dealing with the challenges of typhoons and the effects on operations was no new thing for Jefferson. Typhoon Sinlaku was his third. He lauded the Herculean efforts of the “typhoon shift,” saying “Good teamwork the whole time. Everything just clicked.”

“The soldiers had their heads and hearts in the game,” he concluded.

For their efforts during those few days of overwhelming challenges, the soldiers and civilians most closely involved with the restoration of site power were awarded for their dedication with letters of achievement and Army Achievement and Commendation medals.

All personnel involved agreed that the effort was collective, and without the steadfast determination of each soldier on duty during the typhoon, operations restoration would not have been as swift.

The mission and operations have long since returned to normal. Typhoon Sinlaku hit hard, pushing the envelope of the resources of the unit. But E Co. drives on, and continues to support its fellow DSCSOCs and warfighters from the front lines to garrison.

E Co. extends the challenge to Mother Nature: bring your worst, and we will persevere.

Thanksgiving in Qatar brightened for Space soldiers by special visitor



Chief of Staff of the Army GEN Eric K. Shinseki, left, administered the oath of re-enlistment to SSG Steven Adams from the Joint Tactical Ground Station Central Command. The once-in-a-lifetime event took place in Qatar, where Adams was deployed and served as the Engagement Control Team leader. Photo by SFC Robert Wall

By MAJ Laura Kenney, Army Space Command
and CWO Vernon Dayton, Unit Reporter

CAMP AS SAYLIYAH, Doha, Qatar — What makes the Thanksgiving season special? Besides the food that is ... Often it’s the company you keep, and, for soldiers of the Joint Tactical Ground Station, Army Space Command, deployed here from Fort Bliss, Texas — the guest list definitely made Thanksgiving 2002 one to remember.

Chief of Staff of the Army, GEN Erik K. Shinseki, topped the list of special persons who came here to share holiday time with soldiers and sailors.

Three JTAGS soldiers shared a pre-Thanksgiving lunch with the general and other soldiers and sailors. But one JTAGS soldier really hit the jackpot, and was administered the oath of re-enlistment by the Army’s top general.

SSG Steven Adams, Engagement Control Team Leader, raised his right hand and repeated the time-honored words to the stern but friendly face of the man with four stars on his desert pattern BDU cap.

“I do solemnly swear, that I will support and defend the Constitution of the United States against all enemies, foreign and domestic; that I will bear true faith and allegiance to the

(See *Thanksgiving*, page 47)

Space unit likes its training 'cubed'

By SSG Franklin Barrett, Unit Reporter

OKINAWA — Training recently took on a third dimension for E Company, 1st Satellite Control Battalion, Army Space Command. It was not just another routine few hours at the rifle range. Instead, these soldiers spent a hard-charging day firing, testing on Common Tasks, and, the perennial soldiers' favorite ... getting "gassed" in the CS chamber.

The unit conducted the action-packed training and testing day recently, with 27 soldiers participating in the three-part range. The range, conducted on Camp Hansen here, qualified soldiers on their assigned weapons, the M16A2 and tested them in this year's Common Tasks. The third "dimension" showed up as soldiers endured and survived mask-confidence training, an annual requirement for all soldiers.

The planning and coordination effort for the scheduled training involved every aspect of the unit. The unit's Training NCO, SGT Robert Nelson, was the centerpiece for conception and planning. To accomplish the same objectives in the past, the unit would have had to conduct several large ranges throughout the year.

"By having large ranges, there were a lot of soldiers who were having to wait for their firing line — complaining about how most of their day was spent that way when they could have been training," said Nelson. He thought grouping the ranges would largely eliminate that aspect of the training. With cooperation and participation from the other NCOs in the unit, Nelson was able to coordinate the combination of the three events.

NCOs from the first sergeant to team leaders worked together in planning and execution.

The unit's Supply NCO, SGT Victor Glaze, handled all of the logistical needs. SFC Brian Groves, Operations Platoon Sergeant, and SGT Erica Schaffer, the unit's Nuclear, Biological and Chemical NCO, made it happen at the mask-confidence training. SGT Michael Stansbury and Groves worked together as Range Safeties to ensure the success of the M16 Qualification Range, while SFC Brian LaMay oversaw the event as the NCOIC and Range Safety Officer. The unit armorers, SGT Christopher Golden and SPC Daniel Fagan, teamed up to ensure weapons and ammunition were a "go."

Vehicle load plans developed by LaMay and his Support Platoon enabled the advanced party to move out from Fort Buckner, the unit's installation, in a



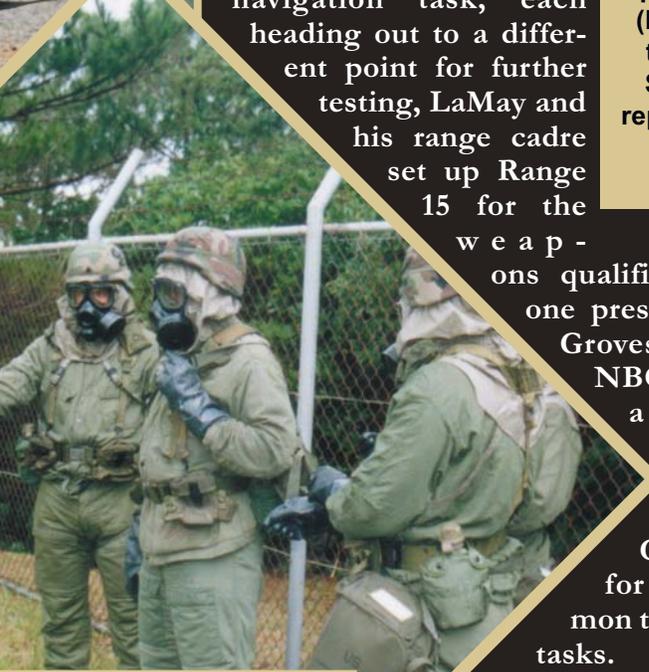
Above, SFC Brian LaMay fires his assigned weapon, the M16A2, in the prone-unsupported position; right, SGT Erica Schaffer inspects soldiers protecting themselves against Nuclear, Biological and Chemical (NBC) attack; below, SFC Brian Groves directs SPC Shamikka Fenstermaker and SPC John Ames in the Gas Chamber. Photos by SSG Franklin Barrett





timely manner on the morning of November 21, 2002. The soldiers being trained and tested fell in for accountability and inspection at 5 a.m. With the bus warmed up, and gear in store, bus driver SPC Mitchell James began the long drive to Camp Hansen at 5:35 a.m.

The plan for the day was to integrate all three of the tasks, weapons qualification, CTT and mask confidence. While the teams of soldiers prepared their land navigation task, each heading out to a different point for further testing, LaMay and his range cadre set up Range 15 for the



weapons qualification of everyone present. Meanwhile, Groves prepared the NBC chamber with a stout treatment of CS gas, and Schaffer and SGT John Castine prepared for the NBC common task testing (CTT) tasks.

Three checkpoints were plotted for land navigation, one at the weapons range, one at the NBC chamber and one in between.

At the weapons range, Nelson tested the soldiers on the Claymore and communicating in a secure net, as well as verifying the soldier's land navigation checkpoints.

At the NBC Chamber, Schaffer and Castine tested soldiers on the NBC Common Tasks in conjunction with Groves' mask confidence training.

At the third checkpoint, SSG Daniel Bleifield, the unit's Personnel Sergeant, tested soldiers on first-aid tasks.



BLAST FROM THE PAST

In February 1984, then LTC Robert Stewart along with Navy CAPT Bruce McCandless II, participated in two extravehicular activities (EVA's) to conduct first flight evaluations of the Manned Maneuvering Units during the STS-41B Challenger mission. These EVA's represented man's first untethered operations from a Spacecraft in flight.

See story on page 8.

In the NBC chamber, always a 'hot-spot' for drama, range cadre observed soldiers in mask-confidence training.

One soldier, SPC Christopher Smithson, went beyond the call of duty by singing the Army Song, unmasked, in the CS chamber. After this unique exhibition of his pride in the Army, Smithson spent more than 10 minutes clearing his uniform and his body of the unpleasantly potent CS gas.

While the M16 Range was being prepared, the gas chamber remained hot, and this added to the simultaneous completion of both. As a result, "Everyone was in

and out of the chamber, and tested on the CTT tasks, within the three-hour scheduled time frame," Groves said.

By 10:30 a.m., the weapons range was ready to go "hot," and the first firing order prepared for zeroing their weapons.

On Okinawa, the only ranges available for Army units are 25 meters, with stationary paper targets, rather than the familiar 300-meter pop-up ranges. With the first firing order zeroed, qualification began. When the smoke cleared later in the afternoon, four soldiers achieved the coveted "Expert" qualification. Fourteen soldiers achieved sharpshooter, and five made it as Marksman.

"There was a 100-percent first time 'go' overall, which is an accomplishment itself," said SFC Lester Blandin, the unit's Operations Trainer.

With all the soldiers tested in CTT, and cleared in mask confidence, the last group of firers completed the range by mid-afternoon.

For larger units, the combination of these three events into a one-day range may not seem like much, but for smaller units like E Co., it takes a large amount of cooperation and coordination to ensure the success of such a feat.

"Leadership, especially that of the junior non-coms, was key to the success of this type of range," said Schaffer, with understandable pride.

Re-enlistment at 9/11 site 'a profound experience' for Space soldier



SGT Raul Sheran, B company, 1st SATCON, is administered the oath of re-enlistment by his company commander, CPT. Thaddeus Underwood, at a place seared in his heart, as it is in the hearts of all Americans. Sheran took the oath to renew his dedication to country and service at Ground Zero, World Trade Center, New York City, with his fellow soldiers as witnesses. U.S. Army photos

By SFC Mathew Frias, Unit Reporter

FORT MEADE, Md. — For a soldier, re-enlisting is a milestone in his or her career. A soldier has the option to ask when and where he or she would like to re-enlist; and if possible, the company will try to coordinate arrangements to make it happen.

SGT Raul Sheran, who hails from Brooklyn, New York, asked if he could re-enlist in New York City at the World Trade Center (WTC) Ground Zero. Since he is from New York City, the events that occurred on Sept. 11, 2001 touched him and his family personally. He wanted to dedicate his re-enlistment to the memories of what happened on that day. He wanted observers to ponder the reasons why those of us who re-enlist do it — “to defend these United States against all enemies foreign or domestic.”

And to protect our loved ones.

On Oct. 18, 2002, Sheran’s wish to re-enlist at Ground Zero in New York City became a reality. After a great deal of coordination and planning, 21 Black Dragon soldiers of B Company, 1st Satellite Control Battalion departed home base, not on a mundane bus, but instead on two Black Hawk helicopters. The helicopter trip was made possible with the assistance of Chief Warrant Officer David Rosser from the Military District of Washington. Chief Rosser had heard about Sheran’s re-enlistment through his stepson, SPC Kenneth Smith, from our unit.

For many soldiers, this was their first time on a Black Hawk helicopter. “I would never have thought to be flying in a Black Hawk in my military career,” said SPC

Taito Taylor. For most soldiers, just riding in a Black Hawk helicopter made the day. But there was more to come.

For the flight, just going over the landscape from a height of a couple thousand feet was amazing. But coming into New York City, the view was extraordinary. Going by the Statue of Liberty and seeing the Manhattan skyline — for many of us something we'd only seen in films — was breathtaking.

We ended up landing at Manhattan Wall Street Southside Helipad. We had to wait until the FBI director Louis Freeh departed before we could land.

“Things happen,” said one of the Black Hawk pilots.

After disembarking, we proceeded to walk to WTC Ground Zero. This only took about 10 minutes. Walking through downtown Manhattan around the Wall Street area, and seeing the people around looking at us, the soldiers of B Company, made us proud to be in the U.S. Army.

People left and right were offering uplifting comments and asking us where we came from. We even had some funny remarks, such as, “Is that a bazooka you’re carrying?”

We then told the questioner that it was the U.S. flag and our unit flag in a carrying case — and we were going to use them for a re-enlistment ceremony at Ground Zero.

After arriving at Ground Zero, we met up with LT Quentin DeMarco of the Port Authority Police of New York and New Jersey, who showed us around and gave us an enlightened briefing about what happened on Sept. 11, 2001. Most of us were awestruck about what had happened, even so many months after the terrible events, especially after seeing the aftermath.

DeMarco lost some of his comrades during the Sept. 11, 2001 events, and he offers these briefs in their memory.

After the briefing, DeMarco showed us the tempo-

rary memorial that was set up while the construction to rebuild was ongoing.

Sheran re-enlisted near the memorial around 11 a.m. It was a solemn ceremony, and rightly so.

“I re-enlisted here for the family and friends directly affected on this day.”

