A Joint Professional Bulletin for US Field & Air Defense Artillerymen

Fires

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2007 Surge of Ground Forces in Iraq—Risks, Challenges and Successes
An Interview with LTG Raymond T. Odierno

Earth, Wind and Fire: The Experimentation Environment
Innovation, Freedom of Action and Thinking Freely

Space Artillery: Building the GMD Force of the Future
Handpicked Soldiers Protecting the US from Ballistic Missile Threats

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Front Cover: Soldiers from A Battery, 2nd Battalion, 320th Field Artillery (2-320 FA), 1st Brigade Combat Team, 101st Airborne Division, fire rounds from their M119A2 howitzer at enemy targets during Operation Fulton Harvest in the Al-Jazeera Desert, 13 January. A Battery fired more than 1,100 rounds in 48 hours while in direct support of 2-327 Infantry during the operation. (Photo by 1LT Jonathan J. Springer, 2-320 FA Public Affairs)

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Green Tab to Green Tab Fire Support —The BCT Commander's Best Fires Asset

By Major General Peter M. Vangjel, Chief of Field Artillery

Six years of war against a determined enemy has presented us with a number of fire support challenges, however, it also has provided an opportunity for introspection. It is imperative that we examine whether or not our organizational and operational designs and concepts are working as originally envisioned. Under modular force design, the Army's core unit is the brigade combat team (BCT), a unit with organic enablers and capabilities that allow ground commanders to conduct operations that formerly required significant augmentation and/or task organization changes.

During my initial 100 days of command, I spent a great deal of time engaging field commanders—particularly BCT commanders—on the topic of fire support. At the Fires Center of Excellence, Fort Sill, Oklahoma, we are committed to resolving fire support coordination and integration capability gaps that may have arisen as unintended consequences of the transformation to modularity. We must provide BCT commanders with the finest fire support system in the world and allay their concerns and confusion about who best can provide advice, Field Artillery (FA) training and certification support for lethal and nonlethal fires. Modularity has presented some unique challenges for BCT commanders in terms of scope and integration—especially in the fires warfighting function.

Unintended Consequences. The modularized BCT concept empowered the maneuver commander by placing the capability to deliver responsive fires in his operating environment *within* his formation. As with any change, however, it also created unintended consequences that may hinder his ability to integrate and coordinate fires in his area of responsibility (AOR).

One area of concern is the fire support coordinator's (FSCOORD's) role. In the past, the term "FSCOORD" was attributed to the senior commander of the firing unit supporting the maneuver commander. The FSCOORD was responsible for all aspects of fires—from coordination through delivery.

Redefined roles and missions of critical fires personnel in the BCT also have redefined the FSCOORD's position. He is now a staff officer organic to the BCT, without command authority which inhibits his ability to coordinate training and certification for subordinate battalion fire support assets.

Other areas of significant concern are fire support training, certification and professional development. Under modularity, because fire support personnel are organic to maneuver battalions, the subordinate maneuver commanders have training, resource and oversight (TRO) responsibility for all fire support personnel in their units. It is here that the unintended consequences of modularity seem to have "struck a chord" with BCT commanders.

The following are summarized comments from BCT commanders regarding unintended consequences of modularity. Modularity placed fire support training and certification directly in the BCT commander's lap—a task that he is not trained to supervise or execute. It increased the BCT commander's span of control to the point where, because his attention is captured by other command issues, he cannot focus energy on holistic fire support training. A third consequence of modularity centers on professional development.

BCT commanders have expressed some frustration about handling the training management and leader development of their fire support assets. They realize that fire supporters are being retained in units longer than they should be due to a fear that replacements will not be forthcoming. They also are aware that, because in many cases there is no lethal or core FA mission, these adaptable Soldiers now are performing BCT-critical, non-FA functions that have been short filled by other branches, and subordinate commanders do not want to lose them. Further, the maneuver commanders are not as cognizant as they feel they should be with respect to correct assignment patterns and appropriate professional development training for their fire supporters.

Continued dialogue with active BCT commanders has reinforced that their most pressing concerns are: 1) Defining the roles and functions of the staff FSCOORD and the fires battalion commander; and 2) Addressing who best can provide fire support professional development, training and certification.

As BCT commanders experience these issues, I continue to receive inquiries from the field. Among them are: "What should I expect from my FSCOORD? What role does he play with my staff? With my other battalion commanders? How much advice is he capable of giving? What role should my fires battalion commander fulfill? Isn't *he* the senior fire supporter in my brigade? How can I best take advantage of his special skill set for the good of the formation?" These are logical questions and concerns, and it is instructive to examine our doctrinal sources for guidance and consideration before making recommendations.

FSCOORD. The BCT FSCOORD executes critical fires tasks for the BCT commander. *Field Manual (FM) 3-90.6 The BCT* defines the BCT FSCOORD as, "…the special staff officer responsible for BCT fires, which include Army indirect fires and joint fires. He advises the BCT commander and staff on all aspects of indirect fires planning, coordination and execution in support of BCT operations. He assists the BCT S3 to integrate fires into the maneuver commander's concept of operation." Figure 1 lists some of the BCT FSCOORD's responsibilities.

Similarly, *Joint Publication 3-09 Joint Fire Support*, dated 13 November 2006, defines the US Army FSCOORD as "… *the senior Field Artillery (FA) officer* permanently assigned as the full-time fire support staff advisor to the commander and staff. The FSCOORD performs all the staff functions associated with fire support."

There is no specific mention of the experience level or qualifications of the BCT FSCOORD lieutenant colonel (LTC) assigned to the position. Based on current assignment priorities, patterns and the fact that the demand for FA LTCs far exceeds the inventory, the reality is that a LTC serving as a staff BCT FSCOORD will be the *exception* rather than the rule. BCT commanders should anticipate that this position likely will be filled by an FA major. Ideally, he will have served as a fires battalion operations officer or executive officer and be an intermediate-level education (ILE) graduate, but even that is not assured. Thus, the experience level of the officer assigned to the BCT FSCOORD position ensures an able staff officer, but may not provide an experienced leader to cultivate the fire support advisor relationship that a BCT commander desires.

Fires Battalion Commander. The fires battalion commander executes a number of critical tasks for the BCT commander. The fires battalion commander controls all the tactical, logistical, administrative and training activities of the fires battalion. He directs employment of the battalion in accordance with assigned missions from the BCT commander. Figure 2 lists some of the fires battalion commander's duties.

The fires battalion commander can serve also as a maneuver battalion commander when directed by the BCT commander. While this utilization augments BCT capability on the ground, it does not eliminate the requirement for effective fire support advice.

- Direct fires section operations.
- Recommend essential fire support tasks to the commander.
- Recommend fire support coordination measures to the commander.
- Coordinate the commander's fire plan with the fires battalion, the fires brigade and the division fires section.
- Facilitate the targeting meeting.
- Accompany the BCT commander, deputy commanding officer or tactical command post to assist in the execution of tactical operations.
- Advise the S3 on positioning of fires units.

Figure 1: The Fires Support Coordinator's (FSCOORD's) Responsibilities as Outlined in *Field Manual (FM) 3-90.6 The Brigade Combat Team (BCT)*

In addition, the fires battalion commander should assist the BCT commander with personnel management and leader development for FA Soldiers and leaders within the BCT. The fires battalion commander is uniquely aware of professional development "gates" and timelines for Artillerymen and can help the BCT commander assign leaders to various developmental jobs.

A thought for the BCT commanders—in terms of leadership experience, the fires battalion commander has been selected by a Department of the Army board. It is most probable that he has served as a fire support officer at some level from company to division and has acquired the requisite brigade and higher-level fire support experience in previous assignments. He is not simply a peer battalion commander within the brigade, but one with a special skill set—he is an expert in lethal and nonlethal fires integration and coordination. He brings other assets and skill sets to the table to help the BCT commander solve current "fire support training gaps" identified by a number of BCT leaders. He would be my recommendation as the BCT commander's personal fire support advisor.

Addressing Training and Certification Gaps. In examining the functions of the FSCOORD and the fires battalion commander, we see that neither has TRO responsibility for fire support personnel within the brigade. It appears that the staff FSCOORD will be unable to perform this task in the foreseeable future. His newly assigned nonlethal tasks and duties will demand all of his available time.

In my view, the best asset to resolve this gap is the fires battalion commander. He has a staff, assets and resources to execute effective training. Of course, the BCT commander will need to emphasize the importance of fire support training to his subordinate maneuver battalion commanders, but it seems logical for a BCT commander to synchronize and consolidate fires system training under a single commander who answers directly to him.

At least 10 BCT commanders have conveyed to me that they are considering consolidating the FA fire support assets either at the BCT headquarters and headquarters company level or giving them directly to the fires battalion for training and oversight. Such a situation certainly would enable better fire support training, but the commander would need to ensure that his fires battalion commander clearly understands that *support to maneuver battalion commanders is his first priority*. Because the BCT commander now owns all the assets in question, his guidance will be followed.

- Oversee the training of the entire battalion with particular emphasis on those elements directly concerned with delivery of fires.
- Continually assess the needs of the battalion in terms of its ability to sustain its internal operations and to support assigned missions.
- Establish clear and consistent standards and guidance for current and future operations. Ensure the battalion staff and battery commanders understand the battalion commander's intent.
- Establish policies to promote discipline and morale within the battalion.
- Provide for the administrative and logistical support of the battalion.

Figure 2: Some Duties of the Fires Battalion Commander from *FM 3-09.21 Tactics, Techniques and Procedures for the Field Artillery Battalion*

An added benefit is that the fires battalion commander, as a "green tabber," is experienced and, therefore, can provide the higher-level fire support perspective and advice that the BCT commander needs and desires.

Under modularity, the staff BCT FSCOORD *should* be the senior FA officer within the brigade, but current inventory and personnel management priorities cannot support this concept. So who should the BCT commander look to for advice on fires matters? *FM 3-90.6* offers us an opening: "The fires battalion commander is no longer the BCT fire support coordinator (FSCOORD). *The BCT Commander must clearly define the roles of his fires battalion commander and his staff FSCOORD*, and ensure that they clearly understand their respective responsibilities."

In the foreseeable future, the fires battalion commander, without question, will be *the* fire support expert within the BCT. He is a centrally-selected commander, often with sufficient experience to function as the BCT commander's indispensible right hand for fires. He also has a number of other assigned tasks related to the employment of a fires battalion that lend themselves to effective fire supporter training, certification and professional development. He is a valuable tool for the BCT commander with a critical skill set who can help with fires integration, coordination and execution.

A strong interactive relationship between the BCT commander and his fires battalion commander is paramount. It must be based on confidence and competence—a relationship in which the fires battalion commander enables the maneuver commander to dominate his AOR through the effective application of both lethal and nonlethal fires.

Our fires battalion commanders are self-assured in their abilities and willing to help the BCT commander manage fires across his AOR. The fires battalion commander must be "that guy" on whom everyone can rely for all matters related to fire support. The fires battalion commander should be responsible for the fires warfighting function within the BCT. He should be accountable to the BCT commander to ensure all lethal and nonlethal fires assets and organizations are trained and proficient. To that end, we at the Fires Center of Excellence will ensure we provide current and cogent training on lethal and nonlethal fires application and integration to future fires battalion commanders so that they are competent and confident in their roles as the BCT commander's primary fires advisor.

This is an excellent topic for discussion, and I have included it in our agenda for the Fires Seminar in June. The theme for the conference is "Artillery Strong: Challenges and Opportunities in an Era of Persistent Conflict." I know that all FA leaders will arrive well prepared to discuss innovative solutions to a number of issues regarding the Branch.

If you have insights to share, please visit the Fires Knowledge Network website, at **https://www.us.army.mil/suite/page/130700**, and provide your thoughts so that we can capture them for use during the Seminar. It is critical that we also receive input from our many respected maneuver leaders who can help us frame the issues because, ultimately, we are the maneuver commanders' 24/7 fire support force. *Anticipate–Integrate–Dominate! Artillery Strong!*

2008 Fires Seminar—3-5 June

"Artillery Strong: Challenges and Opportunities in an Era of **Persistent Conflict.**"

The 2008 Fires Seminar will be held at the Reimer Conference Center in the Field Artillery School, Snow Hall, part of the Fires Center of Excellence at Fort Sill, Oklahoma, from 3 to 5 June. It will focus on two subject areas: leader development and the integration and coordination of fires in the contemporary operational environment.

Monday, 2 June, will be a session for the battlefield coordination detachment (BCD) community including the BCD commanders and their deputies, key personnel from Department of the Army, Training and Doctrine Command, Combined Arms Command, the US Air Force, Joint and Combined Integration Directorate, and Capabilities and Development Integration Directorate.

