

A Joint
Professional
Bulletin
for U.S. Field
& Air Defense
Artillerymen

Fires

sill-www.army.mil/firesbulletin/

May-June 2009



**Transformation:
moving ahead**

Approved for public release; distribution is unlimited. • Headquarters, Department of the Army • PB644-09-3

ARTICLES

- 3 Air Defense Artillery School moves to Fort Sill**
By Wilson A. Rivera
- 4 Standing-up the Fires Center of Excellence**
- 6 Crash Course: training junior leaders**
By 2LT Kyle Vonderheide, ADA
- 8 Dispatching the Fleet: Patriot, an instrument of national power**
By Mike Zaborowski
- 10 Patriot ISR: cultivating situational awareness for commanders**
By CPT Christopher R. Garnett, ADA
- 13 ANGLICO: the great enabler**
By LTC Michael D. Grice, USMC
- 18 ANA Artillery: training the trainer**
By MAJ Daryl L. Fullerton, FA
- 23 Retrain, Reset, ReRed: preparing for OEF**
By LTC Michael J. Forsyth, MAJ George L. Hammar IV and CPT Jason C. MacConnell, all FA
- 28 Army Space Support to a BCD: a critical enabler**
By COL Kevin M. Felix, MAJ Christopher M. Crawford and MAJ Jeffrey T. Lakey, all FA
- 32 Training, targeting, C² for today's COE**
By MAJ Matt B. Dennis, FA
- 35 Clear, Hold, Build: new tactics to defeat COIN**
By LTC David G. Fivecoat and CPT Stuart C. Chapman, both IN
- 37 MRAP Prime Movers: protecting the field artillery on the battlefield**
By CPT David K. Smith, FA
- 40 Adjust Fire: new direction for tube artillery**
By LTC (Retired) Forrest R. Lindsey, USMC
- 42 Heat adaptation for the contemporary Soldier**
By CPT Russell G. Nowels, AR, CPT Coley D. Tyler, FA, and Dr. Phillip L. Henson

FIRES DEPARTMENTS

- 1 Mud to Space:**
ADA at Fort Sill - New Horizons
By Brigadier General Rodger F. Mathews, Chief of ADA

Front Cover: SGT Nikolas Shults, C Battery, 2nd Battalion, 44th Air Defense Artillery, Fort Campbell, Ky., aims a Stinger missile during a readiness exercise in Baghdad, Iraq, July 2008. (Photograph courtesy of 2-44th Air Defense Artillery)

DISCLAIMER: *Fires*, a professional bulletin (PB), is published bimonthly by Headquarters, Department of the Army under the auspices of the Fires Center of Excellence (CoE) (Building 758, McNair Road), Fort Sill, OK. The views expressed are those of the authors and not the Department of Defense or its elements. *Fires'* content doesn't necessarily reflect the U.S. Army's position or supersede information in other official Army publications. Use of news items constitutes neither affirmation of their accuracy nor product endorsements.

By Order of the Secretary of the Army:

George W. Casey Jr.
General, United States Army
Chief of Staff

Official:


Joyce E. Morrow

Administrative Assistant to the
Secretary of the Army, 0909704

Peter M. Vangiel
Major General, United States Army
Commanding General
Fort Sill, Okla.

Editor-in-Chief: Sharon McBride
Managing Editor: Vacant
Art Director: Vacant
Assistant Editor: Tonya S. Goforth
Interim Art Director: Jason Scott Kelly

PURPOSE: Founded in 2007, *Fires* serves as a forum for the professional discussions of U.S. Army and Marine Field Artillery (FA) and Army Air Defense Artillery (ADA) professionals, both active and Reserve Component (RC); disseminates professional knowledge about the FAs and ADA's progress, developments and best use in campaigns; cultivates a common understanding of the power, limitations and application of joint fires, both lethal and nonlethal; fosters joint fires interdependency among the armed services; and promotes the understanding of and interoperability between the FAs and ADA's active and RC units—all of which contribute to the good of the FA and ADA, Army, joint and combined forces, and our nation.

OFFICIAL DISTRIBUTION: Free copies are sent to USA and USMC FA units: 7 per corps artillery, FA/fires brigade, brigade combat team (BCT), Stryker cavalry regiment (SCR), FA Marine regiment and battlefield coordination detachment (BCD) headquarters; 13 per FA/fires/battalion/squadron; 3 per fire support element (FSE), fires and effects cell (FEC), effects coordination cell (ECC) fire support cell (FSC), fire support coordination center (FSCC), force fires coordination center (FFCC) and separate battery or detachment; 3 per fire support team (FIST) and combat observation lasing team (COLT); and 1 per Master Gunner and Fire Support Officer (FSO). Free copies to Army ADA units: 7 per Army air and missile defense command (AAMDC) and ADA brigade headquarters; 13 per ADA battalion; and 3 per air defense airspace management (ADAM) cell and separate battery or detachment. The FA and ADA Schools' departments, directorates and divisions each get 2 copies. Other U.S. Army and armed services units/organizations and U.S. government agencies that work with FA or ADA personnel, equipment, doctrine, tactics, training organization or leadership issues may request a free copy—including, but not limited to, ROTCs, recruiting commands, libraries, attaches, liaison officers, state adjutants general, public affairs offices, military academies, laboratories, arsenals, major commands, etc. Contact *Fires* at <http://sill-www.army.mil/firesbulletin/>.

SUBSCRIPTIONS: Those not eligible for official distribution may subscribe to *Fires* via the U.S. Superintendent of Documents, P.O. Box 37154, Pittsburgh, PA 15250-7954 (1-866-512-1800) or via membership in the U.S. Army FA Association (www.fieldartillery.org).

SUBMISSIONS: Email to the Editor, *Fires*, at firesbulletin@conus.army.mil; mail to P.O. Box 33311, Fort Sill, OK 73503-0311; overnight to Building 758, Room 7, McNair Road, Fort Sill, OK 73503-5600; or call at DSN 639-5121/6806 or commercial (580) 442-5121/6806.

REPRINTS: *Fires* is pleased to grant permission to reprint; please credit *Fires*, the author(s) and photographers.

POSTMASTER: *Fires* (USPS 309-010) (ISSN 1935-4096) is published bimonthly; periodical postage paid by Department of the Army at Lawton, OK 73501 and an additional mailing post office. Send address changes to *Fires*, P.O. Box 33311, Fort Sill, OK 73503-0311.

ADA 24/7 Hotline & Email
(Organization, Doctrine,
Material, Training)
DSN 978-5312 or (915)
568-5312
ada_fires@bliss.army.mil

FA 24/7 Hotline & Email
(Organization, Doctrine,
Material, Training)
DSN 639-2204 or (580)
442-2204
redleg@conus.army.mil

ADA at Fort Sill — New Horizons

By Brigadier General Rodger F. Mathews, Chief of ADA

It's a great day to be a Soldier. Team, this is my first opportunity to speak to you and layout my basic intent for the branch and school. As you all know, the changes we've been planning for and anticipating during the last four years officially have happened. Fort Sill, Okla., and the Fires Center of Excellence are now the home of the Air Defense Artillery School. The headquarters has moved, and the official transition of authority from Fort Bliss, Texas, to Fort Sill took place June 23.

Fires Center of Excellence. First, let me say that it will be business as usual. Most of the different programs, courses and supporting units will complete their transitions to Fort Sill into next year. Some courses begin

instruction at Fort Sill soon. For most young Soldiers, officers and enlisted, this transfer of authority changes the place we called home, but it won't change the routine a Soldier expects in terms of education, quality of education and the assignment process (field assignments, education, etc.).

On a broader scale, what will change is our role in the evolution of fires as we know it. As an integral player in the Fires Center of Excellence, we will participate in a changed paradigm. We will focus much of our efforts on training for and providing capabilities or effects to warfighting commanders. The Fires Center of Excellence was created to leverage each branch's contributions to fires to gain a greater effect on the battlefield. Additionally, this transition will gain efficiencies in how each branch conducts business. That means reducing or combining similar and redundant functions at the center level.

The transition was a long time coming and involved many people's hard work and a lot of planning. Much of the groundwork is laid to ensure the basic functions of our schoolhouse are set for operations. Our headquarters and headquarters battery-forward and Base Closure and Realignment Commission Relocation Integration Center have been on the ground at Fort Sill since June of last year, and until recently, the movement had been piecemeal. Personnel from 6th Brigade and the schoolhouse were leaving by ones and twos for the past year, but now we are in the time of major movements.

The first Air Defense Artillery Captain's Career Course at Fort Sill will kick-off in August. The remaining Soldiers and civilians are either on their way or preparing for the move. The ADA school will be fully operational at Fort Sill by March 2010. We will close-out 6th Brigade at Fort Bliss in March 2010, and the remaining personnel will relocate.

All of this means big changes for Fort Sill and ADA as a whole. Fort Sill is gaining a brigade's worth of Soldiers, families and equipment. Some of that equipment will include Avenger weapons systems, Patriot systems, counter-rocket, artillery and mortar systems, military transport vehicles and the labs and simulators that support training.

Almost half of 6th Brigade's civilian workforce decided to move with the school, which will be a major advantage as we set up and keep operations running. Civilian personnel provide longevity and a major support structure for everything the Army does, and their willingness to relocate has made and will continue to make a big difference.

MG Howard B. Bromberg (right) transfers authority of chief of ADA and commandant of the ADA School to BG Roger F. Mathews during a ceremony outside of McNair Hall, Fort Sill, Okla., June 23. (Photograph by Linda Young, Lead Photographer, Fires Center of Excellence)



Facilities. At Fort Sill, such an influx of personnel undoubtedly will cause some turmoil for a while, but they are well prepared to welcome the newcomers. The best part is that those newcomers will go into top-of-the-line facilities at Fort Sill.

At Fort Bliss, our air defense personnel were spread among 58 separate buildings and offices — a considerable problem when we need such close coordination among personnel. At Fort Sill, these positions will be consolidated into just nine buildings. This will make it much easier for staff to coordinate, work together, communicate and stay connected throughout the day.

There are also new barracks ready for the Advanced Individual Training Soldiers, arranged in a campus-like setting and close to classrooms, the dining facility and other facilities. Placed between the barracks will be the Air Defense Artillery Walk of Fame. The Walk of Fame will feature demilitarized air defense weapons from past eras.

The walk itself will be made of bricks that will be purchased by past, current and future soldiers. The brick will display their names and ranks or the name (and rank if applicable) of a person they select to honor. To purchase a brick, go to www.firsttofire.com. All of the new ADA buildings at Fort Sill will be named after air defenders who contributed significantly to the branch and span time from World War I to the present.

NCO Education System. New facilities are not the only improvements ADA troops will meet at Fort Sill. There are also many changes to the NCO Education System as we build the Fires Center of Excellence. Many of these affects will be minimal, but there will be a few things that will affect the Air Defense Branch and its Soldiers greatly.

The ADA Advanced Leader Course and Senior Leader Course completed their pilot phases. When these courses move to the Fires Center of Excellence NCO Academy, they will meet the Training and Doctrine Command Commander's guidance to develop and integrate the Senior Leader and Advanced Leader Courses by October.

With the migration of tasks from the Advanced NCO Course into the Advanced Leader Course, ADA NCOs will be more technically competent in their area of expertise and have greater leadership training. The updated tasks in the Advanced Leader Course will prepare air defense NCOs for a higher degree of responsibility and decision making, and give them the knowledge and confidence to handle situations that traditionally would have been reserved for more senior NCOs.

The Senior Leader Course was developed by migrating tasks from the First Sergeant Course to create a more challenging and adaptive curriculum. These students may be selected to become a first sergeant before they are selected for master sergeant. All Senior Leader Course instructors have attended the Sergeants Major Academy's First Sergeant Course and can teach subjects



An artist's rendition of the new ADA campus at Fort Sill, Okla. (Source: MAJ Donna Abrokwa, Fort Sill, Okla.)

and matters that a first sergeant deals with on a daily basis.

Additionally, we have implemented a Senior NCO Mentorship Program where first sergeants, master sergeants and sergeants major are invited to come to the academy and talk about their personal experiences and insights on being a first sergeant. The information they can provide will be invaluable.

Fort Sill also will enable the NCO Academy to make training more challenging for students. Due to the different terrain offered at Fort Sill, students will be able to apply a wider variety of land navigation skills. Camp Eagle is an excellent training area for challenging and rigorous situational training exercises. I'm confident that these changes will be positive for our ADA NCO Education System.

Joint ADA. The hard work of integrating ADA effects into joint and combined fires always has been a strength of our branch and fighting formations. We are and always have been inherently joint. With the publishing of "Lighting from Land," we set the course to formalize our efforts and to chart our path into the 21st Century. You need to get a copy of this document, read it and embrace it.

From new facilities to new ways of conducting business, ADA's future is bright at Fort Sill. As all of us who are involved in air defense know, the current and emerging technologies are just astounding. Working more closely with field artillery in the Fires Center of Excellence will make us an even greater force and benefit both branches. It's an era that will bring new potential to our fires capabilities, keep our branch leading the way in the defense of our nation and our troops and bring greater offensive possibilities.

Every person who has worked for the Air Defense School at Fort Bliss — Soldiers, civilians, contractors, volunteers and their families — has invested in air defense and made it the outstanding branch it is today. Each and every person who has worked for the schoolhouse has plotted the course for ADA, from the Cold War to watching the skies over Korea, to keeping our troops safe on the battlefields of the Middle East.

The hard work of everyone who has come before and of those who are building the Fires Center of Excellence has made our world a safer place for our forces, our nation and our allies.

Although it's hard to see the end to our long history at Fort Bliss, ADA will continue to lead the way in training, defense and on the battlefield. We will continue to be *First to Fire*. ■

Air Defense Artillery School moves to Fort Sill

“The casing of the school’s and 6th ADA Brigade’s colors is just the beginning of the future for the ADA branch.”

The organizational colors of the U.S. Army Air Defense Artillery School and Center, the 6th ADA Brigade and its three battalions were cased for their relocation to Fort Sill, Okla. Due to the 2005 Base Realignment and Closure Act, the ADA school will be consolidated with the Field Artillery School and Center to create the Fires Center of Excellence at Fort Sill.

“Thank you to those who came before us in the past, the commandants, sergeants major and Soldiers [who] brought the [ADA] branch to where it is today,” said Major General Howard B. Bromberg, commander and commandant of the ADA school and Fort Bliss, Texas. “I’m absolutely confident that we will set new standards at our new location and absolutely confident that we will remain *First to Fire*, now and forever.”

During World War II, Fort Bliss’ main role as a cavalry installation changed to become an air defense post. In 1940, the War Department introduced its anti-aircraft artillery, and between 1948 and 1966, construction began to support anti-aircraft artillery and guided missile programs. In 1954, the U.S. Army Anti-Aircraft Artillery and Guided Missile School at Fort Bliss was born. In 1968, the ADA School was founded.

The ADA school trains Soldiers, Marines, sailors, civilians, and allied forces in ADA concepts and weaponry. Curricula ranges from the Patriot missile, Avenger, and man-portable stinger systems; command, control, computers and intelligence; Basic Officer Leadership Course; Warrant Officer Basic Course; Patriot Master



MG Howard B. Bromberg, Fort Bliss commander and, at the time, commandant of the U.S. Army Air Defense Artillery School and Center, and CSM Robert Rodgers roll-up the school colors during a color-casing ceremony, May 6, held at Memorial Circle to signify the school’s departure from Fort Bliss, Texas, to Fort Sill, Okla. (Photograph by Wilson A. Rivera, *Monitor* Staff)

Gunner Course; Captain’s Career Course and training future leaders through the ADA NCO Academy.

The 6th ADA Brigade supports and oversees the school with advance individual training of Soldiers in specific military occupational specialties and common military task training.

The casing of the school’s and 6th ADA Brigade’s colors is just the beginning of the future for the ADA branch. The air defender *First to Fire* statue at Fort Bliss’ Pershing Gate will move with the school to Fort Sill. The statue was modeled after the soul of the ADA branch. The statue will be moved and placed in front of the newly built facilities for the ADA School and 6th ADA Brigade headquarters. ■

Wilson A. Rivera
Monitor Staff
Fort Bliss, Texas



MG [Retired] Donald Infante, former commander and commandant of the U.S. Army Air Defense Artillery School and Center and Fort Bliss, Texas, MG Howard B. Bromberg, present commander of Fort Bliss, and BG Robert F. Mathews, then the commander of the 94th Army Air and Missile Defense Command, Hawaii, passes a replica air defender statue representing the ADA branch from past, present and future, during a color-casing ceremony at Memorial Circle, May 6. (Photograph by Wilson A. Rivera, *Monitor* Staff)

Standing-up the Fires Center of Excellence

By Fires staff

Fort Sill marked another milestone on the Base Realignment and Closure highway. During the month of June, the duties of the chief of the field artillery and commandant of the FA School transferred from Major General Peter M. Vangjel to Brigadier General Ross Ridge. Also during June, Major General Howard B. Bromberg transferred authority of the duties of chief of the air defense artillery and commandant of the ADA School to Brigadier General Roger F. Mathews.

Ridge had been assistant commandant of the Field Artillery School; Vangjel had been commandant and Fort Sill commander. Bromberg was commandant of the ADA school and commander of Fort Bliss, Texas. Mathews recently transferred from Commander of the 94th Army Air and Missile Defense Command, Fort Shafter, Hawaii. These transfers of authority are related to moving the Air Defense School



MG Peter M. Vangjel (right) transfers authority of the chief of the field artillery and commandant of the FA School to BG Ross Ridge at Fort Sill, Okla., June 4. (Photograph by Jason Scott Kelly)

here from Fort Bliss to prepare for the evolution of the FA and ADA Centers into the Fires Center of Excellence.

Under the new arrangement, the commandants will be responsible for their respective schools and will be the branches' chief proponents in the Army. They also will supervise the respective branch training curriculum for the NCO Academy. "Our future lies in the professional education of our officers and NCOs," Ridge said at the FA TOA.

The current restructuring is just the beginning of laying the foundation needed to make sure future leaders have the knowledge needed to succeed in the myriad of missions placed before them, Ridge said.

The NCO Academy, as well as Basic Training, will be under the supervision of the Fires Center of Excellence staff. The Fires Center will integrate the systems and resources of the FA and ADA, including personnel, and is charged with finding the necessary resources to complete all missions and tasks.

Field artillery. During his tenure from September 2007 as the chief of FA and commandant, Vangjel addressed many challenges facing the FA during an era of persistent conflict. Realizing the FA was de-

grading in its core competencies, he charged the school leadership with redesigning current courses and designing new courses to "re-Red" the Artillery.

"Our field artillerymen are the perfect prototypes for getting it done, despite risking skills atrophy," said Vangjel at the FA TOA ceremony. "We are turning that around."

He also, along with MG Howard B. Bromberg, chief of ADA, accomplished the collocation of the FA and ADA schools and centers to create the Fire Center of Excellence. Vangjel remains the commander of Fort Sill until this summer when he will take command of Third Army, U.S. Army Central.

Vangjel has served as the Director of Strategy, Plans and Policy for the Office of the Deputy Chief of Staff, F-3/5/7, in Washington, DC. Vangjel, commissioned through the University of New Hampshire Reserve Officer Training Corps, has commanded units at every level from battery to corps artillery encompassing several weapons systems in the FA arsenal.

He has served on multiple operational deployments, including Operations Desert Storm, Desert Shield and Kosovo and Operations Iraqi Freedom I and II. His



BG Ross Ridge (Photograph by Jason Scott Kelly)

staff assignments include tours at the Pentagon on both the Joint and Army staffs. He holds two master's degrees, one in National Security and Strategic Studies from the National Defense University, Washington, D.C., and one in Administration from Central Michigan University in Mount Pleasant, Mich.

Before assuming his new duties as chief of FA and commandant of the FA School, Ridge served as the chief of staff, Strategic Effects Directorate, Multi-National Force, Iraq. He also served in the Republic of Korea as the executive officer to the commander, U.N. Command/Combined Forces Command/U.S. Forces, Korea; chief of staff of the 2nd Infantry Division at Camp Red Cloud; and as the commander of the 2nd Infantry Division Artillery at Camp Stanley.

Ridge served as the deputy commander for Operations Group, National Training Center, Fort Irwin, Calif.; commander of 2-8 FA, attached to the 1st Brigade, 25th Infantry Division; and as the chief, Lethal/Nonlethal Effects Branch within the Training and Doctrine Command Brigade Coordination Cell responsible for the Army's new Stryker brigade combat team, at Fort Lewis, Wash.

He also served with the Joint Interagency Task Force — West in Alameda, Calif., where he was forward deployed to Bangkok, Thailand, as the officer-in-charge, U.S. Pacific Command Counternarcotics Forward Detachment responsible for U.S. Department of Defense counter-drug support for Southeast Asia.

He deployed to Haiti in support of Operation Uphold Democracy, where he served as the Brigade Civil-Military Officer for Port-au-Prince.

Ridge has a master's degree in Administration from Central Michigan University and a master's degree in Strategy from the U.S. Army War College, Carlisle Barracks, Pa.

Air defense artillery. Bromberg was the chief of ADA and commandant of the ADA School since January 2008. In addition to the moving of ADA School to Fort Sill and standing up the Fires Center of Excellence with Vangjel, he and his staff developed a vision and campaign plan for the ADA's future. His continuous communications with the ADA community cemented the knowledge and understanding of what moving to Fort Sill means to them and the ADA's future.

Previously, Bromberg was the chief of staff for U.S. Strategic Command at Offutt Air Force Base, Nebraska. He has served as the deputy director, Force Protection and Director, Joint Theater Air and Missile Defense Organization, J-8, the Joint Staff in Washington, D.C.

Bromberg was the commanding general of the 32nd Army Air Missile Defense Command, Fort Bliss, Texas with duties as the deputy area air defense commander, Coalition Force Air Component Command and Operation Enduring Freedom, Saudi Arabia; deputy area air defense commander, Joint Forces Air Component Command and Operation Noble Eagle, Fort Bliss; deputy area air defense commander, Coalition Force Air Component Command, Kuwait; and deputy area air defense commander, Coalition Force Air Component Command, Operation Iraqi Freedom, Iraq.

He also has served as the operations officer for the Defense Branch, J3, the Joint Staff, in Washington, DC; the deputy commanding general, USAADASCH and Fort Bliss; and the commander, 11th ADA Brigade at Fort Bliss. He will remain the Commanding General of Fort Bliss, focusing on the post's growth and the readiness of the Forces Command units assigned there.

In addition to his new



BG Roger F. Mathews (Photograph by SFC Jason Shepherd, U.S. Army-Pacific Public Affairs)

duties as chief of Air Defense Artillery and commandant of the Air Defense Artillery School, Mathews will oversee the move of the ADA School units, personnel and equipment to Fort Sill.

Previously, Mathews served as the commanding general, 94th Army Air and Missile Defense Command, Fort Shafter, Hawaii. He also served as deputy commanding general for Operations, U.S. Army Space and Missile Defense Command/Army Forces Strategic Command, Peterson Air Force Base, Colo.; assistant commandant/deputy commander, U.S. Army ADA Center and Fort Bliss, Texas; and chief of staff, 32d Army Air and Missile Defense Command, Fort Bliss.

He has served as the commander of 69th ADA Brigade, V Corps, U.S. Army Europe and Seventh Army, Germany; and deputy commander, U.S. Patriot Joint Task Force, Operation Iraqi Freedom; joint air defense operations/planner, Joint Warfighting Center, U.S. Joint Forces Command, Norfolk, Va.

He also served as commander, 4th Battalion, 3rd ADA, 1st Infantry Division (Mechanized), U.S. Army Europe and Seventh Army, Germany and Operation Joint Guard, Bosnia-Herzegovina; and operations officer, later deputy, operations branch, later chief, Operations Division, later deputy director, J-3/5, Joint Task Force 6, Fort Bliss, Texas. He holds a master's in Administration from Central Michigan University in Mount Pleasant, Mich. ■



BG Roger F. Mathews, the first commandant at the U.S. Army Air Defense Artillery Center at the Fires Center of Excellence, Fort Sill, Okla. passes the unit colors to **LTG Benjamin R. Mixon**, commanding general, U.S. Army - Pacific during a change of command ceremony at Fort Shafter, Hawaii, June 5. (Photograph by SPC Ashley M. Armstrong, 94th Army Air and Missile Defense Command Public Affairs)

Crash Course: training junior leaders



SSG Clifford Fraipont and his team clear a room during close-quarter combat training, at Fort Hood, Texas, May 21. Fraipont serves with Headquarters and Headquarters Battery, 3rd Battalion, 157th Field Artillery, Colorado Army National Guard, 115th Fires Brigade. (Photography by SSG Liesl Marelli, U.S. Army)

The mission. Ultimately, 5th Battalion, 7th Air Defense Artillery, was selected to participate in the 2008 Joint-Task Force-East exercise. The battalion was tasked with conducting embedded mounted and dismounted infantry training alongside the 10th Bulgarian Infantry. Although it was a mission outside of the realm of the battalion's core mission-essential task list, leaders and Soldiers of the command readily embraced it. The battalion leadership knew that an intensive training program would have to be implemented to develop the skills and tactical proficiency in a variety of infantry tasks, such as supporting urban operations and mounted and dismounted patrols. The battalion was divided into two separate task forces. The first, Task Force Panther, would transform into a mounted infantry unit, and deploy to Bulgaria. The other task force would sustain the battalion's air and missile defense contingency response capacity. Task Force Panther entered a rigorous 13-week training program.