After the re-enlistment, we had to wait for the helicopters to refuel and to return to the heliport. All of us ended up going somewhere for lunch. “Where’s the famous New York City pizza?” asked SSG (P) Richard Gilbert. We tried looking around but most of us went to a Chinese fast food restaurant and some went next door to an Irish restaurant. For the soldiers that went to the Chinese fast food restaurant, “It was pretty cheap and not bad,” said SPC Kevin Feimster, “especially for downtown New York City.”

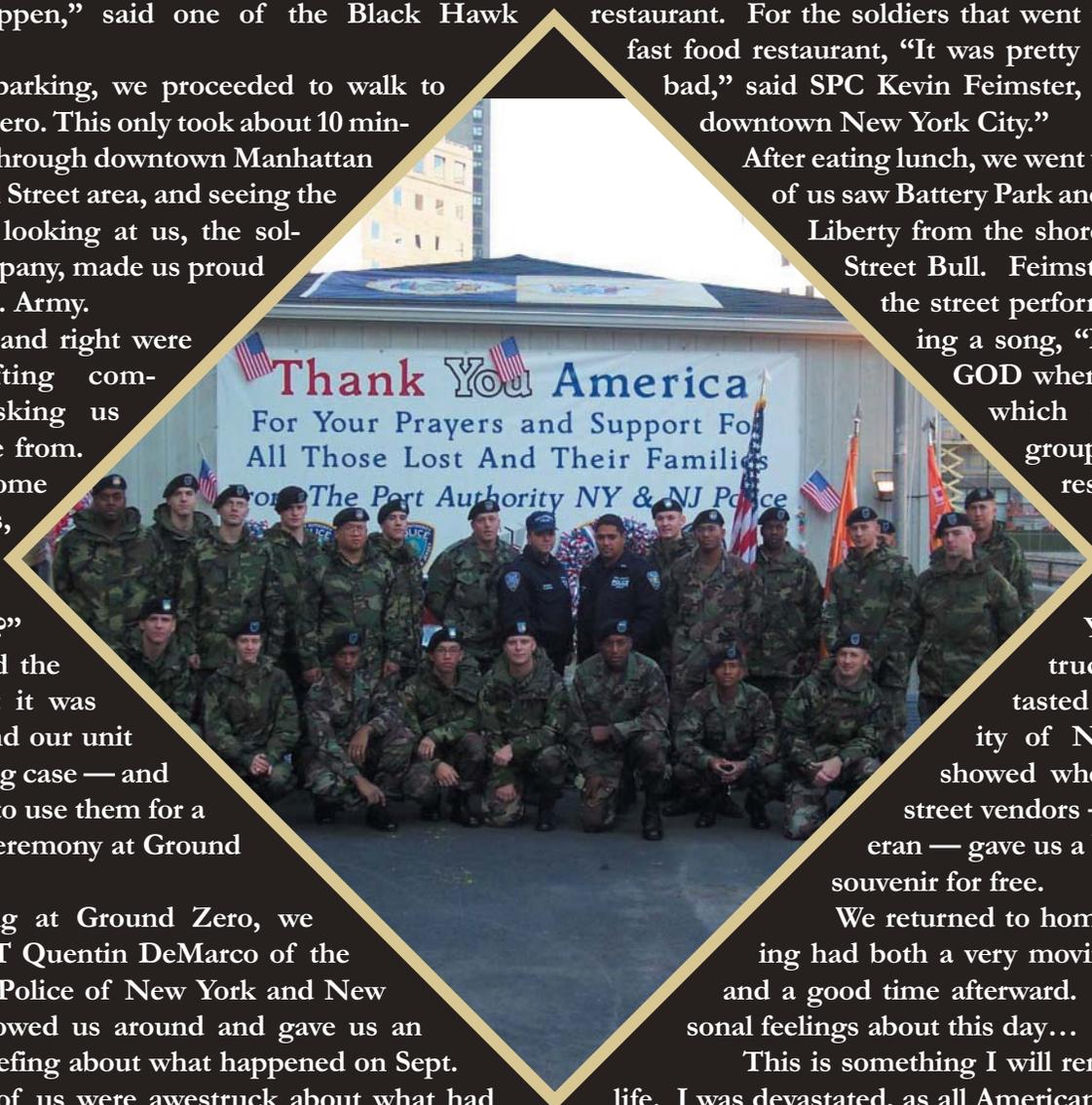
After eating lunch, we went walking. Some of us saw Battery Park and the Statute of Liberty from the shore and the Wall Street Bull. Feimster said one of the street performers was singing a song, “I’m Gonna tell GOD when I get home,”

which stuck to our group through the rest of the day.

Some of us got to pose on a New York City fire truck. We even tasted the hospitality of New York City showed when one of the street vendors — a proud veteran — gave us a New York City souvenir for free.

We returned to home station, having had both a very moving experience, and a good time afterward. As to my personal feelings about this day...

This is something I will remember all my life. I was devastated, as all Americans were, by this attack on our country. To actually go to one of the sites, and then to be a witness and participant while one of my fellow soldiers re-dedicated his life to the service of our nation — it was a profound and moving experience that will serve as a major highlight of my military career.



Special Forces to test electronic battlefield reporting device during Robin Sage exercise

By Debra Valine, Editor, The Eagle

Soldiers used to carry notebooks and pens that they used to record everything around them while in the field — where they were, the location of other friendly or enemy forces, type and number of aircraft or ground vehicles, and which way the group was heading. When the soldiers returned to where the unit was set up, the information they recorded was transferred up the chain of command.

The modern warfighter may soon carry a personal digital assistant (PDA) that will allow him to instantly transmit information such as where he is and what he sees at his location to a base unit — the Dismounted Intelligence Situational Mapboard software on the Low Earth Orbit Position and Reporting Device (LEOPARD) coupled with the Advanced Warfare Environment (AWarE) software. The LEOPARD system was developed by the U.S. Army Space and Missile Defense Battle Lab. The DISM software was developed by Trident Technology in Fairfax, Va.

This integration of software and hardware was requested by the Special Operations Command Battle Lab at Fort Bragg, N.C., as a sensor-to-shooter tool that will allow warfighters to communicate electronically. It was tested during the Robin Sage training exercise at Fort Bragg in late February.

“Robin Sage is the world’s largest unconventional warfighting exercise,” said MAJ Scott Stearns of the John F. Kennedy Special Warfare Center and School at Fort Bragg. “It is the culminating event in the Special Forces qualification course. It’s spread out through central North Carolina encompassing 14 counties and 7,500 square miles. The students work in an unconventional scenario where they are training to fight and win a battle.” The exercise has been held quarterly since 1952.

Instructors at the school tested the LEOPARD device during the conduct of the exercise, allowing stu-

dents to focus on their mission.

“We are looking at what is going to be the validation of near-real-time situational awareness within the unconventional warfare environment,” said LTC William Banker, chief of the Army Special Operations Digital Environment Center at Fort Bragg.

“Traditionally our communications have not been digital unless it was a text message,” Banker said. “Now we have a digital map which means it has icons on it that are placed there for near real-time reporting via a satellite link. We are looking at what that increased awareness brought about by near real-time display and reporting capabilities can do in terms of increasing combat effectiveness in the unconventional context.”

The instructors will provide their impressions of the device after the exercise concludes.

“We will use the lessons learned provided by the instructors to generate the next generation of the system,” Banker said. “We do not believe the LEOPARD is ready for production. We are looking at refining the system and improving the board design.”

LEOPARD is a product of the Battle Lab’s Army Space Exploitation Demonstration Program which identifies, tests, experiments, assesses and transitions emerging Space-based capabilities to the warfighter. LEOPARD’s target audience is dismounted units whose mission set causes them to operate beyond the coverage of typical tactical communications networks, for example, Special Operations Forces, scouts, forward observers, long-range detachments, etc.)

“LEOPARD provides global, two-way, on-the-move voice and data communications,” said Jeff Faunce, chief of the Experiments Division of the Space and Missile Defense Battle Lab. “It is a lightweight and rugged, user friendly portable device that also gives the



soldier the ability to send free text messaging up to 200 characters.”

LEOPARD provides the ability to track deployed soldiers, as well as receive real-time information from the forward battlespace. It consists of two devices: a hand-held unit carried by soldiers in the field — maybe one per team — and a base unit in the tactical operations center. Integrated into the hand-held unit, which looks like a PDA and weighs about 7 pounds, is a global positioning system and an Iridium satellite telephone.

“The global positioning system gives the position and when the soldier makes a call back to the base station, the base station updates the map it has of the battlefield,” said CPT Tim Tubergen of the SMD Battle Lab — West in Colorado Springs, Colo. “The base station not only records the soldier’s position, it also records any other information the soldier provides such as enemy location, friendly forces location, obstacles on the ground, etc.”

Another component of LEOPARD, the Viper Laser Range Finder — similar to binoculars — allows soldiers using LEOPARD to transmit targeting data. The laser measures the distance from the soldier to the item being targeted and the GPS system incorporates those coordinates with the coordinates of the soldier’s location to transmit accurate information on the target.

“The Laser Range Finder is an integral part of how Special Forces will use the capability to mark targets or other items of interest to the mission,” Faunce said.

“We have incorporated a transfer of information from the base station to the AWarE software,” Tubergen said. “Anything the soldier has entered is transferred from the field to the base station. The person monitoring the AWarE will automatically see what the soldier

sees.”

AWarE is a suite of configurable capabilities that supports the needs of today’s warfighter. These capabilities range from basic administrative functions using Microsoft Office tools to intelligence preparation of the battlefield (IPB). Some of the AWarE applications include Force Operations, Situational Awareness, Time Sensitive Targeting, Missile Warning, IPD, C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance) Management and Engagement Operations.

“AWarE supports mission planning and provides unprecedented situational awareness that is achieved through the combination of stove piped data streams into an integrated three-dimensional display,” said Michael Leech, of SMDC’s Battle Lab. “This state-of-the-art 3D situational awareness improves decision making within a tactical operations center, significantly reduces multiple

data entry and in-theater footprint by merging capabilities into a multifunctional ‘plug and play’ architecture.”

“If I can report or update situational awareness without opening my mouth and talking on a radio, that is good stuff,” said COL Kevin Buckner, deputy director of the SMD Battle Lab in Huntsville, Ala. “As the system evolves, it can only get better for the warfighter. The enemy may know there are electrons floating around in cyberspace, but it’s difficult for them to know what those electrons are doing.”



Above, SGT David Watts, SSG Jesse English, and Capt. Tim Tubergen of SMD Battle Lab-West and Larry Ravenscraft, SMDC Battle Lab in Huntsville, view information recorded in the field and transmitted electronically to a base unit that will be part of the tactical operations center in Exercise Robin Sage at Fort Bragg, N.C., in February. The team was in Huntsville, Ala., Jan. 9 testing the integration of the Dismounted Intelligence Situational Mapboard (DISM), software on the Low Earth Orbit Position and Reporting Device (LEOPARD), and the Advanced Warfare Environment (AWarE) software.

Opposite Page, Kirk Davis, a contractor with ARINC in Colorado Springs, Colo., relays information back to the base station during a recent test of software being integrated into a system that will instantly update the battlefield situation map.

Debra Valine is a public affairs specialist in the U.S. Army Space and Missile Defense Command and functions as the editor of *The Eagle*. She retired from the Army in 1997 after a tour as the chief of Army newspapers at the Pentagon. Following retirement, she worked for three years as the editor of the only weekly newspaper in NASA before accepting her current position in SMDC.

Space Soldier and His Wife Bring Warmth to Afghanistan

By MAJ Robert Zaza

B AGRAM AIR BASE, Afghanistan — Army Space Support Teams normally provide Space products and expertise to Corps commanders and staffs. That's the extremely important job that Army Space Support Team 4 is deployed here currently to do, as participants in the global war on terrorism.

Recently, though, a member of that team, mobilized reservist 1LT Shawn Price, gave a bit more than even the 100-percent all soldiers are expected to give, when he spearheaded a humanitarian relief effort with the assistance of his wife Marie.

A project to provide blankets and winter clothing to destitute Afghans began in November 2002 with Marie Price's idea to do something for the American soldiers in Afghanistan. Marie said, "I wanted to send supplies to the soldiers, just extra stuff. I contacted my husband and we discussed the idea." Price felt that the need for adequate clothing among the Afghans was so great that they should gather clothing and blankets for them instead. He told Marie, "We have it made, compared to the local people." Now they knew exactly what they had to do.

Marie's church, the 1st Baptist Church of Kettering, Ohio, rallied together to collect 22 large boxes of winter clothing. A childcare center, La Petite Academy, and Marie's apartment complex also donated clothing. The Family Support Office at Wright Patterson Air Force Base, near Dayton, Ohio helped immensely by shipping the boxes, which otherwise would have been cost prohibitive.

On Jan. 12, 2003, Price joined a group of soldiers from the 450th Civil Affairs Battalion, a unit from Riverdale, Md., on a mission to distribute the boxes to people in

the Bagram Valley, in the shadow of the Hindu Kush Mountains. The 450th conducted the mission on a Sunday, a day normally reserved for "down time."