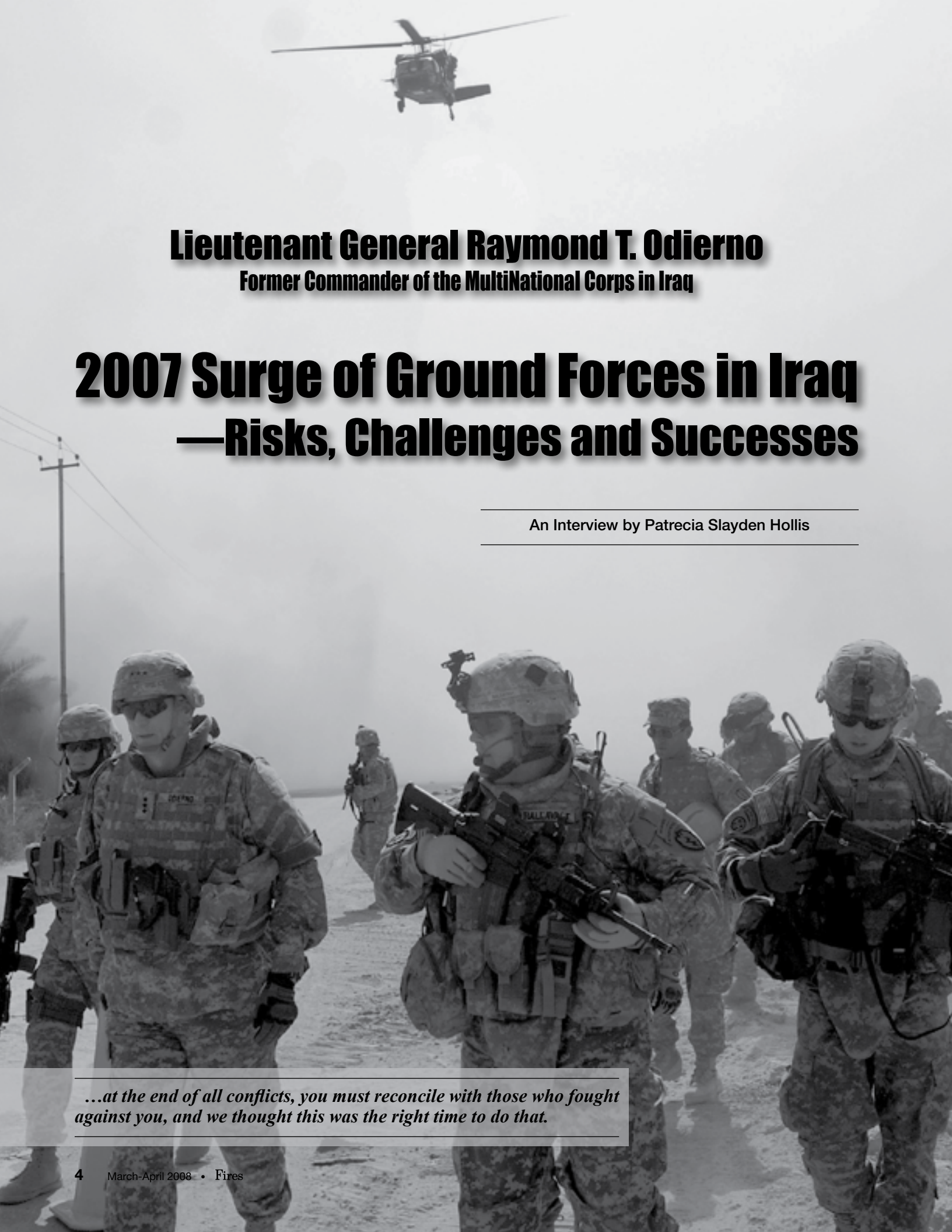
The seminar officially begins on Tuesday, 3 June. The seminar ends at approximately noon on Thursday, 5 June.

Invitees from the 2 June session may attend the seminar. Joint, allied, retired, active and Reserve Component senior leaders of the Army Air Defense Artillery and Field Artillery and Marine Corps Field Artillery should receive invitations via email.

Invitees who haven't received an email invitation may contact the Seminar Support Center at atzr-cva@conus.army.mil.

Information about the seminar is available at **www.mhli.org/fortsill2008/**.

2LT Amos Fox, fire support officer, B Company, 2nd Battalion, 8th Infantry Regiment, 2nd Brigade Combat Team, 4th Infantry Division, secures a building to set up security for the Ashurah pilgrims in Haswah, Iraq, 6 February 2006. (Photo by MC2 Katrina Beeler, US Navy)



Lieutenant General Raymond T. Odierno

Former Commander of the MultiNational Corps in Iraq

2007 Surge of Ground Forces in Iraq —Risks, Challenges and Successes

An Interview by Patrecia Slayden Hollis

…at the end of all conflicts, you must reconcile with those who fought against you, and we thought this was the right time to do that.

Lieutenant General (LTG) Raymond T. Odierno, III Corps Commander, asked for an increase in troops in Iraq to implement counterinsurgency (COIN) strategies after becoming Commander of the MultiNational Corps, Iraq (MNC-I), the ground forces in Iraq, in mid-December 2006. This bold request was in the face of our nation heatedly discussing whether or not US troops should remain in Iraq and how fast the troops could be withdrawn. On 10 January 2007, President George W. Bush announced the "Surge" in Iraq to the nation on TV. It entailed 30,000 additional US Soldiers and Marines on the ground in Baghdad and the Anbar Province, increased responsibilities for the Iraqi government and security forces, and added diplomatic and economic initiatives. LTG Odierno was the operational architect of the Surge in Iraq, which began in February 2007. This interview was conducted on 7 March 2008 at Fort Hood, Texas, two weeks after LTG Odierno returned from Iraq.

Q When you arrived as Commander of MNC-I, what were the conditions that prompted you to ask for additional troops?

A Sectarian violence in Iraq was spiraling out of control. Sunni and Shi'a were attacking each other in a cycle of violence that continued to grow with Iraqi civilian deaths at their highest rate. The plan had been to transition operations to the Iraqi security forces, but the sectarian violence was so high a transition was not yet possible.

So General [George W.] Casey, then Commander of the MultiNational Forces in Iraq, challenged me to determine what we could do to stem the tide of sectarian violence—determine decisive operations that would accomplish that objective. That caused us to start planning.

The Iraqi civilians wanted security, jobs and basic services, and the Iraqi government that was only eight months old was trying to deliver them. But there was a gap between what the Iraqi citizens wanted and what their government could deliver.

Various groups tried to fill that gap—al Qaeda, militias, Iranian-influenced extremists, Sunni insurgents, Shi'a extremists—all telling the people they would protect them when their government could not.

So, first, we had to provide the people security, and we needed the additional troops to do that. We also implemented economic, political and other military programs to help fill the gap and bring more stability to Iraq.

Q Although the international media tends to use the term "Surge" to describe the overall changes in military operations in Iraq, in fact, your operations were in terms of 1) the Surge of US forces, 2) the expansion of Iraqi security forces, 3) reconciliation among factions in Iraq and 4) the stand up of groups of concerned citizens. How did you change corps operations to accomplish them?

A These objectives were not conceived at one time but developed over time. We realized that if we could protect the Iraqi people, they would be less likely to be influenced by those groups advocating violence through intimidation and coercion. So we changed our tactics, techniques and procedures [TTPs] to protect the Iraqis. We pushed all our units out into small operating bases in and outside the city. Previously, our troops had patrolled an area and then withdrawn into large forward operating bases. So we moved our troops out into smaller operating bases, either security stations jointly based with the Iraqi Army or police or to combat outposts that were US only. These platoon- to company-sized formations lived and slept among the Iraqis, 24 hours, seven days a week.

We got to know the people, and they became comfortable with our troops among them as we provided around-the-clock security. This encouraged the Iraqi Army and police to join us, building a synergy of effort that further developed the Iraqi people's confidence that we could provide security.

As the Surge of troops into Iraq began—the first brigade came in, in January, and troops continued to come in until June—we began to conduct offensive operations to eliminate al Qaeda's safe havens and sanctuaries, most identified by the Iraqis themselves. Working with the Iraqi forces, we basically cleared these specific areas, employing house to-house searches.

Another advantage of the Surge was that with the additional units, we ultimately had more American units to partner with Iraqi units. We found this accelerated the development and improvement of many Iraqi formations. The Iraqis learned best by watching us and working with us all day, everyday.

We employed additional protection measures, such as building walls around neighborhoods and markets—"Safe Neighborhoods and Markets." This was necessary to protect the population from al Qaeda and other extremist groups who were attempting to re-accelerate sectarian violence by a variety of means in order to destabilize the Iraqi government, including by causing mass casualties in attacks on neighborhoods or busy markets.

Working with the Iraqi government, we jointly established that everyone conducting extra-judicial killing would be prosecuted—everyone would be treated the same.

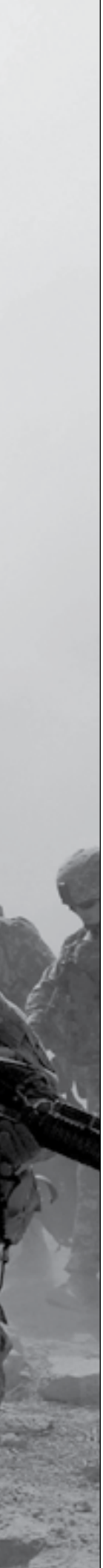
The walls reduced the freedom of movement of the criminals and terrorists because they had to negotiate the joint checkpoints. This along with our increased ability to collect data on them made it more difficult for them to be among the population.

We also changed the way we conducted targeting. Up until early January of 2007, targeting mainly was focused on al Qaeda and Sunni insurgents—not a lot of Shi'a or Iranian-influenced extremists. We realized we had to balance our targeting.

Working with the Iraqi government, we jointly established that everyone conducting extra-judicial killing would be prosecuted—everyone would be treated the same. We started a campaign to target all extremist elements.

With the approval of the Iraqi government, we went into places, such as Sadr City and other areas of Baghdad with Shi'a extremists, to target their leaders and those planning to kill Sunnis, Christians and others. We were very successful at going after these groups, and over time, they realized that if they conducted violent operations, they would be targeted. We began to see a reduction in sectarian violence.

As time went on, the other objectives began to develop. When the people felt more secure, "neighborhood watches"—



Lieutenant General (LTG) Raymond T. Odierno (left) walks with Soldiers as he conducts a visit to a patrol base. (Photo by SSG Curtis Cashour, MultiNational Corps, Iraq [MNC-I] Public Affairs)

concerned local citizens—came forward who wanted to help us protect their families and communities. They were tired of al Qaeda's and other extremist groups' violent methods—dominating the people by extorting money from them and employing heinous means against them. It was impossible for the Iraqis to live normal lives. After we eliminated the enemy's safe havens and sanctuaries and protected the population, it was easier for the Iraqis to come forward to help us.

But this didn't just "happen." It came after company, battalion and brigade commanders had a lot of discussions with the people, reaching out, developing relationships and trust—that's what it's all about: trust.

We then began reaching out to reconcile with enemy groups, from the bottom up. Because we knew at one time, many had fought against us and had been involved in killing or injuring our troops, reaching out was hard to do. But at the end of all conflicts, you must reconcile with those who fought against you, and we thought this was the right time to do that.

Groups wanting to reconcile began coming forward, starting in the Anbar Province with the "awakenings" where tribes wanted to help us fight al Qaeda because they believed their future lay with the Coalition. Then it spread into Baghdad and north and south of Baghdad. It was all about commanders at the local levels reaching out to these groups and accepting reconciliation.

Those reconciling had to sign a statement saying they rejected al Qaeda and other extremists and they would honor and work with the government of Iraq and the Coalition Forces. As time went on, we became confident that the majority of the people reconciling were genuine.

Q What were some of the risks you had to take?

A As the corps commander, I had to provide "right and left limits" for the commanders conducting the new TTPs and "underwrite" any risks associated with them.

We knew an initial risk would be an increase in Coalition casualties at the beginning of 2007 when we went house-to-house to clear well-established al Qaeda's areas. These areas had a significant number of improvised explosive devices [IEDs]—some buried deeply and some set up to protect zones for al Qaeda to operate in. Although we risked an increase in our casualties initially, we had to eliminate these safe havens and sanctuaries to stop the sectarian violence.

Another risk was that some extremists would not be willing to reconcile and would try to devise means to attack and discredit the Iraqi government and Coalition Forces.

But reconciliation turned out to be a very successful program. These people were tired of being part of the insurgency, wanted to reject al Qaeda and wanted legitimacy with the Iraqi government. They thought the best way to gain legitimacy was by reconciling with the Coalition because they trusted we would treat them fairly.

The benefits we gained in reconciliation were increases in intelligence from the Iraqis and their cooperation, helping to marginalize those not willing to reconcile. We then could go after the remaining enemy groups with a clear understanding of who they were.

Those probably were the two biggest risks we took. And we took these risks while the debate was going on in the US about whether or not we were making progress and if we should withdraw our troops.

Q What were your challenges at the corps level?

A We made sure the Iraqi forces and government were involved in *everything* we did—in fact, the Iraqi forces had the lead in Baghdad. We coordinated every operation from my level down to the battalion level with both US and Iraqi forces. That happened more smoothly over time.

One tough recommendation I made was to extend the US troops' tour from 12 to 15 months. Twelve months is a *long* tour—and this was not the first tour for most of our troops. But we needed the expertise on the ground that extra three months to continue the success we were having. In the end, the troops and their families took that extension very well.

As the corps commander, one of my challenges was allocating forces. We did not have the number of troops—ratio of friendly to enemy forces—recommended in the Army's COIN manual to conduct classic counterinsurgency operations. So I had to figure out the best way to use my forces and where.

We knew going into the Surge that we would focus on Baghdad. Based on documents recovered in a raid, we knew al Qaeda thought the areas around Baghdad were important for them to control major routes to bring car and truck bombs, suicide bombers, supplies and the like into Baghdad. So we allocated forces not only in Baghdad, but also for the areas surrounding Baghdad.

I worked force allocation everyday to ensure the right combination of forces were in the right places at the right times. We spent a lot of time studying the areas, getting nightly input from the divisions, analyzing intelligence and wargaming different courses of action to allocate forces.

As it turned out, we made the right decision to allocate forces for the surrounding belt as well as in Baghdad; by doing that, we were able to control the environment better, protecting the Iraqi population and making it more difficult for al Qaeda to conduct operations in Baghdad.