The battalion conducted a convoy live-fire exercise in January 2008 in which all units participated. Then, the battalion focused on military operations in urban terrain basics, such as entering and clearing rooms, and moving through urban areas, to develop a strong foundation of this essential task for all batteries. Using the various resources available, it was possible to videotape a unit during operations, increasing the lessons learned from the after-action reviews immensely. The transformation of units throughout the battalion began with a focused attempt by the entire unit, starting with the overall leadership, to learn and create the building blocks for mounted and urban maneuver that would positively affect training at lower levels.

Given the extended amount of time available for a successful train-up, the

By 2LT Kyle Vonderheide, ADA

Throughout the Army, many units have been tasked with nontraditional missions to meet the various training and operational needs in the War on Terrorism. Usually, units that participate in such exercises or operations are selected because of their tactical expertise and core mission-essential task list—a convenience no longer consistently afforded to our armed forces. General (Retired) Peter J. Schoomaker, the 35th Chief of Staff of the Army, embraced the mantra that every Soldier at his core is an infantryman, and he stressed the necessity for this philosophy to underpin Army training programs.

Air defense Soldiers perform a variety of tasks from site emplacement and defense to actively engaging and destroying aerial threats. However, infantry tactics, that are needed to participate in the contemporary operating environment effectively, typically

are not at the forefront of the air defense core mission-essential task list. The smallest fighting element currently used by the Patriot is the battery because it requires a full unit effort to employ the weapons system. Infantry Soldiers are trained to lead and maneuver in much smaller formations and elements. Typically, most air defense Soldiers do not operate in these formations and elements unless executing convoy operations.

Joint Task Force-East is an annual exercise in which U.S. European Command units conduct partnership exercises with Bulgaria and Romania. According to the U.S. Department of State's website, the purpose is to strengthen the political and military bonds between the U.S. and eastern European countries. While elements of U.S. Air Force Europe perform partnership flights and demonstrations of the various weapons systems used by the participants, Army units train with their Bulgarian or Romanian counterparts.

battalion established key dates that directly influenced the training plans developed at the battery level. To develop proficiency at nontraditional skills and tactics, it is imperative that a challenging, realistic training plan be created, allowing for time to ensure that leaders are well-versed in the material for which they will be responsible.

The training. One battery developed and taught a “leadership university” to all Soldiers who served as team leader or at a higher level. The rest of the Soldiers began training the key tasks for the operation, developing expertise and proficiency simultaneously. The leadership university allowed leaders to learn and make mistakes in an unfamiliar area. Training the trainers was instrumental in the transformation to an infantry-like unit because it allowed team leaders and squad leaders to develop a good baseline proficiency in requisite skills before training their Soldiers.

As a platoon leader, I had the opportunity to create a training plan, allowing for platoon leadership to take ownership of the training that the battalion and battery would evaluate for our certification. My platoon sergeant and I created a synchronization matrix, detailing a task and purpose for each hour during our train-up. This ensured that we had a schedule to provide quantifiable results, evaluate our training on a daily schedule, and plan retraining if necessary. We created standard operating procedures for combat loading each vehicle, ensuring unity and continuity among the platoon and physically prepared for the actual execution of the training. Providing an organized and quantifiable training program was incredibly important to informing subordinates of training expectations and standards.

The transformation of a highly proficient air defense platoon into a trained motorized infantry platoon is a continuing process. A little more than three weeks after the conclusion of the leadership university, we convoyed across Germany to begin our training.

Following our matrix, we began training tasks. This allowed our new team leaders and squad leaders to understand their responsibilities and the burdens of command.

The transformation. The most difficult part about the transformation was neither the tactical skills nor muscle memory related to traditional maneuver tasks. Rather, the greatest challenge was developing young leaders without any real leadership experience or training to take the reins and

be as assertive and aggressive as their peers in the maneuver units. This may seem to be an easy task, but it is somewhat daunting and difficult to a 20-year-old Soldier who suddenly finds himself a vehicle commander with four personnel.

To slowly accustom these inexperienced leaders to small-unit tactics, we started our training with dismounted operations outside of an urban area. All Soldiers receive basic instruction that covers these tactics and formations during their entry-level training.

So, we focused more on developing leadership skills and less on tactical skills. Starting with fire teams and building toward platoons, we taught and reinforced skills and used our team leaders as the primary instructors.

While this period was a little rough due to the junior leaders’ hesitance to rely on gut instinct, it paid off because Soldiers gained confidence in their new leadership. As a unit prepares to perform a nontraditional mission, allowing time for “growing pains” to be resolved as young Soldiers establish their leadership styles is important so they can affect their subordinates successfully.

Command and control. The most difficult aspect of unit movements for any new leader — corporal through second lieutenant — is command and control on the battlefield. While modern technology aids in the control aspect with readily available communications between teams and squads, control still can be difficult. While it is nearly impossible to teach someone to manage command and control skills, it is possible to develop a deeper understanding of leadership’s responsibilities by placing people in the next higher echelon of command. When squad leaders were forced to make decisions and account for the tactical risk for a platoon, and when team leaders had to manage a squad, the junior leaders quickly garnered a deeper understanding for higher echelon leadership. Experience in leading others and patience from the chain of command to allow these developing leaders to learn from their mistakes was the most effective training.

The benefits. Preparing for this nontraditional mission has reaped enduring tertiary benefits. Forcing team and squad leaders to adopt an assertive stance is a must for any unit to reach a higher standard of performance — whether operating in its traditional role or otherwise. In many aspects of garrison operations, the leadership skills and assertive nature have benefited our unit. Soldiers in non-leadership positions

have acted independently to accomplish various missions, whether in maintenance or administratively.

Following a three-week intensive focus on small-unit leadership and tactics, Soldiers from private first class through sergeant positively adopted a hunger to accomplish missions without specific guidance in pursuit of the desired end state. The change in the mindset of our Soldiers is not a coincidence and can be traced directly to the attitudes that were developed while they trained on small-unit infantry tactics. The benefits of an aggressive posture in young leaders and Soldiers — gained by holding a position that forces them to take responsibility and risks — have extremely positive results to a unit, even if the unit does not have a nontraditional mission.

Initially, infantry and armor units bore the brunt of the burden in the War on Terrorism due to their ability to employ combat power rapidly with extreme violence of action. As we transformed into an infantry unit, I believed the difference between maneuver units and the air defense Soldiers is 100 percent mental.

Air defense Soldiers are neither less physically fit nor less intelligent than their combat-arms brethren. The difference is that many air defense Soldiers do not get the opportunity to lead until they reach the NCO ranks. This delay can be avoided. Air defense units that train in small-unit tactics will benefit from junior Soldiers who display increased leadership. It doesn’t matter whether the training was based on a nontraditional mission or leadership development.

Our training reflects evolving battlefield expectations. Therefore, we must develop Soldiers who are ready to face the challenges of leading other Soldiers on today’s battlefield. It is wrong to do anything else. Leaders must prepare the next generation of Soldiers today. We don’t have the time to wait until an air defense Soldier reaches the NCO ranks to prepare them for added responsibility as a leader. ■

Second Lieutenant Kyle B. Vonderheide is the Platoon Leader for 1st Maneuver Platoon, Alpha Battery, 5th Battalion, 7th Air Defense Artillery, Kaiserslautern, Germany. He oversaw training as his platoon transitioned from primarily launcher crew-members to a unit ready to perform small unit infantry tactics, both mounted and dismounted. He is a 2007 graduate of the U.S. Military Academy at West Point, N.Y., with a Bachelor of Science in Military History.

Dispatching the Fleet: Patriot, an instrument of national power

Throughout history, nations have projected power abroad to protect their strategic interests and those of their allies. Instruments of national power include diplomatic, economic, informational and military means. “Dispatching the fleet” is one method of implementing military power in conjunction with the other national power elements to influence events in the world to a country’s advantage.

“Dispatching the fleet” invokes thoughts and pictures of large armadas of warships, troop ships and support ships, leaving home ports to travel to the other side of the world to protect a country’s interests, such as trade routes and critical commodities; to conduct a show of force; to counter enemy threats; or to engage and defeat an enemy. Historical examples of “dispatching the fleet” run the gamut from peaceful to wartime missions.

President Theodore Roosevelt dispatched the Great White Fleet consisting of battleships and support ships to circumnavigate the globe and display American military power and a “blue water” naval capability in December 1907. During the Falklands War in 1982, Prime Minister Margaret Thatcher, Great Britain, dispatched a naval task force to retake the islands from Argentinean invaders. Even today, the U.S. dispatches carrier strike groups around the globe as an instrument of national power to protect U.S. interests.

However, in many instances, “dispatching the fleet,” may convey an offensive intent to potential adversaries and may exacerbate tensions in a region. Threatening to use force or demonstrating a capability to use force — a form of “gunboat diplomacy” — normally is weighed carefully by the National Command Authority. Other military options may be more appropriate as a stand-alone option or as part of a larger integrated military response.

One such military option that makes a strategic statement, similar to “dispatching the fleet” but purely defensive in nature, is the deployment of antiballistic missile Patriot air defense artillery units to various regions of the world. The “dispatching” of Patriot, normally as part of flexible deterrent options, shows U.S. resolve and commitment to regional partners who may be threatened by neighboring countries. Since the end of Operation Desert Storm, Patriot units have been used to protect U.S. forces and our allies worldwide against potential adversaries that threaten the use of theater ballistic missiles and weapons of mass destruction.

The Patriot system is the world’s most sophisticated long-range, high-altitude, all-weather air and missile defense system. Patriot was tested during combat during the First Gulf War against Saddam Hussein’s scud missiles. After that war, Patriot underwent numerous upgrades before its employment during Operation Iraqi Freedom where the system and the Soldiers who manned it successfully engaged and destroyed nine Iraqi missiles. Lessons learned from Operation Iraqi Freedom, both technical and tactical, were implemented in the Patriot system and in the training of Soldiers during the last six years, making the Patriot system even more effective against the ever-evolving threat.



TOP: The Great White Fleet anchored at Callao, Peru, 1908. The fleet’s mission was circumnavigating the globe and displaying American military power. (Photograph courtesy of the U.S. Naval Historical Center)
BOTTOM: A MIM-104 Patriot missile launcher at Osan, Republic of Korea, September 12, 2001. (Photograph by SrA Scottie T. McCord, USAF)

Patriot has become a key strategic piece in the “geopolitical game” played seriously by the U.S. and friendly countries to counter increasing threats to world peace. Patriot is sometimes the “price of admission” to bolster a friendly country’s resolve and gain its support in preserving the peace. Dispatching a Patriot battalion with more than 500 personnel for a year-long deployment overseas is similar in many respects to dispatching an aircraft carrier — it is a strategic move, and its impact is immediate on regional events.

“Just as the sailors of fleets dispatched for strategic reasons in bygone eras knew they would be away from their families and loved ones for long time periods, the same is true for today’s Patriot Soldier.”

Currently, more than 50 percent of the Patriot force is deployed forward outside of the continental U.S. helping to maintain the peace. Patriot Soldiers are conducting their air and missile defense mission and performing their part in projecting national power by showing U.S. resolve and support in seven different countries around the world. Also, one Patriot unit is in Iraq in a nonstandard tactical role performing a security force mission and contributing to the reduction of operational tempo for other Army units in the War on Terror.

The remaining Patriot units in the continental U.S. are ready to deploy, rebuilding combat power, or testing new upgrades to the

system. Patriot is certainly a high demand, low density weapon system with more missions and requirements worldwide than the force can fulfill. The National Command Authority with advice from the Joint Chiefs of Staff prioritizes worldwide requirements and judiciously uses Patriot in only the most critical areas of the world to benefit our national strategy.

Just as the sailors of fleets dispatched for strategic reasons in bygone eras knew they would be away from their families and loved ones, the same is true for today’s Patriot Soldier. They are asked to stand guard and watch the skies 24 hours a day/ seven days a week to protect other U.S. servicemembers and critical assets vital to our national defense and those of our allies. This vigilance occurs in dangerous regions of the world where rogue nations have the ability to rain hundreds of missiles down on any targets they select. Patriot provides a capability to counter these threats and contributes greatly to a friendly nation’s confidence in the resolve of the U.S. to preserve the peace.

The families of our Patriot Soldiers do not embrace happily the separation from their husbands, wives, sons or daughters serving as Patriot crewmen or support staff, but they accept it. They understand that their Soldiers are making a huge impact on world peace. Although a Patriot deployment by either air or ship may not be as majestic as a carrier strike group sailing out of a port, the families can be proud of their Soldiers performing a vital strategic mission equivalent to “dispatching the fleet.” ■

Mike Zaborowski
Senior Systems Analyst, ITT
El Paso, Texas 79906

First joint airspace conference takes place in Iraq

In an attempt to better use the airspace over Iraq, members of the Multi-National Corps–Iraq held the Airspace Interoperability Synchronization Conference at Camp Victory, Iraq, May 30. As members of the Multi-National Corps–Iraq joint fires and effects cell, air and missile defense team servicemembers, in concert with other entities, are responsible for executing airspace command and control as well as air and missile defense within the Iraq theater of operations.

In addition, the joint fires and effects cell/air and missile defense cell is the nerve center for all Army air and missile defense data link communications in Iraq. Its coordination and integration with the Air Force’s control and reporting center, Balad Air Base, Iraq; the Marine’s tactical air operations center, al Assad, Iraq; and theater air defense airspace management systems is critical for successful airspace management and deconfliction. With that kind of responsibility, the subject matter experts in the different airspace career fields decided to have a face-to-face conference to discuss and assess the current procedures and determine how to conduct operations more smoothly.

It’s rare to have all the different organizations in one area to coordinate and plan the various operations, so this was an important opportunity. The conference allowed the attendees to gauge where they are in airspace command and control, and air

and missile defense, and find ways to make the processes more efficient and more effective.

The goal for the two-day conference was to continue to improve joint tactics, techniques and procedures, while fostering and encouraging teamwork among the services and developing personal relationships focused on integrating assets and capabilities to form strong joint alliances.

“Nothing substitutes being able to sit at a table and being able to trade ideas with the other people who are doing the same job you are doing on a daily basis,” said Major Richard Ramsey, joint interface control officer at the Combined Air Operations Center. “Ultimately this will make things run even more efficiently out there in the theater.”

After the conference, participants can examine the topics and solutions from the gathering and use the lessons learned in other commands and theaters. The lessons learned in Iraq can be applied in Afghanistan and any other operational environment in future conflicts. They could become the benchmark for coordinating airspace jointly. ■

By SSG Tim Beckham
U.S. Air Forces Central Public Affairs

Patriot ISR: *cultivating situational awareness for commanders*

By CPT Christopher R. Garnett, ADA

“Complacency is the biggest killer on the battlefield.”

— GEN Peter J. Schoomaker,
former U.S. Army Chief of Staff

Conventionally speaking, the U.S. Army Air Defense Artillery’s mission is to protect the force and selected geopolitical assets from aerial attack, missile attack and surveillance. ADA’s theater objectives include preserving combat power, gaining the initiative and supporting offensive operations. However with today’s counterinsurgency operations, the likelihood of a future enemy employing both conventional and unconventional warfare is becoming more likely.

As a result, the U.S. Army Air and Missile Defense community must develop and integrate ground intelligence, surveillance and reconnaissance into its general operations — giving ADA units more operational flexibility. This will increase survivability, situational awareness and situational understanding for commanders during operations. In the future, the over-the-horizon threat will be a hybrid enemy.

Traditionally, ADA units in theater, specifically Patriot units, have ground maneuver units attached to them to provide operational ground security. However, attached ground defense erodes the ADA commander’s overall situational awareness. Simultaneously, this practice limits these attached maneuver units’ abilities to focus on offensive and follow-on operations. Although originally well intended, this practice allows the ADA commander to focus solely on air defense operations and nothing outside of the unit’s immediate location. Due to the requirements of fighting COIN, this conventional practice likely will be unavailable to ADA units in the future, posing a potential weakness.

Future ADA operations against a hybrid threat will require Patriot batteries to emplace in locations close to and distant from urban, rural and sparsely populated areas. This complex terrain will require commanders to evaluate and understand the threats posed against their personnel, equipment and location. For example, maneuver forces in and around urban areas would be constrained from performing defense operations due to their organic capabilities and what they can bring to the fight; this is not a practical or useful role.

Patriot commanders need organic ISR capabilities to obtain and maintain continuous situational awareness and understanding. Typically, air defense planners emplace Patriot units in remote locations. Unfortunately, these distant units commonly are unintentionally vulnerable to asymmetric threats. Although quick-reaction forces are an effective defense against specific enemy actions, organic ISR teams would enable the commander to counter enemy threats before they evolve. This “eyes and ears” approach would increase the survivability, situational awareness, and situational understanding for the commanders during air defense operations.

With maneuver warfare as the basis of our conventional operations, the biggest ground threat to Patriot units is the common practice of bypassing small or non-relevant enemy elements to maintain momentum. Due to the physical sensitivity of ADA equipment, this



CPT Christopher R. Garnett, U.S. Army, provides over-watch and sends up mortar fire missions at the Combined Arms Expansion Course at the U.S. Marine Corps Air Ground Combat Center, Twentynine Palms, Calif., April 13. (Photo by Capt. Manny Zepeda, U.S. Marines)

bypassed threat could pose a significant problem.

Thus, commanders need continuous information on the physical status of their remotely located equipment, including potential threats to it.

A possible realistic scenario may include a Patriot battery emplaced in a location that is far from any determined ground threats. However, after close examination of the terrain and operational footprint, the commander discovers a small village is located just 15 kilometers from his unit's location. Enemy elements could use this village as a staging location for follow-on attacks. Patriot ISR teams would deploy undetected to a concealed position to observe all activities in and around this village. Because ADA units lack scouts and sniper assets, the two-to-three-man Patriot ISR teams would report on all personnel and equipment entering and leaving the village.

Information from these ISR teams is extremely valuable to commanders of static ADA units because the units cannot immediately initiate offensive operations or relocate. Commanders could anticipate an attack and institute measures to defend the unit. This area reconnaissance obtains detailed information about the terrain or potential enemy activity. However, area reconnaissance is not the only way ADA commanders can gather intelligence.

ISR missions. The information ISR teams produce can protect battery positions, launchers in a remote configuration and future battery convoy initial route operations. Additionally, ISR supplies information from vantage points that overlook battle position in urban terrain (counter-surveillance). These positions must be identified to reduce the likelihood of potential enemy surveillance, civilian interference and the possibly asymmetric attacks.

Patriot ISR counter-surveillance missions in and around urban sprawls would include identifying high-rise locations in direct line of sight or overwatch of a battery/battalion position; possible civilian vehicular movement choke points in lines of communication and main supply routes that would degrade direct access; organic teams of personnel, if needed, to occupy surrounding civilian infrastructure that poses a security risk to a battery's or battalion's position during war; and designing and producing an "occupation in urban terrain" planning book that outlines actions for that setting.

ISR skill tasks. ADA and Field Artillery units use organic reconnaissance, selection, occupation of position teams. These RSOP teams select sites for the batteries. ISR teams would be an extension of RSOP — disseminating information requested by the immediate commander.

"Patriot commanders need organic intelligence, surveillance and reconnaissance capabilities to obtain and maintain continuous situational awareness and understanding."

Common tasks for ISR teams include, but are not limited to, obtaining the location of possible hostile forces; describing the composition, activities and identification of possible hostile forces; identifying strengths, weaknesses, gaps or vulnerabilities in the enemy's disposition and its ability to reinforce itself; confirming or refuting apparent hostile courses of action; conducting reconnaissance and surveillance of designated named areas of interest; and reporting information in accordance with current intelligence reporting criteria and dissemination plans.

Fundamental ISR skills. ISR teams would be inserted using either a foot patrol or by vehicle. Based on the theater of operations,

unit mission and assets available, the commander must identify ISR tasks. Though ISR teams need specialized skills, they do not require formal schooling. Most of these skills, fundamental to the Soldier, will be mastered at the unit level. Thorough planning and understanding of the commander's intent is essential for ISR success.

- Conduct radio operations.
- Identify and select a location for effective surveillance operations.
- Camouflage and conceal personnel, equipment, position and vehicle(s). Conduct field sketching and basic ground photography.
- Determine the avenue of advance to a desired position with little to no visual or acoustic signature displacement.
- Conduct map reading and land navigation skills using a compass.
- Execute surveillance operations over prolonged periods of time.
- Operate in low-light conditions.
- Use GPS-aided navigation equipment.
- Function in adverse weather conditions.
- Use night vision equipment.
- Extract from a surveillance position with little to no visual or acoustic signature displacement.
- Collect and forwarding a size, activity, location, uniform/unit, time and equipment (SALUTE) report.
- Monitor and record information in a logbook or designated ISR journal.

Intelligence, surveillance and reconnaissance fundamental skill set

The fundamental skills for ISR tasks are listed in the above figure.

Bridging of skills, tasks and mission. Though introducing and improving these skills is vital, the ISR teams' effectiveness will be based on realistic training. Commanders need sound judgment to balance the requirements of mission success with the associated risks. To maintain the realism, training needs to be conducted under conditions that are expected in combat — such as secrecy in planning and execution, tactical insertion and extraction methods, use of tactical communication procedures and the incorporation of opposing forces and/or civilians-on-the-battlefield elements for ISR teams to observe and report.

Personnel selection for ISR. The recommended manning of Patriot ISR teams at the battery level would include the RSOP officer-in-charge (likely a second lieutenant) a junior NCO as NCOIC and a junior enlisted service member, preferably with a Military Occupation Specialty 25F Network Switching Systems Operator/Maintainer. The OIC would be responsible for developing a training plan and working in conjunction with the battery commander's intent. Ideal training time would be during traditional red-cycle-driven events — maximizing time spent for developing and strengthening ISR skills and allowing for non-red cycle training time to focus on Patriot-specific skills.

Additionally, a battalion should have an ISR evaluation team/master-training team. This team would coordinate training within the battalion and report progress on all ISR teams. This team would include a staff officer, either a captain or first lieutenant, as the OIC

“Information from these intelligence, surveillance and reconnaissance teams is extremely valuable to commanders of static ADA units because the units cannot immediately initiate offensive operations or relocate.”

and an NCO as the NCOIC. This battalion-level ISR team would be the main point of contact for training resources and references. ISR team evaluations would be graded on a “GO/NO-GO” criteria and would not be included in or conducted during Patriot Gunnery Table VIII evaluations. Training needs to focus on conventional operations and take into account that future conflicts likely will involve a hybrid enemy.

Developing ISR training from a Soldier’s perspective will broaden his skills and strengthen his Warrior Ethos, warrior tasks and battle drills (2008 U.S. Army Posture Statement). Incorporating ISR into Patriot training will strengthen Soldier development by enabling ISR team members to research, develop training and offer leadership opportunities that normally would not be offered. Integrating ISR into general operations gives ADA units more operational flexibility develops Soldiers and increases unit capabilities.

The counter-argument against Patriot ISR is a common and traditional response. The need for organic ISR is not needed due to maneuver units providing ground security through ISR missions.

Maneuver warfare often requires bypassing small, insignificant enemy elements to maintain operational speed and tempo. This traditional security attachment from past

operations requires a reliable, secondary organic ISR plan.

Second, the demands of personnel shortages and necessary training time can be used to argue against Patriot ISR. The mission-essential task list tasks for Patriot operations must be commanders’ training focus. However, ISR training requires three personnel per battery at most.

Time allocated to this training can be independent from METL tasks and Patriot-specific training and can occur during red-cycle training events when large amounts of personnel demands from taskings are assigned. ISR skills alone do not require formal, in-depth training, nor do they call for extensive time that would equate to time away from conventional Patriot training.

Patriot ISR operations will bring an enormous capability to ADA units. The information passed along by ISR teams will be common air defense specific information that is organic to the unit and will allow for an effective and quick decision by the commander.

With current COIN operations and both conventional and hybrid threats, this aspect of intelligence gathering for ADA operations is invaluable. This “eyes and ears” tool for commanders to gather information through surveillance operations will increase their situational awareness and understanding drastically, resulting in positive control and information for ADA commanders at all levels. ■

Captain Christopher R. Garnett, Air Defense Artillery, is a student at the Expeditionary Warfare School-U.S. Marine Corps Base, Quantico, Va. He was the battery executive officer, C-Battery, 1st Battalion, 1st ADA, 94th Army Air and Missile Defense Command, Okinawa, Japan. He has a Secondary Teaching Certification from Aurora University, Aurora, Ill., Secondary Teaching Endorsement in National Security Policy from Northern Illinois University, DeKalb, and a Master’s of Public Administration from the University of Oklahoma in Norman.



M1A1 Abrams are on the move during the maneuver phase of operations at the Combined Arms Expansion Course at the U.S. Marine Corps Air Ground Combat Center, Twentynine Palms, Calif., April 13. (Photo by CPT Christopher R. Garnett)



ANGLICO: the great enabler

By LTC Michael D. Grice, U.S. Marines

“To provide Marine Air Ground Task Force commanders a liaison capability ... to plan, coordinate, employ and conduct terminal control of fires in support of joint, allied and coalition forces.”