Price reported that the distribution got out of control after a while, because the Afghans were so desperate. The 450th made arrangements with the local "Mullah" to leave



1LT Shawn Price, a mobilized reservist with Army Space Support Team 4, distributes desperately needed clothing to children and adults in Afghanistan, where he is presently deployed. His wife Marie, with the aid of her church and other local citizens, collected the clothing and blankets once her husband told her of the need. Army Space photo.

the remaining items with the village elders, who distributed the items by need to villagers following evening prayer. The boxes consisted of a variety of winter apparel, adult pants and shirts, infant- and toddler-wear, and blankets.

After the mission, Price wrote in an email to Marie, "I can't describe the desperation of these people — how badly they need help. We ran into some problems giving out the clothes because the crowd got slightly out of control, so we

had to end it early. They weren't being malicious, just overcome with the need to get what they could — sisters fighting brothers, parents pushing their children aside. I don't think I've ever seen the look on a child's face that I saw when they were clawing at us for clothes. It wasn't panic; it was survival. It was the look that you would see on the face of a grown adult fighting for his or her life. Everything here is about 'survival of the fittest'."

He added, "On the good side, they were grateful to see us. The people at your church need to know that The Lord allowed them to do a great thing — possibly the greatest thing that any civilian can do as part of the effort in Afghanistan."

In a spirit of faith and goodwill, American soldiers and civilians gave potentially life-saving clothing to the people who needed it the most.

COMMAND in BRIEF

Army Space teams deploy

PETERSON AIR FORCE BASE, Colo. — Three Army Space Support Teams deployed recently to Southwest Asia. The deployments are part of the normal rotation schedule, but, with the uncertain, currently volatile nature of that area, the goodbyes said at a ceremony Jan. 23 held an extra poignancy.

Team 1 deployed to support V Corps. The team completed certification training in September, supported Exercise Victory Strike in Poland in October, deployed to Kuwait to support V Corps during Exercise Internal Look in November, and returned home just before Christmas. Their scheduled current deployment is planned to end in six months.

Team 3 journeyed to support U.S. Army Forces, U.S. Central Command, Combined Force Land Component Command. The team also had deployed to Kuwait in early November for Exercise Internal Look, and had returned home just before Christmas.

Team 5 left to support Marine Expeditionary Force 1, in a move called “a unique opportunity for us to support our sister Service” by 1st Space Battalion commander, LTC Scott Netherland. This team recently returned from a deployment to Southwest Asia, where they were part of the global war on terrorism. They also participated in Internal Look, and returned home before Christmas.

COL Kurt Story, Army Space Command Chief of

Staff, led the farewells to each team, saying, “In the normal run of things, these soldiers do a great job with scheduled deployments, bringing Space products to the commanders in the field. They’ve been especially critical as part of the global war on terrorism, and many of the people you see here today in desert battle dress are on their second or third deployment

for that purpose. But, with world events being what they are today, and the country at war with Iraq, there is a great possibility that these soldiers will remain in theater for an indefinite period of time. So, in essence, this is a deployment with many more potential levels and responsibilities than ones that have gone before.”

A member of Team 1, SSG Jessica Adams, agreed that the pace of deploy-

ments has been hectic, and that this particular one has people a bit more anxious.

“I can’t say you get used to it, but ... deploying is what we do. This one, I’ll have to admit has me a bit more nervous, but at the same time excited. Whatever the circumstances, we’ll continue to do our job,” she said.

Her husband, 1SG Travis Adams, Headquarters and Headquarters Company, 1st Satellite Control Battalion first sergeant, attended the farewell ceremony, in his woodland battle dress a colorful contrast to his wife in her deserts.

“Yeah, I’m left behind again,” he joked. But he quickly became serious, and talked about his pride in



SGT Gregory Singer, left, and SPC Joshua Foye from the Army Space Support Company's Team 5, prepare items for their recently deployment.
Photo by Sharon L. Hartman

his wife, and described how they handled the deployments.

“It might be easier on us because we’re both military, and understand the system, and how to cope. But of course I worry about her and miss her, and part of me wishes I was going. But, we each have a mission.”

Netherland led the standing-room-only crowd gathered to see the teams off in a crescendo of applause.

“Know that our hearts and prayers are with you, as we know that you will continue to do superbly your mission of supporting the warfighter with the very best Army Space has to offer.”

By MAJ Laura Kenney

New Sheriff Visits Army Space Command, explores future working relationship

PETERSON Air Force Base, Colo. — What interest do areas such as satellite imagery, non-line of sight tracking and a reach-back capability have to local law enforcement?

Plenty, according to the newly elected El Paso County Sheriff, Terry Maketa.

Maketa was invited to U.S. Army Space Command Jan. 8 to receive a briefing on the Command’s capabilities, a tour and the opportunity to meet some of the people who provide Space-based products to the warfighter.

“I was extremely impressed with what I saw,” said the 15-year veteran of the El Paso County Sheriff’s Office.

Recently, local governments and law enforcement have moved toward incorporating high technology in their day-to-day operations, such as the use of

TASERs in the Sheriff’s Office. The city of Colorado Springs has also proposed use of a Global Positioning Satellite-based Automatic Vehicle Locator system to assist emergency vehicles.

Seeing what may one day have commercial and law enforcement applications, especially to his department, was of great interest to Maketa.

One of the many products of Army Space Comands that caught his attention was the field of satellite imagery.

Maketa said this type of tool would be of great use in areas such as fires, floods and intelligence for narcotics interdiction.

Army Space was a key player in last summer’s Colorado wild fire fighting efforts when it was asked to provide specially enhanced satellite images of the affected areas.

“The whole satellite imaging arena and what you are able to do with the images once available would be of great use to our department,” he said.

He also pointed to the real-time capabilities Army Space is utilizing with Blue Force Tracking, and the comprehensive reach-back ability that is found in the Army Space Operations Center, which would help his own department’s daily operations.

“The biggy is knowing where your resources are at any given time,” said Maketa.

“El Paso County is almost 2,160 square miles. We have people in every corner of it,

and some days in every corner of the state. And then we start talking about transport and so forth. So absolutely, it would be nice to see where our resources are, and their progress for officer safety issues as well as efficiency.”

Maketa admits his knowledge of the Army’s role in Space was not extensive. No stranger to military



Bo Dunaway, Director, Spectral Operations Resource Center, explains some of the technology to incoming El Paso County Sheriff, Terry Maketa, left, during a guided tour of Army Space Command facilities.
Photo by Sharon Hartman

life, Maketa grew up on military bases.

“My dad was in the Infantry — a 26-year career. I just never heard any discussions of the Army’s role in Space. I knew the Army had artillery and ground launched missiles but ... Space?”

“I was of course aware of the military use of Space assets, but I was pretty surprised to learn of the advancements and the deep involvement of the Army in Space.”

Commenting on his visit to the Command and the important role Space is playing in today’s world Maketa said, “What I experienced was something that I see as being the first step in a long-term relationship. It provided for me a snapshot of what we can expect in the civilian sector and law enforcement.”

“I know the relationships between local law enforcement and military installations — whether it is the Army or Air Force — have improved over the years. There is more of an effort to share information. I’m actually looking forward to building on the blocks that we have today.”

As to his thoughts about Army Space Command personnel ...

“All I can say was I was just completely impressed with not only the technological capabilities but also the personnel here at Army Space. Anyone I interacted with had a very professional demeanor and was very knowledgeable about what they did.”

Maketa went on to say that Army Space personnel knew what their role was — be it National Defense, Homeland Security or forming solid partnerships with local law enforcement.

By Donald Montoya

Transformational Communications conference held at Army Space Command

PETERSON AIR FORCE BASE, Colo. — The Transformational Communications Office (TCO) — Senior Leadership Team (SLT), a group responsible for many of the actions that will change the face of warfighter communications in the near future, held a conference Nov. 20 at the new Army Space Command headquarters here.

The TCO, formally organized in September, is responsible for planning and directing the implementation of the Transformational Communications Architecture for the Department of Defense, intelligence community and NASA. The TCO, under Director Rear Adm. Rand Fisher, who is also the Commander, Space and Naval Warfare Systems Command, and Director of Communications at the National Reconnaissance Office, meets monthly in the Pentagon.

At the invitation of BG Richard V. Geraci, Deputy Commanding General, U.S. Army Space Command, and Deputy Commanding General for Operations, U.S. Space and Missile Defense Command, and also a member of the TCO-SLT, the group scheduled the November meeting to take place at the recently opened Army Space Command facilities.

The TCO-SLT is composed of representatives from the Department of Defense, intelligence community and NASA, with the critical mission of coordinating, synchronizing and directing changes in communications to meet the growing requirements of warfighters and the intelligence community. The ability to transmit detailed information quickly and reliably to and from all parts of the globe will help streamline military command and control and ensure information superiority, enabling faster deployment of highly mobile forces capable of adapting quickly to changing conditions in the field. Satellite communications play a pivotal role in providing the interoperable, robust, “network-centric” communications needed for future operations

The conference included representatives from Army Space, the National Reconnaissance Office, the Office of the Secretary of Defense for Command, Control, Communication and Intelligence, Air Force Space Command, Defense Information Systems Agency, NASA, MILSATCON Joint Program Office, CIA, U.S. Strategic Command, National Security Space Architect, Naval Operations, HQ Department of the Army Chief Information Office, Communications and Joint Staff Communications. Several participants were virtually present from the Pentagon via video teleconference. A tour of the new Army Space Command headquarters was provided.

By MAJ Laura Kenney

Homeland Security and Transformation

“... Our nation has taken great strides to improve homeland security since Sept. 11, 2001,” wrote President George W. Bush July 16, 2002. “Citizens, industry and government leaders from across the political spectrum have cooperated in a manner rarely seen in American history. Congress has passed important laws that have strengthened the ability of our law enforcement agencies to investigate and prosecute terrorists and their supporters. We formed a global coalition that has defeated terrorists and their supporters in Afghanistan and other areas of the world. Over 60,000 American troops are deployed around the world in the war on terrorism. We have strengthened our aviation security and made our borders more secure. We have stockpiled medicines to defend against bioterrorism and improved our ability to defend against weapons of mass destruction. We have improved information sharing within our intelligence agencies and we have taken steps to protect our critical infrastructure.”

By LTC Michael H. Postma

We are a nation at risk from a new and changing threat. The terrorist threat to America comes in many forms and has many places to hide. Terrorists attack us and exploit our vulnerabilities because of the freedoms we hold dear. The U.S. government’s most important mission is to protect the homeland from future terrorist attacks. To counter the threat, the president established a Homeland Security Department. The Homeland Security Department will consolidate 22 agencies with 170,000 workers into the new department, which constitutes the largest reorganization of government since the Department of Defense was created half a century ago.

Secretary of Defense Donald Rumsfeld stated that since the 2001 Quadrennial Defense Review, DoD has focused attention on the evolving threats. Defense of our homeland continues to be our top priority. DoD established the U.S. Northern Command to consolidate under a single unified command existing homeland defense missions that were previously executed by other military organizations. The specific missions of the command are to:

- Conduct operations to deter, prevent and defeat threats and aggression aimed at the United States, its territories and its interests within the assigned areas of responsibility.
- As directed by the president or secretary of defense, provide military assistance to authorities including consequence management operations.

U.S. Northern Command plans, organizes and executes

homeland defense and civil support missions.

Approximately 500 civil service and uniformed personnel are assigned to the U.S. Northern Command Headquarters at Peterson Air Force Base, Colorado Springs, Colo. The command will be augmented with additional forces, as required, to execute missions ordered by the president. Plans call for the command to be fully operational by Oct. 1.

The Army’s top priority is winning the global war on terrorism while defending the homeland. The Army has not been directed to take such a large role in securing the homeland since World War II. During the post-World War II era, civil support activities remained an Army function. The Army, however, devoted significant resources and priority to its other roles and functions, especially warfighting, that allowed it to optimize its structure, doctrine and training to that end. After Sept. 11, 2001, the Army was directed to plan and prepare to protect, prevent and respond to threats and disasters directed against our homeland. It must also continue its support to civil authorities for other significant dangers.

When directed, the Army will conduct combat operations within the homeland to prevent, deter, preempt and defeat an adversary’s threat. Most of the Army’s participation in homeland operations will be civil agency augmentation. The Army maintains significant resources for response to a major disaster and/or emergency, to include threats or use of weapons of mass destruction or effect.

The U.S. military must be able to prevent, protect and respond to threats and hazards in three geographic zones: The Homeland Zone, Middle Zone and Forward Zone. These zones are not strict boundaries and may overlap or change depending on a given situation. They provide an integrated defense toward preventing, protecting and responding to homeland threats.