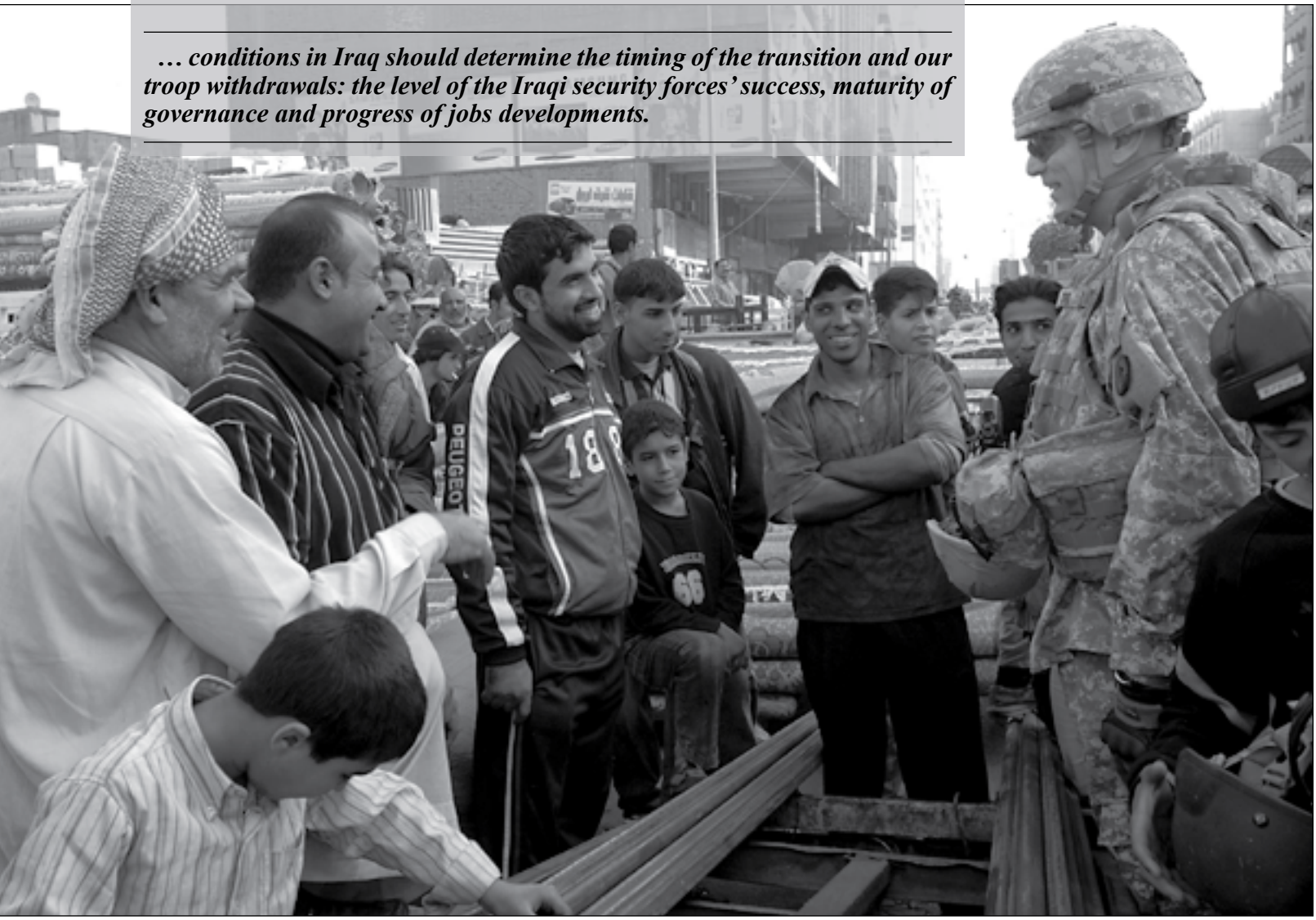
Q How did you balance lethal and nonlethal fires?

A It's all about precision. Iraq is complicated. No area is the same. Each commander had to assess his environment in terms of not only the enemy threat, but also political, economic and governmental capabilities; tribal implications; citizens' reactions to the Coalition Forces; area leaders' interaction with the Coalition; concentrations of religious sects; and other factors. Depending on the environment, a commander could operate differently in one neighborhood as compared to the neighborhood right next to it.

A commander had to be prepared to employ the full spectrum of joint nonlethal and lethal fires in his area. Some commanders conducted 20 percent nonlethal and 80 percent lethal operations, while others conducted 80 percent nonlethal and 20 percent lethal operations. Taking into account the environmental factors, a commander adapted his operations to be effective in each part of his area. This enabled us to conduct precision operations.

One improvement in Iraq, since I was there as a division [4th Infantry Division] commander in 2003, was the volume and accuracy of intelligence data. This intelligence was due in part to the number of Iraqis coming forward with information about al Qaeda and the extremists. But it also was because of the significant increase in the number of UAVs [unmanned aerial

… conditions in Iraq should determine the timing of the transition and our troop withdrawals: the level of the Iraqi security forces' success, maturity of governance and progress of jobs developments.



LTG Odierno talks with shoppers at Baghdad's Shorja Market, 8 December 2007. The General and MNC-I CSM Neil L. Ciotola spent the day touring markets and combat outposts around Baghdad. (Photo by SSG Curtis Cashour, MNC-I Public Affairs)

vehicles], HUMINT [human intelligence] collectors, SIGINT [signal intelligence] and other intelligence sources—they all had increased by tenfold. Battalion and brigade commanders had more access to intelligence than I had had as a division commander.

The commanders' assessments of their areas and our increased intelligence allowed us to truly understand the conditions on the "battlefield." When lethal fires were called for, we conducted precision strikes, whether it be with attack helicopters, MLRS [Multiple-Launch Rocket System], 155 [155-mm howitzers] or close air support. The increased precision of our weapons systems enabled us to strike precisely those people responsible for the majority of the violence while limiting collateral damage and injury or death to innocent people.

One major tenet in Army doctrine has been to "mass effects," referring to lethal effects. In our Surge operations, we massed effects, but they were a combination of different kinds of lethal and nonlethal effects. For example, we massed effects by simultaneously reconciling with Iraqi groups, spending money in specific areas to meet the people's needs and conducting information operations to influence the people and their leaders—plus lethal precision strikes, as necessary.

Q What were some of the most effective TTPs your company-level leaders used to accomplish their missions?

A These young leaders were incredible in how they worked with the population to provide security and build relationships, taking advantage of the effects available to them. Once a company commander cleared an area, he visited four or five homes everyday—just knocked on the doors and started conversations. He got to know the people in his area and began to build relationships with them. In this process, he identified leaders willing to help him move their neighborhood forward.

It was remarkable how these company leaders could adapt so quickly and move from conducting lethal to nonlethal operations in their unique areas. The key was they had the flexibility to do that, and it was part of my job to see that they did. This is what makes our Army so strong: our leaders think through unique challenges on the ground, adapt and overcome those challenges to achieve their objectives.

These young company leaders were very innovative in developing TTPs to meet challenges.

Q As you left Iraq nearly a year after the Surge started, what conditions indicated the new strategies were succeeding?

A First, sectarian violence had decreased by 70 percent—to the point that, today, it is hard to tell if an incident was sectarian

violence or just pure crime. As a result, Iraqi civilian casualties had decreased significantly as well as US casualties.

IED attacks had dropped precipitously—by 70 percent—down to the level of attacks in 2004. For the past two years, IED attacks had been rising steadily.

We had seen a split in Muqtada al Sadr's militia. Most members of his militia had agreed to a cease fire and were working to reconcile with us.

The Iraqi security forces' ability to conduct independent and joint operations had improved significantly.

Many neighborhoods returned to normal. How did we know that? The number of shops open increased by tenfold or more—the shops open in the Doura Market in Baghdad alone increased from 30 to 900, while Taji north of Baghdad had 600 stores open when a year ago only five or six were open.

In December 2006, when I flew over Baghdad in a helicopter as the new corps commander, there were no kids out playing soccer. The last day I was in Iraq, Sergeant Major [Neil L.] Ciotola and I flew over Baghdad and saw kids playing in 182 soccer games.

Although it still has a way to go, the government in Iraq has continued to improve. For example, all 18 Iraqi provincial governments (the equivalent of our state governments) are now functional. They are executing budgets, which they were not able to do before, and developing reconstruction plans.

Across the board, we saw a revival of calmness and greater stability and prosperity in Iraq.

Things have changed for the better in Iraq, but I don't want to leave the impression there are no challenges. There is still danger—although we've seen a significant degradation of al Qaeda and extremist operations, there are still groups in Iraq able to conduct attacks.

Overall, basic services in Iraq are better. But some parts still lack electricity and some have problems with water and sewage.

The Iraqi security forces still need to improve, and they need equipment. The Iraqi forces are adding 40 battalions in 2008, and they don't have all the officers they need. The Iraqis want each officer to have a three-year specialized education, which will take some time. But the "good news" is the Iraqis are not willing to make just anybody an officer.

LTG Odierno speaks with a group of local sheiks at Patrol Base Kemple on the banks of the Euphrates River, 18 December 2007. (Photo by SSG Curtis Cashour, MNC-I Public Affairs)

In 2007, the Iraqis rejected al Qaeda and evil, clearly demonstrating they want to move forward.

Iraq now has security and hope. In 2007, the Iraqis rejected al Qaeda and evil, clearly demonstrating they want to move forward.

Q What role do you recommend for the US military in the long-term development of Iraq?

A The requirements of our military will change and decrease over time. Obviously, we hope to continue to transition the country's security responsibility over to the Iraqis. And as we do that, we want to enable other governmental and nongovernmental organizations to help the Iraqis build their economy and governance.

For some time, we will have a role in helping to develop, train and equip the Iraqi security forces. In the short term, maybe for the next couple of years, we still will be involved in helping them provide security.

The process of transitioning all responsibilities to the Iraqis must be conditions-based. Conditions in Iraq should determine the timing of the transition and our troop withdrawals: the level of the Iraqi security forces' success, maturity of governance and progress of jobs developments.

Q The new *Field Manual (FM) 3.0 Operations* says, "The fires warfighting function is the related tasks and systems that provide collective and coordinated use of Army indirect fires, joint fires, and command and control warfare, including nonlethal fires, through the targeting process." In comparison to this emerging doctrine, how did you employ your Joint Fires Cell?

A The cell operated just like *FM 3.0* says it should. It was responsible for synchronizing all lethal and nonlethal fires—from allocating close air support, MLRS or other lethal fires, to conducting information operations, to overseeing reconciliation, to synchronizing how the corps used money to produce certain effects—the cell worked across the full spectrum of effects. It monitored and synchronized all those programs and developed policy for me to ensure we allocated our assets in the key areas.

In my mind, the cell did what it always has done: helped the commander mass his effects where most needed. The only difference is the effects we massed were not "traditional" effects, but they still played the same role in our operations.

Q Why do you have a brigadier general vice the colonel authorized as chief of the corps fires cell, your Joint Fires Cell—why a Deputy Commanding General for Fires (DCG-Fires)?

A The cell's operations were very significant to our success in the Surge. The cell worked closely with the Iraqis and other Coalition Forces as well as other US and international agencies. It needed the experience, expertise and authority of a general officer as its chief.

LTC Troy Perry (right), Commander of the 2nd Battalion, 69th Armor Regiment, 3rd Brigade, 3rd Infantry Division, and LTG Odierno (center) look on as Turki Hamad, a local school teacher, points out damage caused by a 26 July 2007, vehicle-borne improvised explosive device attack in Baghdad's Karada neighborhood. (Photo by SSG Curtis Cashour, MNC-I Public Affairs)

It is time for the Army to authorize a brigadier general as chief of the corps fires cell.

Q How did the fires functions in the new modular brigade combat teams (BCTs) and divisions work, and what do you see in the future?

A Each division and brigade environment was very different—even within one area of responsibility—making the employment of fires assets different.

All the BCT and division commanders considered their fires battalions and fires brigades to be maneuver elements. These units still were responsible for delivering fires, employing radars, calling for fires—all the more traditional fires tasks. But they also owned battlespace and conducted reconciliation, engagements, patrols—in short, they were responsible for multiple functions. The flexibility of the Field Artillery units to execute multiple functions was a common theme in the BCTs and divisions.

We have been employing the modular structure in theater for a couple of years now, and it is time for an AAR [after-action review]. Division and brigade commanders need to examine the implications of the modular structure on the fires function and not only in COIN, but also for the long term across the spectrum of conflict.

Q What do you see as the future of the fires brigades?

A The fires brigades in MNC-I belonged to the divisions. The enablers the additional headquarters brought—the leadership and analysis, planning and execution capabilities—gave the division commanders tremendous flexibility. And this would be as true in higher intensity conflicts as it is in COIN.

Fires brigades also brought the capability to fire GMLRS [guided MLRS or GMLRS Unitary, pronounced "Gimlers" in theater], which was extremely valuable. Once a month, my Joint Fires Cell briefed me on GMLRS Unitary coverage in Iraq because it was that important to our operations.

If you talk to the division commanders, they all want their own fires brigades. So, I think we need to take a look at the fires brigade structure in the Army. We must do the analysis and decide whether or not we need more fires brigades and, if so, how many more. It is time to talk about that.

Q How did you employ GMLRS Unitary, the 70-kilometer MLRS-fired precision-guided munition (PGM), and Excalibur, the 24-kilometer 155-mm-fired PGM?

A First, they were *extremely* effective. In fact, GMLRS and Excalibur were my brigade commanders' weapons of choice.

These brigade commanders faced several challenges. They needed fires that would take out a target precisely in urban areas from standoff distances while causing little collateral damage or risk to their own forces. Commanders liked these two PGMs because they could employ them in all weather conditions.

Commanders also used close air support PGMs very effectively. The point is the brigade commanders had a range of PGMs to choose from, based on the type, size and location of the target. Close air support PGMs usually had 500-pound warheads, GMLRS has a 200-pound warhead while Excalibur has a 50-pound warhead, giving commanders options. We *must* have these and other precision strike capabilities for future operations.