— Air Naval Gunfire Liaison Company mission statement

The days of unilateral service action are over. Joint, combined and coalition operations are *de rigueur* in the “Long War.” With the drawdown of Operation Iraqi Freedom, the U.S. Marine Corps embraces the opportunity to join the U.S. Army and NATO forces fighting in Afghanistan. Joint task force, coalition and combined endeavors provide forces, equipment and expertise not available to a single service or even a single nation. In addition to the increased capability, they present significant challenges in the areas of command, control and integration.

Due to its inherent flexibility, born of a culture of task organization based on the Marine air ground task force, the USMC stands ready to lead, follow and otherwise embrace such efforts. To be successful, however, the MAGTF commander needs a trusted agent to bring his intent to nonorganic subordinate and adjacent units, to provide planning expertise and to leverage U.S. Navy and USMC combat power to support all partners.

Fortunately, the commander has an agent to meet the demanding, challenging and dynamic requirements of diverse confederations — the air naval gunfire liaison company. Unfortunately, ANGLICO remains a little-known and often poorly understood organization. To understand ANGLICO, its origins and its potential future, this article provides a brief history of the organization, an example of its employment in support of OIF and recommendations for this specialized organization’s future.

History. The ANGLICO was created during the reactivation of the 1st and 2nd companies in 2003, but its storied lineage reaches back to the hard-fought amphibious campaigns in the Pacific during World War II. Then called the Joint Assault Signal Company, the specialized unit performed the communications and control functions of sea-based and airborne fires — in support of assault forces as it stormed hotly contested beachheads. Through World War II, the unit evolved to a crucial component of amphibious operations.

In 1949, the organization traded the JASCO moniker for ANGLICO. The company participated in the daring amphibious assault at the Battle of Inchon during the Korean War in 1950.

Capt. Robert A. Knauer, firepower control team leader, 2nd Air Naval Gunfire Liaison Company, II Marine Expeditionary Force, makes visual contact with a Navy F-14 Tomcat. Knauer guides the F-14 onto a target during the Multi-National Maritime Engagement-II, May 25, 2005. (Photo by Cpl. Stephen M. DeBoard, U.S. Marines)

In 1951, the company grew into a two-company unit and participated in combat operations throughout the Korean Conflict. Following active combat operations on the Korean peninsula, ANGLICO Marines and sailors deployed to Lebanon, the Dominican Republic and the emergent war in Vietnam.

In 1965, Sub-Unit 1, 1st ANGLICO, was created as a fire support coordination and control organization under Military Assistance Command, Vietnam. The newly formed unit specialized in controlling naval gunfire and U.S. Navy and U.S. Marines close air support. The organization served throughout the entire theater of operations, providing support to various allied and sister service units, including the U.S. Army, the Army of the Republic of Vietnam, the Republic of Korea army and marine corps, the Australian army and others.

Although Sub-Unit 1's primary mission was integrating fires, it also provided the essential liaison function between MACV and the varied supported units. ANGLICO Marines and sailors continued active service in Vietnam until the end; it was one of the last American combat units to leave Vietnam. They departed in early 1973 after providing crucial fire support to the Republic of Vietnam soldiers and marines during the North Vietnamese army's offensives in 1972.

ANGLICO provided support for deployments throughout the 1970s and 1980s — most notably during the Lebanon peacekeeping operations in 1982 and the invasion of Grenada in 1983. The unit's liaison and fires integration capabilities were an integral part of Marine Amphibious Unit deployments. ANGLICO detachments trained with countless armed forces in coastal areas and participated in combat and contingency operations. As the MAUs transitioned to Marine Expeditionary Units-Special Operations Capable, ANGLICO became one of the MAGTF commander's most useful tools for training and humanitarian operations with other militaries from the Mediterranean Sea to the Korean peninsula to Australasia's beaches.

Saddam Hussein's invasion of Kuwait in 1990 showcased the unit's value as the MAGTF commander's enabler. Active and reserve ANGLICO units provided fire support and liaison to the U.S. Army 82nd Airborne Division and coalition units from Saudi Arabia, Kuwait, Qatar, Oman, United Arab Emirates, Bahrain, Syria, Morocco, Spain and the French Foreign Legion.

ANGLICO Marines and sailors also conducted pre-battle combined arms and fire support training to ensure all supported forces functioned effectively within or adjacent to a MAGTF. When Operation Desert Shield transitioned to Operation Desert Storm, ANGLICO units integrated all forms of fire support on the battlefield and provided crucial communications links between U.S. and Coalition units.¹

In 1999, USMC manpower reductions forced the deactivation of active duty ANGLICOs. They were replaced by much smaller Marine Liaison Elements at I and II Marine Expeditionary Forces — each had a significantly reduced communications and fire support coordination capability. Although greatly reduced in size and ability, the I MEF MLE supported the British Royal Marines' 3 Commando Brigade in Basra during the initial months of OIF, operating closely



LCpl. Antonio J. Castillo and Pvt. Matthew J. Hurley, radio operators, 2nd Air Naval Gunfire Liaison Company, II Marine Expeditionary Force, demonstrate the use of ANGLICO's Global Positioning System and range-finding equipment to French navy LT j.g. Jerome Laye, a pilot based off French carrier Charles de Gaulle, May 25, 2005. (Photo by Cpl. Stephen M. DeBoard, U.S. Marines)

with the 15th MEUSOC and other I MEF forces.

The MLE Marines and sailors — critical enablers for the MEF and the British forces — were the primary link to the direct air support center and Coalition air support. The MLE's successful support of British forces proved the effectiveness of ANGLICO capabilities, but it found the MLEs inadequate for the requirements for liaison and fire support integration in support of OIF and Operation Enduring Freedom.²

Growing operational demands required the reactivation of the active duty 1st and 2nd ANGLICOs in 2003. A new unit, 5th ANGLICO stood up in 2005.³ The reactivated active duty ANGLICO units gave the MAGTF commander a robust capability that enabled him to bring his intent, planning expertise and the full spectrum of Marine fire support to every member in the joint, coalition or allied fight — including the enduring deployment of rotational ANGLICO units to Iraq.

Unit organization. ANGLICO is a separate company located in the MEF Headquarters Group and serves as the primary liaison between the MAGTF command and non-Marine units.³ Each company numbers more than 200 Marines and sailors — equivalent to a battalion-level command. A command screened and slated lieutenant colonel leads the ANGLICO, consisting of a headquarters platoon and three brigade platoons. The company is self-sufficient with organic logistical, supply, motor vehicle, ordnance and communications resources to support any assigned unit.

Cpl. Jonathan M. Reid and LCpl. James L. Sauerwald, both observers with 2nd Air Naval Gun Liaison Company, II Marine Expeditionary Force, watch target impact to ensure the targets are hit, March 3. (Photo by Cpl. Michael Curvin, U.S. Marines)

Company headquarters. Headquarters includes the command element and the headquarters platoon. The company headquarters has the staff elements of a typical battalion-size organization — administration, intelligence, logistics and a large, robust operations section that incorporates subject matter experts for all forms of supporting arms. The headquarters platoon maintains a large, armory, motor pool, a comprehensively equipped communications section and an organic motor vehicle maintenance capability. It equips, trains, deploys, commands and controls the subordinate ANGLICO elements.

The company headquarters is staffed and equipped to be an independently deployable fire support coordination center that can embed into a joint, coalition or allied division-level organization. It provides liaison, planning expertise and detailed integration and deconfliction of MAGTF fires for the supported unit.

Embedding ANGLICO units — at the division and down to the line company — is arguably the company's most valuable service. It provides a direct link between the MAGTF commander and the non-Marine unit — either part of or adjacent to the Marine area of operations. At the division level, the ANGLICO headquarters as an FSCC performs all fires related battlefield functions, such as naval surface fire support, CAS and surface-to-surface integration. It is digitally capable and integrates into all USMC and nearly all U.S. Army, USN and U.S. Air Force battlefield systems.

Brigade platoon. The company's three brigade platoons perform fire support integration, MAGTF planning, communications and liaison between the MAGTF and an adjacent or subordinate brigade or regimental-size non-Marine unit. During OIF, ANGLICO brigade platoons supported coalition forces from

Great Britain and Poland and U.S. Army units, Special Operations Forces and U.S. Army and USMC military transition teams and their Iraqi counterparts, including combat operations outside Multi-National Force-West in Basra and Baghdad.

Doctrinally, the brigade platoon embeds in a brigade-size or equivalent coalition or allied unit that requires either MAGTF fires, falls within a command relationship with the MAGTF commander or both. Once attached, the platoon headquarters becomes a special staff section at the brigade headquarters.

The subordinate units within the platoon join the battalion task forces and company teams, bringing their requisite expertise to all levels of the supported unit. In reality, this model works well with U.S. Army and other top-tier brigades due to their similarity in capabilities. However, the brigade platoon moves up one level to provide support at the Iraqi Army division level because of the design of the Iraqi Army formations.

The ANGLICO has three brigade platoon listed on its table of organization. Within each platoon, there are platoon headquarters, two supporting arms liaison teams and four firepower control teams — two within each SALT. Functionally, each element operates independently without relying on the supported unit for vehicles, radios and other equipment or supplies. Like the company headquarters, the brigade platoons and SALTs perform as complete doctrinal Marine FSCCs at the brigade and battalion levels. The FCT has the trained personnel and necessary equipment to fight as a fire support team.

Although their ranks range from major to first lieutenant, the platoon, SALT and FCT leaders largely share the same billet description, acting as the subject matter expert on the MAGTF,



fires, communication and planning for the unit they support. The principle difference is the level of their assigned units, ranging from the brigade/regiment to the company/team.

These leaders provide planning and execution expertise for the supported commander. They may prepare a traditional fire plan, conduct a helicopter-borne combat resupply, plan an air assault or explain how the Marine Corps planning process works.

They are interpreters who bridge the gap between the supported unit and the MAGTF. They also lead their own FCTs and deploy and deploy forward in support of combat operations and units-in-contact with the enemy as needed and directed.

The platoon command and SALT leaders also may act as either the leader or the co-leader of the supported unit's tactical air control party.⁴ If they cannot integrate into the marine aviation command and control system, the ANGLICO platoon commander establishes a tactical air control party capable of fulfilling the functions of Marine aviation that apply to the supported unit — offensive air support, assault support, control of aircraft and missiles, aerial reconnaissance and electronic warfare. If the platoon does not have an assigned aviator as the air officer, the platoon commander fills that billet, submits joint terminal attack and assault requests to the MAGTF air officer and plans for their integration.

SALT. There are two deployable SALTs in each brigade platoon. Each SALT is equipped for independent operations. The team includes a combat arms officer, a naval aviator and a staff sergeant scout observer; they may be joint terminal attack controllers, communicators, drivers and/or scouts.

The SALT serves as the senior fire support element for the subordinate FCTs and performs the primary mission as the supported unit's 24-hour operations capable FSCC. If robust support is not required, the SALT may split into two SALT (-) elements — capable of providing planning and MAGTF integration expertise while simultaneously acting as the higher headquarters for one or more FCTs.

The SALT leader serves as the MAGTF representative to the battalion/task force commander and usually serves on his staff as an advisor. His duties include attending meetings, planning sessions and conducting training on the MAGTF and supporting arms.

FCT. The FCT is subordinate to the SALT and is the smallest, lowest level independently deployable unit within ANGLICO. There are two FCTs per SALT that support company-size units during combat operations. The FCT has the same capabilities as a doctrinal USMC rifle company fire support team plus the mobility and communications capabilities from its organic equipment.

The FCT leader is a JTAC-qualified combat arms officer or a naval aviator. His team has a scout observer FCT chief, a radio operator and a driver. All personnel in the FCT are cross trained to perform the duties of any other member. The driver can act as the gunner and call for fire. The radio operator can talk to aircraft over the appropriate nets when required.

Operational employment in Iraq. ANGLICO's configuration is based on the doctrinal model of "two up and one back." Supported organization would have two units-in-contact and one in reserve — the two SALTs with two FCTs per brigade platoon.⁵ In OIF, the conflict's stabilization into a counterinsurgency fight considerably changed that dynamic.

Despite the nonstandard combat environment, ANGLICO's inherent flexibility provided robust support to meet the changing requirements. ANGLICO elements supported U.S. Army units from independent task forces to entire brigades, simultaneously working with MiTTs and their Iraqi counterparts, coalition partners, and USMC units that required fires and CAS control and fire support.

An example of the organization's flexibility is the brigade platoon that supported the 1st Brigade, 1st Armored Division in Ar Ramadi, Iraq. The U.S. Army brigade was a subordinate

unit within the Marine Expeditionary Force (Forward) and was a battlespace landowner in the MNF-W area of operations. During a highly active 2006 to 2007 deployment, the ANGLICO brigade platoon that supported 1st Brigade, 1st Armored Division, reorganized to support five separate maneuver task forces — each with numerous company teams.

To meet this large requirement, the SALTs were restructured; five SALT (-) elements were created, and each was coupled with one deployable FCT. In addition, the platoon was complemented by the Air Force tactical air control party, providing additional JTACs and air liaison officers.⁶

The platoon's members were employed at the tactical level, supporting armored and infantry task forces as they conducted offensive operations in and around Ar Ramadi. They occupied overt and covert observation posts, integrated CAS in the tightly confined urban canyons of the city and deconflicted surface-to-surface fires that ranged from mortars to Guided Multiple-Launch Rocket System missiles. They were inculcated into the U.S. Army and coalition units that they supported and served in combat side-by-side with their non-Marine counterparts.

Future employment. ANGLICO proved to be an invaluable part of the MEFs (Forward) that have been winning the fight in al Anbar. As Iraq stabilizes, the need for the ANGLICO's specialized capabilities in Iraq has declined. The focus is shifting toward Afghanistan where the skills provided by ANGLICO are in high demand. To meet the demand, the company headquarters redeployed to the continental U.S. to train, equip and deploy brigade platoons to both combat theaters. In addition, West Coast Marine Expeditionary Units will deploy with SALTs in the near future.

As the USMC's presence in Afghanistan grows, the requirement for the MAGTF to work with joint, coalition and allied organizations increases. ANGLICO is the USMC organization that meets this need; it is staffed with trained and equipped professionals who are ready to bring the full spectrum of capabilities resident in the MAGTF to support non-Marine units. ANGLICOs and the U.S. Army enjoy a strong, habitual relationship in training and at war, strengthening the bonds between these services. In the future, this bond will serve both services well as they continue to train, deploy, and fight side-by-side. ■

Lieutenant Colonel Michael D. Grice, USMC, Field Artillery (FA), is the Expeditionary Fire Support Branch Chief at Expeditionary Warfare Training Group Pacific, at Naval Amphibious Base Coronado, Calif. He served as the Executive Officer of 5th Battalion, 11th Marine Regiment, Camp Pendleton, Calif. Brigade Platoon Commander, 1st ANGLICO, Camp Pendleton, Calif., deploying in support of Operation Iraqi Freedom; Commanding Officer of Battery E, 2nd Battalion, 11th Marine Regiment, Camp Pendleton, Calif. and served with the 31st MEU (SOC), deploying for Humanitarian Operations to East Timor. He is slated to take command of 1st ANGLICO this summer.

Endnotes:

1. Condensed from Ahern, Peter W., Dennis M. Cunniffe and Mitchell J. McCarthy, "ANGLICO," *Marine Corps Gazette* (November 2005), 72-76.
2. Brian T. Koch, "Evolution of ANGLICO," *Marine Corps Gazette* (February 2007), 26.
3. There are three active and two reserve ANGLICOs in the Marine Corps: 1st ANGLICO is at Camp Pendleton, Calif.; and is part of I Marine Expeditionary Force, 2nd ANGLICO is at Camp LeJeune, N.C., and supports II MEF, 3rd ANGLICO is at Long Beach, Calif., 4th ANGLICO is at West Palm Beach, Fla., and 5th ANGLICO is at Okinawa, Japan and supports III MEF.
4. In cases where ANGLICO supports U.S. Army units, the terminal attack control party (TACP) responsibilities usually will be shared with U.S. Air Force air support operations squadron personnel.
5. Until 2007, there were only two brigade platoons in each active duty company; the increase in USMC end strength made the addition of a third brigade platoon possible for 1st, 2nd and 5th ANGLICOs.
6. The combined ANGLICO/U.S. Air Force TACP was integrated down to the company/team levels, with U.S. Air Force and ANGLICO personnel at every echelon. There were 22 JTAC teams throughout Ramadi during active-combat operations, led by the brigade TACP. In addition, U.S. Naval Special Warfare JTACs would fall under brigade TACP control for some operations.

Get your thoughts into the *Fires* Bulletin: Here's how ...

Article subjects. *Fires* strives to be “forward-looking.” We’re at the dawn of a new Army transformation. Many exciting things are taking place in the field and air defense artillery fields of expertise. Article subjects should therefore be current and relevant. Writers may share “good ideas” and “lessons learned” with their fellow Soldiers, as exploring better ways of doing things remains a high emphasis with *Fires*.

If an article subject is significant and pertains to FA or ADA and its diverse activities, as a rule of thumb we’ll consider it appropriate for publication. Article subjects include (but aren’t limited to) technical developments, tactics, techniques and procedures; how-to pieces, practical exercises, training methods and historical perspectives (AR 25-30, Paragraph 2-3, b).

We are actively seeking lessons-learned articles which will enhance understanding of current field and air defense artillery operations. The magazine’s heart is material dealing with doctrinal, technical or operational concepts. We especially solicit progressive, forward-thinking and challenging subject matter for publication. In addition to conceptual and doctrinal materials, we encourage manuscripts dealing with maintenance, training or operational techniques.

“Good ideas or lessons-learned” articles should have two closely related themes: one, what did you learn from what you did? The second theme is: what is most important for others to know, or what will you do differently in the future? Include only the pertinent information on how you did it so someone else can repeat what you did. Don’t include a “blow-by-blow” of your whole deployment. The article’s emphasis should be that your unit has a good idea or some lessons-learned to share.

Steps involved in submitting an article to *Fires* are outlined following.

All articles should have the “bottom line up front”; however, to better ensure your chances of publication, we recommend that you read all the criteria contained in this article as well as apply the guidance contained in the *Fires* style manual at sill-www.army.mil/firesbulletin/style.asp for more details. We do not pay for articles or illustrations other than providing contributors with complimentary copies of the magazine.

Fires is not copyrighted. All material published is considered in the public domain unless otherwise indicated. (Occasionally we use copyrighted material by permission; this material is clearly marked with the appropriate legal notification.)

If you get permission to use someone else’s graphic or photo, especially from the private sector, we need proof of that in writing.

Getting started. Select a relevant topic of interest to the U.S. Army Field and Air Defense Artillery community. The topic must professionally develop members of these fields. Write an outline to organize your work. Put the bottom line up front and write clear, concise introduction and conclusion paragraphs. Follow the writing standard established in AR 25-50, Preparing and Managing Correspondence, Section IV (the Army writing style), and DA Pamphlet 600-67, Effective Writing for Army Leaders, especially Paragraphs 3-1 and 3-2.

The Army standard is writing you can understand in a single rapid reading and is generally free of errors in grammar, mechanics and usage. Also see *Fires*’ style manual. Maintain the active voice as much as possible. Write “Congress cut the budget” rather than “the budget was cut by Congress.” (DA PAM 600-67, Paragraph 3-2, b[1]). Write as if you were telling someone face-to-

face about your subject: use conversational tone; “I,” “you” and “we” personal pronouns; short sentences and short paragraphs. Articles should be double-spaced, typed, unpublished manuscript, between 3,000 and 3,500 (or less) but no more than 5,000 words, including endnotes as appropriate.

Authors should check their articles’ contents with unit commanders or organization directors or S2s/G2s to ensure the articles have no classified or operations security information in them. Clearance requirements are outlined in Army Regulation 360-1, Chapter 5, Paragraph 5-3. Headquarters Department of the Army/Office of the Secretary of Defense clearance is required if your article meets any of the criteria listed there. Article clearance is further covered in Paragraph 6-6, with procedures on how to do so outlined in Paragraph 6-9. The bottom line on most article clearance is discussed in Paragraph 6-6. While you certainly may ask your local Public Affairs Office’s advice, it is the “author’s responsibility to ensure security is not compromised. Information that appears in open sources does not constitute declassification. The combination of several open-source documents may result in a classified document.”

So while the *Fires* staff may question the sensitivity of an article we receive, it is not our responsibility to “officially” clear articles, however if we do see something within an article that might cause concern, we reserve the right to withhold publication of such an article until it is thoroughly vetted with the proper subject matter expert or Army authority. But it still remains the author’s responsibility, as outlined in AR 360-1, not to compromise national security or U.S. Army operational security matters.

We reserve the right to edit an article, so the *Fires* staff will edit all manuscripts and put them in the magazine’s style and format. The author of an article or interviewee will receive a “courtesy copy” of the edited version for review before publication, however, if the author does not get back to the *Fires* staff with any questions or concerns within a specified suspense date (typically five to seven working days) it will be assumed the author “concur” with all edits and the article will run “as is.”

Except in the case of Armywide “news” items, authors should not submit a manuscript to *Fires* while it is being considered elsewhere. A comprehensive biography, highlighting experience, education and training relevant to the article’s subject and credentialing the author as the writer of the article. Include e-mail and mailing addresses and telephone, cell and fax numbers. Please keep this information current with *Fires* for as long as we’re considering the manuscript.

Photographs and graphics. Must be accompanied with an adequate description of the images and photographer/illustrator credits. All graphics files and photos must be separate the text. Do not embed images, they cannot be used in this format.

We accept high-resolution digital images (about 1 MB or more each). These can include photographs, drawings, slides, maps, charts, unit crests, etc. (See the “Fires Photographer’s Guide” for more information on page 27.)

Sending the article. E-mail to the editor, *Fires*, at firesbulletin@conus.army.mil; or mail to P.O. Box 33311, Fort Sill, OK 73503-0311; for overnight delivery use, Building. 758, Room 7, McNair Road, Fort Sill, Oklahoma 73503-5600.

For more information, or general questions call: DSN 639-5121/6806 or commercial (580)442-5121/6806. ■

ANA Artillery:

training the trainer



By MAJ Daryl L. Fullerton, FA

For the past three years, the Afghan National Army's field artillery corps has been languishing. It has not progressed beyond simple direct fire despite millions of dollars spent and hundreds of trainers deployed. There are many reasons for this stagnation, but number one among them is the lack of training the U.S. embedded training team artillery mentors receive before deployment.

The ANA uses Russian equipment which is very different from U.S. artillery. So, expecting a U.S. mentor to excel without adequate preparation using Russian artillery is unrealistic. In the first months working with their ANA counterpart, most mentors ask themselves, "Who is teaching whom?"

Artillery mentors experience little in their careers that prepares them for this difficult mission. The ANA artillery's weapons, techniques and language are unfamiliar to the mentors. To make it worse, once in country, the mentors immediately are dispersed among the 34 provinces and have little contact with one another for the duration of their deployments, preventing them from learning from their peers.

As each mentor team is forced to fend for itself, a wide difference in the tactics,

techniques and procedures develops from one ANA artillery unit to another. These differences weaken the credibility of the mentors and the Coalition as methods taught vary from team-to-team and year-to-year.

This article provides a primer for future artillery mentors heading to Afghanistan and also gives a "capability snapshot" for Coalition Force commanders working closely with the ANA artillery. Understanding the unique challenges the ANA artillery faces prevents Coalition commanders from expecting too much (which might lead to mission failure) or too little — which could render the ANA artillery as insignificant and continue to stifle its growth.

Current status. To understand how to train the ANA artillery, mentors need to know the ANA artillery's current training and capabilities.

Institutional training. Currently, the Kabul Military Training Center only trains the artillery skill of the artillery cannoneer. There is no formal training for fire direction specialists, forward observers, artillery NCOs and officers. As a result, the crews are capable at occupations and direct fire, but they must learn indirect fire techniques at forward deployed locations under the artillery mentors' supervision.

The weapons system. The Russian 122-millimeter, D30 towed howitzer is the primary weapon system of the ANA

artillery. It is a simple, rugged, capable and accurate weapons system that sufficiently meets the ANA's needs when the system is used properly. However, this weapon was designed for the Soviet Army during the Cold War under a vastly different philosophy for fire support.

In the Soviet doctrine, the battery commander was both the observer and the fire direction center. He personally computed the firing data and sent it to the guns. In addition, the fires generally were delivered by massing multiple batteries onto preplanned targets. This created a rolling barrage ahead of the advancing Soviet troops. This method of supporting combat operations with fires is incompatible with fighting an insurgency because of its indiscriminate nature.

In contrast, NATO doctrine allows any unit in contact with the enemy the capability of adjusting limited and accurate artillery fire. Afghanistan is filled with small villages where poor farmers live extensively apart from the insurgency. Indiscriminate massed artillery fire from the Soviet Army's war in Afghanistan turned many of these otherwise neutral farmers toward supporting the Mujahedeen.