Civilian agencies at the federal level are the primary agents for the coordination and employment of federal support. With the exceptions of protecting the nation from missile, air, naval and ground assault and the protection of military facilities, the military will play a supporting role. The Army will be guided by civilian law and led by the principle that the federal government assists state agencies except in terrorism and weapons of mass destruction incidents where the federal government has primary jurisdiction. When supporting state and local authorities, the Army usually does so through other federal agencies according to established agreements and plans.

Homeland operations consist of those legally sanctioned military measures to prevent, protect and respond to all threats against the United States and its territories and possessions that endanger its people, resources, facilities and critical infrastructure. The Army will support these missions in the following ways:

- Prevent an adversary from attacking the U.S. homeland.
- Protect against homeland attacks when prevention fails.
- Respond to civil authority's requests for support

Army unit design must include the ability to be tailored for homeland operations. This may require support to law enforcement or consequence management. Unit design must include sufficient manpower and equipment to provide the needed support without degrading the unit's warfighting capability. Additionally, units must have command and control capabilities that are interoperable with Joint, interagency and local or state entities.

The U.S. military must be able to prevent, protect and respond to threats and hazards in three geographic zones: The Homeland Zone, Middle Zone and Forward Zone. These zones are not strict boundaries and may overlap or change depending on a given situation. They provide an integrated defense toward preventing, protecting and responding to homeland threats. This operational con-

struct is proactive, threat focused and conducted in depth by layering military and interagency capabilities. In each zone, Army forces must also be able to rapidly deploy when conducting Joint operations, while leveraging focused logistics, providing trained and ready soldiers and units, and increasing current and future capabilities for sustainment and survivability. As needed, the Army will control and defend land, people and natural resources in each zone.

The Homeland Zone consists of all states, territories, possessions and surrounding water out to 500 nautical miles. It is the inner ring of a comprehensive land, maritime and aerospace defensive strategy. In conflict, the Army may be called upon to defeat an adversary in this zone while simultaneously conducting operations to defeat the source of the threat in the other zones. The risks in this zone include terror cells; enemy special operations forces; weapons of mass destruction/effect and chemical, biological, radiological, nuclear and explosive attack; strategies that degrade our installations or ground, air and sea means of transportation and infrastructure; natural and technological disasters; challenges to public confidence; and criminal activities.

The Army's role in response to crises in the Homeland Zone may include: Joint and interagency operations, defensive operations, support to law enforcement, disaster relief, civil disturbance, counterdrug operations, force protection of deploying forces, infrastructure assurance and other civil support actions. As outlined in various plans, statutes and directives, the Army will help defend the industrial base, provide engineering and transportation support, treat and evacuate casualties, manage the consequences of weapons of mass destruction/effect and chemical, biological, radiological, nuclear and explosive weapons, and support and reinforce civil authorities. Army forces in this zone will likely be special purpose and include small unit support packages.

(See *Homeland Security*, page 51)

Seminar War Games

By Terry Nelson

The Army Transformation is on a fast track. The Army Chief of Staff established the foundation for transformation with the publication of The Army Vision on Oct. 12, 1999. This vision was followed by significant efforts to update key Army doctrinal publications. FM 1, The Army, was published in June 2001. FM 1 delineated the roles, purpose and functions of the Army. In June 2001, FM 3-0, Operations, was released. This document describes the keystone doctrine for full spectrum operations. On Oct. 17, 2001, Concepts for the Objective Force White Paper, was released with the purpose of building the foundation of advanced capabilities and core technologies needed for the Objective Force and setting the conditions for irreversible momentum to the Objective Force.

The Objective Force will be organized, manned, equipped and trained to be more strategically responsive, deployable, agile, versatile, lethal, survivable and sustainable across the full spectrum of military operations. The Objective Force will be composed of modular, scalable, tailorable organizations equipped and trained for prompt and sustained land operations that can transition quickly between changes in task, purpose and directions by maneuvering into and out of contact without degrading operational momentum. Trained and equipped leaders and soldiers at the lowest levels will make decisions on the future battlefield.

The Army Transformation is not just about new systems; it is about major changes in doctrine, organizations, training, materiel, leader development, personnel and facilities (DOTMLPF). Not only will the operational Army change, but the institutional Army will change as well. The development of effective soldiers and leaders is more important to the realization of the campaign qualities of the Objective Force than technological advances.

Although "change" is often viewed as a difficult process within organizations, our Army has undergone significant change throughout its history that required its

soldiers to adapt. Change is part of our strong military heritage. The process to transform the Army to the Objective Force unfolds along a path of deliberate and theoretical discussions that will result in irreversible momentum toward achieving the Objective Force. These theoretical discussions have been frequently conducted on a recurring schedule at the highest levels of senior leadership within the Army as the journey continues to define and refine the Objective Force.

Informed by history and theory, concepts describe the nature and practice of future warfighting. Concepts provide the basis for future developments across the doctrine, organization, training, materiel, leadership development, personnel and facilities. They help us decide on investments in science and technology that will provide required capabilities when they are needed. While concepts might be limited by technological possibility, they are not limited to present day or near-term required capabilities. To be useful, concept development must be broadly based and encompass both the art and the science of future warfighting. Concept development must include continuous refinement through experimentation, assessment and analysis.

Key to the successful development of concepts to support the Objective Force is a series of seminar war games that engage TRADOC and Army major command senior general officer leaders. Seminar war games were initiated to review and investigate issues, build understanding and foster commonality of purpose and unity of effort. These gatherings focus on issues derived from the operational environment and earlier concepts. Critical concept and requirement products developed during the seminar war games have received validation through another series of reviews at the Department of the Army. The Chief of Staff Army has regularly convened Four-Star Requirements Review Councils to validate and approve these developed products.

The concept of conducting seminar war games was

The Objective Force will be organized, manned, equipped, and trained to be more strategically responsive, deployable, agile, versatile, lethal, survivable, and sustainable across the full spectrum of military operations.

initiated early in the Army Transformation process. The consideration of critical Objective Force concepts and the Future Combat System (FCS) Operational Requirements Document (ORD) was central to the development of the Stryker Brigade combat teams and functioned as a precursor to the seminar war game. It brought together key strategic leaders from the development and user communities very early in the development process. Led by the CG TRADOC, the forum addressed key DOTMLPF issues, gave clarity to these issues and provided focus for the way ahead. The result was a shared understanding of concepts, needs and related issues that promoted unity of effort and consistency in products developed at the proponents' home stations. The war game has proved itself in accelerating production of integrated, full-spectrum concepts and requirements, producing products much more quickly than the linear, decentralized requirements development process used previously.

In 2001, the Training and Doctrine Command intensified its efforts to define the future Objective Force. TRADOC focused on war gaming those critical concepts that required senior Army leadership decisions in the near term. Key concepts that were reviewed during the initial seminar war games included units of employment, units of action, battle command, maneuver sustainment, maneuver support, training, doctrine, leader development as well as the Unit of Action/FCS ORD. These war games not only enabled senior leaders to flush out the specific concept under review but also enabled other functional proponents to assess their functional areas to determine required synchronization and interdependencies.

Each war game addressed a standard scenario that the Objective Force may encounter in the full spectrum of military operations. The Caspian Basin scenario was frequently used because it provided the potentially complex environment needed to test operational capabilities.

Prior to each seminar war game, a set of objectives

and issues were developed to focus the event and enable the group to formulate operational imperatives or specific requirements for attaining concepts under development. Senior leaders were frequently assigned player roles during the war game that caused them to further define their concepts in the context of the overall warfighting environment. Although the outcome of each war game was not examined further in any constructive simulation, each work group led by senior general officers reached consensus in validating their product. An examination of how "we used to do things" was not an option during war games. The defining question became "how do we do things in the future given a new operational environment?"

Seminar war games have been critical events for the Army Space and Missile Defense Command (SMDC). These events produced the most significant recognition of Space contributions to the Objective Force to date. Recognition spanned from comments of the CG, TRADOC, to specific support provided by the School proponents during work groups and reinforced during plenary sessions. TRADOC war games highlighted the criticality of Space operations and information operations (IO) to future warfighters. Although Space and IO are not recognized as battlefield operating systems (BOSs), these capabilities have surfaced as key enablers of full spectrum operations during each war game.

Space control operations are now recognized as a critical component of entry and decisive operations. There is general consensus that Space control could be considered as an information operations enabler. Support for Space control has enabled SMDC to accelerate requirements documents under development in this area.

SMDC war game objectives are twofold. First, the command's goal is to depict how Space and missile defense contributes to achieving future force operating capabilities defined in overarching TRADOC con-
(See *Seminar War Games*, page 47)

Global Engagement VI

By COL Glen C. Collins and
LTC Michael H. Postma

War gaming activities provide warriors with the opportunity to thoughtfully consider challenges to national, regional and global security. The post-Cold War era, rather than bringing peace and stability to the world arena, has fostered security challenges along the entire spectrum of potential conflict. Recognizing the volatile international environment, the Chief of Staff of the Air Force, GEN John J. Jumper directed that a recurring war game be developed to examine the comprehensive application of aerospace power: Global Engagement. The Global Engagement war game series endeavors to highlight the importance of aerospace power to successful Joint warfare operations. To this end, Global Engagement examines the totality of modern warfare on a level playing field.

The objectives of the Global Engagement war game series are fourfold. First, these war games seek to make a direct contribution to maintaining the national security of the United States. Second, the war games seek to accurately portray the aerospace power's contribution to a commander's warfighting objectives. Third, Global Engagement seeks to educate a broad range of current and future decision makers on both maximizing the application of aerospace power and overcoming challenges to the security of the United States. The series highlights aerospace power's contribution to national security, specifically as it relates to executing the national military strategy. Finally, the war games establish an enduring input to the long-range planning process in the Air Force that both informs and educates planners on potential warfighting challenges and the means of conducting future wars.

In November 2002, the Chief of Staff of the Air Force hosted the Global Engagement VI (GE VI) War-game at the Bolger Center for Leadership Development in Potomac, Md. The war game's objective was to

explore the Joint concept of operations against a 2015 robust asymmetric threat using currently programmed force structures. The GE VI scenario was a major theater war level conflict with notional red forces in Southwest Asia. It was conducted at the SECRET RELEASABLE AUS-CAN-GBR classification level.

The game was structured so that two sub-games were conducted simultaneously. Two blue teams fought two independent red teams. Each subgame had its own assessment team while sharing the same control/National Command Authorities and the rest of the world/green cell. Each combined Joint task force blue team worked with a Joint support team. The Joint support teams represented the supporting unified commands and the interagency process. The Army's GE VI objectives were to:

- Demonstrate how networked land forces enable the Joint force to achieve positional advantage and operational dominance.
- Present how new and projected Army command, control, communications, computers, intelligence, surveillance and reconnaissance capabilities support the operational and tactical Joint warfighting.
- Demonstrate the Army's capabilities to conduct precision strike (lethal, nonlethal, kinetic, nonkinetic) from operational and tactical distances to achieve positional advantage.
- Demonstrate the complementary nature of dominant maneuver and precision engagement.
- Demonstrate the contribution of land power to Joint warfighting.

The U.S. Army Space and Missile Defense Command deployed a team of four Army Space officers led by COL Glen Collins, the Force Development and Integration Center director, to GE VI. The Army Space officers worked closely with the other Service



Space officers to ensure that robust Space play occurred during the war game. Space play objectives included developing offensive and defensive counter-Space concept of operations. The actual Space play focused on the contribution of Space intelligence, surveillance and reconnaissance (such as Space-based radar), protection of Space assets from the red team's anti-satellite weapons and Space force application.

Blue team A was led by LTG (R) Michael C. Short. Short's plan was developed using a current day mindset to employ the Joint force. He planned to flow forces into the operational theater after sufficient force protection assets were in place to defend blue team A's units as they closed. His forces flow plan depended initially on air assets. They were followed by ground and maritime forces. The overall concept was to conduct an air campaign to set the conditions for operational success and then to introduce ground forces. Blue team A's planning focused on beginning operations when red team A set off certain triggers.

During GE VI's execution, red team A attacked early and was very aggressive. As a result, blue team A lost portions of its Space-based intelligence, surveillance and reconnaissance assets and some of its ability to track the red team's weapons of mass destruction and anti-access systems. This changed blue team A's focus from "knocking down the door" by defeating the enemy anti-access systems to dealing with several high-value systems that the red team was husbanding and hiding. Those high-value systems included the majority of the red team A's anti-access systems that presented targeting and force protection problems for blue team A. This increased the time it took for blue team A to "knock down the door" and delayed the introduction of ground forces. It also delayed achievement of the blue team A's campaign objective of forcing a red team

regime change.

Blue team B was led by LTG (R) Stephen B Croker. Croker's plan was first to place a small blue team B force in the red team B's backyard. Blue team B's forces were arrayed outside the operational theater with key units flowing into the region. The blue team B's forces leveraged in-place force protection capabilities. Once blue team B's forces had closed on the theater, Croker's campaign plan was to simultaneously kick down the red team B's door and seize key lodgments where the red team B least expected it. Blue team B's campaign plan also incorporated a deception plan that had limited success.