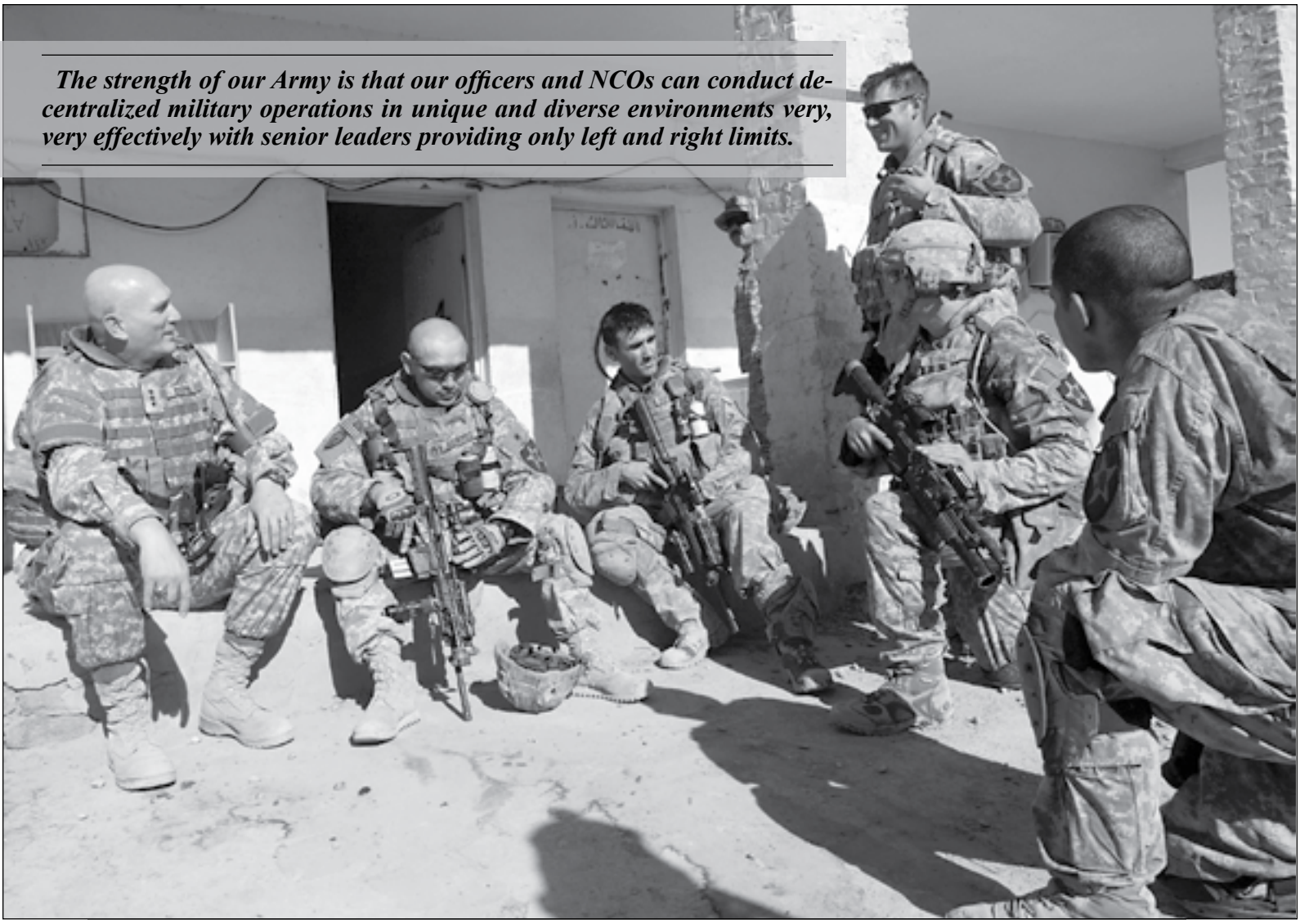
Division and brigade commanders need to examine the implications of the modular structure on the fires function and not only in COIN, but also for the long term across the spectrum of conflict.

Q What should Artillerymen be doing to be most effective in our nation's future military operations?

A First, you must maintain your skills and capabilities to provide accurate, predicted fires on time and on target. You are proven fire supporters—the best at integrating and synchronizing all effects—and those skills are critical to the Army as well.

You must maintain the standards. Command Sergeant Major Ciotola says that it takes courage to lead and enforce the standards. It is easier *not* to enforce standards.

The Army needs young leaders with the courage to enforce standards, which ultimately saves lives and prevents injuries everyday. The best units maintain clear standards in all operations throughout their deployments. Disciplined organizations



The strength of our Army is that our officers and NCOs can conduct decentralized military operations in unique and diverse environments very, very effectively with senior leaders providing only left and right limits.

LTG Odierno (left) meets with Soldiers of C Company, 2nd Battalion, 23rd Infantry Regiment, 4th Brigade Combat Team, 2nd Infantry Division, at Combat Outpost Crazy Horse on 10 November 2007. (Photo by SSG Curtis Cashour, MNC-I Public Affairs)

not only accomplish their missions, but accomplish them with fewer casualties.

And you must continuously evaluate yourselves and adapt in order to execute changing missions across the spectrum of conflict. This is true of the entire Army as well, not just the Artillery.

The strength of our Army is that our officers and NCOs can conduct decentralized military operations in unique and diverse environments very, very effectively with senior leaders providing only left and right limits. We must continue to develop leaders who think, adapt and innovate so well that senior leaders empower them to plan and execute operations down to the company levels.

Q What message would you like to send Artillerymen stationed around the world?

A You are the Army's ultimate "Pentathletes" with your leadership, flexibility, agility, adaptability and attitude toward mission success. You execute many diverse missions in multiple warfighting functions very well.

As a branch, you are involved at every level of Army operations, from the company to the corps levels, giving you a comprehensive perspective of fires and maneuver. As captains, you work at the battalion level, as majors at the brigade level and as lieutenant colonels at the division level—gaining experience and expertise at one level above your rank. You understand effects at all levels and how they affect the range of military operations—tremendous value added to the Army

As Artillerymen, you should be very proud of what you have accomplished.

Lieutenant General Raymond T. Odierno, until recently, was the Commander of the MultiNational Corps, Iraq (MNC-I) and was the operational architect of the 2007 Surge. At the time of this interview, he was the Commander of III Corps at Fort Hood, Texas, and has been nominated for his fourth star and will become the Commander of the MultiNational Forces, Iraq. He served as the Assistant to the Chairman of the Joint Chiefs of Staff at the Pentagon; Commander of the 4th Infantry Division in Iraq, deploying it for Operation Iraqi Freedom (OIF); Director of Force Management for the Army's G3 at the Pentagon; and Deputy Commanding General of Task Force Hawk in Albania. During Operations Desert Shield and Storm, he was the Executive Officer for the 3rd Armored Division Artillery. He holds two master's degrees, including an MA in National Security and Strategy from the Naval War College, Newport, Rhode Island.

Patrecia Slayden Hollis is an independent consultant. She was the Editor of the *Fires* and *Field Artillery* Bulletins at Fort Sill, Oklahoma, and the Managing Editor before that, retiring in 2007.

Fires LEADERS' LIBRARY

Air Defense and Field Artillery Soldiers and leaders are more responsible for their career development and personal knowledge acquisition than ever before. Often, however, it's difficult to know where to go for helpful information without *some* guidance.

With that in mind, *Fires* brings you a new feature—Leaders' Library. This section will feature books and articles *your* leaders consider informative, important and relevant to today's continuously evolving operating environment and developing Pentathletes. Email the *Fires* Bulletin at firesbulletin@conus.army.mil with your thoughts about the selections.

I would like feedback from the field to know how these Leaders' Library selections apply, if at all, to your current situation.

Major General Peter M. Vangjel
Chief of Field Artillery (FA)
Commanding General, FA School and Fort Sill

Recommendations:

Firepower in Limited War - Robert H. Scales Jr., Revised Edition, Novato, CA: Presidio Press, 1997. 325 Pages. $17.95

Artillery of the Napoleonic Wars, 1792-1815 - Kevin F. Kiley, Greenhill Books/Leventhal, Limited, 2002. 300 Pages. $34.95

Review of *Firepower in Limited War*

In his book, Robert H. Scales Jr. examines the use of firepower in limited war, ranging in intensity from acts of terrorism to larger conflicts with intensities less than full-scale conventional war along the lines of Operation Desert Storm. By doing this, he hopes to furnish useful insights into the employment of firepower in a wide variety of circumstances to provide leaders with a realistic perspective of the firepower's strengths and limitations.

He discusses firepower in the American way of war, the Second Indochina War of the 1960s, the Soviet intervention in Afghanistan in the 1980s, the Falklands Campaign of 1982, Operation Desert Storm of 1991, and future limited war. The first four case studies he took from the first edition, published by the National Defense University Press, while the chapter on Operation Desert Storm was excerpted from his book, *Certain Victory: The U.S. Army in the Gulf War* (1993). In each conflict, firepower from mortars, field artillery, helicopter gunships, or tactical airpower played a critical role in defeating the enemy. It permitted friendly ground forces to cross the killing zone alive and accomplish their mission.

Looking into the future of limited war, including insurgencies, he envisions an essential role for firepower in the form of precision munitions and targeting to protect friendly ground forces or to destroy enemy formations. In sum, Scales supplies a useful analysis of firepower in limited war.

Dr. Boyd L. Dastrup
FA Command Historian
US Army Fires Center of Excellence
and Fort Sill, Oklahoma

2008 *Fires* Photo Contest Deadline 1 August

The 1 August submission deadline for the 2008 *Fires* Photo Contest is approaching quickly. The competition is open to any military or civilian, amateur or professional photographer.

Scope and Purpose. Photos should capture images that tell the story of today's Army and Marine Field Artillerymen or Air Defenders in the War on Terrorism (WOT) or in training between June 2007 and June 2008. These photos may appear as a cover or other shots for future editions of the magazine, as part of the Chief of the Fires Center of Excellence poster series or in other esprit de corps or strategic communications projects.

Although entrants may submit horizontal or vertical photographs, vertical shots tend to work best for magazine covers and posters. For more information on how to take a great photo, visit our website at **sill-www.army.mil/firesbulletin/photographers.asp**.

Two Prize Categories—Six Prizes. A First Place prize of $500, Second Place prize of $200 and Third Place prize of $75 will be awarded in each of two categories: 1) Training for Combat/Stability Operations and 2) Actual Combat/Stability Operations. Each entrant can submit up to three photographs.

The winning photos will be published in *Fires* and posted in the magazine's Photo Gallery on our website at **sill-www.army.mil/firesbulletin/**.

Submissions. Submit your photos to *Fires* Bulletin via email, CD, zip disk or file transfer protocol. Email images to the *Fires* Bulletin at firesbulletin@conus.army.mil. Please submit only one image per email. Mark the subject line as "2008 Photo Contest/Photo #1 (2 or 3), Entry Category–Your Last Name."

For more information on the contest rules, please visit our website at **sill-www.army.mil/firesbulletin/contest.asp**. If you have further questions, call the *Fires* staff at DSN 639-5121/6806, commercial at (580) 442-5121/6806 or email us at firesbulletin@conus.army.mil.

Embracing the Joint Training Enterprise

By Major (Retired) William M. Rierson, FA

The US clearly is fighting an adversary that resorts to asymmetric warfare; insurgents in Iraq and Afghanistan know they cannot defeat the US military on the conventional battlefield.

In an effort to overcome an innate lack of collaborative supporting arms, the irregular enemy soldier merely resorts to the most basic of warfare tactics—small units, decentralized "hit and run" tactics, ambush, assassination and simple sabotage. He looks for and attacks our weaknesses. He blends into the civilian population and uses it for cover and concealment. He manipulates information or generates misinformation that can alter economic, political and societal landscapes, impacting combat operations.

Time can be an enemy also. The Vietnamese fought for 30 years. The Sandinistas fought for 18 years. The Palestinians continue to fight after 40 years. Patience is the one virtue the modern insurgent has in ample reserve and as a potential advantage over our conventional forces. In opposition to that advantage, our own political and domestic environments require us to find a means quickly to defeat the insurgency or, at a minimum, create conditions that permit the host nation to assume the military lead of the counterinsurgency fight.

This article addresses how our predominantly conventional military trains to defeat an unconventional enemy who is willing to accept huge losses and constantly is adjusting tactics to counter or avoid our strengths.

Leveraging Resources. Countering our adversary's advantages and unconventional tactics means US and coalition ground maneuver units must leverage the joint application of all US Services' resources to bring their combat power to bear in a full and coordinated response. Widely distributed forces, like those we have in Iraq and Afghanistan, must be able to gather and share information efficiently and rapidly via a secure network at all levels of command and across boundaries. This information superiority, in turn, increases command speed and coordination opportunities across the battlespace. It allows our forces to "get inside" our enemy's abbreviated decision cycle and mitigate the advantages of hide-strike-hide insurgent tactics and *ad hoc* command and control architectures. It sets the stage to defeat the enemy piecemeal—cell by cell, leader by leader.

We are engaged on a nonlinear battlefield that demands resources beyond traditional Cold War era air-land battle planning and "combined arms" operations. We are challenged to plan and execute timely joint operations. Failure to provide and disseminate timely intelligence that supports surgical effects-based operations will result in our inability to counter a sophisticated insurgent threat. Our conventional ground and supporting air forces must arrive in theater prepared for this new asymmetric fight. To do so, units down to the brigade combat team (BCT) and squadron levels must carry out innovative and realistic predeployment training that includes joint training objectives.

The old Army cliché used during the Cold War era is still applicable: "Train the way you fight." A new interdependent joint force training model is required to take advantage of the combat multipliers available to the warfighter, even down to the individual trooper.

But, how does a 21-year-old sergeant, leading a combat patrol, gain immediate access to joint assets that can provide him the supporting firepower he may need to engage an immediate threat? Even more importantly, how does that sergeant's commander gain the actionable intelligence provided by those same joint resources that may alleviate engaging in close combat or delivering a lethal response?

Removing insurgent threats without high-risk close-combat action or destructive power (that increases the potential for collateral damage) requires collaboration and interdependency of intelligence resources. When a passive solution is not possible and a lethal response is required, or organic weaponry is not adequate or appropriate, the maneuver commander should be able to rely consistently on immediate and effective nonorganic *joint* fire support. Such a capability dictates binding Services partnerships and integration of Services' resources to provide joint training opportunities.