However, respect for the Afghan people requires the use of proportionate, accurate and timely artillery fire to mitigate the risk of collateral damage while still defeating

the enemy. The protection of innocent Afghans is important as the ANA builds its credibility with its own people. It is also important to note the ANA leadership wishes to adopt NATO procedures to the greatest extent possible to gain world respect as a professional fighting force. The artillery mentors face the challenge of modifying the standard Soviet methods of employment of the D30 to meet these requirements.

Differences. Before work with ANA soldiers and the D30 howitzer can begin, there are a few basic differences between NATO and former Soviet TTPs that must be understood to alleviate confusion and potentially dangerous inaccurate fire.

Mils. First, all Soviet fire control systems use 6000 mils in a circle — not 6400 mils like NATO systems. This has little impact because both 6000 and 6400 mils are incorrect. A mil is defined as the angular measurement in which one-mil equals one-meter at 1000 meters. In truth, there are 6283.185 mils in a circle. The NATO standard rounds up to 6400 mils to simplify the math; the Soviets rounded down to 6000 mils. We apply the correction factor of 1.0186 when using the mil relation formula because of this residual error. The similar correction factor for 6000 mils is 0.955.

Complications with the 6000 mil system are not limited to the mil relation formula. U.S. style range deflection protractors, plotting boards and target grids are incompatible with the D30; the old Soviet plotting equipment must be used. It is difficult to use these items for adjusting fire in the NATO standard and worse yet; they can't be used for 360 degree operations. Also, when adjusting fire with an Afghan observer, the ANAFDC must be prepared to receive corrections using either compass because 6000 mil compasses—the most commonly issued compass by ANA troops — and 6400 mil compasses are available.

Firing data. The Soviet writing style for firing data is another area of confusion. Their standard practice was to place a hyphen between the second and third digit of deflections and quadrants. They would write 3000 as 30-00. The number is read as 30 and 00. Because the Soviets trained many of the senior ANA artillerymen, this writing style is one of the few “universal standards” across the ANA artillery corps.

The legacy Soviet TTP for determining map coordinates is prevalent among ANA soldiers. The Soviet method is backward to

NATO methods and lists Northing followed by Easting. They also label the coordinates with letters for easy reference, such as X for Northing and Y for Easting. Without understanding this fundamental difference, it is easy to see how this could lead to a dangerous situation. During training, we found it better to refer to coordinates as “Y” (Easting), then “X” (Northing), followed by altitude, ensuring that the proper grid was relayed.

Munitions. There are two types of high explosive munitions for the D30 available to the ANA. The projectile is the same, but the powders are different. The first is marked on the canister and box as “ПОЛНЫЙ.” This is a solid charge, normally referred to in English as “full” and is intended for direct fire and indirect fire out to the weapon's maximum range. The second is marked “УМЕНЬШЕННЫЙ,” commonly referred to as “reduced” or “reducible.” This canister is loaded with five increments, four of which are removable to alter

the trajectory and weapon's range.

As expected, powder charges are also backward when compared to NATO standards. The charge is identified by the number of powder bags removed from the reducible canister and not the number used. For this reason charge four, the removal of four bags, is the D30's smallest charge.

Tabular firing tables. There are two TFTs available for the full and reduced charge HE projectiles—a Normal and a Mountain Terrain TFT. The differences between these two TFTs are the conditions used as “standard” when determining the values. The Normal Terrain TFT uses conditions based at sea level where the air pressure and temperature are higher. The Mountain Terrain TFT uses conditions based on an altitude of 1500 meters, where the air pressure and temperature are much lower.

Afghanistan is a high desert with an average altitude much closer to 1500 meters than sea level. When computing data without taking the time to accurately account for nonstandard conditions using the Normal Terrain TFT, which is sometimes referred to as “cold-stick,” errors of up to 900 meters can result due to the lower air pressure



CPT Jason Jones, U.S. Army embedded training team artillery mentor, (foreground) trains on the D30 towed howitzer in Kabul, Afghanistan, March 6, 2008. (Photo by MAJ Daryl L. Fullerton, 82nd Airborne Division and Combined-Joint Task Force-82)

and temperature alone. For this reason, the Mountain TFT is a better option for the ANA.

Challenges. Artillery mentors have had to work around a number of challenges to make the D30 fit the requirements of a modern army that is fighting an insurgency and to modify old Soviet practices to better integrate with NATO operations. These challenges are based on the Cold War design of the weapon system itself, equipment shortfalls and the lack of standardization across the ANA Artillery.

Weapons system design. The first problem is the weapon itself. The D30 was designed for massed preplanned fire against large forces on a linear battlefield. It does not easily convert to dispersed, responsive, precision, 360-degree operations against small bands of enemy forces.

The Soviet firing chart, which is complicated and intended to be used by the battery commander at the observation point, is the first issue to overcome. It does not support NATO style adjust-fire techniques because it was intended for use at the OP. Also due to the Soviet firing chart's rectangular design, it can not be used for 360-degree operations. Unfortunately, the 6000 mil sight on the howitzer leaves the ANA little choice, but to use it for determining the deflection from the guns to the target.

The deflection on the D30 sight is unlike

“One of the most challenging problems facing the ANA artillery is a lack of required equipment.”

any U.S. howitzer. The deflection increases to the right, not left; and it uses a fixed, not a common deflection. The deflection increasing to the right does not create much difficulty. However, the lack of a common deflection requires special computations for each gun. A fixed deflection means the deflection ring is locked, making it more like the azimuth counter on U.S. style sights than what we normally call “deflection.”

Once the aiming reference, such as aiming poles, are in place, there is no way to “punch 3200.” So, each howitzer has its own deflection to the aiming reference and its own deflection when oriented on the same target. In U.S. style howitzers, once the gun is oriented and an aiming reference is in place, the deflection is reset to an arbitrary number; 3200. This allows for all guns in a platoon to have the same deflection—known as a common deflection

—when oriented on a target. The Russian TTP was not to announce deflection, but the difference from the azimuth of fire, which each gunner would then add or subtract from his deflection to his own aiming reference and apply the result to the sight.

The D30 sight also uses either a range drum in combination with a site dial or only quadrant elevation. Site is a correction for the difference in altitude of the guns and target. When using the range drum, a function of range-to-target is applied to the drum and site is applied to the site dial. The tube is then raised until the bubbles are level.

This method is good for speed, but lacks accuracy, because there are generally no nonstandard conditions applied to the range and the drum is based on the Normal Terrain TFT. For reasons stated above, huge errors result.

The other method is ignoring the range drum completely and applying a quadrant elevation to the elevation counter much like U.S. style sights. In this method, the elevation needed to reach the target is added to site. The result, known as quadrant elevation, is applied to the site. Because this best matches NATO standards, this is the recommended method for the training the ANA.

When the gunner uses the range drum, he selects the charge by moving a pointer on the drum. He selects **II** for full charge, **Y** for reduced (all increments loaded), two for charge two, or four for charge four. For these charges, the range to target is divided by 50

to determine the Normal Terrain TFT drum setting. For charges one and three, the pointer is placed on **Y** and four respectively. The TFT (column 2) must be used to determine the drum setting. Also, column 2 of the TFT must be used for all charges to apply the Mountain TFT values or to account for nonstandard conditions.

Site is computed slightly differently. There is no complementary site factor in the Russian TFT. Instead, there is a table in the back of the TFT where elevation and angle of site are used to determine a correction to the angle of site. This correction is the equivalent to what we refer to as complementary angle of site and is added to angle of site for the final site value.

Equipment shortfalls. A lack of required equipment is one of the most challenging problems facing the ANA artillery. Many units lack panoramic telescopes, direct



MAJ Daryl Fullerton, U.S. Army embedded training team leader, and
Mohammed Saleem, Afghan National Army Battery Commander, at
Khot Castle, Pakista, Afghanistan, December 9, 2007

fire telescopes, aiming circles, stakes and other basic-issue items. These items are being ordered, but it takes a long time for these orders to be filled. Much of the needed equipment has to be purchased from former Warsaw Pact countries and is difficult to acquire in the needed numbers in working condition.

The Soviet equivalent to the graphic firing table, which allows for the rapid application of nonstandard conditions to firing data, is a weapon specific range arm used on the Soviet firing chart. This range arm has angled lines used to modify range to target which accounts for air pressure, air temperature, etc. This assumes the firing unit has the proper range arm for the D30 because all weapon systems will be different. Unfortunately, this is not the case for most ANA artillery units.

The ANA uses every available version of the Soviet firing chart from rocket to mortar systems. Most charts lack the proper range arm, but all of the charts measure deflection the same way—making them useful, but not ideal.

The lack of these specialized range arms requires accurate, very time-intensive, long-hand computations. Accounting for all available nonstandard conditions takes a trained FDC at least 30 minutes. Huge errors can result—especially if using the Normal Terrain TFT—if time is not taken to account for air pressure at least.



am mentor, (left) demonstrates a weather meter to CPT Commander (center), through an interpreter at Khayer . (Photo by CSM Wilburn E. Myatt, 2-319 Field Artillery Battalion)

While some illumination and smoke rounds are available to the ANA, there are no TFTs for computing data for these munitions. The proper TFTs for these projectiles are being purchased through former Warsaw Pact countries, and hopefully this problem will be rectified in the near future.

Lack of standardization. The ANA lacks a formal FA school with a mandate to standardize the terms and TTPs to be used by all ANA artillery units. There is no standard call-for-fire, crew drill or even a standard word for azimuth of fire. Without these standards, the ANA artillery cannot learn to support any maneuver unit in contact with the enemy quickly without confusion — which could lead to fratricide. Standardization allows artillerymen to transfer from one unit to another and quickly integrate. Standards also allow leadership to define when a section or platoon is certified and can accomplish defined tasks safely.

Artillery is a complicated business in any language, but when non-Dari speakers attempt to teach these difficult concepts — through an interpreter — a large percentage of meaning is lost. Most interpreters move around and do not remain with the same training team for long periods. Very few artillery mentors are lucky enough to have interpreters with them long enough for them to understand the concepts themselves. To complicate matters, many of the standard English artillery terms are jargon and do

not translate well to English — let alone Dari. Words such as lay, site, deflection, quadrant and declination are understandable to those who underwent formal training, but when translated through a college-educated civilian interpreter, it is impossible to predict how they will be translated. Every Fort Sill graduate knows the difference between deflection and azimuth, but according to a civilian dictionary they are nearly the same. In the U.S. Army, we have an entire manual dedicated to defining military terms to ensure common understanding. This level of standardization is still in its infancy in the ANA.

The solution. Many of the ANA artillery's challenges can be overcome with proper TTPs. Establishing these standards and TTPs were discussed at an artillery conference at the Kabul Military Training Center with artillery mentors attending from all Coalition partners from across Afghanistan. Lacking an ANA proponent for standardization, the assembled mentors agreed to numerous TTPs, which mitigate many of these challenges.

Probably the most important standardization is the use of common terms with the same meaning. Through the use of some of the more experienced interpreters, common terms were identified. These terms were codified on a number of artillery forms, which were distributed to the artillery mentors.

The forms are available on the Army Knowledge Online at <https://www.us.army.mil/suite/kc/11235523>. They include a call-for-fire card, record of fire, rapid fire table, gunner reference card, weapon record data card and a record of missions fired. In addition, both Normal and Mountain Terrain TFTs were translated into Dari.

These forms and tables use the same words for the same concept from observer all the way to the gun line. All of the words on these documents are written in Dari, English, and transliterated using Latin letters, which allows mentors to learn and try to use the proper words themselves. This will cut our reliance on the quality of the translation by the interpreter.

To overcome many of the equipment shortages and the shortfalls of the Soviet firing chart, we created a Microsoft Access program to compute firing data. This Afghan-Field Artillery Computer allows the ANA to use the D30 to conduct adjust-fire missions — accounting for all nonstandard

conditions. The resulting firing data, which previously took 30 minutes, is computed in only five to 10 seconds. The program uses the same standardized Dari words from the forms to further cement the common terms into an ANA artilleryman's vocabulary.

The A-FAC is simple to use and requires very little training because it is in Dari. ANA soldiers, who in many cases had never used a computer, have been able to compute firing data with just four hours of training. This program is also located on the Army Knowledge Online for future mentors to become familiar with before their deployment. The program works on any computer with Microsoft Access 2003 or later.

To exploit this new Microsoft Access program and measure the nonstandard conditions needed to ensure accurate data, ANA artillery units recently were equipped with laptop computers, weather gauges, propellant temperature gauges and global positioning systems. Using these items, the ANA can compute accurate and timely firing data — accounting for most of the five requirements for accurate predicted fire.

While the A-FAC will run on any computer, the laptops given to the ANA were modified to run only the firing computer and nothing else. This action attempts to prevent the misuse of the computers and to discourage theft.

“Many of the challenges facing the ANA artillery can be overcome with proper tactics, techniques and procedures.”

The 4th Brigade Combat Team, 82nd Airborne Division, Fort Bragg, N.C., created a small artillery school to train the ANA artillery on this new equipment and TTPs. A platoon at a time was sequestered away from distractions for 28 days near Gardez. This initiative proved to be the best method for changing the culture of the ANA artillery and indoctrinating them to these new standardizations.

When the platoons are at their home bases, they routinely are tasked to conduct guard duties or join combat patrols, which prevent them from training on their artillery tasks. During their 28 days at Gardez, the platoons conducted daily classroom and hands-on training. At the end of the course, the platoon conducted a full-day, live-fire exercise. For the first time, these platoons were certified against an

established written standard.

Key personnel from the platoon had to pass written tests. The entire section had to demonstrate their competence in occupation and live-fire crew drills. Once the platoon completed the course and was certified, the soldiers returned to their forward operating base — ready to provide basic counterfire support.

The way ahead. With the hard work of the artillery mentors, the partnership of Coalition units, new TTPs, standardized terms and documents, and the new automated A-FAC, the ANA artillery can conduct basic indirect fire relatively soon. However, this capability is not sustainable until the future ANA field artillery school begins training fire direction specialists, forward observers and artillery NCOs and officers. There are plans to create this formal institution, but it will be some time

before the systems are in place.

Because of the immense responsibilities placed on artillery mentors, someone must assume the duty of formally training them enroute to Afghanistan. The challenges faced by these mentors are too great to expect them to learn on the fly. Before their deployments, they must receive hands-on training on the D30 and its peculiarities. They must understand the advances made by the previous mentor teams to continue those efforts. The current learning and relearning has stifled the ANA's progress. We can do better.

Without trained observers and fire supporters in the ANA maneuver units and an Afghan-led standardization program, the long-term goal of ANA artillery's firing in support of ANA ground combat operations will be a challenge. However, a certified ANA artillery platoon partnered with a

Coalition target acquisition radar can be successful as a counterfire team.

This should be the first step toward our end state. Successful accomplishment of this mission will build pride and satisfaction and will speed the ANA artillery's growth and break its current stagnation. ■

Major Daryl L. Fullerton, field artillery, is the Deputy Lethal Fires Chief for the 82nd Airborne Division and Combined-Joint Task Force-82. He served as the executive officer for 2nd Battalion, 321st Field Artillery, (Airborne), 82nd Airborne Division, Fort Bragg, North Carolina, deploying in support of Operation Enduring Freedom. Previous assignments include Firing Battery Observer/Controller-Trainer for Army National Guard units in Virginia, West Virginia and Pennsylvania; and commander, Howitzer Battery, 3rd Squadron, 2nd Armored Cavalry Regiment at Fort Polk, La.

Old Hickory Guardsmen fire new artillery round in Iraq

North Carolina Guardsmen of A Battery, 113th Field Artillery Battalion, 30th Heavy Brigade Combat Team, headquartered in Clinton, N.C., became the first Army National Guard crew to fire an Excalibur precision artillery round at Forward Operating Base Mahmudiyah, Iraq, May 21. The Excalibur is a Global Positioning System-guided 155-mm round fired from the battalion's self-propelled M109 Paladin howitzers.

"This will develop the next generation of artillery," said 1st Lieutenant Frank Dyson, a fire direction officer. He worked with the Excalibur field service representative, Dennis Patnode, for the test.

"I am here for feedback from the Soldiers going through the drill and to improve the weapon," said Patnode.

Dyson said the Excalibur gives the brigade a faster, more accurate punch. "We do not have to coordinate with outside agencies' [for additional] weapons," Dyson said. "We have precision at our fingertips."

Conventional artillery devastates its

A Battery, 113th Field Artillery Battalion, 30th Heavy Brigade Combat Team, fires the first Excalibur precision artillery round at Forward Operating Base Mahmudiyah, May 21.

(Photo by SGT Robert Jordan, HHC/30th HBCT)

target but can endanger surrounding areas. Excalibur solves this. If the round cannot identify the target after firing, it shifts to a safe area and does not explode.

"In unconventional warfare, collateral damage is unacceptable," Dyson said. "Excalibur does not cause problems; it creates solutions. Excalibur can increase the role of artillery."

Patnode travels with the four-man crew, watching each man quickly prepare to fire. Commenting on A Battery's expertise and professionalism, Patnode said, "I evaluate

all the time; I cannot tell the difference between this crew and [one from] the active Army."

Dyson gives the order over the radio for the crews to fire the weapon. The Paladins cannons are rotated into firing position. Soon the rounds are heading toward their targets, miles away. "It is the highlight of a fire direction officer's career," said Dyson.

SGT Robert Jordan
30th Heavy Brigade Combat Team
Clinton, N.C.



Retrain, Reset, ReRed: preparing for Operation Enduring Freedom

By LTC Michael J. Forsyth, MAJ George L. Hammar IV
and CPT Jason C. MacConnell, all FA

When the current 2nd Battalion, 77th Fires (105T), Fort Carson, Colo., team came together in spring 2008, we knew the battalion would deploy to Afghanistan. As a direct support field artillery battalion, our mission is two-fold. First, we will provide decentralized, timely fires in support of our maneuver elements in the 4th Infantry Brigade Combat Team in a large, rugged area of operation. Second, 2-77 Fires has a maneuver mission — the battalion will assume control of an area of operations and the requirements and responsibilities for that area. So we stood up our own maneuver platoon, and headquarters and headquarters battery, which has the dual function of a DS FA and a maneuver headquarters.

2-77 Fires recently returned from a nonstandard mission in support of Operation Iraqi Freedom. In Iraq, the *Steel Warriors* provided a counterfire capability only for a short period of time before shifting exclusively to a maneuver mission. Core FA competencies atrophied considerably during OIF and rated as “untrained” during the unit’s training assessment. Resetting personnel and equipment within one year to prepare for the Afghanistan mission meant hard work.

The reset training plan focused heavily on basic FA competencies, simultaneously creating a maneuver platoon to train exclusively as an Infantry element. One year later, we assessed our core FA competencies and maneuver platoon as “trained” as we prepared to deploy to Afghanistan. This article describes our training plan, how we accomplished it and the lessons learned from our experience in preparing for Operation Enduring Freedom X.

Post-OIF assessment. Like most artillery units’ rotations to OIF, 2-77 Fires’ mission emphasized owning battlespace and conducting maneuver operations rather than indirect fire support to maneuver operations. Due to potential collateral damage, conventional artillery support in urban areas was nearly nonexistent. The unit’s AO was near the Zafarina and Diyala regions of Iraq. During the first three months of the rotation, the unit primarily manned two M119A2 Howitzer systems for counterfire, and provided maneuver capability within its battlespace.

Following the initial 90 days, the mission shifted solely to maneuver operations, including mounted and dismounted patrols, targeted raids, civil-military operations and combined Iraqi army and police operations. These missions resulted in the transition of the Diyala region from U.S. forces to the Iraqi army. This change in mission set had a two-fold negative effect that revealed itself

A Battery, 2nd Battalion, 77th Fires (105T), fires a M198, 155-mm towed Howitzer at Fort Carson, Colo., September 2008. (Courtesy of 4-4 Infantry Brigade Combat Team)



as we began training for Afghanistan.

First, junior NCOs and Soldiers lost confidence in their ability to perform their Military Occupational Specialty 13B Cannon Crewmember duties. Second, many Soldiers who arrived in the unit in Iraq — immediately following Basic Combat Training and Advanced Individual Training — became proficient in maneuver operations, but not as functioning artillerymen. This led to a degradation of artillery skills across the unit. In addition, the unit conducted no artillery certification during the 15-month deployment.

Because the basic skills of sound gunnery procedures are perishable, 13-series tasks were assessed as “untrained” across the battalion. Even though the unit’s deployment to Iraq was successful, the unit had an uphill climb to “re-Red” for upcoming operations in Afghanistan.

The mission in Afghanistan. Unlike OIF, units deployed to Afghanistan provide direct support fires for their entire deployments and may deliver more than 40,000 rounds during that time. Further, the fires run the gamut of capability to include providing smoke, shooting danger-close in support of a contact and conducting counterfire with a variety of munitions. This fact represented a sobering challenge to retraining the battalion to a level of proficiency in these tasks.

Also, to date, all FA units deployed to OEF are land owners responsible for their assigned AOs. This includes maneuvering infantry elements to deny the area to insurgents, establishing relationships with local leaders and partnering with the Afghan army and police to enable them to blossom as a credible fighting force.

Finally, this dual mission requires a staff that can act as an FA headquarters while simultaneously providing command and control for the AO. As an FA headquarters, the staff ensures sound gunnery procedures and maintains certification requirements. The FA commander provides the best advice and recommendations to the BCT commander for the use of fires and battlefield position.

The maneuver mission pressed the staff to develop a solid understanding of the area and then employ forces in partnership with Afghan forces to dominate the terrain to prevent insurgents from gaining any foothold. This is a daunting, critical mission for the BCT’s success and the bigger picture of winning in Afghanistan.

Back to basics. After multiple nonstandard missions in Iraq, the consensus across the Army is that FA core competencies slowly eroded over time;

2-77th Fires was no different. The reset training plan focused on five skills as an overarching concept that everyone could remember — we called it the “Big Five.” It included FA gunnery skills as the top priority, then, physical training, marksmanship, medical skills and battle drills. The Big Five was the training foundation of a detailed training plan for the year.

We started with individual skills and basic FA tasks. Each leader took safety tests for his level of responsibility, using the Artillery Skills Proficiency Tests (*Field Manual 3-09.8 Field Artillery Gunnery*) as a guideline for all 13-series MOS. The battalion progressed to section-level training, centering on gunner’s skills, and section certification tables for all FA sections — the guns, fire direction centers, meteorological, radar and survey sections.

The certification of all Soldiers through Table VII took about six weeks of deliberate progression. The culminating exercise was two weeks of field training. Week one was a dry certification; senior FA NCOs stringently evaluated all skills. Week two was Table VIII live-fire certification, cementing the previous seven weeks of training and building confidence in our ability to deliver fires. By the end of this period, 2-77th Fires reestablished skills in safe and accurate shooting and in supporting our maneuver units with fires. The leaders and Soldiers regained confidence as field artillerymen.

A “monkey wrench” was thrown into our plans following certification. We learned that we will man M198 155-mm Howitzers in addition to our own organic M119A2 105-mm guns. We reorganized the battalion to meet the operational reality in Afghanistan based on this requirement. We converted our A Battery to a 155-mm battery and retained our B Battery as a 105-mm unit. A Battery immediately began truncated certification training on the new weapon system, which we received from the Rock Island Arsenal, Rock Island, Ill., loan program.

While the two gunlines built FA skills, the maneuver platoon stood up and trained as an infantry unit. This platoon included Soldiers from across the battalion (including G Forward Support Company) and most of the MOS in the unit. Each Soldier was attached permanently to HHB, and the target acquisition platoon leader and platoon sergeant became the maneuver

platoon leader and sergeant. This platoon did everything together from physical training to field training exercises.

After establishing the organization, we partnered with 1-12 Infantry Regiment, Fort Carson, Colo., to teach our novice leaders their assigned craft. The training concept started at the individual level with basic infantry skills, such as movement techniques and marksmanship. It then progressed through team, squad and platoon exercises — each culminating with a live-fire exercise. All exercises had mounted and dismounted components and focused on the warrior battle drills contained in *Army Training and Evaluation Program 7-1-Drill, Warrior Battle Drills*, dated July 2006.

Two keys contributed to the success of our maneuver platoon’s training progression. First, we established the organization and permanently attached the Soldiers to HHB early in the training, and they did everything as a unit. Second, our partnership with a brother infantry battalion in the brigade gave U.S. resident experts to fine tune training realistically.

After about 12 weeks, we transitioned to collective training with the goal of six firing platoons (two guns each), delivering



B Battery, 2-77 Fires, patrols during training at Fort Carson during their battles drills in preparation for the second part of the training cycle. (Photo courtesy of the author.)

decentralized fires from a forward operating base in support of maneuver elements. We used Table XII for this training. For nearly eight weeks, we conducted firing exercises, in support of maneuver units in the brigade. During each exercise, the firing platoon operated from firebases, replicating the environment in Afghanistan.

Platoon external evaluations culminated the brigade capstone exercise, certifying each platoon's ability to provide the full suite of fires in a decentralized environment. While the firing units conducted EXEVALs, the maneuver platoon and G Company conducted battle drills in several tailored situational training lanes, both mounted and dismounted.