During GE VI's execution, blue team B absorbed some strikes from red team B while the blue team B required forces closed on the theater of operations. The red team B used its theater ballistic and cruise missiles as anti-access tools. This created a delay in the blue team B's ability to completely gain theater access. The blue team B's campaign plan to execute decisive operations only when a large Joint force could be sustained inside red team B's country was correspondingly frustrated. Ultimately, achievement of the blue team's campaign goal to cause a regime change in red team B was also delayed.

GE VI provided a great deal of insight on future warfighting capabilities across the Services and identified seams that need to be addressed during the transformation process. New concepts such as the Air Force's Global Strike Task Force, Navy's Sea Power 21, Army's Objective Force and the Marine Corp's Expeditionary Maneuver Warfare were played out in a realistic setting against a future adversary. The GE VI after-action review process was completed in February 2003. The results are posted in the Objective Force collaboration area on the Space Operations Network.

SMDC Moves Into Space Planning for Army Transformation

By Bob Clarke

Planning is such an important part of any process. It's no fun and nobody likes to do it, particularly when it involves looking far into that nebulous, intangible place called "the future." In organizations as widely diverse as the Department of Defense and the U.S. Army, without planning you are destined to follow the courses of the loudest or most influential voices. In an environment driven by the resources of manpower, money and time, volume and influence carry loud voices. And those voices become screams the closer to program implementation and the wider the political and industrial support they have enlisted. All too often, it seems that a new piece of equipment hits the field and we look back and ask ourselves, "How did that happen? What was the requirement?"

Planning can help resolve such runaway programming — the phenomenon that occurs when concepts evolve to programs without adequate analysis to prove the need in the first place. It can help combat developers in the Army to focus on providing support to the Warfighter, keeping those forces who execute the nation's will — on the ground and in the trenches — properly organized, equipped and trained. Planning, separate from the more tangible aspects of programming and budgeting, allows the freedom of thought to provide that support, allowing the process to get out in front of the influence peddlers. A plan, well conceived, analytically founded, collaboratively built and committed to by the implementing leadership provides a good vector for the programmers. If articulated well to "the outside," good plans also lead to innovative thought from the users and industry alike. The enemies of this process are those that say we analyze too much; "just buy the thing and get it out to the soldiers." Equipment that results from this reaction most often fails in the long course because of inadequate doctrine, organization, training, materiel, leader development, personnel and facility (DOTMLPF) foundation.

We in the Army consider ourselves good planners and executors. In the combat developments arena, however, we rarely are. There are dozens of reasons why. We have processes galore: Army Requirements process; Concept-Based Requirements System; the Planning, Programming, Budgeting and Execution System; Joint Strategic Capabilities Planning Process; and scores of others. They're complicated, twisted by parochial interests and frustratingly long. We are often overcome by the industry-provided whiz-bangs for which we strive to find military utility, and we spend more time protecting our interests than developing them. Who hasn't heard the expression: "it's obsolete before we get it fielded?" The Army Space business is particularly subject to these criticisms. The problem clearly drew the attention of the 2000 Rumsfeld Space Commission Report that the Services were all over the map on Space planning and control, unable to keep pace with technology advancements.

Relative to the Fiscal Year 2003 \$365 billion defense appropriation, Space-related programs demand as much as 10 percent; the Army's portion of that approaches \$500 million per year. Yet the size of the funding for individual Army Space programs doesn't necessarily measure their importance or value. "Space programs" in their many forms are critical to the execution of our newest Defense Planning Guidance and the Army Transformation campaign. The American military in these times has no choice but to leverage the fullest extent of Space-related programs to be successful on the battlefield. But without adequate planning, the small, seemingly unimportant Space programs can easily be marginalized out of existence; some simply slip off the table, undefended. The Army can't be satisfied with the survival of only a few of the most visible Space programs. Do we simply accept that our current level of Space program success leaves us with the glass half full? Half empty? Or will DoD say the Army simply has

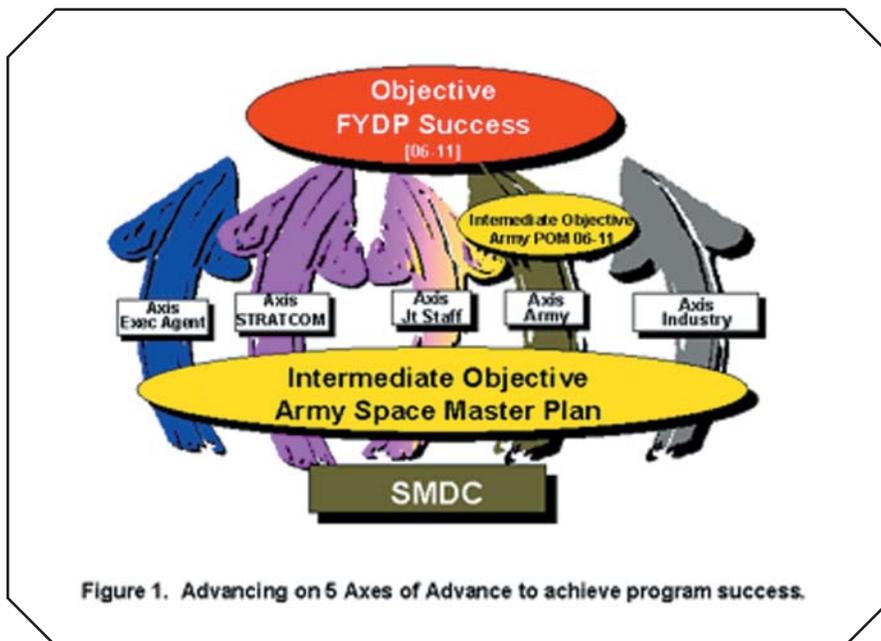


Figure 1. Advancing on 5 Axes of Advance to achieve program success.

too much glass?

Pursuant to Secretary of Defense Donald Rumsfeld's direction, DoD is moving out with a more concerted and controlled effort to "get its act together" in Space. Rumsfeld appointed the Secretary of the Air Force (also Director of the National Reconnaissance Office) the Space Executive Agent for DoD. Also at his direction, the DoD Comptroller established what is today a "virtual" Major Force Program (MFP)-12: Space.

The contents of Joint Pub 1-02 notwithstanding, the definition of "Space program" is arguably unclear — for example, it's easy to posit that a particular program is not "Space" because it only "uses" Space sources. But, in a programmatic sense, by including specific program elements in MFP-12, DoD is defining what it means by Space programs. Service Space programs have always existed in the Future Years Defense Program somewhere, but now they are more easily identified as such and can be more easily analyzed and compared. One day, when the "virtual" MFP turns real, it is likely that DoD, prompted by the Space Executive Agent using its National Security Space Plan yardstick, will exert much greater control of Service Space programs.

In light of the potential for significant DoD oversight, the Army's reasons for solid, collaborative Space programming could scarcely be stronger than they are today. First, global warfighting is more dependent on the technologies of Space than ever before. Military commitments come on ever-decreasing warning times requiring en route planning, accurate and timely intelligence assessments, specialized training and long-range communications. Combat units must be smaller and lighter, fight more dispersed, move more quickly over longer distances and yet produce greater, more focused firepower — and some of the bullets we shoot come in the form of electromagnetic radiation. Forces must use equipment that is interoperable and con-

nectable between and among other forces, and this all has to be done seamlessly — both physically and in time. The Army is transforming itself to fight in this new environment, and its Space program must support these changes. Second, the existence and ultimately the power of the Space Executive Agent will force the Army to develop plans and respond with programs that will fit within the National Security Space Plan. This will cause Army planners to provide the analytical underpinning that justifies the need for its Space programs and the quantifiable rationale if Army programs must be uniquely Army ... or join willingly with other Service programs where the support is logical and efficacious. Third, in the proverbial environment of increasing demands on resources, the Army must ensure that it stewards its funding prudently. That charge implies that duplication is avoided where possible, that technologies are shared and proliferated when they reveal strong military utility, and, most importantly, that other-than-materiel solutions are sought first rather than last.

In 2003, the U.S. Army Space and Missile Defense Command (SMDC) will discharge its responsibility as the Army's specified Space proponent by executing a collaborative Space planning process (SP2). Founded soundly on an identified need, articulated in the Army Transformation campaign plan and the more recent Army Strategic Planning Guidance for 2005-2020, the process will consist of simultaneous efforts along five primary axes (Figure 1). The SMDC approach aims to achieve its first major objective: to optimize the resourcing of Army Space-related programs in the next major Future Years Defense Program build for Fiscal Years 06-11. Action officer activities on each of the axes — from those involved with the Executive Agent in National Security Space Plan development to those involved with U.S. Strategic Command in developing the combatant commander's Integrated Priority List to those Deputy
(See *SMDC Moves into Space*, page 51)

Key Enabler ... from Page 3

protection and prevention and ensures the capability to control Space while denying its use to the enemy.

Decisive operations in support of the Joint Force Commander depend on tactical success in close combat — the ability of the Objective Force to close with and destroy enemy forces and to seize and control terrain. Robust Space-based capabilities, integrated with a seamless command, control, communications and computer intelligence, surveillance and reconnaissance structure, are key to this phase of the operation. National technical means, coupled with tactical surveillance, theater reconnaissance and wide area surveillance, will in the mid- to far-term enable the Objective Forces commander to see the enemy first, understand his intent, plan a response, distribute the appropriate data and information, and then attack.

The potential for future adversaries to exploit urban and complex terrain require the Objective Force to see, know and act

effectively throughout this environment as well. The Space-enhanced Objective Force will achieve rapid decision while discriminating between friend, foe and non-combatants and avoiding collateral damage. Essential near- through far-term force enhancement Space capabilities will include beyond-line-of-sight communications, discrete imaging and targeting data, and continuous GPS coverage for force positioning, navigation and timing.

The countless command and control linkages and situation awareness demands fundamental to a ground maneuver force's tactical mission makes the Army the largest military service user of Space-related force enhancement capabilities. Legacy forces and emerging Interim forces already leverage overhead constellations of military, civil and commercial Space systems for intelligence, communications, early warning, positioning, weather and terrain information and support today. And they will make even

greater use of such capabilities as the Army's Transformation continues. The Objective Force will not only exploit the potential of planned and programmed Space systems, but its requirements will help shape the design of future systems and the architectures that deliver their Services. Space capabilities will play an increasingly key part in the operational simultaneity, situational understanding, precise and tactically responsive intelligence, surveillance and reconnaissance, and assured communications implicit in the Objective Force Operational Concept. The articles in this issue focus on our Space-related capabilities as we prepare ourselves for the fielding of the Objective Force and what Space will do for the Army. Future Journals will discuss modernization requirements and what the Army should do for Space. I encourage you to study the articles and share this information with those you support.

Secure the High Ground!

Army Transformation War Game ... from Page 5

beyond ISR also exist). During ATWG, our own dependence on Space created a lucrative, asymmetric target for the enemy. It will remain paramount for our leaders to be aware that loss of Space capabilities will degrade more than just our military operations.

Reachback Disruptions

The Objective Force relies heavily on being able to “reach back” to remote locations where a more extensive knowledge base of information, expertise or other capabilities exist. Secondary and tertiary effects of network disruptions (or attacks on CONUS-based reachback centers or Space ground stations) are generally not well understood. This year, game controllers determined these types of disruptions had significant worldwide impacts during ATWG. There is a critical need to recognize and prioritize protection of critical networks and Space-related infrastructure across theaters.

Navigation Warfare

GPS jamming will be significant on future battlefields and has the potential to extensively influence transition operations. We have grown increasingly reliant on GPS services to aid in the accomplishment of a variety of missions. Our military must remain proficient in conducting operations in a GPS-jammed environment. This type of navigation warfare must be considered as we evolve operational concepts and requirements for materiel development for Joint warfare.

Global Perspective is Key

Space Operations must be coordinated and applied with a global perspective across all theaters of operation. Space Operations have no logical geographical boundaries and can impact target areas much wider than those belonging to regional component commanders. We must continue to mature operational concepts for Space Operations with a global perspective.

Conclusion

The most recent ATWG examined and assessed Objective Force capabilities in a hypothetical worldwide crisis nearly two decades from now. Resulting findings and observations will be useful in making preliminary key decisions about refinements that may be required as we solidify Objective Force specifications. Our assessment indicates the Army cannot achieve its transformation goals or realize the Objective Force characteristics without Space-based capabilities. As we investigate Army Space operations in Iraqi Freedom, we'll also be able to confirm or refute these findings. Providing robust Space-based capabilities requires both a significant resource commitment and long lead times. Given that many of our adversaries will gain access to similar capabilities over time, we must be forward thinking about the need to plan and invest adequately in Army Space capabilities to ensure our Objective Force is a “full spectrum force, dominant at every point on the spectrum of operations.”