Rehearsals are Key. Joint training and realistic mission rehearsals are the key—not only for that sergeant and his commander, but for the supporting assets—the fighter pilots, intelligence analysts, ground surveillance radar operators and the coordinating staffs. Synchronized tactical training scenarios should not only permit joint force participation, but require it for units to accomplish

their missions. Establishing a persistent combined-arms, interdependent joint training model must be the standard, not the exception, for all Services' combat training centers (CTCs), equivalents and homestation collective training events. Innovative training must transcend traditional Service training norms and leverage joint force capabilities throughout the depth of the battlespace.

A potential joint solution template is the ongoing BCT air-ground integration training concept. The BCT air-ground integration experiment is a collaborative Army Training and Doctrine Command (TRADOC) and Air Force Air Combat Command (ACC) initiative supported by US Joint Forces Command's (USJFCOM's) Joint Fires Integration and Interoperability Team (JFIIT). It is a direct response by the Services to Central Command's (CENTCOM's) request to reduce proficiency gaps in operational planning and using joint air-ground resources.

Predominately, the desired result is for BCTs to leverage joint close air support and joint intelligence, surveillance and reconnaissance (JISR) assets better, from the national level down, to help prosecute the tactical fight. The BCT air-ground integration emphasizes individual skills training and predeployment training during homestation collective training events, culminating in a mission readiness exercise at the CTC. At each step along the way, the Services' training coordinators and force providers include joint context, where appropriate, through synchronizing not only training scenarios, but also resources.

Training Assessment. JFIIT's role is to conduct assessments of each training event. These assessments occur during homestation training and CTC rotations. The assessments focus primarily on the ability to create a realistic joint training environment. Additionally, the assessments measure the unit's improvement in air-ground integration to determine the efficacy of the training.

Based on assessment results and feedback collected by the Center for Army Lessons Learned (CALL) during training and in the theater of combat operations, JFIIT writes collaborative reports chronicling the entire concept. The culminating report does not detail the participants' strengths and weaknesses, but determines whether the BCT air-ground integration concept was successful at creating a joint training environment and increasing participant abilities to conduct joint air-to-ground operations.

The BCT air-ground integration training initiative and other synergistic initiatives, such as the JISR Integration for the Western Range Complex, are equal parts of a holistic solution to import a joint training capability to the Services. That solution is the "Joint Training Enterprise," as termed by US Army Major General Jason K. Kamiya, Director of Joint Training (J7) and Commander of the Joint Warfighting Center at USJFCOM. These collaborative efforts involve the USJFCOM J7/J8, TRADOC, ACC, Forces Command (FORSCOM), Fleet Forces Command (FFC) and Marine Forces Command (MARFORCOM).

Training Template. Rather than occurring as an anomaly, a persistent joint training routine helps the maneuver and air power commanders coordinate the full application of joint combat power and intelligence gathering capabilities to facilitate a successful counterinsurgency within the current operational environment. This same joint training capability "template" could be applied to any homestation, CTC or collective training event to provide a viable joint solution to joint air-ground gaps identified in the CALL Joint, Interagency, Intergovernmental and MultiNational (JIIM) Lessons Learned Report 2007, Joint Context Training and Knowledge Gaps, 16 March 2007.

To achieve trained, integrated, interdependent joint forces, commanders at the major Services and joint command levels formally must mandate joint training take place and create opportunities for the Services to exercise joint tasks. Service training venues must embed joint training as part of the predeployment training sequence, not simply offer or program it into occasional joint training exercises.

Until senior leaders dictate joint training as a requirement and not as an option, the Services and subordinate tactical level commanders at the street fighting level will continue to focus on the "25-meter targets" of individual and unit collective training. They perceive their plates as full with no room for another task; for most, this is an accurate perception. There is only so much time within the regeneration process. The end result is they often ignore joint training until they are in theater and then must conduct on-the-job training while under fire. Embedding joint training tasks within currently existing Services' training is the only real option, and BCT air-ground integration is the start.

Major (Retired) William M. Rierson, Ph.D, Field Artillery (FA), is the Lead Analyst for the Joint Fires Division, Joint Fires Integration, Interoperability Team (JFIIT) at Eglin Air Force Base, Florida. He served as a Joint Fire Support Instructor at the US Air Force Air Ground Operations School in Hurlburt Field, Florida; Assistant Professor of Military Science at North Georgia College in Dahlonega; Commander of Headquarters and Headquarters Battery, 3rd Battalion, 1st Field Artillery, (HHB/3-1 FA) in Bamberg, Germany, deploying in support of Operation Desert Storm; and a Fire Support Officer for 2-10 FA at Fort Benning, Georgia. He also served as a Fire Support NCO for Division Artillery Support Element and 2-6 FA in Hanau, Germany, before receiving his commission. He has a Doctorate of Education from the University of West Florida in Pensacola.

Joint fires observers call for air-to-ground engagements during the 4th Brigade Combat Team's, 4th Infantry Division, rotation at the National Training Center, Fort Irwin, California. (Photo by Casey Bain, Joint Fires Integration and Interoperability Team)

CPT Dale Thurber, assistant operations officer and battle captain, 42nd Infantry Division (42 ID), explains tactical maneuvers to the Egyptian Army's 9th Armor Division (9 AD) battle staff as the two groups prepare for Bright Star 2007, at the Cairo West Air Base, 9 November 2007. (Photo by SFC Peter K. Towse, 42 ID Public Affairs)

Operational Fires and **Effects: Full-Spectrum** Capability for the ASCC

By Chief Warrant Officer Four John A. Robinson and Colonel Billy F. Sprayberry, both FA

Leading the Army's transformation at echelon-above-Corps, US Army Central Command (USARCENT) is in the final stages of its makeover as the Army's first Army Service Component Command (ASCC). The development of its multifunctional Operational Fires and Effects Directorate has been on the cutting edge of this evolution and has joined the operational fight paving the way for other ASCCs to follow.

Recognizing that the nature of each ASCC differs according to location and mission focus, this article shares developmental lessons learned, the Operational Fires and Effects roles and missions, and some thoughts on the way ahead.

Transformation. The entire USARCENT general staff already has transformed, so this article focuses primarily on the transformation and role of the Operational Fires and Effects Directorate, still a subdirectorate of Operational Maneuver (G3). This will change and fall in line with the ASCC Design Model 3.2, subordinating G3 Fires directly under the chief of staff. (See Figure 1 for the new organizational structure.)

For organizational control, Operational Fires and Effects is subdivided into three divisions: joint fires, effects synchronization and information operations (IO). For deployment control, Operational Fires and Effects is divided further into the operational command post (CP) and the main CP elements.

For Operational Fires and Effects, a 10-12 person slice of the operational CP—designated the early entry CP—actually will precede the operational CP into theater, serving a tactical CP-like

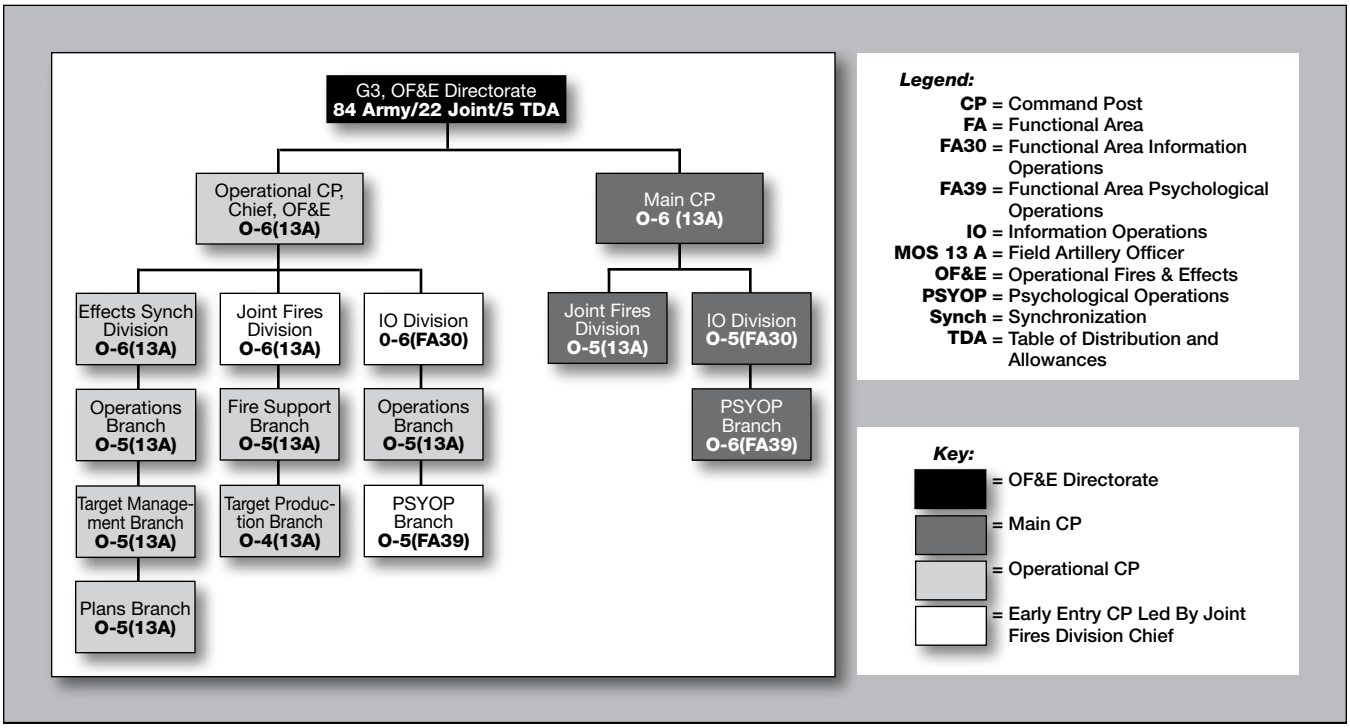


Figure 1: New Operational Fires and Effects Directorate Organizational Structure

function. The early entry CP is led by the joint fires division chief (Field Artillery O6) and includes joint fires division, IO division and psychological operations (PSYOP) personnel.

For the deployable ASCC, the operational CP is considered the general staff's primary deployable element. When the operational CP enters theater, it rejoins the early entry CP. The main CP initially serves as a reach-back node, but once the theater has matured sufficiently, the main CP deploys to rejoin the operational CP (see Figure 2).

For fires and effects coordination, the benefits of the ASCC structure over the legacy structure are immeasurable. Under the old construct, fires and effects disciplines were dispersed throughout the staff, and fires personnel were positioned under G3 Current Operations. Often, IO and PSYOP personnel were augmentees, joining an inadequately staffed organic IO section. Due to compartmented planning and security clearance issue, targeteers were partitioned and routinely were inaccessible to fires and IO personnel. When resourced, fire support planners resided within G3 Plans or G3 Future Operations. Finally, under the legacy construct, there simply was no counterpart to the effects synchronization division, a capability that quickly has proven indispensable within the transformed ASCC staff.

Staff Actions Synchronization. The staff transformation—from augmentee-based to organic-based—and follow-on consolidation of fires and effects functional disciplines have eliminated the stovepipes that thwarted timely sharing of information and synchronization of staff actions. However, if the effects synchronization division were not added to the lineup, just the teaming of joint fires division and IO division still would have not produced the synergistic effects we achieve today. Through its operations branch, the effects synchronization division is more than *just* the "glue that binds" the lethal and nonlethal capabilities of joint fires division and IO division, respectively. The divisions' target management and plans branches also provide the level of exactness that drives the entire Operational Fires and Effects Directorate.

Because the regional ASCC typically has day-to-day, real-world, theater-supporting functions; having these teams work, train and play together during routine, daily operations builds a more cohesive group if operations accelerate from shaping to domination (see Figure 3 on Page 16).

COL Carl Pfeiffer (bottom right), Chief of Staff, 42 ID, observes as LTC Hesham Rashdy (center), Chief of Intelligence for the Egyptian Army's 9 AD, reviews battle plans with MAJ Mustafa Omra (left), Future Operations Officer, and other members of his staff in the 42 ID command post in Cairo on 6 November 2007. (Photo by SFC Peter K. Towse, 42 ID Public Affairs)

Warfighting Functions Synchronization. It is the effects synchronization division that brings together the joint fires division (lethal) and IO division (nonlethal) and all of the "soft power" interagency combat multipliers to mass a variety of unconventional assets on a conventional problem set. These multipliers include public affairs, civil affairs, engineers, chaplain, surgeon, operational sustainment (personnel and logistics) and operational protection (military police; chemical, biological radiological, nuclear and explosive; and air defense). In coordination with others, the effects synchronization division is the lead agent for those working groups and boards that serve to synchronize USARCENT's warfighting functions.