Next, we transitioned to our mission rehearsal exercise at the Joint Readiness Training Center, Fort Polk, La. At JRTC, the battalion validated the training path and identified deficiencies to address before the deployment. The battalion exercised the battalion command and control system as an FA battalion and conducted operations as a maneuver unit with its own AO.

Operating within the realistic counterinsurgency environment during force-on-force exercises at JRTC, each firing

platoon conducted a live fire exercise and ran through a series of situational training lanes. This exercise validated our training plan and also revealed the need for work on 6400-mil operations in the firing platoons — our most glaring deficiency.

We refined our training plan after JRTC for the final days before deployment. This included retouched certification, a maneuver platoon live-fire exercise and a fire support coordination exercise — supporting every maneuver company in the brigade. We modified our second iteration of certification, focusing on out-of-traverse fire missions. We conducted each mission as an “action azimuth,” building “muscle memory” in the task.

During the final live fire was a brigade fire support coordination exercise; all firing platoons supported every maneuver company in the brigade. Additionally, our own maneuver platoon participated in a platoon live fire with HHB providing the command and control. At the conclusion of these major events, the battalion loaded equipment for deployment and used the final training weeks to solidify individual skills.

The ability of the 13D FA Automated Tactical Data Systems specialists to develop, maintain and calculate accurate firing data was one of the areas of greatest concern for the command group during the train-up. Fire direction centers are the critical node in the gunnery team in Afghanistan. The skills atrophy was worst in this MOS. Returning the FDCs back to a level of excellence called for unique measures.

We created a weekly school for the FDC personnel supervised by the battalion fire direction officer. Modeled on the FDC tables in Chapter Six of *FM 3-09.8 Field Artillery Gunnery*, training included critical skills, such as compensating for intervening crests and downloading/using the Interactive Gridded Analysis and Display System meteorological data from the U.S. Air Force website for the specific operating location. To reinforce the training's importance, the command group made attendance mandatory and exempted 13Ds from every other duty, task or appointment on training days.

Each section chief taught specific blocks, supervised by the battalion fire direction NCO. The focus on the fire direction training resulted in the battalion firing more than 8,000 rounds safely and accurately, boosting

the 13Ds' confidence in their skills and abilities to support the brigade with fires.

Staff development. The standard model for staff planning is the Military Decision-Making Process as outlined in *FM 3-0 Operations* and *FM 5-0 Army Planning and Orders Production*. However, our upcoming deployment and the need for quick planning required a different process. The battalion command group used the Rapid Decision-Making Process, modeled on Recognition-Primed Decision Making. The RDP is similar to the MDMP, however, it focuses the staff on a single course of action and involves more direct interaction between the commander and staff.

Training began with an inexperienced staff that was unfamiliar with the MDMP — except for the battalion S2. We systematically trained on the MDMP, ensuring everyone understood its fundamentals. The staff practiced developing FA support plans and tactical operation orders, focusing on the maneuver portion of our mission.

The battalion S3 taught a leader professional development series. These sessions included officers and NCOs. We wanted to enable the NCOs to fill the staff officer's role in the MDMP during the officer's absence. This training was “new ground” for the NCOs because only one NCO had attended battle staff school. The series ran the gamut from mission analysis to operations order production.

In between the leader professional development sessions, the battalion conducted a series of field problems. Initially, the staff had difficulty establishing a tactical operations center. None of the officers had seen a TOC built out of tents, and many NCOs had never set up a TOC tent. So, the learning curve was enormous. From setting up the TOC to conducting limited staff planning, these exercises provided valuable experience for both officers and NCOs — especially working together and learning each others' strengths and weaknesses.

As the staff developed and grew as a team, it slowly understood the importance of maintaining a running staff estimate and its importance in operations. The staff began using a running estimate, initially focused on garrison activities and then focused on tactical scenarios as the battalion began a series of brigade training exercises. The staff learned to maintain a running estimate to produce an order in a time-compressed environment through these exercises.

RDP. Due to the nature of COIN warfare and the operational demands in Afghanistan, the battalion command group transitioned the staff from the MDMP to



Fort Carson, Colo., September 2008. The Soldiers practiced their mission in Afghanistan, providing maneuver support for the 4-4 Infantry Brigade Combat Team



A Battery, 2-77 Fires, trains at its fire base at the Joint Readiness Training Center, Fort Polk, La. in January. (Photo courtesy of 4-4 IBCT)

RDP for planning in that environment. The RDP has four steps — identify the mission, test the courses of action, wargame the courses of action and develop orders — versus the seven steps of the MDMP. The RDP is modeled on Gary Klein's theory of leaders make decisions, which he dubbed recognition-primed decision-making (See *Sources of Power: How People Make Decisions* by Gary Klein; and "The Recognition-Primed Decision Model" in the January-February edition of *Field Artillery* by David A. Bushey and Michael J. Forsyth).

The first step of the RDP is identifying the mission. During this phase, the staff conducts a full blown mission analysis exactly as they would do during MDMP. It develops facts, assumptions, specified tasks, implied tasks and any limitations that may affect the mission. The commander provides input to this process, giving the staff his concept of operation and one specified COA on a mission analysis worksheet.

The commander gives the staff a sketch of his visualization of the battlefield, his key tasks and his endstate on one sheet of paper. At the end of this step, the staff issues a warning order. The WARNO has a restated mission, friendly and enemy COAs and the commander's guidance as outlined in his mission analysis worksheet. Once the staff has the commander's input, it is incumbent upon them to test or "operationalize" the commander's COA. If the COA is invalid, the staff immediately notifies the commander. This allows him to change his COA or use the initial concept.

Step two involves the staff developing the COA's details or determining that it will fail. If the COA could fail, the staff must review the mission analysis immediately, ensuring

the commander is aware of the possible failures so he can issue new guidance. However, if the COA passes, the staff further develops it with graphics, support matrices, subunit tasks, a task organization, a skeleton OPORD and the second WARNO.

After issuing the COA, the staff moves to step three — wargame the COA. During this phase, the staff conducts a wargame with a synch matrix. This war-game is no different from the MDMP's wargame. The

staff wargames the COA and determines if it will hold up or not. At the same time, the staff finalizes the initial concept and further certifies the commander's intent and overall success of the mission. Upon completing this step, the staff produces the third WARNO and issues updated synch matrices and execution checklists.

The final and fourth step involves the staff creating the order and all appendices. The staff produces the order and hangs it on the web-shared portal, immediately allowing all units access. During this phase, the staff conducts an OPORD brief; battery commanders back brief the battalion commander; and rehearsals (technical and tactical) are conducted.

Initially, 2-77 Fires battalion staff had no experience or practical knowledge of the MDMP. Therefore, we taught the basics before we switched to the RDP model, which is only effective if the staff knows how to develop an order using the MDMP and maintain a running estimate. If RDP is done correctly, the staff can reduce the time it takes to produce an OPORD, providing the commanders on the ground extra time to conduct troop-leading procedures and rehearsals before mission execution.

Afghanistan's pre-deployment training challenged the 2-77 Fires, requiring the battalion to return to its core competencies to ensure mission success in OEF. It also required a change of mindset. While it may seem counterintuitive, Iraq is not Afghanistan. The environment, population, culture, terrain and enemy are radically different. The insurgency is based in the rural areas versus urban areas in Iraq.

Based on these unique challenges, 2-77 Fires devised a training plan that could "re-Red" the unit, simultaneously mentally

shifting the Soldier's from OIF to OEF in 12 months. The key to our success was focusing on the "Big Five," emphasizing FA gunnery skills. By using the prescribed doctrine and tailoring it to the OEF environment, 2-77 Fires moved from an untrained readiness assessment to a trained assessment within the 12 months allotted for training.

For our maneuver mission, we believe the critical element to success was organizing the maneuver platoon early and attaching it to HHB. Then, the partnership with a brother infantry unit in the brigade captured the finer points of maneuver operations. As we prepare to deploy in the next 45 days, we are confident that our training plan prepared us for Afghanistan. Hopefully, other units find some elements useful as well. ■

Lieutenant Colonel Michael Forsyth, Field Artillery, is the Commander of 2nd Battalion, 77th Fires, 4th Infantry Brigade Combat Team, 4th Infantry Division, Fort Carson, Colo. He has served as the Executive Officer and Effects Coordinator for 3rd IBCT, 10th Mountain Division, Fort Drum, N.Y.; Operations and Executive Officer for 4-25th FA in 3rd IBCT, 10th Mountain Division; and commanded a battery in the 101st Airborne Division, Fort Campbell, Ky. He has served in combat in the Persian Gulf War and twice in Afghanistan. He authored *The Red River Campaign of 1864* and *the Loss of the Civil War by the Confederacy* and *The Camden Expedition of 1864*. He holds two master's degrees, one in Military Art and Science from the U.S. Army School of Advanced Military Studies.

Major George L Hammar, IV, FA, is the Battalion S3 for 2-77 Fires. He served as the Brigade Military Transition Team S3 for the 33rd Brigade, 8th Iraqi Army Division, in Karbala, Iraq; a Fire Support Observer/Controller and Senior Fire Support Analyst at the Joint Multi-national Readiness Center, Hohenfels, Germany; Public Affairs Officer for 66th Military Intelligence Brigade in Darmstadt, Germany; and the Assistant S3 and the Commander of Battery B for 3-321FA, 18th FA Brigade (Airborne) at Fort Bragg, N.C. He has also served in the Persian Gulf War and Operation Iraqi Freedom. He has a Master's of Military Studies, Land Warfare, from American Military University, Charlestown, W.Va.

Captain Jason C. MacConnell, FA, is the Assistant S3 for 2-77 Fires. He served as a Company Fire Support Officer for D Company, 1-9 Infantry, 2nd BCT, 2nd Infantry Division, deploying in support of Operation Iraqi Freedom. As an FSO, he coordinated, planned and executed lethal artillery fires, attack aviation and fixed wing close air support for maneuver operations in eastern Ramadi.

We prefer action digital photographs — Soldiers, Marines or systems in actual operations or training vice posed or static. “Hi-Mom” shots of Soldiers or Marines in a group smiling and waving usually don’t add value to the article — unless, of course, the photographs were shot immediately following the cessation of combat operations.

Here are some guidelines you can follow to give us high enough resolution photographs in formats we can use.

Shoot the picture at the highest resolution possible. Set your digital camera on the largest image size and the highest quality resolution the camera will allow. The highest resolution settings usually are called “High,” “Super Fine” or “Ultra-High.”

Cameras set at “Standard” or “Basic” quality can sometimes produce images only good enough for websites or PowerPoint presentations, not publication in a magazine. Just because a photograph looks good on your computer screen does not mean it is printable in *Fires*.

At *Fires*, we need high-resolution digital photographs. Translated into “megapixel talk,” the photographs should be no smaller than 2 megapixels, which is approximately 4-by-6 inches at 300 pixels per inch or 16-by-24 inches at 75 ppi. For magazine covers and larger feature photographs, we prefer 6 megapixels or more, which is approximately 6.5-by-10 inches at 300 ppi or 26-by-40 inches at 75 ppi.

You will be able to take fewer photographs with your camera on the highest setting, but those you take most likely will be usable in the magazine. The cost of photograph storage cards, or memory cards, has drastically decreased in the past few years; larger storage cards allow you to take more photographs at the higher quality settings.

We can use tif, but we prefer photographs saved as a jpg. When saving a file as a jpg, choose a “Quality” setting of “Maximum” or “10” and the “Format Option” of “Baseline (Standard).”

Depending on the compression ratio when the photograph is saved in jpg, the closed file size of the photograph will be 150 kilobytes (KB) or more. To find out the closed file size, right click on the photograph file thumbnail, scroll to the bottom of the menu and select “Properties.”

Do not manipulate the photograph. Do not crop, resize or try to edit the image in any way. This includes adjusting the brightness and contrast. We know what

2009 *Fires* Photo Contest

We are accepting entries for the photo contest until August 1, 2009. For contest rules and last year’s winners, go to sill-www.army.mil/firesbulletin/contest.asp.

settings work best according to the specifications of our printer. We also have the latest professional digital image manipulation software. Let us take care of that.

And, please, don’t try to “beef up” the resolution of the small, low-resolution photograph you’ve shot. Shooting a one megapixel image and increasing the ppi after you’ve shot it will not make the image clearer or more usable — it only will make the image larger. You are limited by the resolution setting at the time the photograph is taken.

Important: do not place the photographs in Microsoft PowerPoint or Word and send them to us. They are unusable in those formats.

Send us the digital photograph. Following the first two steps may result in a large file for each photograph.

Do not send more than 20 megabytes per email. You can send several photographs in multiple emails. Include caption information (when, where and who’s doing what — including each person’s rank, full name and unit) for each photograph attached and the title/name of the associated article/author. Also include the photographer’s full name, rank and unit for credit in the magazine.

This information can be embedded in the photograph properties or sent as a separate text document. To embed information in the photograph properties, right click on the photograph’s icon; scroll down and select “Properties”; click on the “Summary” tab; type the information in the “Summary” window; click “Apply” and close the “Properties” window. *Caution:* unless you are using Adobe Photoshop software to embed information, only the information typed in the “Summary” window that is visible when you first open the “Summary” screen (without scrolling down) will be saved.

A file transfer protocol site is available at Fort Sill for uploading very large or many photographs. No special software is required to upload your images. Just send us an email requesting instructions for uploading your



U.S. Marine 1stLt. Barry L. Edwards, public affairs officer, Regimental Combat Team Six, photographs Marines preparing an Excalibur round at Camp Fallujah, Iraq, November 4, 2007. (Photograph by MSgt. Paul D. Bishop, 2nd Marine Division)

photographs on our FTP site.

You also can mail your photographs. We accept photographs saved on either a CD or DVD.

All submissions become the property of the magazine and cannot be returned.

Magazine information. If you have questions about shooting digital photographs, call the *Fires* staff at DSN 639-5121/6806 or commercial (580) 442-5121/6806. Our email is firesbulletin@conus.army.mil. Our mailing address is *Fires*, P.O. Box 33311, Fort Sill, Oklahoma 73503-0311. If you want to overnight your photographs to us, the address is Building 758, Room 7, McNair Road, Fort Sill, Oklahoma 73503-5600.

We know the majority of our digital shooters are not professional photographers. You are authors/photographers who are Soldiers and Marines — even better, Field Artillery and Air Defense Artillery professionals — telling the story of the best branches in the Army and Marine Corps in the world.

Specific information about submitting an article to *Fires* is available in this edition on page 39 and on the *Fires* website at sill-www.army.mil/firesbulletin/authors.asp *Good Shooting!* ■

Army Space Support a critical

“Securing the high ground
and Missile Defense Command (SMDC)/Arm



In November 2008, the 4th Battlefield Coordination Detachment commander at al Udeid Air Base, Qatar, approached the 1st Space Brigade commander from U.S. Army Space and Missile Command to discuss integrating Army space capabilities into the battlefield coordination detachment. The 1st Space Brigade commander offered the battlefield coordination detachment commander a small U.S. Army space team — an Army space coordination element — to augment the battlefield coordination detachment in its deployment to the U.S. Central Command combined air operations center.

This offer came at the perfect time. A reserve officer, without space experience, had been shouldering the space mission in the battlefield coordination detachment, but was redeploying. The detachment did not have any organic space expertise, yet its mission is integrating and coordinating with the combined forces air component commander, ensuring that the land component receives all necessary support, including space.

The combined forces air component commander is also the space coordinating authority for U.S. Central Command. To exercise that authority, he has the director of space forces and 23 other space officers spread throughout the

combined air operations center, ensuring that space capabilities are integrated with Army and land component operations. The battlefield coordination detachment needed space expertise.

The first deployment of an army space coordination element to the U.S. Central Command area of responsibility materialized from this initial discussion in February 2009. This article describes the battlefield coordination detachment's responsibilities, discusses the organization and functions of an Army space coordination element and demonstrates the critical need for Army space operations as a key enabler within the battlefield coordination detachment structure.

Current space forces in U.S. Central Command. Before describing the Army space coordination element within the battlefield coordination detachment and combined air operations center, it is important to understand space forces in theater. The current fight is the first war in which space is integrated at all levels of command.

Only a few years ago, the Army created Functional Area 40 Space Operations Officers. Today, these officers are organic to fires brigades, division and corps staffs.

By COL Kevin M. Felix, FA, MAJ C
MAJ Jeffrey T

Fires brigades are authorized one functional area 40 officer; division and corps staffs have two. These space operations officers serve in space support elements and provide expertise in space systems and integration in the staffing process. The Army's space experts have current operational experience and the technical expertise to use space-based products as combat multipliers.

In addition to space support elements, Army space support teams deploy from 1st Space Brigade, Peterson Air Force Base, Colo. Army space support teams have six Soldiers — a team of space experts with a communications and information technology suite, allowing it to produce space-related products including Global Positioning System/navigation accuracy predictions, satellite location predictions (i.e. when a red surveillance satellite is overhead), and space-related geospatial/imagery products. These Army space support teams augment key space support elements and provide enhanced space operations to the war fighter. Army space support

port to a BCD: 1 enabler

starts at U.S. Army Space
y Forces Strategic Command (ARSTRAT).¹¹

- U.S. Army Space and Missile Defense Command/
Army Forces Strategic Command's vision statement

A panorama of the night sky above Lava Beds, Calif., featuring the moon rising at left and the arc of the Milky Way Galaxy. (Photo courtesy of the National Park Service)

Christopher M. Crawford, FA40, and
T. Lakey, FA40

teams operate in Iraq and Afghanistan at the division and corps levels.

Space operations officers, both Army and U.S. Air Force, are fielded across the area of responsibility on the staffs of various task forces, joint/combined commands and other agencies. A key enabler in the space fight, the Army Central Command space support element ensures our space forces are manned properly and resourced for current operations. It also integrates new space capabilities and programs into the theater.

However, the center of gravity for space operations in theater is the director of space forces and his staff. The director of space forces is the senior space advisor to the U.S. Air Forces Central commander. The director executes space coordinating authority on the commander's behalf and advises him on space employment.

The director's staff reviews potential space capabilities for theater feasibility and integrates new capabilities that are operationally relevant. He represents

the commander to outside organizations regarding space issues and monitors the status of space forces within the theater, including space cadre from the different agencies within the national intelligence community.

The director of space forces staff also organizes and prioritizes all space support requests. The space support request process is similar to the joint tactical air strike request process. Any U.S. Central Command space-related problems are identified, tracked, and resolved.

The director of space forces synchronizes all space-related support across the theater. He coordinates and plans the daily theater space operations throughout the area of operations. He and his staff are supported by other Air Force space operations officers embedded throughout the divisions of the combined air operations center. In short, the director of space forces is the space integrator for the U.S. Central Command area of operations and the combined forces air component commander's proponent on space matters.

Battlefield coordination detachment.

The 4th Battlefield Coordination Detachment is the ground component commander's representative to the air component commander in Central

Command's combined air operations center. It coordinates all preplanned and immediate joint tactical air strike request. The detachment also exchanges operational and intelligence data between ground forces and the combined air operations center—including monitoring and interpreting current ground operations to enhance situational awareness within the combined air operations center.

The detachment provides the ground force's view of the enemy situation to the combined forces air component commander and combined air operations center staff. It provides ground liaison detachments with information for pilot mission briefs in support of ground operations. The battlefield coordination detachment also facilitates current air tasking order execution, coordinates U.S. Army aviation and Army missile fires in the air tasking order and airspace control order, and coordinates intra-theater airlifts.

The current battlefield coordination detachment organization has a headquarters element with six different sections—operations, intelligence, plans, airspace, airlift and air defense. Each section corresponds to a division within the combined air operations center for a total

Field Manual 3-14.10 Space Brigade Operations lists these tasks for the Army space coordination elements.

of 40 Soldiers. However, this unit structure can change to meet the land component commander's and combined forces air component commander's mission requirements. The staff includes experienced operators from various mission area backgrounds with vast operational experience. However, space expertise is traditionally not organic to a battlefield coordination detachment's organizational structure.

A **Army space coordination element.** The Army space coordination element is an emerging concept, placing space expertise within the battlefield coordination detachment. The Army space coordination element facilitates land component forces enhanced battlespace situational awareness and the advantages of time and accuracy when detecting and deterring an adversary's technical capabilities. Leveraging space assets, the Army space coordination element gives the ground commander a superior view of the battlespace to gain and maintain the operational advantage by ensuring that space effects are focused on the land component's needs.

“Leveraging space assets, the Army space coordination element gives the ground commander a superior view of the battlespace to gain and maintain the operational advantage ...”

The Army space coordination element concept was integrated in several past joint exercises. Its placement within the theater force structure, its number of Soldiers and its capabilities were refined. The size and type of Army space coordination element force structure is flexible, depending on the nature of space operations in a theater. For this current deployment, its force structure includes one Functional Area 40 Space Operations Officer and two space-experienced NCOs — one trained in satellite communications and another trained in intelligence.

The Army space coordination element is in the most advantageous position to fuse relevant data in a timely manner because of its close relationship with Army space forces in the theater and the office of the director of space forces, residing in the combined air operations center.

A deployable Army space coordination element — working for the battlefield coordination detachment — supports

Army space coordination element tasks

- Provide Army space representation and support to the space coordinating authority.
- Act as principal Army advocate to the space coordinating authority and the Joint Warfighting Space Expeditionary Force.
- Assist the space support elements, supporting the ground component commanders, in ensuring the Army space equities are recognized and incorporated into the space coordinating authority concept of space operations and execution support.
- Assist in the joint space planning process and the development of space priorities.
- Coordinate space operations with the battlefield coordination detachment.
- Support the space coordinating authority when directed and in coordination with other Service components.

land component requirements, provides operational perspective and prioritizes space capabilities. The Army space coordination element is the space forces' service advocate to the space coordinating authority through the director of space forces office. The Army space coordination element works closely with the U.S. Army Central Command space support element. The end state is timely space support to our operational Army space forces, who support the land component commander's intent for the integration of space effects in his operations.

I **ntegration.** The battlefield coordination detachment works with different sections in the combined air operations center that integrate effects and operations. The Army space coordination element ties into in the different sections/cells in coordination with the director of space forces — not separately. This working relationship becomes synergistic and provides more rapid and precise space effects to the land component commander.

Through the Army space coordination element, the battlefield coordination detachment can support the director of space forces, combat operations division-space and combined theater electronic warfare coordination cell efforts to integrate space capabilities.

Space professionals are embedded within the combat operations division-space of the combined air operations center, who work with current operations — especially time sensitive operations, including theater missile defense, battlespace characterization, personnel recovery/ combat search and rescue, and satellite communications/Global Positioning System electromagnetic interference.

The Army space coordination element, involved with all these efforts, provides critical two-way communications with the

ground forces for situational awareness and information sharing. The Army space coordination element provides key information to the land component, alerting it to operational impacts of space-related outages or, in the other direction, forward indications of space impacts to combat operations division-space, so it can identify and resolve issues quickly.

The combined theater electronic warfare coordination cell is another combined air operations center cell that is tied directly to space. It coordinates, synchronizes and integrates electronic warfare planning, operations and testing in support of U.S. Central Command and its component commands. This cell ensures control of the electromagnetic spectrum for the U.S. and its Coalition partners and denies the same to our enemies.

Due to Coalition forces' heavy reliance on and use of the electromagnetic spectrum, there are many areas where the Army space coordination element and combined theater electronic warfare coordination cell work closely together. Blue-on-blue interference, both satellite communications and Global Positioning Systems, deconfliction of electronic warfare with friendly satellite communications and the adversary's use of satellite communications are areas where integration of both units is critical to success. The combined theater electronic warfare coordination cell focuses on mostly terrestrial and airborne electromagnetic operations — friendly or potentially enemy — and complements the Army space coordination element's work with our space-based electronic warfare capabilities.

A **capabilities integrator.** The Army space coordination element integrates closely with national agencies to bring current capabilities and initiatives to the fight. Close coordination with the director of space forces allows this integration. Through the Army space coordination element, the battlefield coordination

detachment — working with the deputy director for military support — introduces current technology to the fight and forwards new requirements from the theater to the director for military support office.

Using national capabilities—developed to fight a Cold War enemy — in new and unique ways helps the ground commander fight successfully in an asymmetric warfare environment. The space support element and Army space support teams from various commands collect, prioritize and forward requirements through the Army space coordination element to the director of space forces to meet the commander's intent.

“... Army space personnel use their unique experiences to bridge technical gaps, ensuring the space effects' operational value is understood and used at all levels.”

Also, the U.S. Army Central Command space support elements support the Army space coordination element and ensure the space coordinating authority includes Army space equities in support concepts. Because it is embedded with the battlefield coordination detachment, the Army space coordination element raises issues and concerns from the ground component's perspective through its respective space professionals. This critical linkage and support rapidly mitigates operational issues for ground commanders with our national and other space-based assets.

A critical enabler. FM 3-14.10 Space Brigade Operations lists the Army space coordination element's tasks (see the figure). These tasks center on the Army space coordination element's important role in creating a synergistic relationship between the land and air component commanders.

The Army space coordination element already has had success integrating space in counter-improvised explosive device operations. Key information was forwarded to land components rapidly ensuring situational awareness in this difficult mission. The Army space coordination element was integral to the quick identification and resolution of electromagnetic interference, ensuring the sustainment of critical intelligence, surveillance and reconnaissance operations. Army space coordination element personnel also identified gaps in communications between the strategic and operational space community and land component commands.