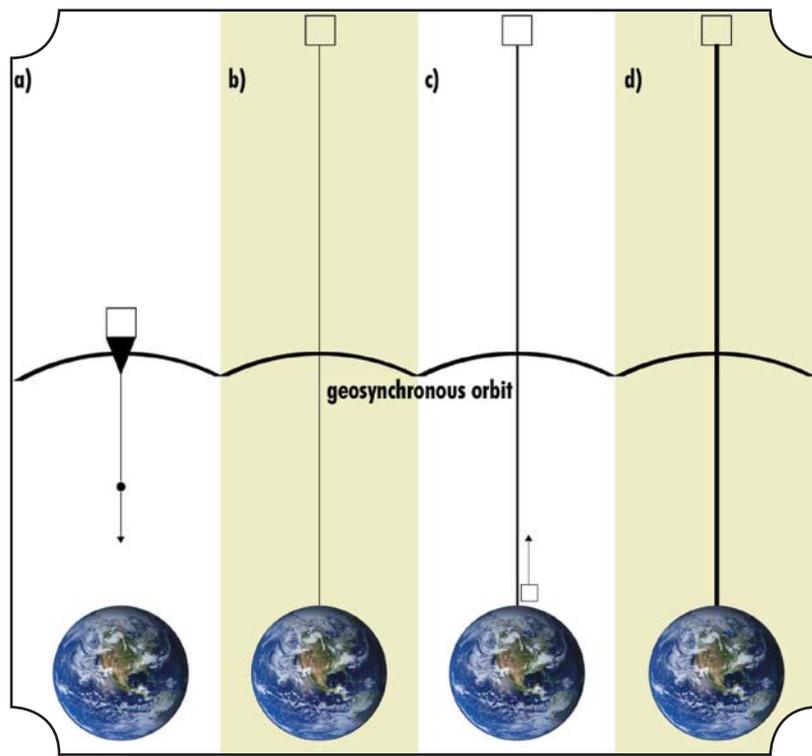


Figure 2

Don't Forget "Access" ... from Page 17

number of aircraft and small expendable rocket technologies exist that may be used. What is clear is that significant efficiencies result because the air-breathing first stage can return to a base and be reused rather than burn up on re-entry. Additionally, reusable exo-atmospheric deployment allows for higher flight rates for the aircraft and placement of payloads to low Earth orbit (LEO) at a wide range of inclinations and locations other than the two major launch facilities the United States currently operates. Because the reusable aircraft are not associated with fixed launch facilities, they could also be deployable across the United States or globally if required.

Deploy on Demand Versus Launch on Demand

A key improvement and performance parameter desired by the Space community is the ability to get military payloads to Earth orbit in a matter of days or hours as opposed to today's months or years. Whereas many Space access studies focus on

specific new platforms to improve the ability to reach orbit, the "deploy-on-demand" concept focuses on bridging the gap in responsiveness by using current launch systems differently. A deploy-on-demand architecture would place affordable micro-satellites dormant in orbit with their later use anticipated. Unlike current constellation "spares," these assets would ride piggyback aboard currently planned chemical propulsion launches in a "hitchhiking" mode. Once in orbit, these assets could be activated to replace or supplement existing military Space capabilities should conflict render them insufficient or unavailable. A deploy-on-demand supplemental architecture would require significant improvement in micro-satellite potential and experimentation to ensure that instantaneous activation and reliability of small satellites in support or replacement modes are possible.

ail Guns

Rail guns use a conductive projectile fired from a light gas gun into the

rail gun. The projectile then slides between two parallel conductive rails and closes an electric circuit. The resulting current flowing in the circuit generates a magnetic field that accelerates the payload to orbit-achieving velocities. Rail gun systems would require specially hardened satellite packages to ensure satellite stability as it leaves the launch tube as well as hardening to address significant g-loading. The largest guns will subject the satellites to a thousand times the force of the Earth's gravity (1000g) for approximately one second. Although damage by this vast acceleration can be overcome in circuit design, it would require significant hardening of some of today's fragile satellite components such as solar cells or antenna structures. The rail gun does away with the need for significant propellant volumes aboard the launch vehicle because the massive electric generators and gas gun components used to launch the vehicle remain on Earth, allowing the payload to occupy a very large portion of the launch vehicle's

mass. A fixed rail gun system may be able to generate up to 300 launches per year with payload of 10,000 pounds per launch. At these rates, the gas gun could potentially loft 1,500 tons a year into low Earth orbit. By comparison, the Space Shuttle (the largest current U.S. Space access vehicle) can place 63,500 pounds in orbit.

Slingatron

A slingatron is a propellantless, magnetic means of launching a projectile. Slingatrons can be configured in a variety of geometries, but the most common consists of a spiral track (or launch tube) that gyrates at a constant frequency about a set radius. Under proper conditions, a projectile entering the spiral at the center will undergo nearly constant tangential acceleration before exiting. The slingatron launcher offers the potential to conduct intercontinental bombardment, and to place nano-satellites and micro-satellites in orbit.

The Space Elevator

In the most basic description, the Space elevator is a cable with one end attached to the Earth and the other end roughly 60,000 miles in Space — over twice the distance to geosynchronous Earth orbit. Although a frequent device of science fiction, the Space elevator has moved out of the realm of pure speculation and into the “merely” fantastic because of recent advances in materials science. The Space elevator concept relies on a cable manufactured from ultrastrong, lightweight composite carbon nanotubes. Theoretically, a carbon nanotube structure is up to 40 times stronger than steel; when used in a Space elevator, it could be used to haul payloads to Space in much the same way as an elevator climbs to higher floors in a building. This is possible because the carbon nanotube cables are theoretically strong enough to hold together under the “orbital” dynamics of a very long cable pulled taut by the spinning of the Earth.

The illustration (Figure 2 on page 45) is a

notional representation of the deployment scenario for the Space elevator. First, (A) a Spacecraft is sent to geosynchronous orbit where it begins deploying a small cable. As the cable is deployed, the Spacecraft floats outward to provide a stabilizing anchor for the emerging facility. When the end of the cable reaches the Earth, (B) it can be retrieved and secured at some point along the equator. Climbers of increasing size can then be sent up the initial cable (C) to reinforce the initial cable. Finally, (D) a usable, high-capacity cable is complete and can handle large capacity payloads that can be released into a number of differing orbits.

Funded by the NASA Institute for Advanced Concepts, research into the Space elevator indicates that once the apparatus is constructed it would have the capacity to lift — not launch — payloads of up to 50,000 pounds to geosynchronous orbits at costs per pound of between \$50-\$100. This is several orders of magnitude better than current day (or even projected) capabilities and would truly revolutionize the ability of the United States to access Space.

Conclusion

The Department of Defense currently uses Space capabilities to perform a variety of missions that are not easily or reliably achieved using other terrestrial means. In the future, this dependence shows little sign of dwindling. The Joint force will rely on Space for more than communications, navigation and intelligence functions and will begin to apply force in, through and from Space. None of this is possible, however, without access to Space in a timely efficient and flexible manner. Assured and reliable Space access will require a transformation in U.S. launch capabilities. The major insight gained from this study was that current funding priorities in the area of Space access have significantly constrained the Space access architecture to a continued dependence on disposable, single-use chemical propulsion to

boost critical U.S. payloads to orbit. In the future, this approach may be insufficient to meet the needs of future Joint operational warfare and present significant exploitable vulnerabilities to adversaries in tomorrow’s international environment.

Reliance on these expensive shuttle or disposable staged rocket technologies is increasingly unacceptable for the military exploitation of Space. Indeed, the problems of anti-access, critical mobile targets and hard and deeply buried targets place a premium on the unique capabilities that Space access provides.

These capabilities, including hyperspectral sensors, the global positioning system, missile defense, and even the application of force to, through, and from Space, will provide the United States with the anti-symmetric strategies of choice against future (even current) adversaries. But these “high-demand, low-density” capabilities will remain so unless the United States is able to access Space more cheaply and responsively than it does today. Should the United States move to a wider vision of placing payloads in Earth orbit, the resulting dramatic reductions in launch cost and complexity will revolutionize U.S. capabilities to exploit Space as a military domain.

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Gary Trinkle is the senior Space analyst supporting the Space Applications Cell of the USJFCOM J9 (Joint Experimentation). He retired from the U.S. Army in 1998 after 24 years of service as an armor officer and concluded his career as the USASMDC liaison to the CG, TRADOC. An employee of SY Coleman/L3 Communications, Trinkle was involved in the development of the Army FA 40 training program and has served as a SETAC Space and missile defense contractor at J9 since 1999. Most recently, he was part of the J9 Future concepts assessment group (Project Alpha) and has led an extended study of future “swarming” autonomous entities.

Seminar War Games ... from Page 39

cepts. Secondly, the war games are used to broaden and refine our own Space concept to develop the desired capabilities and to influence national Space strategy and Joint requirements to support Army needs. SMDC has participated in the TRADOC seminar war games from their conception. The Directors of the Force Development and Integration Center and the Space and Missile Defense Battle Lab have routinely supported each of the war games. Additionally, the Commanding General, SMDC and Deputy Commanding General for Operations have also attended the war games.

War games will continue to be a high priority within TRADOC and the Army in the year 2003. Future plans call for war games to address issues such as homeland security and to refine the unit of action and unit of employment operational and orga-

nizational concepts.

Vigilant Warriors 2003 will be the capstone event in a yearlong series of seminar war games, workshops, studies and experiments. Vigilant Warriors 2003 will address Joint interdependence issues that confront combatant commanders and Joint force commanders in accomplishing assigned missions. TRADOC and Joint Forces Command will collaborate in examining force structure, scenario development and Joint operational concepts to include assisting in the development of a single Joint capstone concept. The game scenario will contain multiple, near-simultaneous crises, stretching across the globe with the potential for multiple major combat operations and lesser contingencies. Vigilant Warriors 2003 provides the opportunity to experiment with the Joint capstone concept by examining func-

tional and Service component issues and transformation initiatives. The war game will require each Service to assume both its Title 10 responsibilities and to serve in a Joint functional role.

TRADOC seminar war games are providing the opportunity to the entire Army and Joint community to address the tough issues that will face the Services in the future operational environment of 2020 and beyond.

Terrance E. Nelson has been the Deputy Director, Force Development and Integration Center-West, U.S. Army Space and Missile Defense Command since April 2001. Nelson received a Bachelors Degree in Mathematics from North Dakota State in 1968, and a Masters' in Mathematics from the University of North Dakota in 1970. Nelson entered into active Army duty in 1970 and retired as a colonel in 2000 with almost 30 years of active duty, plus two years in the U.S. Army Reserve and Colorado National Guard.

Thanksgiving ... from Page 25

same, and that I will obey the orders of the President of the United States and the orders of the officers appointed over me, according to the Uniformed Code of Military Justice. So help me God."

Another special visitor to the unit, the Army Space Forces Commander, COL David Shaffer, spoke to Adams the next day.

"The man was still smiling from ear to ear, like the Cheshire cat. I kidded him a little about not waiting for me to administer the oath, but... I don't blame him. It's not every day you can get re-upped by the Chief of Staff of the Army."

Adams concurred.

"Even in these turbulent times, the fact that the Chief of Staff of the Army took the time to re-enlist me shows an affirmation of the connection between the leaders who must decide freedom's policies and

the soldiers tasked to enforce it. It was a significant honor that I consider one of the major highlights of my military career," said Adams, who re-enlisted for four years.

Shaffer and the Space Forces Command Sergeant Major, Reginald Ficklin, made the extensive trip for the same purpose as Shinseki, to show their concern and connection to forces deployed far from home at a special time of the year.

The JTAGS mission is to provide continuous 24 hours a day, 7 days a week in-theater processing and dissemination of tactical ballistic missile and infrared data, intelligence alerting and early warning in support of the Theater Event System and the CENTCOM Combatant Commander's mission.

The hot, dry climate of this region bears many similarities to these soldiers' home state of Texas,

but, still, it's a far cry from "home for the holidays."

Shaffer said he was pleasantly surprised, however, at the high morale of the troops he visited.

"I went out there to motivate them, and instead, they motivated me. I came away so impressed by their attitude that I've been bragging about them to everyone, ever since."

The motivation factors did seem to work both ways though.

"Having the brigade commander and sergeant major come all the way out here really tells us that we're not forgotten, even though we're so far away from home and loved ones," said PFC Wesley Wright, JTAGS Operator.

Chairman ... from Page 13

Second, transformation is not just about seeking revolutionary changes in the conduct of warfare. Sudden and dramatic changes do occur. Nuclear weapons and stealth technology are examples of previous remarkable changes.

Revolutionary changes, however, should not be the sole focus of our transformational activities. Silver-bullet solutions to meet future defense requirements are rare.