Conceptually, our intent is to feed operational planning considerations (developed by staff operational planning

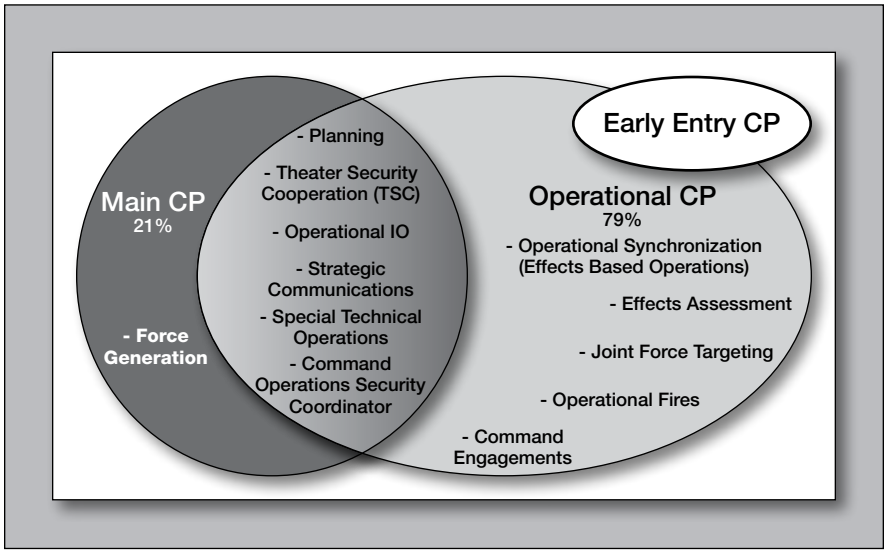


Figure 2: Operational Fires and Effects Directorate Roles and Missions

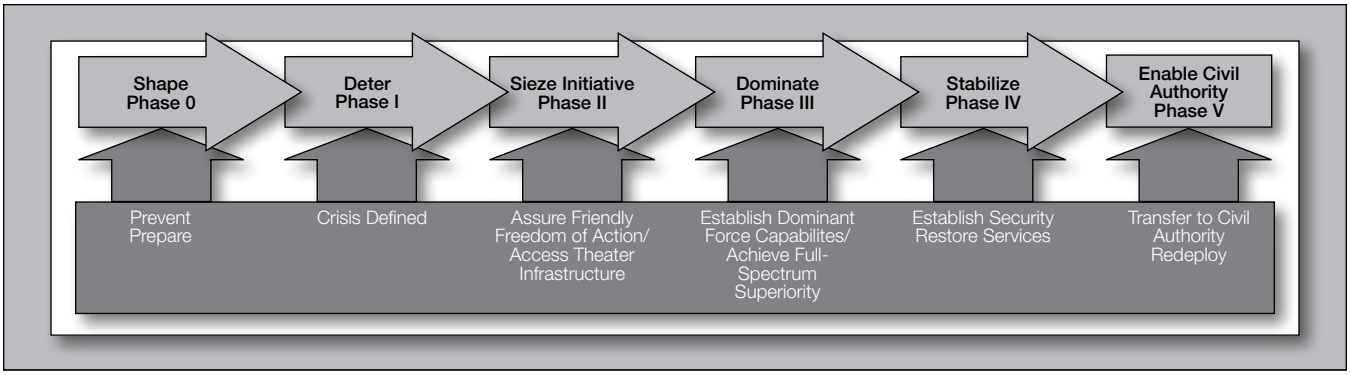


Figure 3: Phasing Model (*Joint Publication 3-0 Joint Operations*, dated 17 September 2006)

teams), targeting recommendations (via the targeting working group) and IO solutions (via the IO working group) into an effects working group that meets weekly. The effects working group, chaired by the effects synchronization division chief, serves as a forum for reviewing options and plans and conducting face-to-face coordination between staffers (see Figure 4).

Ultimately, the options, plans and other initiatives are forwarded through the monthly Council of Colonels to the monthly effects synchronization board. This synchronization process and the targeting and other subordinate processes that feed into it are designed to work throughout joint full-spectrum operations from Phase 0 through Phase V (see Figure 3).

Of the five phases, Phases 0 (Shape) and III (Dominate) are the most distinct in terms of their respective focus on either soft or hard power. This article will pay particular attention to those two phases.

Phase 0—Shape. USARCENT remains focused on a four-part mission set (see Figure 5) when engaged at operational and strategic levels as it deals with a total of 27 countries throughout the Central Asia, Middle East and East Africa regions.

As illustrated in Figure 4, the USARCENT battle rhythm is geared toward day-to-day, real-world shaping operations, classified in the joint lexicon as "Phase 0 operations."

Joint Publication (JP) 3-0 Joint Operations defines the *shaping phase* as: "Joint and multinational operations…performed to dissuade or deter potential adversaries and to assure or solidify relationships with friends and allies….'Shape' phase activities…may be executed in one theater in order to create effects and/or achieve objectives in another."

USARCENT maintains two headquarters—the forward CP, based at Camp Arifjan, Kuwait, and the rear CP at Fort McPherson, Georgia. The forward CP maintains Parts 2 and 4 of the four-part mission set (see Figure 5). The majority of Parts 1 and 3 are administered from the rear CP where the bulk of Operational Fires and Effects is based. These CP locations are not to be confused with the deployment construct of operational CP and main CP.

Theater security cooperation activities, coordinated through the G3 Civil International Military Affairs, are one subset of theater engagement and are so wide-ranging that the greater USARCENT staff can contribute to activities accomplishment. Theater engagement activities include exercises, operations, planning conferences, command and staff consultative talks, exchanges, seminars and workshops, leadership education, symposiums, senior leader visits and engagements, and orientation visits.

Targets of Opportunity. In a typical month (see Figure 4), USARCENT targeteers continuously review all sources of intelligence and reporting, looking for new opportunities to develop theater engagement activities. One key consideration in this effort is to look for ways to enhance a country's ability to stand with us in the War on Terrorism (WOT) and/or bolster its indigenous counterterrorism capabilities. For example, if a particular country's army expresses an interest in or demonstrates a need for enhanced medical or engineer capabilities, this could translate into a medical or engineer information exchange; while another country might benefit from a visit by US senior NCOs offering recommendations to improve its NCO corps or training.

These *targets of opportunity* are developed and submitted to the targeting working group for staff consideration, vetting and further development. Once a target is deemed viable, it is forwarded

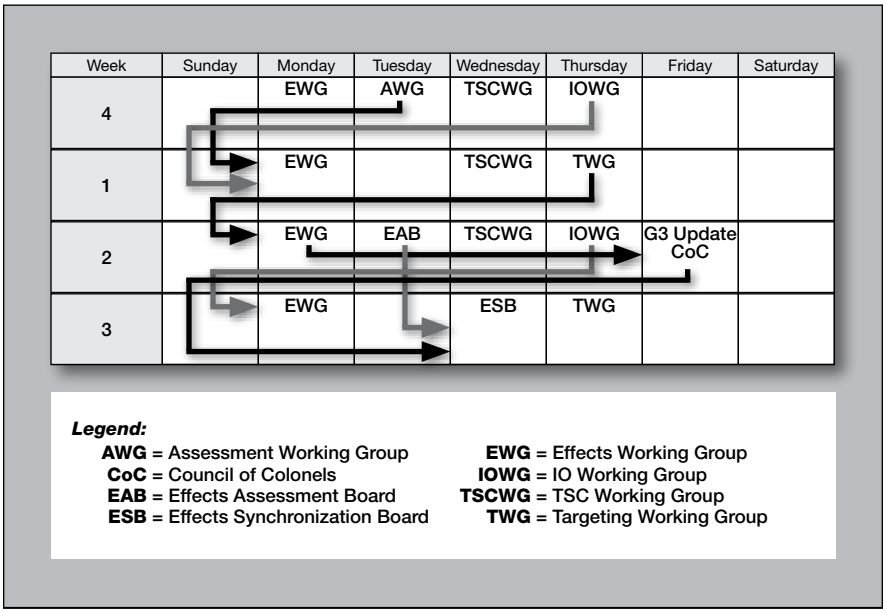


Figure 4: Phase 0 Battle Rhythm Calendar

to the effects working group for inclusion into the broader USARCENT engagement framework. After a review by the Council of Colonels, it is briefed to the commanding general.

IO Working Group. Items flowing from the IO working group follow a similar process. This is essentially a strategic communications process, and the USARCENT Commanding General sees it as such.

Some engagement opportunities must be preceded by a commander's offer to the host nation. For instance, the actual senior leader engagement may be the primary purpose of a country visit. The IO working group, in coordination with Civil International Military Affairs, participates in the development of objectives, themes and messages for country visits and offers of assistance.

Other engagement opportunities are "domestically-focused" and include senior leader visits with key decision makers at the combatant command, Department of the Army and Joint Staff. We must put forth the same effort for domestic communications as we do for international communications.

No process is complete without a feedback process integrated within the execution loop. Key to this assessment process is feedback garnered through domestic and international engagement opportunities. This entire process is facilitated through the biweekly assessment working group and monthly effects assessment board. Assessments are driven by our four-part mission focus and our ongoing theater engagement and security cooperation initiatives.

The CENTCOM AO may be the most critical focus area for current US strategic engagement. It contains all three WOT theaters—Iraq, Afghanistan and the Horn of Africa—and requires our constant attention to contain future threats, build relationships to mitigate those threats, and to ensure our continued access to support ongoing combat operations. USARCENT's Phase 0 operations are critical and ongoing. The Operational Fires and Effects Directorate leads the staff in ensuring we meet these challenges head-on.

Phase III—Dominate. USARCENT retains its legacy mission of operating as a forward-based ASCC to plan and, on order, conduct full-spectrum operations across the USCENTCOM AO. This means we must be prepared to serve as a land component command as previously performed in Operations Iraqi and Enduring Freedom (OIF and OEF) or a joint task force (JTF) headquarters or both. Before transformation, USARCENT was not resourced organically to perform either of these missions and heavily relied on external personnel augmentation to operate as such.

1. Provide a forward-based Army service component command to plan and, upon order, conduct full-spectrum operations across the US Central Command area of operations.
2. Provide Title 10 support and services to theater Army forces commands and directed Army support to other services.
3. Conduct TSC activities.
4. Support force rotations, conduct combined and joint reception and staging operations, and provide theater sustainment and other support as required to forces in Iraq, Afghanistan and the Horn of Africa.

Figure 5: US Army Central Command Four-Part Mission Set

Today, USARCENT's modified table of organization and equipment (MTOE) fully accommodates requirements for land component command operations and includes several joint billets. While any JTF mission would require a joint manning document to account for particular joint personnel requirements, the construct of a JTF is mission-dependent; any potential requirements are so varied as to make it impractical to account for all of them on our MTOE.

Should a JTF mission be assigned, our joint billets, including several in Operational Fires and Effects, provide us the joint personnel cadre needed to establish a continuity baseline for the addition of more joint personnel. For example, the target management branch contains billets for Air Force and Navy targeting personnel—critical in the coordination and deconfliction of cross-service targeting requirements.

Bright Star Exercise 2007. USARCENT recently validated its new construct while serving simultaneously as a combined JTF and combined forces land component command during the Bright Star Exercise 2007 at Cairo West Air Force Base, Egypt. This critical, biannual exercise involved more than 14 participating countries—including many countries from the Middle East and Western Europe—and more than 31,000 personnel. Joint forces from US Central Command Air Forces (USCENTAF, now US Air Forces Central or USAFCENT) and US Naval Forces Central Command (NAVCENT), as well as many of the participating countries, provided the joint force multipliers essential to any combined-arms exercise. Observer/Trainers from US Joint Forces Command (JFCOM) were on hand to validate USARCENT as JTF-qualified.

Coalition partners were integrated into each staff section and contributed to the exercise's overall training value. Operational Fires and Effects included fires, targeting, intelligence, electronic warfare, IO, public affairs and legal personnel from coalition land, air and maritime components. The exercise provided ample opportunity to work through the intricacies of multiple rules of engagement, targeting restrictions, unique features of coalition warfighting equipment and other issues that inevitably arise in any coalition partnership, including the ones we currently participate in throughout the CENTCOM AO.

The CP exercise portion of Bright Star 2007 provided opportunities for USARCENT staff, including Operational Fires and Effects, to migrate Phase 0 tactics, techniques and procedures (TTP) into a more high-intensity conflict scenario encompassing Phases I-IV. A four-week battle rhythm transitioned into a daily cycle is shown in Figure 6 on Page 18.

With the exception of shift changes and future operations working groups, Operational Fires and Effects was the executive agent for the remaining events—a significant coordination responsibility. In fact, in their final evaluation, JFCOM observers deemed Operational Fires and Effects the de facto "staff center of gravity."

This in no way minimizes the impact or contributions of parallel staff sections, but highlights the unique, effects-based approach of Operational Fires and Effects to bring together the full spectrum of warfighting functions.

However, there is a tacit, implied responsibility of such a staff relationship. The USARCENT commander sees Operational Fires and Effects as the de facto coordinator for the strategic communications responsibilities. Requisite authority must accompany additional implied responsibility always. As such, the Operational Fires and Effects chief is charged with tasking authority across

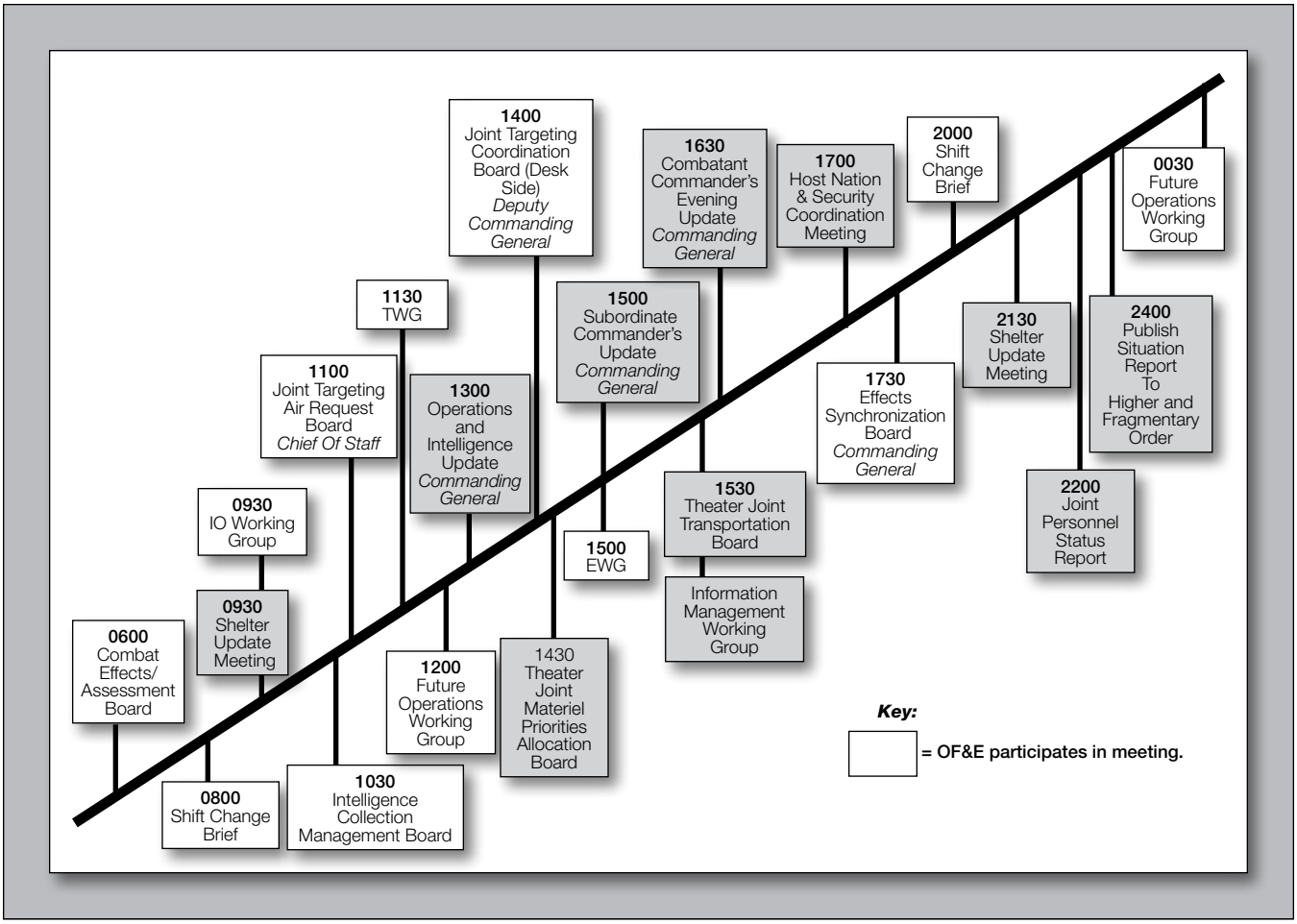


Figure 6: A High-Intensity Conflict Scenario Daily Battle Rhythm for Phases I-IV Derived from a Four-Week Battle Rhythm

the general staff to incorporate subject matter expertise for all strategic communications.