Future operations will continue to

focus on bringing technology to bear on counter-improvised explosive device and counterinsurgency operations. Army space coordination element efforts also will concentrate on increasing satellite communications capabilities in theater and reducing satellite-related interference.

Other future mission areas include improving nontraditional use of intelligence, surveillance and reconnaissance assets for force protection with the increasing availability and use of commercial imagery, shareable with our Coalition partners.

While space professionals from different Services contribute daily to saving lives by their innovative use of available assets and capabilities, Army space personnel use their unique experiences to bridge technical gaps, ensuring the space effects' operational value is understood and

used at all levels. As this first Army Space coordination element integrates into the space fight, its lessons learned from this war can improve knowledge for increased integration for future fights.

This is a distinct advantage to the Army space coordination element deployment with its close ties to the 1st Space Brigade as it supports the 4th Battlefield Coordination Detachment commander. This knowledge and experience aids in the continuity of support to the theater and ensures current space operations are used to train new Army space support teams and Army space coordination element teams for future deployments, increasing their readiness and reducing the learning curve upon arrival.

General C. Robert Kehler, Commander, Air Force Space Command, posed this question and response, “What's the big difference between 25 years ago and today? I would tell you, in my opinion, that space today is embedded in combat operations.” Space support to the Warfighter is a key combat multiplier in the current fight.

The 4th Battlefield Coordination Detachment's Army space coordination element, the US Army's latest space element in the theater, supports all U.S. Army space forces within the U.S. Central Command area of responsibility. Those space forces support the war fighters, making their missions safer and more effective. This Army space coordination element's deployment is the paradigm for future battlefield coordination detachment and combined air operations center space operations — with an eye toward full integration of an Army space coordination element as an organic part

of a battlefield coordination detachment's organizational construct. ■

Colonel Kevin M. Felix, Field Artillery, is the Commander, 4th Battlefield Coordination Detachment, al Udeid Air Base, Qatar. Assigned to U.S. Army Central, his unit serves as an integrator of all air component support to ground component commanders in Iraq and Afghanistan. He has served on the Joint Staff, J5, Middle East Regional, and as Executive Assistant to the Assistant to the Chairman, Joint Chiefs of Staff, Washington, D.C.; Deputy Commander, 1st Brigade, 101st Airborne Division (Air Assault), Fort Campbell, Ky.; and Commander, 2nd Battalion, 320th FA, 1st Brigade Combat Team, 101st Airborne Division (Air Assault), deploying in support of Operation Iraqi Freedom. He was selected as a Senior Army Fellow with the Department of State, is a trained Foreign Area Officer, is a graduate of the Joint Forces Staff College and has an MA in International Relations from the University of Geneva, Switzerland.

Major Christopher M. Crawford is an Army Space Operations Officer (Functional Area 40) assigned to the 1st Space Brigade at Peterson Air Force Base, Colorado Springs, Colo. He was the first Officer-in-Charge of the Army Space Coordination Element for the 4th Battlefield Coordination Detachment/ Combined Air Operations Center. He served as the 1st Space Brigade Plans Chief, 1st Space Battalion Army Space Support Team Leader and G3 Current Operations Officer for U.S. Army Space and Missile Defense Command-US Army Strategic Command, Redstone Arsenal, Ala. He has a Master's of Business Administration from University of Phoenix.

Major Jeffrey Lakey is an Army Space Operations Officer (Functional Area 40) assigned to the 1st Space Brigade at Peterson Air Force Base. He is the current Officer-in-Charge of the Army Space Coordination Element for the 4th Battlefield Coordination Detachment/ Combined Air Operations Center. He served as the 1st Space Brigade Current Operations Chief for U.S. Army Space and Missile Defense Command-US Army Strategic Command. In the U.S. Air Force, he was a Personnel and Manpower Officer and served as Chief of Personnel and Manpower, Joint Functional Component Command for Space, Vandenberg Air Force Base, Calif.; Acting Chief of Personnel, Manpower and Resources, 14th Air Force, Vandenberg AFB; and Military Personnel Flight Commander, 374th Mission Support Squadron, Yokota Air Base, Japan.

Training, targeting, C² for today's COE

By MAJ Matt B. Dennis, FA

"A leader is a man who can adapt principles to circumstances."

— General George S. Patton, Jr.

Today's complex contemporary operating environment results from an explosion of technology, the economy's globalization, complex relationships involving political allies and interests, and many other contributing factors. Increasing threats — and the uncertainty about what the threats are and when and where they will emerge — dramatically affect how we prepare our forces. We no longer can focus on one major type of threat. Now more than ever, our military must prepare for full-spectrum operations.

Field Manual 3-0 Operations defines full-spectrum operations as "The Army's operational concept: Army forces combine offensive, defensive, and stability or civil support operations simultaneously as part of an interdependent joint force to seize, retain and exploit the initiative, accepting prudent risk to create opportunities to achieve decisive results. They employ

synchronized action — lethal and nonlethal — proportional to the mission and informed by a thorough understanding of all variables of the operational environment. Mission command that conveys intent and an appreciation of all aspects of the situation guides the adaptive use of Army forces."

Without knowing a threat's location, composition, size or capabilities, we essentially are asking our Army to prepare for everything. All the while, we must maintain our conventional core competencies for major combat operations against a peer threat. While this seems like an insurmountable task, our all-volunteer force is capable and can be made ready for this tough challenge if we, as leaders, do what it takes. A change in the military's training mindset, how it performs command and control and targeting is required; these components are interrelated.

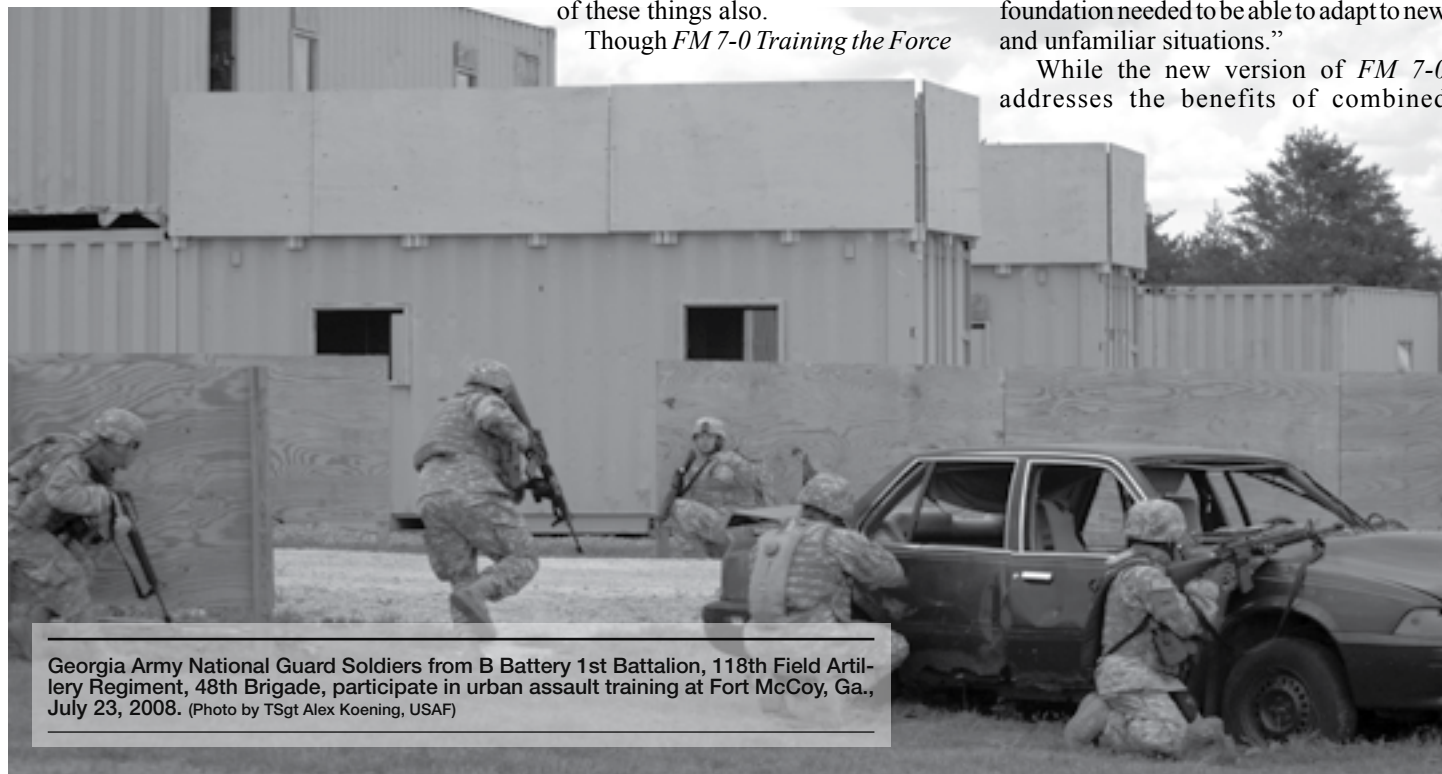
Trainin**g**. There is not enough time in the day to train for every possible threat and mission and reach acceptable proficiency levels. We must shift our focus from what we train to how we train. If the Army must be adaptable, innovative, modular — and all of the other buzz words in our vernacular, — Soldiers must be all of these things also.

Though *FM 7-0 Training the Force*

has been recently updated and is now titled *Training for Full Spectrum Operations*, our current leaders grew up under the old manual and its definitions. Historically, training has been accepted and defined as the performance of physical tasks that, through repetition, results in proficiency or mastery. Properly trained units would vary the tasks' conditions to increase stress and replicate anticipated battlefield conditions. However, a leader still would tell the Soldier when to perform the task.

In the latest version of *FM 7-0*, recently released, education is defined as "Education ... provides intellectual constructs and principles so trained skills can be applied beyond a standard situation to gain a desired result. It helps develop individuals and leaders *who can think*, apply acquired knowledge and solve problems under uncertain or ambiguous conditions. Education is associated with 'how to think.' It provides individuals with lifelong abilities that enable higher cognitive thought processes. Education prepares individuals for service by teaching skills, knowledge and behaviors applicable to multiple duty positions in peace or war. Educated Soldiers and civilians have the foundation needed to be able to adapt to new and unfamiliar situations."

While the new version of *FM 7-0* addresses the benefits of combined



Georgia Army National Guard Soldiers from B Battery 1st Battalion, 118th Field Artillery Regiment, 48th Brigade, participate in urban assault training at Fort McCoy, Ga., July 23, 2008. (Photo by TSgt Alex Koening, USAF)

training and education, it will take a cultural shift led by the Army's senior leaders to empower all subordinates to make the required change—accepting that all Soldiers can *think and do*. The wording in the manual can be interpreted as separating training and education, but I believe that interpretation can create a false dichotomy which should be avoided if we want to truly develop our Soldiers. We can prepare our Soldiers more effectively by blending training and education at all levels. This is the goal of the concept known as Outcomes Based Training, which was first coined by Colonel Casey P. Haskins, the Director of Military Instruction at the U.S. Military Academy, West Point, N.Y., and demonstrated by the Asymmetric Warfare Group's, Fort Meade, Md., Combat Application Training Course program. The concept name evolved to Outcomes Based Training and Education. This is *not* the educational model known as Outcomes Based Education.

OBTE. The foundation of the OBTE is the acceptance that mastery is a combination of cognitive understanding and performance. While physical performance of a task is important and should not be overlooked, it is increasingly important that all Soldiers are conditioned from the beginning to understand the tasks, the appropriate conditions for performing those tasks, and the relatedness of tasks used in combination to solve problems. This concept applies to the most basic individual tasks to the most advanced collective tasks.

CATC demonstrated this, using basic rifle marksmanship as the training vehicle. Initial Entry Training Soldiers learn basic ballistics, minute of angle, sight adjustment principles, weapons handling and clearing malfunctions. These tasks are explained in a way that Soldiers understand them. Furthermore, the Soldiers individually practice their tasks until they can perform them comfortably. As training progresses into drills, Soldiers must think through the fundamentals and perform the basic tasks in different combinations to solve presented problems.

While subtle, Soldiers are taught and encouraged to think on their own, plan as small teams and solve problems to accomplish their missions. There are many benefits that are difficult to measure, such as Soldiers' increased confidence, competence, pride, initiative, accountability and responsibility. The outcome is not adequate performance of a task to a defined standard, but mastery, cognitive understanding and performance of the task and the simultaneous development of intangible attributes. Some might define this as "ownership."

A straightforward example of OBTE in task training is the process of zeroing a M16 rifle or M4 carbine. Most of us are probably familiar with a trip to the 25-meter range to fire at a paper grid target. These paper targets have standard written instructions on them which tell a Soldier "how many" clicks, left or right, to move the front sight post in order to achieve the preferred tight, three-round shot group. Usually, the Soldier makes the adjustments according to the instructions, but really has no idea why.

With OBTE, the Soldiers are taught minute of angle, using simple available resources like a white board, butcher block paper, or a stick-in-the-dirt drawing. By using these visual learning aids, Soldiers learn about the function of the weapon's front sight post and what fraction of a MOA each click, left or right, actually represents. As Soldiers fire at the zero range targets, they are able to measure their deviance from point of aim and work through the math to determine their own sight adjustment, learning that as the range increases, so does the angular deviation. Using this method, Soldiers are able to problem solve with visible feedback to finely tune the zero of their assigned weapon.

Some might think this is a simple example, however, it aptly illustrates how Soldiers can perform a task using traditional methods, or by using OBTE techniques, they can further educate themselves on the "how's and why's" of the assigned task and further reinforce their training.

This causes a "snowball effect" that becomes a training enabler as more complex and collective tasks are presented. Soldiers who are more comfortable performing basic tasks and confident in their abilities grasp new information quicker and focus their attention on new challenges. Increased confidence emboldens them to participate in problem solving and solution development.

Also, due to education that is combined and reinforced with physical performance, knowledge retention increases and less time is needed to return to an acceptable performance level following long periods of nonstandard missions. Perhaps the biggest benefit is how this new training mindset directly impacts the Army's desire for junior leaders to operate under mission command.

Command and control. *FM 6-0 Mission Command: Command and Control of Army Forces* defines mission command as "... the conduct of military operations through decentralized execution based on mission orders for effective mission accomplishment. Successful mission

command results from subordinate leaders at all echelons exercising disciplined initiative within the commander's intent to accomplish missions. It requires an environment of trust and mutual understanding."

Reports from the field state that one of the frustrations of battalion and brigade combat team commanders is that some junior leaders have trouble operating within broad guidance and intent. In some cases, those junior leaders may lack the training foundation that fosters adaptability. In other cases, the leaders may want to be adaptable and innovative, but could be hamstrung by the need to direct every move of subordinates during the mission. Whichever is the case, a potential solution is implementing OBTE at all levels.

Again, we cannot train for every possible scenario, but adaptability and problem solving are universal skills, not restricted to particular tasks. It is possible then, theoretically, to train on our branches' core competencies and military occupation specialties and instill the required attributes for successful mission command.

In our current operating environment, all elements are employed to achieve some effect. Our military transition teams, provincial reconstruction teams, combat outposts and time-sensitive targeting forces are designed and employed to have some effect (lethal or nonlethal) on insurgents or the population in which they operate.

Targeting. According to *Joint Publication (JP) 3-60 Joint Doctrine for Targeting*, "The purpose of targeting is to integrate and synchronize fires (the use of available weapon systems to create a specific lethal or nonlethal effect on a target) into joint operations. Targeting is the process of selecting and prioritizing targets and matching the appropriate response to them, considering operational requirements and capabilities. Targeting helps integrate and synchronize fires with other joint functions (command and control, intelligence, fires, movement and maneuver, protection and sustainment) during the joint operation planning process (JOPP)."

Targeting, begins with a nation's decision to employ forces at the macro level, and trickles down to the smallest element responsible for some effect. Synchronizing all of these efforts and constantly monitoring and adjusting priorities to accomplish the mission are complex tasks that require active participation and communication up and down the chain of command to be effective. Joint doctrine lays the foundation for the targeting process that aids commanders and staffs as they work through their circumstances and allocate resources. The



Georgia Army National Guard Soldiers from B Battery, 1st Battalion, 118th Field Artillery Regiment, 48th Infantry Brigade, Savannah, Ga., prepare to enter a building during urban assault training at Fort McCoy, Wis., July 23, 2008. (Photo by TSgt. Alex Koenig, USAF)

Army modified the joint model slightly.

The Army uses a four-step targeting model that is fully compatible with the six-step joint targeting process. The Army's version — Decide, Detect, Deliver and Assess — is suited for surface warfare and provides a model for a unit to incorporate all of its effects-producing assets into its operation. *FM 5-0 Army Planning and Orders Production* provides an excellent explanation of how D³A and the military decision-making process (MDMP) intertwine in what should be a seamless marriage that produces comprehensive plans that are well synchronized and take full advantage of all elements of combat power.

What has been missing is a good model to aid commanders and their subordinates in the actual engaging of targets. Using the relationship between D³A and the MDMP as an analogy, a targeting model that compliments troop leading procedures is required. *FM 3-60.1 TST Multi-Service Tactics, Techniques, and Procedures for Targeting Time-Sensitive Targets* introduced Find, Fix, Track, Target, Engage and Assess in 2004 as a model for time-sensitive targeting. Though written mostly for implementation by division staffs and higher, it introduced the concept of dedicating a portion of the staff to engage targets.

The latest version of *JP 3-60*, released in April 2007, applies this same model to what it defined as dynamic targeting. Once a target is identified, the dynamic targeting model covers the actions required by the staff and the allocated resources down to the strike reset to ensure a successful strike. Just as the Army adapted the joint targeting process into D³A, which is more suitable for our circumstances, another model for

dynamic targeting may be applicable for full-spectrum operations.

Find, Fix, Finish, Exploit, Analyze and Disseminate was introduced by Special Operations Forces in Iraq who used it as a model for lethal personality targeting. As more conventional forces found themselves conducting similar operations, our SOF shared their model for the mutual benefit of all. This model has a proven track record in synchronizing the assets required for lethal personality targeting.

The potential for use elsewhere as a dynamic targeting model for ground forces is huge. One of the shortfalls of F²T²EA is that it stops at target engagement and battle damage assessment. For our ground combat forces, however, F³EAD process does not stop at a successful strike and BDA. We learned that evidence on the target and/or information gathered from the target may lead to follow-on targets.

The "E" of F³EAD stands for "Exploit." Successful exploitation of a target may provide actionable intelligence for immediate follow-on strikes (maintaining the initiative) or may provide information back into the targeting process for more development. The timely dissemination of observations and effects back into the operations/intelligence engine by all units responsible for an effect is critical for the decisions required for battle command.

FM 3-0 defines battle command as "the art and science of understanding, visualizing, describing, directing, leading and assessing forces to impose the commander's will on a hostile, thinking and adaptive enemy. Battle command applies leadership to translate decisions into actions — by synchronizing forces and warfighting functions in time, space and purpose — to accomplish missions."

F³EAD, when used as a problem-solving tool in conjunction with troop-leading procedures as a dynamic model to aid staff coordination, helps our junior leaders and battle staff — who are charged with operating within broad guidance and intent — solve problems and contribute to the overall situational awareness required by our senior leaders charged with battle command. As a model taught and employed in training, it provides a vehicle for junior leaders to hone problem-solving skills and offers infinite possibilities for scenario-based training.

The bottom line is the military needs problem solvers at all levels. We have sound doctrine with proven principals. We must develop within our Soldiers and leaders the knowledge and creativity required to apply the doctrine and principles to their own unique situations. By changing our training mindset and incorporating proven problem solving models for use in training and combat, we can develop the adaptable leaders we need for these uncertain times. ■

Major Matt B. Dennis, Field Artillery, is currently attending ILE at Fort Leavenworth, Kan. He has served as the Operations Officer, Baker Squadron, Asymmetric Warfare Group, Fort Meade, Md. He has also served as Commander, of Headquarters and Headquarters Battery, 17th FA Brigade, Fort Sill, Okla., deploying in support of Operation Iraqi Freedom; Commander, B Battery, 5th Battalion, 3rd FA, deploying in support of OIF; Stryker Platoon Leader and Assistant Brigade Fire Support Officer, 2nd Brigade Combat Team, 2nd Infantry Division, Republic of Korea; and as Cavalry Troop FSO, Cavalry Squadron FSO and a Platoon Leader, 3rd Squadron, 2nd Armored Cavalry Regiment (Light), Fort Polk, La.

Clear, Hold, Build: new tactics to defeat COIN

By LTC David G. Fivecoat and
CPT Stuart C. Chapman, both IN

What, another counterinsurgency manual? Didn't the U.S. Army and the U.S. Marine Corps just publish one in 2006? If a company commander is preparing to go to Afghanistan, should he read *Field Manual (FM) 3-24 Counterinsurgency* or *FM 3-24.2 Tactics in Counterinsurgency*?

The U.S. Army Training and Doctrine Command published *FM 3-24.2* in October 2008. This unclassified manual stresses a comprehensive approach to COIN operations by tying the concepts of security, governance, economics and information engagement together for brigades, battalions and companies.

FM 3-24.2 discusses five key concepts in COIN—identifying COIN lines of effort (LOEs), expanding on clear-hold-build operations, discussing the importance of securing the population during COIN, creating tactical-level planning horizons in COIN and helping units better understand the enemy they are fighting through the components and manifestations of an insurgency. It also describes typical offensive, defensive and stability operations in COIN and provides a framework to train and maintain host nation security forces. Due to a quick writing and vetting process, the manual was first designated as an FM interim, or a publication that expeditiously delivers urgently needed doctrine.

FM 3-24 Counterinsurgency superbly crafted the Army's and the USMC's approach to COIN from the strategic and operational levels. However, the Army lacked a current, practical manual for small units during COIN operations. Until now, Army and USMC tactical leaders relied on the 1986 publication of *FM 90-8 Counterinsurgency Operations*. However, *FM 90-8* focused exclusively on combat operations against guerrilla forces and lacked two decades of doctrinal updates.

FM 3-24.2 fills the doctrinal gap for the tactical leader and unit with a combination of information from *FM 90-8*, *FM 3-24*, David Gallula's *Counterinsurgency Warfare: Theory and Practice*, Roger Trinquier's *Modern Warfare* and the military's COIN experiences in Somalia, Kosovo, Afghanistan, the Philippines and Iraq.

Many people and organizations contributed to *FM 3-24.2*. MAJ (Retired)



SSG Joshua Bell A Battery, 1st Battalion, 319th Field Artillery Brigade, 3rd Brigade Combat Team, 82nd Airborne Division, Fort Bragg, N.C., inspects an Iraqi checkpoint in Baghdad, March 20. (Photo by SSG James Selesnick, 225th Theater Signal Command)

David L. Frumerie, MAJ Jason Enyert, CPTs Bradley C. Velotta and Stuart C. Chapman, and LTC David G. Fivecoat wrote and edited the updated manual at the U.S. Army Infantry School.

Organizations throughout the Army helped with significant portions of the manual, such as the Counterinsurgency Center, Combined Arms and Doctrine Division and Joint Center for International Security Force Assistance, all at Fort Leavenworth, Kan.; the National Training Center, Fort Irwin, Calif.; the U.S. Armor Center, Fort Knox, Ky.; the Asymmetric Warfare Group; Donovan Library, Fort Benning, Ga.; the Foreign Security Force Transition Team, 1st Infantry Brigade, Fort Riley, Kan.; the USMC; and home stationed and deployed tactical units.

Finally, notable COIN specialists, such as John Nagl, Montgomery McFate, Benjamin Grob-Fitzgibbons and Conrad Crane, reviewed and provided information for significant portions of the FM. Together, this collaborative effort created a solid addition to the U.S. military's understanding of COIN.

COIN lines of efforts. One of *FM 3-24.2*'s foundations is the concept of COIN LOEs. By combining *FM 3-24*'s logical lines of operation and the concepts of stability LOEs outlined in *FM 3-0 Operations* and *FM 3-07 Stability*

Operations, *FM 3-24.2* teaches leaders to link multiple tasks and missions using the logic of purpose—cause and effect—to focus efforts toward establishing operational and strategic conditions.

The COIN LOEs—establish civil security, establish civil control, support to host nation security forces, support to governance, restore essential services, support to economic and infrastructure development, and conduct information engagement—help commanders and units prioritize and synchronize actions during an extended period of time and assess the operations' effectiveness. Although each LOE can contribute to defeating an insurgency, often civil security and civil control must be established before fully developing the other LOEs.

Because each insurgency is unique, *FM 3-24.2* retains the flexibility for commanders to tailor the LOEs for their situations by combining LOEs, such as economics and restoring infrastructure, or splitting a LOE apart, such as dividing rule of law from governance. The LOEs give commanders a means to achieve unity of effort, prioritize assets and balance their actions to secure the population, establish a legitimate local government and defeat the insurgency.

Clear-hold-build. A clear-hold-build operation is a full-spectrum operation that combines offensive, defensive and

stability operations in varying degrees during each phase. This type of operation was used successfully by the French in Algeria and French Indochina, where it was called *tache d'huile* (oil spot); by the British in Malaysia, where it was known as the Briggs Plan; and by U.S. forces in Tal Afar, Iraq, where it was described as a clear-hold-build operation.