Finally, transformation is not a new concept. As mentioned previously, the U.S. military has been transforming for two centuries. Military historians can point to how Generals Dwight Eisenhower, Carl “Tooey” Spaatz and Holland “Howling Mad” Smith plus ADM Chester Nimitz transformed American fighting forces during World War II. Fifty years later, Generals Fred Franks, Chuck Horner and Walt Boomer, together with ADM Stan Arthur, also transformed the way U.S. ground, air and maritime forces were employed during Desert Storm.

After the terrorist attacks in September 2001, transformation has taken a new urgency. We must accelerate our efforts to gain transformation’s potential for our new security environment. We can’t wait until the War on Terrorism is finished. The Joint team needs transformation’s agility and responsiveness to defeat those who threaten our nation, our citizens and our liberties. The United States no longer has the luxury of time to prepare.

Transformation ... What It Is

Transformation is a process and a mind-set — not a product. Adopting a transformational mind-set means applying current fielded capabilities — in the current environment — to accomplish any assigned mission. In today’s fluid and dynamic world, no Service’s core competencies can accomplish the mission alone. Transformation is about creating Joint competencies from the separate Service capabilities. Transformation is specifically about uniting unique Service capabilities into a seamless Joint framework to accomplish the Joint force commander’s

objectives.

Stated another way, transformation is about demonstrating flexibility, dexterity and adaptability to anticipate how the Joint force can master unexpected challenges. To understand this, warfighters must understand transformation’s intellectual, cultural and technological elements.

This understanding of transformation starts with the intellectual element. The most important breakthroughs will take place between the ears of warfighters and planners. Soldiers, sailors, airmen, marines, coast guardmen and DoD civilians must know their units’ technical and operational capability. Joint leaders must comprehend the Joint force commander’s intent and adapt their capabilities — sometimes in an unanticipated environment — to fulfill that intent. They must understand not just the probable employment of their unit — they must appreciate its possible employment.

Commanders should draw on their previous experience — not just repeat past endeavors. In some cases, transformation may mean reaching beyond doctrine — because doctrine may not have described the specific scenario faced by the warfighter. As a result, transformation involves taking operational risk.

That’s not to say military professionals should be reckless. Rather, commanders and leaders must take educated and calculated risks. They must weigh the options — to include the option of doing nothing — in the context of the ultimate objective. Transformation also means encouraging and rewarding subordinates to do the same. That carries an obligation not to punish subordinates when they try something creative and fail.

During the Second World War, GEN George Kenney personified transformation’s intellectual element. He adapted the capabilities of the Fifth Air Force in the Southwest Pacific theater to meet GEN Douglas MacArthur’s objectives. In one example, during August 1943, Kenney employed six squadrons of B-25s to strafe and bomb the Japanese airfield at

Nadzab in advance of an airborne assault. He then used the A-20 Havoc to lay a smoke screen to shield the paratroopers as they descended on the airfield. This innovative use of bombers (to strafe) and attack aircraft (to lay smoke) allowed the U.S. forces to quickly seize the airfield. Kenney comprehended the potential of his forces and employed them in an imaginative way. Kenney matched his forces’ capabilities to the mission and environment — rather than trying to make the environment fit his preconceived notions. Stated another way, Kenney motivated his units to perform as the mission required — not as their habit patterns dictated.

Transformation’s second element is cultural — it involves the operating culture within and among military units and Services. American military cultures are reinforced by tested checklists and proven tactics, techniques and procedures. It’s a comfortable environment of known quantities, familiar faces and common verbal shorthand. Transforming the U.S. military means operating in new ways and sometimes with untested procedures. When a new idea surfaces, we should avoid dismissing it because we never did it that way before. The new idea may not work — but we should first evaluate the concept on its merits. This will require commanders and warfighters to rely on their judgment. Success in embracing the required cultural change will be driven by the degree of trust and confidence among Joint warfighters.

In the past, the trust and confidence among Service components made the difference in combat. Generals “Fighting Joe” Collins and Pete Quesada demonstrated what is possible when warriors extend trust across components’ boundaries. Following the breakout at Saint-Lô, Fighting Joe and Quesada created a shortcut in the targeting procedures to support VII Corps’ exploitation of the fluid battlefield. Quesada took some of his pilots, gave them an FM radio and had them ride with the lead Army tanks. In the process, they reduced the role of the upper chain of command. Collins

and Quesada delegated the target approval to the lowest level — to the warriors facing the enemy.

No one told them they had to do this. These commanders assumed risk in their operation. After all, Quesada and Collins didn't have approved procedures or prescriptive doctrine. Instead, they demonstrated flexibility and adaptability. They succeeded because they trusted each other's judgment and experience. As a result, they accomplished the mission with far fewer American casualties.

This is just one example of what S. L. A. Marshall observed after the Second World War — "Improvisation is the essence of initiative in all combat."³ To succeed in the crucible of combat often requires warriors to adopt innovative approaches. As the Joint team comes together, such original concepts will only succeed if there is trust among the Service components.

Technology is the third element of transformation's foundation. For Fiscal Year 2003, the Department of Defense has requested nearly \$128 billion for current and future weapon systems and capabilities. The Defense Department must invest in the right capabilities that reinforce its ability to perform the unexpected and master emerging challenges of the 21st century. To be successful in the future, these capabilities must allow Joint commanders to integrate our Service capabilities — not force commanders to deconflict them.

In the past, Joint warfare was segregated warfare. Desert Storm is an example of a successful campaign that had sectorized operations. Air operations kicked things off and lasted 38 days. When ground combat began, U.S. Marines attacked in a path along the Kuwait coast; the Arab coalition forces assaulted the

middle sector while the U.S. VII Corps and XVIII Airborne Corps swept around the western flank. Close air support sorties were flown during the ground war, but they were employed beyond the sight of the troops they supported. These are a few examples of how we segregated and sequenced our efforts. It was not integration — it was deconfliction.

In the future, the Joint warfighters must meld component capabilities into a seamless Joint framework. The key to this effort will be shared information among the components. That's what Quesada and Collins did by having an aviator with a radio accompany the lead tanks. Transformational technologies are an area of great promise for integrated information-sharing across Service boundaries. Such technological solutions, however, must be applied in an environment of trust.

Interoperable and integrated command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) suites are critical. Joint ISR will allow our commanders to "watch" the enemy. Enhanced Joint command and control will allow Joint commanders to make decisions faster with other members of the Joint force. It allows for horizontal and vertical integration of plans and operations at all levels. The issue is not moving data faster — the issue is moving the right data to the right people. Then, components gain the insight needed to fulfill the commander's intent in an unpredictable environment. Improved Joint C4ISR will allow U.S. forces to exploit a decision cycle — to observe, decide and act — faster than an adversary. History is pretty clear: The side that does this faster — wins.

Improved C4ISR connectivity is more than a military issue. It

must extend to information — and knowledge-sharing with other federal agencies and with U.S. coalition partners. The War on Terrorism has demonstrated that all instruments of national power perform best when they have access to the best available and most complete information.

Investing in the right new capabilities requires the Defense Department to ensure that new systems are "born Joint" in order to share information with the other Services' systems. The U.S. military must avoid buying technologies that bolster a Service-centric vision. Such an approach risks segregating the battlefield. To ensure that the systems are born Joint, the Joint Chiefs of Staff are developing a Joint operations concept to better describe how we will operate across the range of military operations and to better evaluate how individual Service capabilities fit into the Joint operational framework.

The Way Ahead

A liberally educated person meets new ideas with curiosity and fascination. An illiberally educated person meets new ideas with fear.

— ADM James Stockdale

Joint professional military education (JPME) is an ideal place for the intellectual, cultural and technological mind-set changes we need to inspire our transformation efforts. JPME must reinforce within the U.S. military — both in the officer and senior noncommissioned officer ranks — the mental agility to understand Service and unit capabilities and match them with the mission at hand. A revamped JPME system must foster an ability and a desire to look forward and anticipate future conflict, which is much different than the ability to look back and recite past solutions. A transformed

The end result of transformation is a dramatically better Joint force. Joint operations will function best when Service capabilities are integrated in a seamless operation.

JPME must teach our leaders not what to think, but how to think and it must foster a culture that accepts intelligent, calculated risk. Most importantly, JPME must inculcate a culture of understanding and trust among the leaders of the Services and agencies.

A transformed JPME requires reforming our intermediate and senior Service schools, incorporating new and focused education for our general and flag level officers and offering Joint educational and training opportunities for those who have not received it before — our junior officers and senior NCOs. These reforms will proceed beyond formal education and training opportunities and include how the U.S. armed forces “grow” senior general and flag officers. Joint task force commanders and regional combatant commanders must have an array of leaders with a full understanding of how to integrate the Joint team prior to a crisis, when the lives of Servicemen and Servicewomen are at risk, and the mission’s success hangs in the balance.

The idea that JPME must match the demands of the new security environment is not a new one. When President Theodore Roosevelt accelerated the transformation of the U.S. Armed Forces from a frontier Army and coastal Navy at the turn of the 20th century, he and his Secretary of War Elihu Root placed a premium on the education of the officers who would lead the new forces. The Roosevelt administration matched their procurement of 16 new battleships by

expanding West Point and starting the Army War College to educate the officers who would lead the force. Following this model, we know that current and future commanders must have the same intellectual capital to match the technological marvels this nation provides for its defense.

The end result of transformation is a dramatically better Joint force. Joint operations will function best when Service capabilities are integrated in a seamless operation. Understanding, trust and confidence among warfighters; intelligent risk taking; and forward-looking leaders who anticipate future conflict are vital to making this happen. Investing in the right technology, such as improved Joint C4ISR, will also prove essential to ensuring that personnel at all levels have the information to reduce the boundaries among organizations.

The new Joint Vision document defines in further detail the security environment, the military tasks and the pillars of transformation, but this article complements that effort by defining transformation’s foundation — its intellectual, cultural and technological elements. These elements will give U.S. Joint forces the best tools to ensure the security of our nation.

I challenge readers of Army Space Journal to build on what I’ve written here. Give me your ideas of how transformation applies to our nation’s Joint forces. If you think you know a better way to define the potential and promise of transformation — put that in writing

also. Send me a copy of what you write — I will get back to you. By all means, do not sit on the sidelines and think that others are responsible for transforming our forces to meet the challenges of the 21st century. Your ideas can and will make a difference.

Notes

1. President George W. Bush, remarks to The Citadel, Charleston, S.C., Dec. 11, 2001.
2. Secretary of Defense Donald Rumsfeld, “Transforming the Military,” Foreign Affairs, May/June 2002.
3. BG S. L. A. Marshall, Men against Fire: The Problem of Battle Command (1947; reprint, Oklahoma City: University of Oklahoma Press, 2000).

GEN Richard B. Myers (BS[ME], Kansas State University; MBA, Auburn University) is the 15th chairman of the Joint Chiefs of Staff and is the principal military adviser to the President, the Secretary of Defense, and the National Security Council. As the vice chairman of the JCS during the 19 months prior to becoming chairman, he served as the chairman of the Joint Requirements Oversight Council, vice chairman of the Defense Acquisition Board, and as a member of the National Security Council Deputies Committee and the Nuclear Weapons Council. General Myers has commanded the North American Aerospace Defense Command, U.S. Space Command, A.F. Space Command, and Pacific Air Forces. At the tactical level, he commanded the 335th Tactical Fighter Squadron, 1st Tactical Fighter Wing, and 325th Tactical Training Wing in addition to serving as the commandant of the USAF Fighter Weapons School. A command pilot, General Myers has more than 4,000 flying hours in the T-33, C-21, F-4, F-16, and F-15, including 600 combat hours in the F-4. He is a graduate of Air Command and Staff College and the Army War College.

Homeland Security ... from Page 37

The Middle Zone is a buffer between the Homeland Zone and the Forward Zone. It is the air, land, sea and Space immediately surrounding the Homeland Zone. In this area, the United States exercises influence because of its regional proximity. In this zone, DoD protects the homeland by defeating adversaries before they reach U.S. shores. The risks in this zone include threats to maritime shipping or air avenues of approach to the homeland, illegal immigration, transnational criminal enterprise, ballistic and cruise missiles and cyber attacks.

The Army's roles in response to crises in this zone may include: missile defense; interdiction; interception; intelligence, surveillance and reconnaissance support to counterdrug operations; and other Joint, interagency or multijurisdictional operations. Army forces in this zone will include operationally and tactically mobile maneuver units; special operations forces; networked, enhanced command, control, communications, computer, intelligence, surveillance and reconnaissance capable units; knowledge-based air defense artillery; and ground-based midcourse defense systems.

The Forward Zone consists of the remaining land and sea areas not included in the Homeland and Middle Zones. When actionable intelligence is received, the United States may preemptively defeat the threat at the source. The risks in this zone include state-sponsored and transnational terror, aggressor rogue nations, weapons of mass destruction/effect and chemical, biological, radiological, nuclear and explosive proliferation, cyber attack, ballistic missiles and anti-access strategies and tactics.