The Way Ahead. Operational Fires and Effects continues to improve its "foxhole." The following outlines some of our lessons learned.

Leadership. Operational Fires and Effects is led by a Field Artillery colonel (the de facto USARCENT fire support coordinator) with a corresponding sergeant major. Given this leader's roles and responsibilities, we believe this billet should be filled with, at minimum, a colonel with brigade command experience. The fires brigade commanders for subordinate corps (three of which we controlled in Bright Star 2007) are also Field Artillery colonels. Consequently, the Operational Fires and Effects chief should report directly to the ASCC chief of staff (per ASCC Design Model 3.2) vice the G3.

Infrastructure. While it would be impractical to standardize field infrastructure (tents, vans, etc.) across ASCCs, given Operational Fires and Effects's wide-ranging synchronization responsibilities within the staff, we must resource the infrastructure required to carry out these duties. This includes a large enough workspace so as not to stovepipe subordinate actions. It also includes sufficient space for meetings, working groups, briefings and boards—independent from workspace.

Additionally, the information technology requirements for such a robust Operational Fires and Effects, including coalition and joint partners, necessitate an organic systems administration capability. We have no such organic capability, which poses additional burdens for our G6.

Sphere of Responsibility and Personnel. As Civil International Military Affairs essentially is an effects-achieving staff element, there is merit in merging it with Operational Fires and Effects. A senior colonel leads Civil International Military Affairs, which clearly would pose a leadership-deconfliction issue; we believe consideration of *who is in charge* should take a backseat to *what is most functional and cohesive*. Similarly, the G3 Space personnel should be merged with Operational Fires and Effects, and due consideration should be given to merging air defense capabilities as well.

Operational Fires and Effects has several joint billets that do not appear to be fill priorities for their respective Services. We must be as demanding in filling these key billets as we are willing to fill like-Army billets on our sister Services' staffs.

We believe there is overlap in the functionality of the target production branch (joint fires division) and the target management branch (effects synchronization division). While each has a unique role in the overall targeting process, there may be good results derived from combining the two branches to group special skill sets and low-density specialties and consolidate the targeting process—cradle to grave.

We believe the ASCC must have an assessment cell. Operational Fires and Effects does not have an organic assessment cell, and we believe this is the *most* critical functionality we lack. Our overall planning and targeting processes are at

great disadvantage without this critical node in the Decide, Detect, Deliver and Assess loop. JTFs in both OIF and OEF have contracted and/or are additionally resourced for assessment cells, and these cells always are affiliated with their effects cells. Whether this ASCC assessment cell is resourced with military or contract personnel, this resourcing *must* happen for us to be effective.

Our ASCC lacks an organic interagency process or supporting US government civilian staff, including a political advisor. We rely on CENTCOM for support in the interagency process, and our lack of a political advisor inhibits our diplomatic coordination and initiative in theater.

Schooling and Utilization. This is an area where we believe we excel and strongly recommend other ASCCs follow suit. Our command has been exceptionally forward-looking in its approval of the institutional training and schooling required for our officers and NCOs to perform at such a high level. Joint and functional training—including the Joint Operations Fires and Effects Course, Joint Firepower Course, Joint Air Tasking Order Process Course, Operational Electronic Warfare Course, Battle Staff NCO Course and others—provide the necessary baseline for those new staff members who need them to operate effectively at this level.

We urge developing ASCCs to follow suit and expend the resources needed to equip their personnel properly for the tasks at hand. Additionally, we urge other ASCCs to capitalize on their invested training by ensuring their staffs, especially their staff NCOs, are positioned accordingly and given the opportunity to exercise their new-found skills.

The transformation of the numbered-Army construct to incorporate the ASCC role and the evolution of the subordinate Operational Fires and Effects Directorate remains a work in progress. USARCENT has embraced its first-in-the-Army opportunity aggressively and continues to improve, while still supporting the ongoing WOT. As other ASCCs execute their transformations—especially Seventh Army (US Army Europe), Sixth Army (US Army South) and Fifth Army (US Army North)—USARCENT stands ready to share TTPs and benefit from our counterparts' lessons learned.

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Colonel Billy F. Sprayberry, (FA) is the Chief of Operational Fires and Effects, USARCENT. He has served as the Targeting Officer for 101st Airborne Division (Air Assault), Fort Campbell, Kentucky, deploying in support of Operation Desert Storm; Commander of 2nd Battalion, 4th Field Artillery Regiment (2-4 FAR), deploying to OIF I; and Corps Targeting Officer for NATO Rapid Deployable Corps—Italy, deploying in support of the International Security Assistance Force VIII. He is a graduate of the Army Command and General Staff College at Fort Leavenworth, Kansas, the Army Force Management School at Fort Belvoir, Virginia, and the Air War College at Maxwell AFB, Alabama.

ADA — Relevant, Ready and Engaged

When I spoke to dozens of senior Army career counselors and retention NCOs at the Worldwide Retention Training Seminar, in St. Louis, Missouri, December 2007, it seemed the consensus was that Air Defense Artillery (ADA), as a Branch, is "going away."

This belief, based upon the facts that ADA no longer has the Bradley Stinger Fighting Vehicle in the active inventory and has reduced the number of Avengers, meant to them that ADA was shrinking and in the process of disappearing.

Nothing is further from the truth. ADA is here to stay—relevant, ready and engaged.

Relevancy. ADA Soldiers are supporting Operation Iraqi Freedom with a battalion (plus) of Avengers performing nontraditional ADA missions in Iraq. ADA Soldiers also support Operation Enduring Freedom in Afghanistan, providing both traditional and nontraditional support in the War on Terrorism. By watching the skies and safeguarding geopolitical and strategic assets, ADA ensures protection for the US and our allies. Air Defense officers and NCOs assigned to military transition teams train and support hundreds of Iraqi soldiers. In fact, ADA is evolving to counter threats from not-so-friendly nations, providing an umbrella of protection for our homeland and our allies.

Capabilities. The ADA Branch is engaged in a transformation, ensuring its endurance and relevance for many decades to come. No other branch can do what ADA does. The Patriot Missile System's capabilities were proven effective in war and have become a strategic asset in support of our National Command Authority's foreign policy. The ADA's newly tested and proven Terminal High-Altitude Air Defense system will provide an umbrella of protection to our homeland against long-range ballistic missiles fired from anywhere in the world. The new Joint Land-Attack Cruise Missile Defense Elevated Netted Sensor System increases the protection that our forces receive on the battlefield from all missile threats.

New assignment opportunities have opened up for both officers and enlisted.

Opportunities. New assignment opportunities have opened up for both officers and enlisted. As ADA brigades restation across the globe in support of Base Realignment and Closure recommended initiatives, Soldiers can request assignments in any region of the continental US (CONUS) and many locations outside CONUS as well. With the addition of AD and Airspace Management cells in every brigade combat team, our Soldiers will can serve in pure ADA units or alongside their comrades of other combat arms branches.

The ADA's future remains exciting. We are at the cutting edge of technological advances with new systems, improvements to previously fielded systems and the planning of future capabilities. This translates to future service opportunities, promotions and professional development for ADA Soldiers. ADA remains relevant, ready and engaged.

CPT Carlos Chaparro, AD
Aide-de-Camp to the Commanding General
Fort Bliss, Texas

ADA and USAF Clear the Air

By Major Lisa M. Bartel, Chief Warrant Officer Three David V. Jones, Chief Warrant Officer Two Christopher C. Ridenour and Lieutenant Colonel Artice Scott, all AD

An exercise that began as a way for one battery of the 6th Battalion, 52nd Air Defense Artillery (6-52 ADA) (Patriot), Fort Sill, Oklahoma, to test its mobility to Tinker Air Force Base (AFB), Oklahoma, and share some capabilities briefings between the Army and the Air Force—grew into a complex, two-week joint exercise. The exercise expanded to include all 6-52 ADA units and support from the Air Force's Airborne Warning and Control System (AWACS) and two units from Tinker AFB.

The joint exercise took place at Fort Sill's Forward Operating Base (FOB) Hamilton and Tinker AFB's Glenwood Training Area. This article outlines the lessons learned that benefit future exercises, actual in-theater joint missions and both Services.

New Objectives. The exercise's expansion began during initial talks to arrange the original visit between 6-52 ADA, the 552nd Air Control Wing (552 ACW) and the 3rd Combat Communications Group (3 CCG) at Tinker AFB.

The resulting joint exercise objectives included establishing data and voice connectivity via radio from Fort Sill to Tinker AFB, accessing the Link 16 network via the AWACS, developing a relationship between Tinker AFB and Fort Sill's growing ADA community and familiarizing selected Soldiers and Airmen on each others' equipment and capabilities. The 6-52 ADA also trained on Warrior Tasks and Drills during the exercise. Establishing a joint memorandum of understanding to support joint exercises between the Army and Air Force on a semiannual basis was another important goal.

Mobility. At the beginning of the exercise, A Battery, 6-52 ADA (A/6-52 ADA), tested its mobility by moving its Patriot fire control section, six launchers and additional support equipment—for a total of 29 vehicles—to Tinker AFB, while Headquarters and Headquarters Battery (HHB/6-52) section and the E/6-52 Maintenance Company were direct support. B/6-2 and C-6/52 at Fort Sill swapped places with A/6-52 at Tinker AFB during the second week, further testing the Patriot units' mobility.

Careful planning ensured the exercise succeeded. For example, E/6-52 Maintenance Company quickly repaired the one vehicle that broke down on the highway during the move to Tinker AFB validating its recovery standing operating procedures.

Connectivity. Within the first two days of the exercise, Airmen from the 31st Combat Communications Squadron (31 CCS) traveled to FOB Hamilton to set up an AN/TRC-170 (V2) tropospheric-scatter (TROPO) radio communications system while other 31 CCS Airmen set up an identical TROPO system at Glenwood Training Area.

TROPO Radio. TROPO radio, which can bounce radio waves off the atmosphere, can be used to connect two units separated by a long distance, when line-of-sight communication is interrupted by a manmade or natural object or when satellite service is unavailable.

Soldiers and Airmen had to use untested methods to establish the link between Patriot and TROPO radios because 6-52 ADA discovered that the documented procedures to establish this vital communications link were incomplete. The two documents concerning connectivity to the TROPO radio—*Field Manual (FM) 3-01.87 Patriot Tactics, Techniques and Procedures* and the Patriot Communication Planner's Handbook—contain only about three paragraphs outlining the procedures. This exercise alerted the Patriot community of the need to develop, test and, eventually, implement procedures linking Patriot and TROPO radios for future missions.

Once linked, the connectivity via TROPO radio allowed the Patriot forces to simulate a real-world scenario involving great distances between units. All four ADA batteries performed troop-

An Air Force T-38 trainer flies over a Patriot missile launcher and Air Force tropospheric-scatter radio dishes at Glenwood Training Area, Tinker Air Force Base, Oklahoma, 9 January. (Photo by Jerry Bryza Jr.)

proficiency trainer and live-aircraft trainer software programs, simulating air battles between FOB Hamilton and Glenwood Training Area.

Link 16 Network. The Link 16 network enables access to an air picture of a theater of operations, providing excellent situational awareness to the commander and near-real-time data to the shooter to facilitate precise fires in a timely manner. The link provides near-real-time track data from the Patriot and the AWACS radars. The link is a high-speed information-exchange network design with time-division multiple-user access, allowing multiple users to transmit and receive track information at 64 kilobytes per second.

Because of its extended line-of-sight once it reaches cruising altitude, the AWACS is excellent as a relay platform for the Link 16 network. Using AWACS as a relay platform, the Patriot battalion could provide track data to the Patriot battery command post (CP) located beyond line-of-sight. This allowed the battery CP operator to help the engagement control station operator correlate and identify the track data—as seen by both the AWACS' and Patriot batteries' radars—training to prevent fratricide on a battlefield.

The Patriot battalion's fires direction center or information and coordination central (ICC) at Tinker AFB received the local tracks from the fire units using the Patriot digital information link. The ICC then transmitted those tracks via the Link 16 network to the local battery CPs and the AWACS. The AWACS, in turn, relayed that data to the ADA fire units at Fort Sill.