Offensive operations dominate in the clear phase. In the hold phase, defensive operations are emphasized, and stability operations are preminent in the build phase. However, in each phase, the other two operations play complementary roles. For instance, in the hold phase, the unit may focus its defensive operations on securing the population, while also conducting raids on insurgent leaders and restoring a local well to provide water to the village.

Securing the population. *FM 3-24.2* stresses the importance of securing the population through living forward in small bases, executing populace and resource control operations, and conducting regular patrols to disrupt insurgent actions. This FM contends that the most important piece of the clear-hold-build framework is the proper location of U.S. and host-nation bases to provide security to the largest possible number of people, disrupt insurgent activity and secure key locations and lines of communication. Often, these bases are located within the civilian population, much like a neighborhood police station.

Populace and resource control operations are government actions that concentrate on 1) protecting the populace and its material resources from the insurgents, 2) denying insurgents' access to the population and material resources, and 3) identifying and eliminating the insurgents. These types of operations may include enforcing curfews, establishing movement

restrictions, maintaining check points, supervising a community committee, registering weapons and rationing critical goods. Finally, reconnaissance or combat patrols collect information and provide security by disrupting or eliminating insurgent operations.

Planning horizons. *FM 3-24.2* establishes a concept for planning horizons during COIN by blending the theories of *FM 5-0.1 The Operations Process* and *FM 7-0 Training the Force*. Using long-range, mid-range, and short-range windows, *FM 3-24.2* proposes brigade, battalion and company timelines for each planning horizon. It also suggests quarterly operations briefs as an azimuth check to assess a unit's progress and to encourage learning and adaptation within the unit. For example, a brigade combat team might create a 12-month range plan, a three-month midrange plan and a one week short-range plan.

Despite seven years of fighting an insurgency, the military struggles with lumping the enemy into one large, amorphous group of "a few dead-enders," former regime elements, anti-Iraqi forces, al-Qaeda, anti-Afghanistan forces and the Taliban. Just like politics, all insurgencies are local. Each group possesses its own characteristics and follows certain patterns. *FM 3-24.2* helps Soldiers categorize and understand the insurgency by encouraging an analysis of each insurgent group's components and manifestations.

An insurgency consists of the five groups of people who participate in an insurgency. These five groups consist of leaders, guerrillas, underground, auxiliaries, and a mass base.

These groups are further broken down into eight categories, which consist of leadership, objectives, ideology, environment and geography, external support, internal support, phasing and timing, and lastly,

organizational and operational patterns. These categories define an insurgency and one of the six insurgent strategies (urban, military

focused, protracted popular war, identity focused, conspiratorial, and lastly, composite and coalition) that it is following.

Awareness of these components helps leaders understand the insurgent organization. The three manifestations of an insurgency — its tactics, strengths and vulnerabilities — are visible outputs of an insurgency that provide counterinsurgent units an opportunity to study the insurgency's patterns. Together, the components and manifestations help units to reduce the uncertainty around an elusive enemy and defeat it.

Insurgency components and manifestations. In addition to the five key practices, *FM 3-24.2* helps leaders understand the operational environment; describes types of offensive, defensive and stability operations conducted in COIN; and discusses the training and mentoring of host-nation security forces. It illustrates the challenges and difficulties of the COIN battlefield. Furthermore, it explains tactical site exploitation, sniper operations, base-defense operations and company intelligence support teams. It also contains a short reading list of other COIN-related documents for leaders.

FM 3-24.2 Tactics in Counterinsurgency provides units a comprehensive approach to waging COIN operations successfully during a significant period of time. Tactical leaders, who may not have time to read the entire manual, should focus on the five key practices — the COIN LOEs, clear-hold-build operations, securing the population, planning horizons and the components and manifestations of an insurgency. These sections are particularly useful. ■

Lieutenant Colonel David G. Fivecoat, Infantry, commands the 3rd Battalion, 187th Infantry Regiment, Fort Campbell, Ky. He was the lead writer and editor for *Field Manual 3-24.2 Tactics in Counterinsurgency* in 2008. He has deployed with the 82nd Airborne Division, Fort Bragg, N. C., to Kosovo; the 101st Airborne Division (Air Assault), Fort Campbell, Ky., to Iraq for Operation Iraqi Freedom I and the 3rd Infantry Division, Fort Stewart, Ga., to Iraq during OIF III and V.

Captain Stuart Chapman, Infantry, is the the Company Commander of D Company, 3rd Battalion, 187th Infantry Regiment, Fort Campbell, Ky. He served as a writer for *FM 3-24.2* in 2008. Previously, he served as a platoon leader for the 1-23 Infantry Regiment, 3rd Brigade, 2nd Infantry Division, which deployed in support of OIF IV.

This article is reprinted from the January-February 2009 edition of *Infantry*.



A U.S. Soldier (left) talks to an Iraqi police officer about citizens who were charged with insurgency in Hadr City, Iraq, August 5, 2008, but chose to be forgiven for their prior crimes and work with the U.S. military. (Photo by PFC Sarah De Boise, Combat Camera)

MRAP Prime Movers: protecting the field artillery on the battlefield



By CPT David K. Smith, FA

An artist concept of an M119A2 howitzer section equipped with a mine resistant ambush-protected prime mover and ammunition section variant. (Photo courtesy of CPT David K. Smith)

The counterinsurgency operations in Iraq and Afghanistan require field artillery units to have better armament, force protection and mobility on the nonlinear battlefield. Towed-artillery units are employed heavily in both theaters of operation in support of infantry and Stryker brigade combat teams. These artillery units do not have a prime-mover vehicle authorized to operate outside the protection of forward operating bases. Until the joint light-tactical vehicle's fielding, the interim solution for towed-artillery units is the battle proven mine resistant ambush-protected vehicle.

Transporting towed-artillery in Iraq and Afghanistan drains manpower for the BCTs. In most cases, towed-artillery units must transport their guns either by air or "flat racked" on a combat logistics patrol to move from one position to another. These artillery units' modified tables of organizational equipment still include "soft skinned" prime movers — either M1097 high-mobility, multipurpose wheeled vehicles for M119A2 units or M1083 medium tactical vehicles for M777/M198 units.

Because they lack armor, these vehicles are restricted to the FOBs in Iraq and Afghanistan, so their use is limited. Thus, in Iraq and Afghanistan, FA units cannot execute traditional missions by ground with their organic prime movers.

Operation Iraqi Freedom I lessons learned. The majority of FA cannon units deployed to Iraq in March 2003 were equipped with towed howitzers and light-skinned vehicles. After 21 days of major combat operations, the U.S. Army transitioned to stability operations. Divisions assigned FA battalions to nonstandard missions due to a reduced need for indirect fires. Throughout Iraq, FA units parked their guns and "hit the streets" with their available vehicles, M998 HMMWVs and MTVs.

A major lesson of the 1991 Gulf War was deployability. The Army wanted to get to a fight fast and not take up to six months to build combat power. As a result, the M198 and M119A2 battalion MTOES were designed for rapidly deployable units equipped with light-skinned vehicles. Enemy small-arms fire easily damaged these vehicles, and improvised explosive devices and rocket-propelled grenades proved devastating.

The enemy IED/RPG threat highlighted the need to provide protection for Soldiers who needed to operate from a mobile platform. There were few M1114 armored HMMWVs, the exclusive property of military police units. FA units improvised, welding steel plates onto HMMWVs and placing old flak jackets over doors. This effort to "up-armor" vehicles focused mainly on the doors and sides where troops were susceptible to small-arms fire. Sandbags lined the vehicles' floors and beds to protect against mines. The improvised protection was not very effective — especially against IEDs and mines that detonated beneath the vehicles which lacked armor there.

Firepower was also a challenge for light artillery units because their MTOEs provided only a limited number of crew-served weapons. Soldiers on patrols rode in the open backs of HMMWVs or FMTVs and kept their weapons oriented outward. In some cases, the canvases on hi-back M998 HMMWVs were rolled back near the cab to allow Soldiers to stand with M249s or M4s. There were limited ring mounts for weapons on MTVs or M6 pedicel mounts for HMMWVs. Units fabricated their own mounts, that, when combined with the *ad hoc* armor, resulted in "Mad Max" style gun trucks.

After April 2003, it took almost a year to equip most FA units with 1114 HMMWVs in theater.

Now, units routinely fall in on an entire fleet of 1151 up-armored HMMWVs or MRAPs. Still, the lesson for the FA community remains. The OIF-I events revealed the need to up-armor vehicles that traditionally were less-well protected.

MRAP. On today's battlefield, a towed-artillery platoon, conducting a movement to a firing position, is extremely vulnerable to an IED or complex ambush. Despite properly rehearsed battle drills, any attack can result in casualties. A simple 155-mm IED can destroy a M1097 or M1083 prime mover and kill or injure the entire gun section.

In an ambush scenario with only MTOE-authorized equipment, it is difficult for a towed unit to defend itself properly. Soldiers can return fire only through vehicle doors or from the back of a prime mover with its canvas sides rolled up. Small-arms and RPG fire can cause additional casualties. The Soldiers' only armor protection is their own body armor.

This scenario clearly demonstrates why towed-artillery units no longer move by ground in Iraq or Afghanistan unless absolutely necessary. A towed FA battery equipped with MRAP vehicles is significantly more survivable than it is with the current MTOE-authorized vehicles. The battery can protect itself both on the move and in a static firing point. MRAPs also protect against an IED or RPG.

MRAPs are designed to reduce casualties and increase survivability during IED attacks, mine detonations and small-arms fires. MRAPs have a blast-resistant body design (V-shaped hull), raised chassis and blow-off wheels. The V-shaped hull deflects weapons blasts away from the crew. MRAPs can operate on all terrain and in all weather. In addition, most models are equipped with run-flat tires and fire suppression systems (Center for Army Lessons Learned, MRAP Handbook, Number 08-30, September 2008).

In recent years, the Army launched an aggressive program to provide MRAP vehicles to deployed units conducting COIN operations. According to the CALL Handbook, an MRAP is not a stand-alone vehicle, but a fleet of several different armored vehicles with unique characteristics. The Army divides MRAPs into three categories — Category I for a fire team, Category II for a squad and Category III for explosive ordnance disposal personnel.

All MRAPs are designed to provide protection, mobility and firepower in support of a wide range of mounted and dismounted missions (CALL MRAP Handbook, Number 08-30, September 2008). Examples of current MRAPs include the MaxxPro (Categories I and II) by Navistar Defense, the RG-31/33 and Caiman by BAE Systems and the Cougar (Category II) by Force Protection, Inc. As of March 2009, the Department of Defense has ordered 5,250 MaxxPro, 2,800 Caiman and 1,560 Cougar MRAP vehicles. The Army fielded its 10,000th MRAP in Iraq, February 20.

Most of these systems are in Iraq and are credited with reducing IED casualty rates significantly. Only the smaller Category-I MRAPs, such as the RG-31, are deployed to Afghanistan where the roads are unimproved and, in some cases, nonexistent. By design, all fielded MRAPs have a high center of gravity to help defeat IED explosions under their V-Shaped hulls. This high profile raised roll-over concerns, especially in Afghanistan.

Recently, the U.S. Marine Corps, which is responsible for all MRAP acquisitions for the military, ordered 822 MaxxPro Dashes, a smaller version of the MaxxPro, to meet operational requirements

in Afghanistan. The U.S. Marines plans to replace all up-armored HMMWVs with MRAPs for missions outside of FOBs and combat outposts.

MRAP prime movers for towed-artillery units. In the current MTOE for a light FA battalion, a firing battery is equipped with eight M1097 HMMWV prime movers, eight M1097 ammunition carriers and eight M998 HMMWVs that are allotted for two fire direction centers, two gunnery sergeants, two platoon leaders, headquarters and the commander. M198 and M777 units, likewise, are equipped with M1083 prime movers, ammunition carriers and HMMWVs for battery leadership.

Category I MRAPs, such as the MaxxPro, can take the place of all M1097s in a light FA battery. If the FA adopted an MRAP as a prime mover, FA would have to choose which of the MRAPs would be the universal vehicle. This article uses the MaxxPro for the point of this discussion because it is the most widely fielded MRAP in the Army's inventory.

The MaxxPro can tow the 7,000 pound M119A2 and transport the gun crew with no modification. No major adjustment to standard FA operations is needed. Each howitzer section will be equipped with both a prime mover and an ammunition vehicle. Between the two MRAPs, all personnel and equipment for the howitzer and crew can be transported.

In a M198- or M777-equipped unit, the MaxxPro Plus can be used due to the larger crews and weight requirements. Each vehicle would require specific load plans. Some howitzer basic issue items as well as Soldier's personal equipment (such as ruck sacks) can be mounted externally on the vehicle's hull with simple manufacturer modifications.

For the ammunition vehicle, a standard MaxxPro easily can be modified to transport a basic load of 105-mm ammunition and tow an ammo trailer. Several manufacturers are developing flat-bed MRAPs, similar to a 1083, that could serve as the ammunition carrier. These vehicles can be fitted with a small ammo crane and can transport a base load of ammunition similar to a M1084A2 MTV. Most important, the ammo carrier will have the same protection level as the prime mover and can substitute as a prime mover as required.

MRAPs already support a standard equipment package that howitzer sections need. These include two RT-1523 single-channel ground and airborne radio system radios, global positioning system and/or force XXI battle command brigade and below navigation systems, a Counter Remote Control IED electronic warfare system, Rhino-II anti-IED system and an AN/VIC-3 vehicular intercom system.

MRAPs provide firepower with the capability for mounting an M249, M240B or M2 machine gun or Mk-19 grenade launcher. MRAPs can be equipped with remote weapons stations and add-on armor packages to defeat threats, such as explosively formed penetrators. The platforms also support current and emerging



MaxxPro mine resistant ambush-protected vehicles on line with an M1151 HMMWV in Iraq. (Photo courtesy of CPT David K. Smith)

technologies to assist in defeating threats such as RPGs and snipers on the battlefield.

The current FDC MTOE for light units includes two HMMWVs — one equipped to transport the Advanced Field Artillery Tactical Data System and the other to tow the generator to power it. These two HMMWVs also transport the rest of the section's equipment and crew.

For the MRAP FDC, a MaxxPro has enough room inside for operations. An operator station can be fabricated to support the AFATDS and an additional two RT-1523 radios. The FDC will still need two MRAPs to transport the crew and needed equipment. Externally mounted OE-254s can be installed on the vehicles, and the weapon turret for the main vehicle can be removed to allow for a roof mounted three-kilowatt generator, similar to the configuration on a M1068 or M577.

Each firing platoon gunnery sergeant can be equipped with the smaller MaxxPro Dash or similar MRAP vehicle. This would facilitate the gunnery sergeant's mission of reconnaissance. The MRAP would provide firepower and protection, while transporting the advance party to the next firing location. The Dash also can serve as the battery commander and platoon leaders' vehicles. Some adjustment to the battery's internal manning is necessary to provide for drivers and gunners to support these vehicles based on the current MTOE. However — similar to HMMWV-based operations — once the battery arrives at its firing position, most personnel would dismount to place the battery in operation. Select personnel can remain on the vehicles to man the weapons turrets to provide security.

A Cougar H 4x4 mine resistant ambush-protected vehicle in Taqadum, Iraq, November 29, 2008. (Photo by SGT. Jason W. Fudge, 1st Marine Logistics Group)



Nonstandard missions. The COIN environments inherent need for “boots on the ground” has caused FA to operate in nonstandard missions, such as deploying as motorized Infantry. The towed-artillery units tasked with training and executing these missions are hindered by their MTOE during pre-deployment training. The lack of home station platforms which the unit would normally be equipped with in theater forces the unit to improvise with its current vehicle set, resulting in unrealistic training and expectations.

For example, only one platoon's worth of M1114 HMMWVs may be available for training, which forces the unit to rotate equipment. During a major mission readiness exercise, the unit has to employ its M998s as “Mad Max” gun trucks for training. This makes it difficult to develop load plans, certify gunners from mounted positions, practice casualty evacuation, vehicle emergency drills and maneuver supporting dismounted forces.

An MTOE requiring MRAPs for IBCTs and SBCTs would solve many pre-deployment training challenges. Soldiers could train on the same equipment they will use in combat. This also gives an FA battalion its own fleet of light armored vehicles that can deploy into theater if required.

The U.S. Army's continued growth in the form of IBCTs increases the number of towed cannon systems in the Artillery community. The result will be more towed systems in the active inventory than self-propelled guns. The Army also identified IEDs as a major threat — one our enemies, both current and future, will use against us.

In accordance with FM 3-0, the Army is focused on Full Spectrum Operations with units executing different types of missions along the spectrum of conflict. In the near future, “Hybrid Warfare” is anticipated as potential enemies employ both sophisticated and simple attacks against U.S. Forces. The current assumption is that the threat of IEDs is here to stay as a low-tech means to defeat our hi-tech systems. If FA expects to operate in the current and future operational environment, then the FA community needs to look to the future.

If our current light-skinned prime movers are not relevant today, how can they be relevant tomorrow on a hybrid battlefield where IEDs are commonly employed against U.S. forces? The MRAP is the on-hand solution. As these vehicles are incorporated into our procurement and logistics systems, it is reasonable to say that they will remain part of our fleet in the near future. Towed-artillery units equipped with these vehicles are more survivable and relevant for any mission. ■

Captain David K. Smith, Field Artillery, is the Cavalry Squadron Fire Support Observer Control for the Cobra Team at the National Training Center, Fort Irwin, Calif. He commanded, A Battery, 2nd Battalion, 17th Field Artillery Regiment, 2nd Infantry Brigade Combat Team, 2nd Infantry Division, Fort Carson, Colo., deploying to Iraq in support of Operation Iraqi Freedom 06-08. His previous assignments include Company Fire Support Officer for B Company, 1-506 Infantry Regiment (Air Assault), 2nd Infantry Division, Camp Grievies, Korea; Fire Direction Officer and Platoon leader for Crusader Battery, 1-377 FA (Air Assault), 101st Airborne Division, Fort Campbell, Ky. He also served as the Battalion FSO for 2nd Battalion, 9th Infantry Regiment, 1HBCT, 2nd Infantry Division, Camp Casey, Korea; and Battalion FDO, 2-17 FA

The author would like to thank Mr. Gordon Wolverton and Mr. Anthony Crook for their technical expertise on mine resistant ambush-protected vehicles and for technical design support.

Adjust Fire: new direction for tube artillery

By LTC (Retired) Forrest R. Lindsey, USMC

In the field artillery community, very few articles of faith are greater than the belief that tube artillery is the most valuable fire support system on the battlefield. Not to offend the rocket and missile zealots, but when it comes to most effects per dollar spent or “bang for the buck,” the oldest artillery technology is still a bargain. Tube artillery is cheap, rapid-firing and thoroughly robust.

This standard of fire support is good, but can improve with new technologies and exploration.

The goals include improvements in first-round precision, greater mobility and flexibility, faster response and more to exploit tube artillery’s inherent value.

The U.S. Marine Corps Warfighting Laboratory, Quantico, Va., and the U.S. Army Armament Research, Development and Engineering Command, Picatinny Arsenal, N. J., have been working on advancing tube Artillery technologies for the past few years. This article discusses some of their noteworthy successes.

Laser radar (LIDAR) artillery meteorological system. MCWL is working on a LIDAR Artillery MET system that will measure wind velocities and directions, and air temperature and densities through MET level 10. This system uses an ultraviolet LIDAR that measures molecular movement to derive those values.

MCWL is starting with the standard NATO ballistic/computer MET report output, but the possibility exists to derive more complete MET profiles for better MET modeling and more precise ballistic prediction. This new system will give the military the potential to measure true MET influences seconds before firing for the best aiming data for firing. Anything that brings U.S. closer to the “first round fire for effect” is a good thing.

“The days of wasteful ‘zone and sweep’ missions may be relegated to history.”

The XM-326 Dragon Fire II. Using a French 120-mm rifled mortar tube, MCWL and ARDEC designed an automated Artillery system to test the utility and benefits of self-contained fire control, automatic aiming and semiautomatic loading. The completed system, the XM-326 Dragon Fire II, has a 6400-mil traverse. The new system uses a modified M-95 mortar fire control system to control the actuators that aim the weapon and verifies aiming with a one-mil ring laser gyro system.

During testing at Yuma Proving Ground, Wellton, Ariz., this system demonstrated fire missions of 18 seconds or less from receiving the mission from the Advanced FA Tactical Data System to firing the round. This system also tested “sensor-to-shooter” fire missions with the forward observer controlling the weapon from his targeting system. The XM-326 uses the NATO Ballistic Kernel for its fire control, modified for use with 120-mm rifled mortar ammunition.

Some may say that a “mortar is not field artillery,” but the U.S. Marines considers large rifled mortars such as the old 4.2 inch mortar an Artillery weapon. The Marines recently fielded the Expeditionary Fire Support System to its artillery batteries that use this same 120-mm rifled tube and ammunition.



The XM-326 Dragon Fire II in its light armored vehicle configuration during firing tests at the Naval Surface Weapons Center Dahlgren, Dahlgren, Va. in 2004. (Photo courtesy of LtCol. [Retired] Forrest R. Lindsey)

Experimentation. The XM-326 transitioned to the Program Manager-Light Armored Vehicles as the LAV Indirect Fires Modernization candidate, but some new potential capabilities and applications emerged from MCWL’s experiments.

Rapid conversion. Using the XM-326, MCWL and ARDEC experimented with the concept of “modular” artillery — a towed system that rapidly converts to a LAV-mounted system and back as needed. This concept was tested in 2006. It proved possible to build a helicopter-transportable, towed-firing system that could be winched into a modified LAV in five minutes or less to convert to an armored, self-propelled system and then back to a towed system.

This concept was founded on the need for a medium-caliber firing system to provide mobile fire support when combat shifts to maneuver warfare. Using the LAV platform allows moving the fire support closer to its supported units and maximizes the range to reach the maneuver areas of interest.

Precision. During the XM-326’s firing tests, some surprisingly precise groups were measured at the system’s maximum range of 8,200 meters. This consistency came from an excellent tube/ammunition combination and from precise aiming due to the laser gyro aiming system, the stable platform and the short, stiff mortar tube without a muzzle brake.

When it came time to update the Dragon Fire’s design, Tony Franchino, chief of mortar design at ARDEC, devised a “cookie-cutter” base for the carriage that maximized the contact with the ground for stability and minimized weight. His team made this system work as a 6400-mil traverse platform and kept the 120-mm tube free from impingement. The updated design is as stable and accurate as the first Dragon Fire (15-meter circular error probable), but weighs half as much (3,450 pounds).

Fires on the move. The XM-326’s electric actuators and the automated aiming features are almost fast enough to begin experimentation with accurate fires-on-the-move from the LAV. Rapidly and accurately firing tube artillery from a moving platform would revolutionize direct support artillery

as a maneuver support weapon. Firing from an attacking column would maintain the maneuver unit's momentum and the range fan — actually a circle with a 6400 mil weapon — well beyond visual range.

This innovation would replace the old method of the supporting artillery pulling out of the column, finding a flat spot to shoot from and watching the supported unit move away. The maneuver force could use this technique to maximize speed and shock power and to neutralize potential enemy strong points with steel and smoke well beyond direct line of sight. It also has the added benefit of making it tougher for accurate enemy counterfires.

There are many technical and doctrinal challenges to overcome before this capability becomes reality, but this experimental work should begin as soon as possible. Some of the doctrinal challenges include ensuring artillery safety, deconflicting and managing fires, targeting and maintaining digital communications. These issues are solvable with good experiments and the application of advanced technologies.

Advanced fires planning and execution. The XM-326's automation and connectivity experiments showed it is capable of enhancing standalone capabilities of other current generation, advanced fire support systems. This is possible because each system has its own fire control, survey and communications. There is an additional capability — each gun system can communicate with other gun systems and form a single, integrated entity for executing complex fires programs.

In this integrated system, one firing system is designated the "master gun." The subordinate guns receive their mission data and firing cues from the master gun, and all systems execute their roles in the fire plan precisely on schedule — using the Global Positioning System time standard — and never miss a mark.

Even widely dispersed firing units could act as a single entity with this technique for millisecond-precise times-on-target and very efficient effects delivery. This concept is just the beginning and could produce entirely new tactical advantages where each round fired gains new effectiveness. The days of wasteful "zone and sweep" missions may be relegated to history.

Cannon tube shape monitoring. Longer cannon tubes are not actually straight; there is a certain amount of variance from the manufacturing tolerances from one tube to another. They also change shape steadily as they warm during firing and even when sitting out in the sun. The internal stresses in the steel act can also change the tube's shape as the tube warms.

More information about the tube's initial condition and its changes during firing could account for these variances and increase our precision at greater ranges. We could feed information about the tube's initial condition and its changes during firing to the fire control computer. This could be achieved through different methods. Small lasers and reflectors could measure movement, or piezoelectric strips could sense changes in a tube's dimensions. In any case, cannon tubes do change. Tracking and accounting for these changes could reap benefits of smaller circular errors probable and fewer rounds fired to gain effects at the longer ranges.