The Army's roles in response to crises in this zone may include: deterrence, preemption, threat reduction, security of aerial and sea ports of debarkation, counter-proliferation and intelligence, surveillance and reconnaissance. In this zone, Army forces will likely include special operations forces. They will be operationally mobile with high tactical agility and will need external support for intelligence, surveillance and reconnaissance, Joint fires and effects, human intelligence and ground-based midcourse defense systems.

For the Army to conduct homeland operations, it must have an intel-

ligence, surveillance and reconnaissance architecture that ensures unity of purpose. Human and technical, manned and unmanned, terrestrial and Space-based capabilities will be needed to sense the operational environment in detecting, identifying and tracking threats. Additionally, offensive and defensive information operations will enable the Army to take advantage of superior information to achieve decision superiority. Finally, in meeting the homeland threat, the Army must be able to participate in an integrated Joint force that will detect and destroy enemy cruise and ballistic missile systems.

LTC Mike Postma currently serves as the SMDC Liaison Officer to the U.S. Army Training and Doctrine Command. His professional experience includes Space Operations at U.S. Space Command, commander of a signal task force during Operation Restore Hope in Somalia, and combat developments action officer at the U.S. Army's Signal Center. Additionally, he served as the Saudi Arabian Armed Force J6 adviser under the U.S. Military Training Mission, U.S. Central Command.

SMDC Moves Into Space ... from Page 43

Chief of Staff for Programs action officers involved in working Program Objective Memorandum (POM) issues at Headquarters, Department of the Army — must work in coordinated, collaborative fashion. To do this, the Army must have a common picture of requirements and solutions. A comprehensive Army Space Master Plan will serve as the first intermediate objective that will provide this common picture. The degree to which the second intermediate objective (the Army POM) and objective Future Years Defense Program can be significantly affected on this cycle may be

limited for this first-time effort. But ultimately, as the Army Space Master Plan process grows in strength and utility, the ability to affect the Future Years Defense Program and defend the programs therein, will increase. Hence, the Army Space Master Plan is a means to an end and not an end in itself.

On principle, the Army Space Master Plan will be founded upon a task analysis in seven mission areas. Seven Mission Area Teams (MAT) will provide the tracking of tasks from the top, Army-wide level all the way down to the specific Space-related tasks at

the user/provider level. SMDC will create and shepherd these Mission Area Teams in the taxonomy shown in Figure 2. This grouping had its genesis with the former CINCSPACE Integrated Priority List development teams and has been used in a number of Army Space planning efforts including the Space Modernization Plan developed last year (see article by Karen Oliver, "Space Modernization Strategy"). Work is under way to more precisely define these mission areas and the current programs (program elements) contained within them. Several of the Mission Area Teams

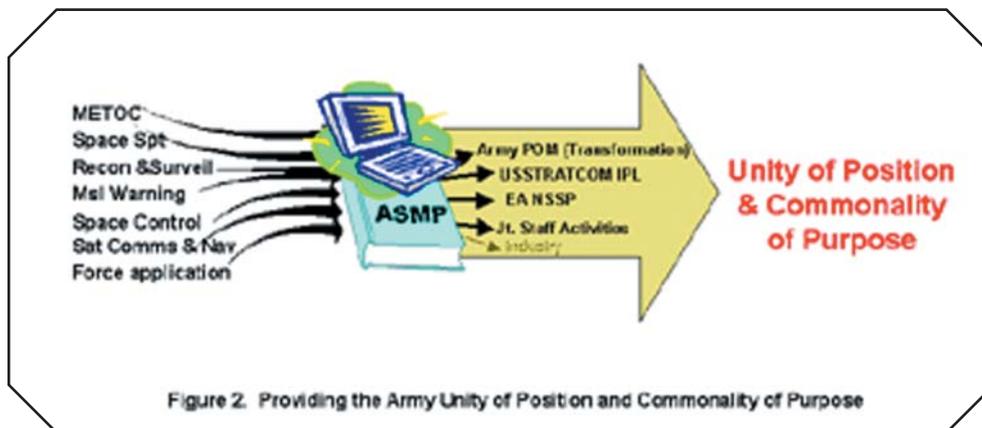


Figure 2. Providing the Army Unity of Position and Commonality of Purpose

will be chaired by key stakeholders from other-than-SMDC commands.

Each team will produce a Mission Area Analysis, a Mission Needs Analysis, a Mission Solutions Analysis and an Integrated Investment Analysis (IIA). During the IIA phase, each team will apply fiscal constraints to the solutions identified. The Mission Area Teams will strive to identify all DOTMLPF solutions to satisfy all Space-related subtasks. The Space Modernization Plan developed last year provides a good foundation for the materiel portion of the solution set.

Each of the seven teams will develop its products consistent with the methodology defined by TRADOC's Concept-based Requirements System. Army Space Master Plan project analysts will integrate them at each stage. Each team will ultimately package the results of each phase of the analysis into its Mission Area Plan. FDIC analysts will then combine the seven Mission Area Plans to produce the final Army Space Master Plan. Along the way, each stage is to be shared collaboratively with analysts performing the same methodology in Air Force Space Command (their process is called the Integrated Planning Process), Navy Space as well as with analysts in the Space Executive Agent. This cross-analysis will attempt to ensure that planning is compatible in mission and scope, that Army programs are jointly supportive and where not, Army programs are soundly justified as Army.

An important, and perhaps the hardest, part of this process is the identification of future capabilities and programs.

Participation by SMDC and other Army battlelabs, the Army Space Program Office, the SMDC Technical Center, and associated Army Materiel Command Research, Development and Experimentation Centers will allow for the consideration and insertion of Army future concepts, technologies and requirements. Further, the Space Integrated Concept Team, the TRADOC Senior Advisory Group and a Space Council of Colonels at HQDA will review the Army Space Master Plan progress to provide rudder checks and guidance. The mere foundation of these Mission Area Teams, and their continual existence under the tutelage of the Space Integrated Concept Team, provides a forum for the Functional Area (FA)-40 Space Operations Officers deployed in warfighting commands and staff positions around the world to send their ideas for future concepts.

Once SMDC has compiled and staffed the Army Space Master Plan and it is approved by TRADOC, SMDC will present it officially to the Army staff. The ultimate goal is to obtain the signature of the Army Chief of Staff — to give the document credibility as the Army's plan for the application of Space-related DOTMLPF solutions to support the Objective Force. This approval, of course, does not imply adequate funding; programs in the plan will still compete for resources in the POM process.

The process — far more important than the document itself — is designed to provide an ever-present source of the Army position on Space-related programs and future capabilities for action officers who

perform activities along the five axes of SP2 advance (Figure 1). Continuous, empirical input from deployed FA-40s will also keep the Army Space Master Plan process current and connected to real-world activities and needs.

SMDC will discharge its responsibility to act as the Army specified proponent for Space by institutionalizing the SP2 process. The Army Space Master Plan will serve as its principle vehicle for accomplishing this mission, with the process to build its most important aspect. With the concerted and collaborative efforts of all those in the Army combat developments community who work in Space-related activities, SP2 will achieve its intended vision of being the source of the Army's position on these programs. It will lay the foundation for dialoguing with the Space Executive Agent, and most importantly, it will assure the warfighter that the transforming Army is working to provide the best and most comprehensive DOTMLPF, Space-related capabilities possible.

Bob Clarke works as a SETA contractor for SYColeman in Colorado Springs supporting SMDC FDIC. He retired from active Army service in 1996 at the grade of Colonel. He graduated from the U.S. Military Academy in 1968, holds a master's degree in Operations Research Systems Analysis from RPI, and is an Army War College graduate. An Air Defense Artillery officer with diverse of command, staff, and combat development assignments, Clarke ultimately served as Acquisition and Support Programs Analysis Division chief, Army Program and Analysis Directorate of the Office of the Army Chief of Staff 1990-1993.

We are a nation at risk from a new and changing threat. The terrorist threat to America comes in many forms and has many places to hide. Terrorists attack us and exploit our vulnerabilities because of the freedoms we hold dear. The U.S. government's most important mission is to protect the homeland from future terrorist attacks.

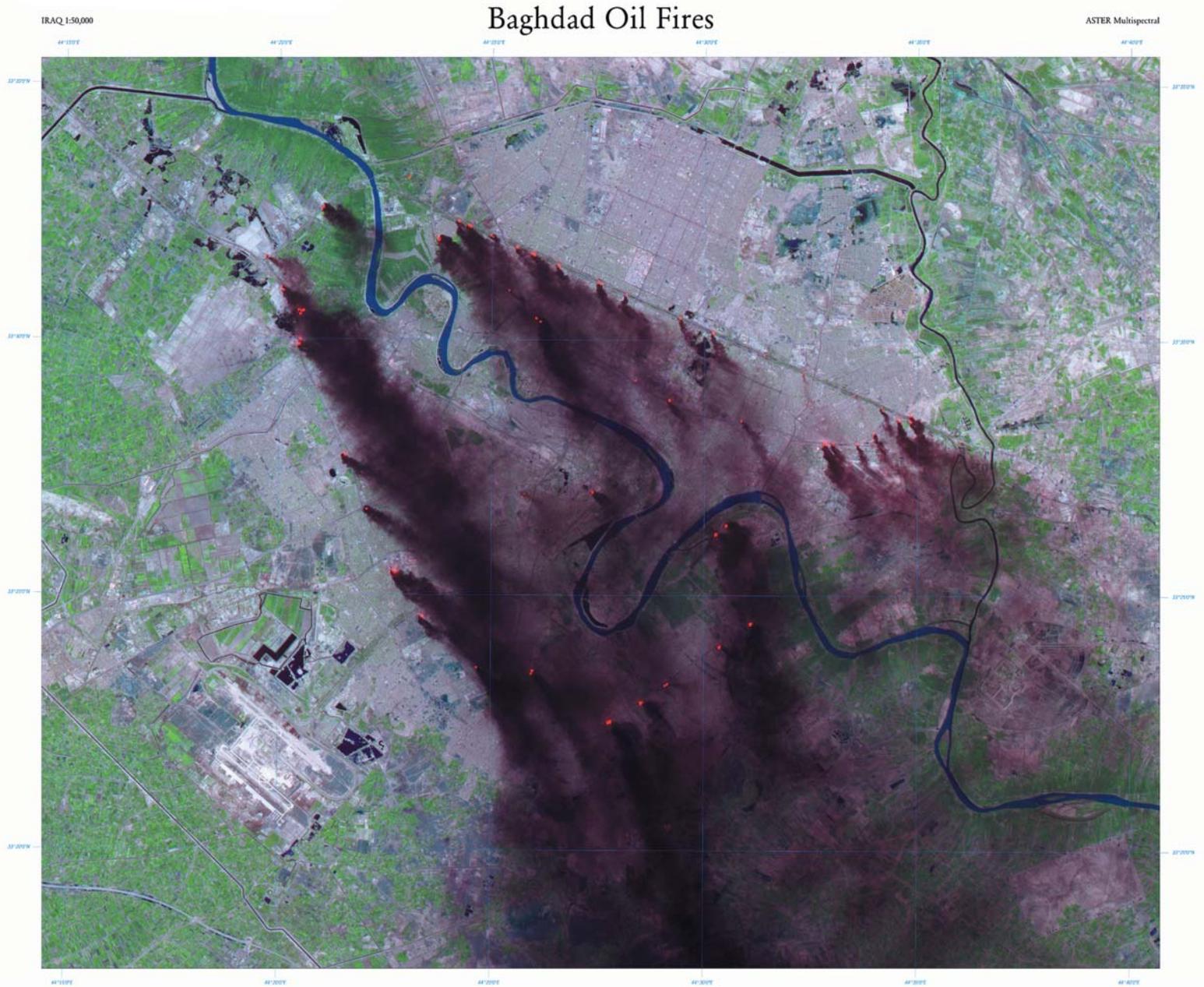
— LTC Michael H. Postma



Successful transformation to the Objective Force is key to the Army's battlefield dominance in the 21st century and to providing the most efficient, lethal land forces to the Joint Force Commander. Space is the Army's key enabler for supporting those forces in any theater.

— LTG Joseph M. Cosumano Jr.

“Another example of disregard for the conditions of Iraq and the Iraqi people is the burning of oil trenches ... ” said BG Vincent Brooks, U.S. Central Command spokesperson in a press conference April 1, 2003. He was referring to the satellite imagery below. The map is a view of an oil fire in Baghdad, Iraq. It was produced by soldiers and airmen from Army Space Command’s Spectral Operations Resource Center who are deployed in the region.



UPCOMING JOURNAL THEMES

Summer 2003 — “The Army’s Future in Space”

SPECIAL EDITION — “Space: Focus on Operations”

Fall 2003 — “Space Technology — Where is it Leading Ground Forces?”

Winter 2004 — “The Army in Joint and Multi-National Space Operations”