Mobile air deconfliction. The quantity and qualities of air support on the modern battlefield are increasing rapidly. The old methods of deconflicting artillery fires from flying objects are no longer adequate. The use of an airspace coordination area as a "box in the sky" to allocate airspace is insufficient and potentially dangerous to aircraft. It constrains aircraft into narrow

flight paths and makes them vulnerable to antiaircraft fires. The use of radars or other sensors to track flight paths within a battlespace is a better method; we could control trajectories in the aircraft's vicinity. This concept has been compared to the old "interrupter" mechanism in World War I aircraft.

A linkage "interrupted" the plane's machinegun each time the propeller blade passed in front of the gun's muzzle. In this concept, an aircraft is tracked in a 3-D space. As Artillery fire missions are readied for fire, the fire support coordination system temporarily blocks any trajectories that would intersect the aircraft's flight path.

This could be accomplished by "disconnecting" the artillery's firing mechanisms systems for a split-second so an aircraft can cross the planned trajectory and then "reconnecting" the firing mechanism once the aircraft has safely cleared. This is an important direction for exploration in the modern constricted battlefield — particularly urban combat - with attack aircraft, unmanned aerial vehicles and medical evacuation aircraft in the same sectors as active artillery fire missions.

These and many other potential technological advances can give new life to the old, but dependable, mainstay of fire support. Developing new and innovative techniques maximizes these systems' performance and makes a great fire support system even better. Given the difficulties our fighting forces face in an increasingly dangerous world, the sooner we do it, the better. ■

Lieutenant Colonel Forrest "Rick" Lindsey, U.S. Marine Corps, retired, is the Senior Engineer for Advanced Technologies at the Marine Corps Warfighting Laboratory, Quantico, Va. As a Marine, he served as the Assistant Program Manager for Fire Support at the Marine Corps Systems Command, in Quantico; an Inspection Team Leader for the On-Site Inspection Agency in the Soviet Union; a U.N. Truce Observer in the Sinai Desert in 1987 - 1988 and Commander, 5th Battalion, 11th Marines, Camp Pendleton, Calif. in 1993 - 1994. He also deployed to Vietnam as a Scout Observer for Company G, 2nd Battalion, 1st Marines, and a Truck Driver and a Cannoner for B Battery, 1st Battalion, 11th Marines. He is a graduate of the Marine Corps Command and Staff College, Quantico, Va.



The XM-326 Dragon Fire II fires during the counter-rockets, artillery, mortars tests at Yuma Proving Grounds, Yuma, Ariz. in 2006. (Photo courtesy of LtCol. [Retired] Forrest R. Lindsey)



SPC Matthew Yancey, Melbourne, Ark., finishes a bottle of water during a patrol of western Baghdad, August 2, 2006. Yancey drank multiple bottles of water to stay hydrated during the mission. (Photo by SPC L.B. Edgar, MND-B Public Affairs)

Heat adaptation for the contemporary Soldier

By CPT Russell G. Nowels, AR, CPT Coley D. Tyler, FA, and Dr. Phillip L. Henson

On the contemporary battlefield, Soldiers frequently endure intense heat typical of the desert environments in the Middle East where temperatures routinely exceed 120 degrees Fahrenheit. This extreme environment requires them to endure intense, daily heat while conducting dismounted patrols for six to 12 hours while covering 10 to 25 kilometers in urban areas, deserts, mountains or broken and wooded terrain.

In addition to the challenges posed by the regional climate, Soldiers wear interceptor body armor and the advanced combat helmet for protection. Further, Soldiers carry a weapon with a combat load of ammunition (usually 210 rounds for an M4 carbine), a CamelBak or multiple canteens for proper hydration, a secondary weapon, first aid bags, casualty litters and other miscellaneous equipment dictated by each mission.

This equipment places an incredible amount of stress on the body, adding 50 to 75 pounds of weight and insulating heat around the core body. To mitigate the risks associated with severe environmental conditions and the weight that Soldiers must bear, leaders and Soldiers must understand the importance of heat adaptation to survive the current operating environment.

Heat adaptation. Army units routinely deploy to southwest Asia in support of the ongoing operations in Iraq and Afghanistan. In preparation for their deployments, these units try to replicate every aspect of combat, using the latest training techniques and facilities available. The growing training resources essentially simulate every complex combat scenario imaginable, such as hostile villages, detainee operations and forward operating base procedures. Despite these advanced training resources, the extreme heat of the Middle East cannot be duplicated in the U.S. However, Soldiers can overcome this challenge through successful heat adaptation preparation.

Heat adaptation is a response to repeated stress application factors such as solar radiation, temperature, humidity, work and exercise intensity, clothing, fitness, etc.¹ Generally, the adaptation is a response to naturally occurring climatic changes in the environment (acclimatization), heat exposure in an artificial climate (acclimation) and training-induced elevations in body temperatures.²

This definition is important because heat adaptation essentially is the sum of acclimation and acclimatization, where the “former” is induced experimentally in an artificial environment whereas

the latter is induced by exposure to natural environments.”³ Thus, heat adaptation’s objective, as an outcome of acclimation and acclimatization, is to achieve three primary physiological changes — a heightened sweat response with an increased sweat output, a lower heart rate and a lower core temperature.

The body’s sweat response supports the body’s cooling mechanism by maximizing evaporative cooling, which lowers the temperature of the peripheral blood before its return to the deeper tissues or the body’s core. Likewise, a lower heart rate results from a more powerful heart-stroke volume, which enables the heart to regulate the body’s plasma levels more efficiently.

As an outcome, the cardiovascular system is more stable when blood is pumped to the skin and muscles or during a significant loss of fluids. These two physiological adaptations drive down the core temperature, which is the final objective of heat adaptation. Therefore, to achieve the physiological responses necessary to complete heat adaptation, an analysis of acclimation and acclimatization must be conducted.

Heat acclimation. Heat acclimation refers to adaptation that can be induced experimentally, while its purpose is to exercise the physiological mechanisms that facilitate adaptation. Physically fit subjects or highly trained individuals exhibit many of the characteristics of heat acclimation.⁴ Researchers commonly refer to this as partial acclimation and credit the result to repeated bouts of exercise.⁵

Repeated exercise applications yield elevated internal body temperatures, causing an increase in the sweat drive and a subsequent boost in evaporative cooling. The desired results of acclimation are increased heart-stroke volume, blood flow to the working muscles and skin, and increased sweat response during exercise

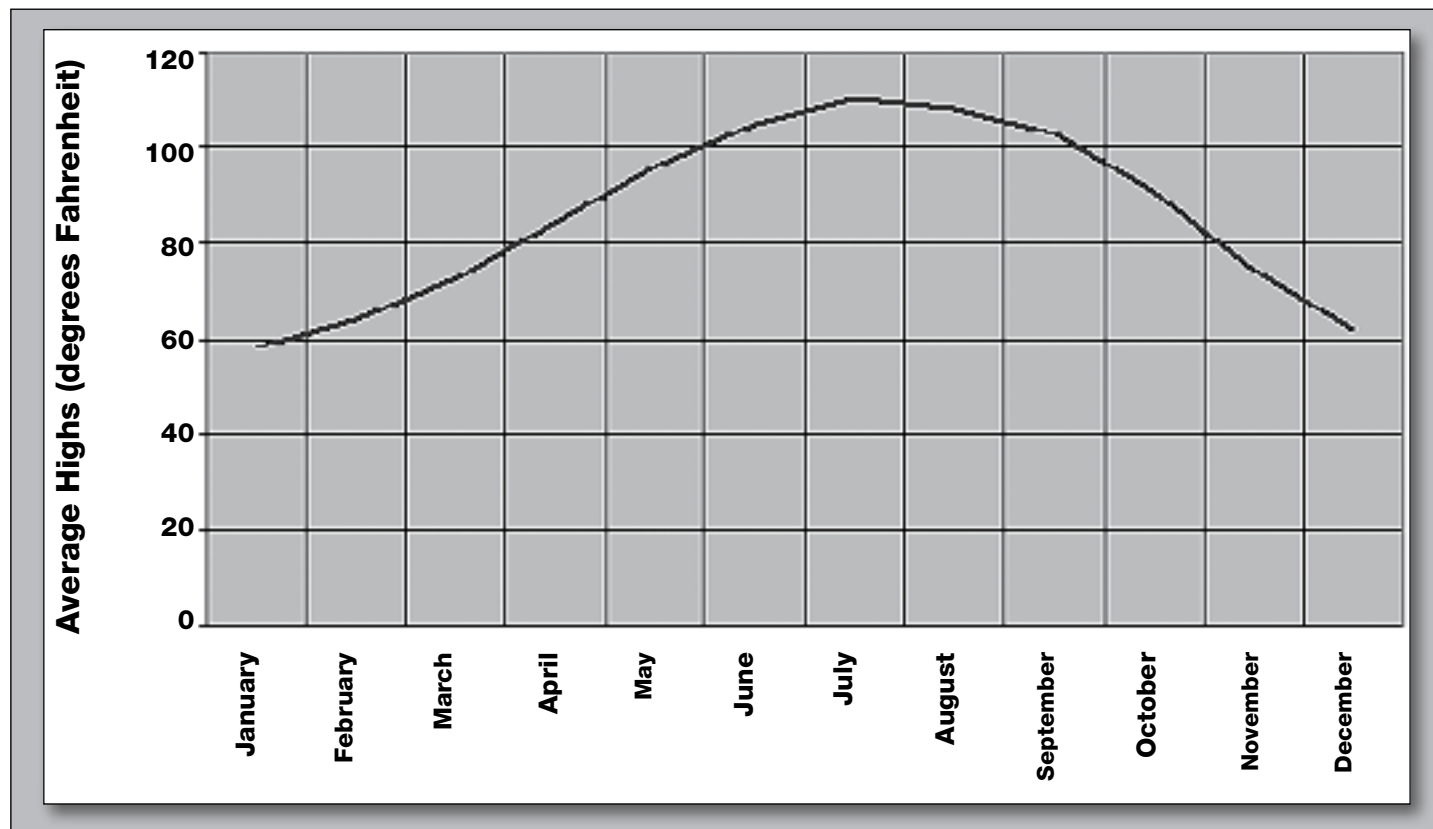
or heat exposure. These results mirror and directly relate to those physiological changes of heat adaptation.

The most important consideration of acclimation for military professionals, though, can be developed in any environment, even cool climates.⁶ This implies that acclimation can be controlled and achieved at any installation or in any environment before deployment. Soldiers can acclimate through targeted physical training at their home stations. Specifically, morning PT and frequent road marches (foot marches) provide sufficient opportunities to exercise the acclimation responses. To achieve the desired acclimation and its physiological side effects, units and Soldiers can implement some simple training techniques.

Increased stroke volume. An increased stroke volume is achieved through interval training. Conducted properly, interval training stresses the heart through exertion and, ultimately, strengthens it during recovery. A stronger heart enables a more powerful heart-stroke volume, increasing its efficiency with a slowed heart rate.

Eight repetitions of 400 meters (at or below a Soldier’s established two-mile run pace) on a track using a three-minute cycle is an entirely realistic option during morning PT. This means that an entire platoon starts a 400-meter sprint together every three minutes, but slower runners will get less recovery between sprints. A platoon conducting interval training at least once a week will obtain an increased stroke volume quickly.

Increased blood flow to working muscles and skin. Increased blood flow to the working muscles and skin is accomplished through longer periods of physical activity, stressing the aerobic system and causing the heart to push more blood to the working muscles and skin. In the muscles, more capillaries will open to generate greater blood flow within the muscle fibers. Likewise, larger quantities



Average monthly high temperatures in Baghdad, Iraq, range from 58 degrees Fahrenheit in January to 110 degrees Fahrenheit in July. (Courtesy of the National Oceanic and Atmospheric Administration)

of blood pump to the skin and cool through evaporation. This process returns cooled blood to the inner organs and allows the core temperature to remain more stable.

Most physiologists and researchers agree that 60 to 90 minutes of continuous physical activity during the warmest hours of the day sufficiently familiarizes the body to such a redistribution of blood.⁷ Long, steady distance running throughout a PT session or constant physical activity (a foot march at a pace greater than 15 minutes per mile) for 60 minutes or longer satisfactorily achieves this result.

In addition, some investigations indicate that the same effect can be achieved through shorter duration, moderately intense, continuous running for 30 to 35 minutes.⁸ This method adjusts to the time constraints for PT. There is no prescribed frequency or limit on long, steady distance, so platoons should incorporate this activity into PT as frequently as possible.

Increased sweat response. Increasing the sweat rate during exercise allows for greater evaporation on the skin. Through evaporation, the subcutaneous blood cools, returns to the inner organs and regulates the core temperature. Achieving the sweat response is the easiest of the acclimation responses because it is practiced during any activity that results in sweating.

Therefore, most PT sessions will yield an increased sweat response. The body can attain an increased sweat response by training or working in the heat of the day or through exposure to a climate controlled environment.

Although more controversial, wearing extra layers of clothes to create a microclimate, inducing a greater sweat response, is another method.⁹ The concern is the additional stress from thermal strain on a subject wearing additional layers.

However, such elite athletes as Meb Keflezighi, the 2004 Athens Olympic Games Silver Medalist in the marathon, advocate this method. In preparation for the 2004 Olympic Games, Keflezighi trained by wearing additional layers to prepare his body for the humidity of Athens, Greece.¹⁰ This method supports continuous training in IBA; it creates a microclimate around the body's core area similar to wearing extra layers of clothing.

“Physiologists and researchers recommend a minimum of 10 to 14 days of living, training and exercising in the environment to acclimatize.”

Acclimation is achieved primarily through work or exercise. It is obvious, then, that PT is paramount to acclimation. Still, it only represents a part of the adaptation process since repeated PT exercises the mechanisms for adaptation but does not result in physiological changes.

Simply put, acclimation is analogous to a runner who trains for the 800 meter run, but then decides to run a marathon. The athlete worked the mechanisms to run, but is not fully prepared for the length of a marathon. To prepare for the longer marathon, the athlete requires considerably more endurance training.

Likewise, Soldiers exercise the mechanisms for heat adaptation through acclimation training. However, they still require exposure to the real elements of the regional environment over a longer, more consistent period of time to complete adaptation. This final phase in adaptation is known as acclimatization.

Heat acclimatization. Exposure to the natural environment induces heat acclimatization and results in improved heat tolerance and decreased physiological strain. The purpose of heat acclimatization is to transfer heat efficiently from the body's core to the skin — ultimately

to the external environment — and improve cardiovascular functioning to deal with the stressors of dehydration and a decreased blood volume from an increased skin blood flow.¹¹

The primary difference from heat acclimation is that acclimatization requires continuous, long-term exposure to heat. Subsequently, the desired results of acclimatization are somewhat similar to acclimation, yet even more critical and more effective for the adaptation process.

Therefore, the desired results of heat acclimatization are improved blood flow to the skin, decreased heart rate, decreased perception of work exertion and increased sweat output and more effective distribution of sweat. Similar to acclimation, these results reflect the physiological changes necessary for adaptation.

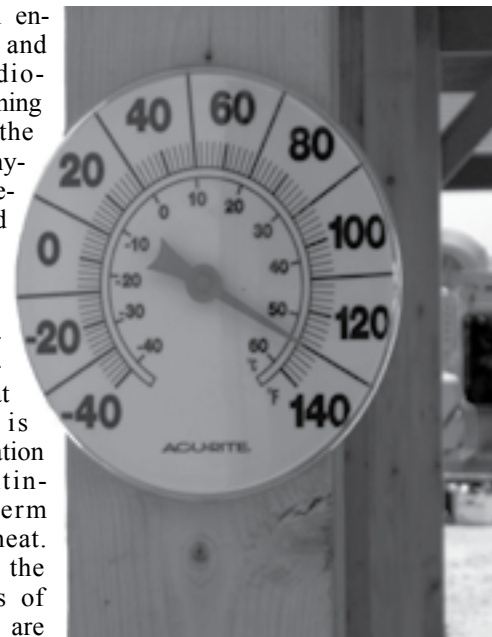
While heat acclimation can occur in any region or environment given certain training conditions, heat acclimatization must take place in the region of interest. Therefore, the only way to achieve heat acclimatization is to live in the environment. Specifically, Soldiers must experience the discomfort of the heat by training, exercising and feeling the physiological strain.

Physiologists and researchers recommend a minimum of 10 to 14 days of living, training and exercising in the environment to acclimatize. The number of days is based on physiological adaptations during heat acclimatization (the point at which approximately 95 percent of adaptation occurs) for variables such as a decreased heart rate, expansion of plasma volume, a decreased rectal temperature, a decreased perceived exertion and an increased sweat rate.¹² This information explains why Army units train in Kuwait for a few weeks before moving into Iraq.

Successful acclimation allows for more efficient acclimatization.¹³ First, a higher level of fitness (acclimation) allows subjects to function with a lower heart rate while carrying a greater relative workload compared to unfit subjects. This enables fit subjects to use less energy to complete a greater amount of work and experience less cardiovascular strain during work in the heat.¹⁴

Second, acclimation improves acclimatization efficiency because a fit subject arrives in the new environment with an already improved skin blood flow and decreased heart rate due to his exercise regime.¹⁵ This suggests that the most important response during acclimatization is the increased sweat output and the distribution of sweat.

It is true that the sweat mechanisms are exercised during



As shown by this thermometer in Camp Taji, Iraq, June 7, 2008, temperatures in the Middle East frequently exceed 120 degrees Fahrenheit. (Photo by SGT Brandon D. Little, 32nd Army Air and Missile Defense Command)

acclimation, but only for short durations. Once introduced into the new environment, the body requires the sweat system (as part of the cooling system) to work continuously — day after day, week after week. This is a critical consideration because few locations in the Army can replicate this process.

To acclimatize the sweat system, physiologists initially recommend light exercise during the coolest hours of the day, followed by subsequent daily increases in the intensity of PT and Army training. In no more than 14 days, Soldiers should be ready to conduct training at near normal levels.¹⁶

One decisive facet of heat acclimatization involves the importance of hydration and its relationship to sweat output. Although hydration is important during acclimation, it is not vital because repeated bouts of exercise rarely last longer than 90 minutes. Thus, once a subject cools down and the sweat system shuts off, lost fluids can be replaced quickly.

Contrary to acclimation, acclimatization does not offer the opportunity to restore lost fluids quickly because the sweat system works continuously. The sweat response may be stimulated as a result of work, yet it does not stop once the work is complete due to intense heat and the body's efforts to cool itself through the evaporation process. In fact, sweat losses in extreme heat often exceed rehydration rates.¹⁷ The effect is constant sweat output, challenging the body's ability to maintain healthy plasma levels.

The body's plasma level (fluid levels) declines without adequate hydration (dehydration). This drop in the plasma level yields a less powerful heart stroke, which decreases the heart's ability to pump an ample quantity of blood to the skin. Subsequently, this cycle impairs the body's cooling system.

The heart attempts to push more blood from a lower total volume to the skin by pumping more rapidly. In doing so, the heart rate increases, which consequently elevates the body's core temperature. Ultimately, this negates any previous advantages of acclimatization and potentially can lead to a severe heat injury.

Yet, even with continuous fluid intake, dehydration may be unavoidable. Recent studies conducted in Iraq indicate that "a threshold may exist for water consumption above which additional consumption may not prevent dehydration."¹⁸ Still, dehydration's impacts are so severe that constant hydration is imperative to remain functional in the new environment and complete acclimatization.

There may be no substitute for living, training and fighting under hot conditions in the regional environment to improve performance in the heat. However, through heat acclimation, Soldiers reap the benefits of intense home station PT — especially endurance

exercises — to develop the critical response mechanisms needed to improve heat tolerance and advance acclimation. Acclimatization then promotes a reduction in Soldiers' physiological strain when they live in the environment, yet, it is critical to recognize that all Soldiers acclimatize and adapt at different rates.

Finally, Soldiers gain confidence by embracing the discomfort while working in the heat and learning the value of hydration to complete the adaptation process. Properly conducted, these two steps complete heat adaptation, ultimately enabling Soldiers to execute their missions on the contemporary battlefield more safely. ■

Captain Russell G. Nowels, Armor, is a Military Movement Instructor, Department of Physical Education at the U.S. Military Academy, West Point, N.Y. He has served as Commander, A Troop, 1st Squadron, 10th Cavalry (A/1-10 Cav), Fort Carson, Colo.; Assistant S3, 3-3 Armored Cavalry Regiment, Fort Carson; Adjutant, Regimental Headquarters and Headquarters Troop, 3rd ACR, Fort Carson; and Executive Officer, G/2-3 ACR, Fort Carson; deploying to Iraq in support of Operation Iraqi Freedom in each assignment. He holds a master's degree in Kinesiology from Indiana University in Bloomington.

Captain Coley D. Tyler, Field Artillery, is a Military Movement Instructor, Department of Physical Education at the U.S. Military Academy, West Point, N.Y. He has served in several positions in 3rd Brigade, 1st Cavalry Division, Fort Hood, Texas, including Commander, Headquarters and Headquarters Company, 3rd Brigade Special Troops Battalion; Assistant S3, 2-82 FA; Battalion Fire Support Officer, 2-7 Cav; Battalion S2, 2-82 FA and Company FSO, D/3-8 Cav; deploying in support of OIF in each assignment. He holds a master's degree in Kinesiology from Indiana University.

Dr. Phillip L. Henson is an Assistant Professor in the Department of Kinesiology at Indiana University. His activities and research center on understanding and improving human athletic performance, especially through the sport of track and field. He served as the Competition Director for the 1996 Olympic Games in Atlanta, Georgia, dealing with the potential heat issues involving the track and field events, such as the marathons and the 50K walk. He holds a Ph.D. in Human Performance from Indiana University.

This article is reprinted from the November-December 2008 edition of *Armor*.

Endnotes:

1. Nigel A. Taylor and James D. Cotter, "Heat Adaptation: Guidelines for the Optimization of Human Performance," *International SportMed Journal*, Vol. 7, No. 1, (2006), 36.
2. E.R. Nadel, et al., "Mechanisms of Thermal Acclimation to Exercise and Heat," *Journal of Applied Physiology*, Vol. 37, No. 4, (October 1974), 517-519. Carl Gisolfi and Sid Robinson, "Relations between Physical Training, Acclimatization, and Heat Tolerance," *Journal of Applied Physiology*, Vol. 26, No 5, (1969), 533-534.
3. Lawrence E. Armstrong, *Performing in Extreme Environments*, (Champaign, IL: Human Kinetics), 2000, 3.
4. *Op Cit*, Gisolfi and Robinson, 533-534.
5. *Op Cit*, Nadel, et al., 517-519.
6. Carl V. Gisolfi, "Work-Heat Tolerance Derived from Interval Training," *Journal of Applied Physiology*, Vol. 35, No. 3, (1973), 349.
7. Ron Maughan and Susan Shirreffs, "Exercise in the Heat: Challenges and Opportunities," *Journal of Sports Sciences*, Vol. 22, (2004), 919.
8. Joseph A. Hounard, et al., "The Influence of Exercise Intensity on Heat Acclimation in Trained Subjects," *Medicine and Science in Sports and Exercise*, Vol. 22, No. 5, (1990), 618-620.
9. Brian Dawson, "Exercise Training in Sweat Clothing in Cool Conditions to Improve Heat

- Tolerance," *Sports Medicine*, Vol. 17, No. 4, (1994), 233-243.
10. Peter Pflitzinger, "Simulating Race Conditions for Optimal Performance," *Running Times*, (January-February 2006).
11. *Op Cit*, Armstrong, 28.
12. Lawrence E. Armstrong and Carl M. Maresh, "The Induction and Decay of Heat Acclimatization in Trained Athletes," *Sports Medicine*, Vol. 12, No. 5, (1991), 304.
13. Kent B. Pandolf, "Effects of Physical Training and Cardiorespiratory Physical Fitness on Exercise Heat Tolerance: Recent Observations," *Medicine and Science in Sports*, Vol. 11, No. 1, (1979), 65.
14. Christine L. Wells, et al., "Training and Acclimatization: Effects on Responses to Exercise in a Desert Environment" *Aviation, Space, and Environmental Medicine*, Vol. 51, No. 2, (1980), 106.
15. K.B. Pandolf, et al., "Role of Physical Fitness in Heat Acclimatization, Decay and Reinduction," *Ergonomics*, Vol. 20, No. 4, (1977), 403-406.
16. *Op Cit*, Armstrong, *Performing*, 28-29.
17. *Op Cit*, Taylor and Cotter, 40.
18. Edward Manning and Bradley Wilson, "Dehydration in Extreme Temperatures While Conducting Stability and Support Operations in a Combat Zone," *Military Medicine*, Vol. 172, (2007), 975.

Fires

(USPS 309-010)
P.O. Box 33311
Fort Sill, OK 73503-0311

Periodicals Postage

PAID

San Bernardino, CA



United States Marines with Battery K, 3rd Battalion, 12th Marine Regiment, 3rd Marine Division, fired high-explosive rounds at Yausubetsu Maneuver Area, Japan, November 22, 2008. Artillery relocation training takes place several times annually in different training areas in Japan.
(Photo by LCpl. Thomas W. Provost, USMC)