The 552 ACW made numerous AWACS orbits throughout the duration of this exercise, and this support enabled ADA to establish Link 16 connectivity with the AWACS and pass "real-time" tracks between the AWACS radar and Patriot radars. ADA also verified that the AWACS can detect our simulated tracks simultaneously, allowing ADA to fight a joint air battle with the AWACS serving as the controlling authority

Joint Capabilities. 6-52 ADA coordinated for select personnel to attend a familiarization flight onboard the AWACS. This opportunity allowed Patriot Soldiers to gain an understanding of the AWACS' capabilities and limitations in respect to air battle management. In turn, the Patriot Soldiers onboard the AWACS shared Patriot-specific information with the AWACS crew.

Two 31st ADA Brigade ADA fire control officers (ADAFCOs) were assigned to the AWACS flights to brief the crew and to act as "interpreters," resolving any miscommunications between the two Services on the AWACS. This was a realistic scenario because, during actual combat, AWACS may be the controlling authority and an ADAFCO would be the liaison between the two Services who coordinates fires and facilitates track identification thus preventing fratricide.

Joint Lessons Learned. All the joint exercise's training objectives were met, but the most important result was the relationship established between Tinker AFB and the Fort Sill's ADA community.

A joint after-action review captured the lessons learned. In addition to the discovery that ADA TROPO radio documentation needs to be updated, three other main lessons were learned.

1. Although 6-52 ADA had authorization to radiate at certain frequencies locally, it found frequency management statewide or at another installation may require additional authorizations. The 6-52 ADA is developing a standard operating procedure to follow for future frequency management requests based on state and national procedures.

2. Service-related "language" inhibited establishing the Link 16 communications during the exercise because parameters for establishing and sustaining the link between AWACS and Patriot units were not identified initially. Either a pre-exercise meeting between the Link 16 experts and AWACS crewmembers to clarify link parameters or having direct-voice communication between the ICC and AWACS would have helped troubleshoot the Link 16 connection.

Once identified as an issue, an Air Force link expert acted as an "interpreter" between the ICC and AWACS crews to troubleshoot the link establishment, while the ADAFCO performed the same function on the AWACS. Before the next joint exercise, link experts from both Services will build a plan to test and execute satellite communications as a primary means of communications, using UHF as a back-up.

3. The 6-52 ADA found that, in addition to some Patriot crewmembers, some AWACS crewmembers can perform the necessary tabular entries to setup scripted mock scenarios for the exercise. In the future, they can work together to create an air battle scenario that will challenge both Patriot and AWACS crews.

The Way Ahead. In the near future, 6-52 ADA plans to conduct another joint exercise with Tinker AFB units, synchronizing AWACS orbits over Fort Sill ADA forces. During these orbits, the AWACS will control real fighter aircraft trying to jam Patriot radars. This training will allow the pilots to hone their jamming skills and simultaneously allow Patriot operators to practice jamming countermeasures.

ADA *inherently* is joint, constantly integrating with other Services' communications and weapons systems based upon the Patriot units' strategic theater missile defense missions. Conducting this exercise with Tinker AFB units gave 6-52 ADA a "taste" of what is required to execute joint operations. The joint exercise created new understanding between the two Services' on their respective capabilities and limitations and led to the development of a common "language" that will help in future exercises and, ultimately, in theater missions.

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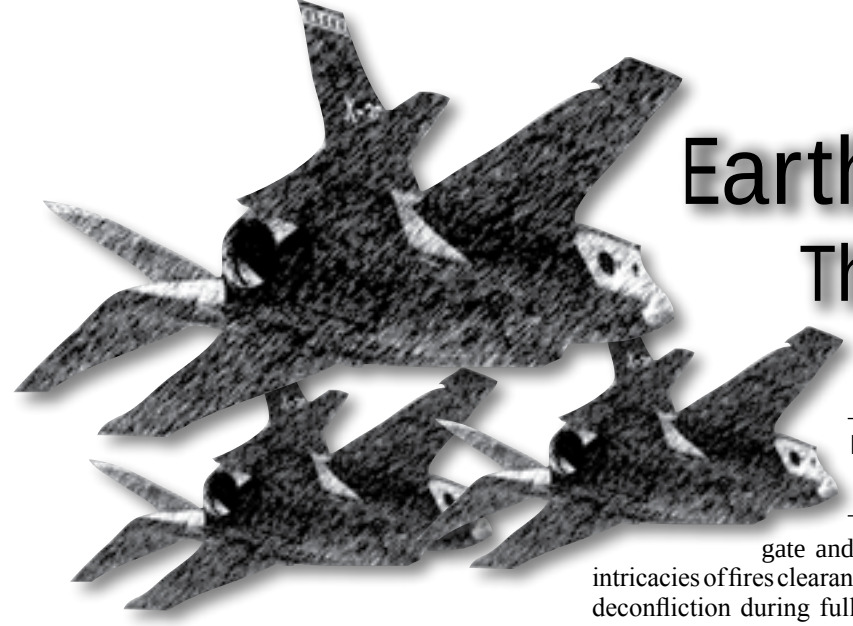
Chief Warrant Officer Three David V. Jones, AD, is the Battalion Electronic Missile Maintenance Officer for 6-52 ADA. He served as the Battalion Maintenance Officer and the Battery Patriot System Tactician/Technician for E Battery, 6-52 ADA (E/6-52 ADA) in Ansbach, Germany; a Battery Patriot System Tactician/Technician for D/1-1 ADA at Fort Bliss, Texas, deploying in support of OIF; and Patriot Missile Crewmember for E/2-7 ADA at Fort Bliss deploying in support of Operation Desert Shield.

Chief Warrant Officer Two Christopher C. Ridenour, AD, is the Air Defense Command, Control, Communications, Computers and Intelligence (ADC^{4}I) Systems Integrator for 6-52 ADA. He served as the ADC^{4}I Systems Integrator for 3-2 ADA; and the ADC^{4}I NCOIC for 1-1 ADA, both at Fort Bliss, Texas.

Lieutenant Colonel Artice Scott, AD, is the Commander of 6-52 ADA. He served as the Deputy Commanding Officer of 69th ADA Brigade in Germany; the Executive Officer for 1-4 ADA, deploying in support of Operation Iraqi Freedom; and the Division Air Defense Officer for the 1st Armored Division, deploying to Kosovo as the Kosovo Force Liaison Officer for MultiNational Brigade (East).



Earth, Wind and Fire: The Experimentation Environment

By Major (Retired) George A. Durham and Lieutenant Colonel (Retired) Frank T. Myers II, both FA

Innovation, freedom of action and thinking freely are the cornerstones of the Army's experimentation environment. The Fires Center of Excellence (CoE) for joint fires at Fort Sill, Oklahoma, has opened and expanded its efforts to study the benefits to be gained by service, agency and multinational interdependency as it pertains to airspace management and clearance of fires as a result of current combat operations, force modernization and transformation initiatives. The Fort Sill Fires Battle Lab's Earth, Wind and Fire (EWF) experimentation campaign is looking at the past and present to forge the future.

After two years of growth, the Fires Battle Lab, with its partners and teammates, is continuing its campaign of experimentation to investigate and ferret out the intricacies of fires clearance and airspace deconfliction during full-spectrum operations. According to experimentation observers and visitors, the Fires Battle Lab rapidly is becoming the focal point for joint fires and airspace command and control (AC^2) experimentation.

As part of this campaign, the Fires Battle Lab is using the issues found in the Center for Army's Lessons Learned (CALL) concerning joint interagency and multinational (JIM) insights—as they pertain to airspace management and deconfliction of fires in Iraq and Afghanistan—as a stepping stone for proposed future combat and material development.

This article highlights the EWF 2007 (EWF07) experimentation results. As stated in the recently completed EWF07 Final Experimentation Report: "For resolution of airspace management, this experimentation venue is invaluable and shows great potential. Fort Sill as the CoE for Fires and the EWF experimental campaign plan is becoming the nexus point for resolving specific contentious joint issues. The battle command system is a joint service requirement that will require detailed phased investigation. The EWF team has proven limited focus human-in-the-loop experiments bridge the gap and can bring clarification and understanding to complex issues."

EWF. EWF07's experimentation venue was a human-in-the-loop simulations experiment supported by a group or federation of digitally linked models and simulations integrated and run via the Army's wide-area information management network known as the Battle Lab Computer Simulations Environment (BLCSE). See Figure 1 on Page 24 for a synopsis of the experiment.

Fires Battle Lab provided overall leadership and simultaneously represented the fire support community (see Figure 2 on Page 25).

Five core simulations and models provided the experimentation venue for EWF07 from four distributed locations include FireSim XXI and Ground Control Station-Generic Unmanned System Segmented (GCS-GUSS) at Fort Sill; Extended Air Defense Simulation (EADSIM) at Fort Bliss, Texas; Advanced Tactical Combat Model (ATCOM) at Fort Rucker, Alabama; and Communications Effects Server at Fort Gordon, Georgia.

FireSim XXI, a stochastic (probability-based) model, simulated the surrogate C^2 system for friendly and enemy maneuver systems and indirect fires systems. ATCOM interactively simulated the C^2 of aviation systems, unmanned aerial systems and enemy air. EADSIM simulated C^2 of Air Defense systems and Counter-Rockets, -Artillery and -Mortars (C-RAM) operations. EADSIM-Joint Acceptance Console modeled Air Force systems and close-air support (CAS) operations at Fort Sill.

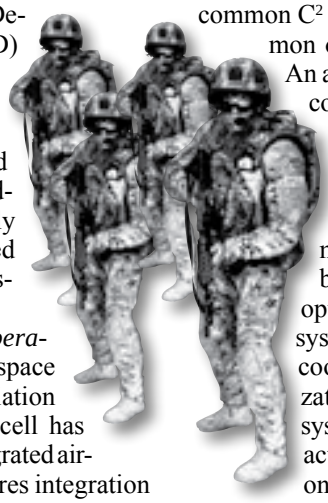
The formal objectives and issues for experimentation were focused on the staff roles, functions, missions and tasks associated with seamless deconfliction of airspace and integration of joint and interagency fires. The EWF07 team also was interested in updating current and future force doctrine and tactics, techniques and procedures (TTPs) in relation to current and expected warfighter tasks, conditions and standards within an automated C^2 environment.

The findings, insights and observations from this experiment are being assigned for action and resolution within the training, combat and material development communities.

Joint Issues. As a result of EWF07, the following issues were raised, reviewed and are being addressed by Training and Doctrine Command and Armywide proponency offices.

Doctrine. There are major discrepancies in approved and currently implemented joint and Army terminology and automation Army Battle Command Systems (ABCS) concerning fire support coordination measures and airspace coordination measures (ACMs). Army and Air Force C^2 systems do not reflect or apply doctrine quickly or accurately, which could result in fratricide. Army and joint operations continue to be hampered by misinterpretation of terms and procedures (i.e., restricted operations zone or ROZ, joint fires area or JFA, engagement area or EA, air coordination area or ACA).

Standards. There is no Department of Defense (DoD) standard for minimum safe distance between manned or unmanned aircraft or munitions and aircraft. Without an agreed-upon standard, it is unlikely an automatic, automated airspace deconfliction system can be developed.

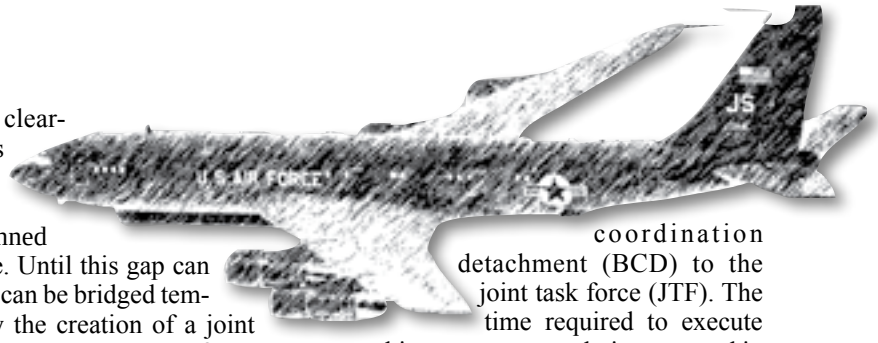


Air-Missile Defense Operations. The air defense airspace management/brigade aviation element (ADAM/BAE) cell has merit and will enable integrated airspace management and fires integration during both mobile and static air-missile defense operations.

The space operations officer located within the fires brigades and divisions will enhance targeting and integration of space- and near space-based intelligence, surveillance and reconnaissance assets. The space operations officer, along with enhanced target mensuration tools at the fires brigades, will increase target accuracy and reduce latency of fires associated with the targeting process.

Directed energy and high-powered microwave weapon systems and munitions will enable enhanced nonlethal fires and will provide enhanced force protection while minimizing collateral damage and reducing risk.

Airspace Management Tool. It is imperative that a single fully functional, automatic, automated airspace management tool exist at the brigade and battalion levels. This tool must provide planning, coordination, synchronization and execution tools that allow for the automatic clearance of fires as well as manned and unmanned aircraft use. Until this gap can be filled, it can be bridged temporarily by the creation of a joint air-ground control cell ($JAGC^2$), which brings key airspace users together as an integrated cell (See "$JAGC^2$: A Concept for Future Battlefield Air-Ground Integration" by Colonel, Retired, Curtis V. Neal in the November-December 2006 edition of *Field Artillery*). Latency of fires and intensive airspace management suggest that a $JAGC^2$ be added to the division staff for the current and modular force in the near term.



Common C^2 System. AC^2 operations are impaired by not having a single common C^2 system or designated common operational picture (COP). An automatic, automated battle command system that tracks manned and unmanned aircraft as well as munitions transforms AC^2 from risk avoidance to risk mitigation. Latency would be reduced if all Services adopted a single battle command system to enable deconfliction, coordination and synchronization of efforts. Within that system, automated, segmented activation of ACMs—based on time, distance, risk mitigation factors, latency criteria, prioritization and mission ranking—will allow quicker clearance of airspace and application of fires while reducing the amount of airspace that must be monitored.

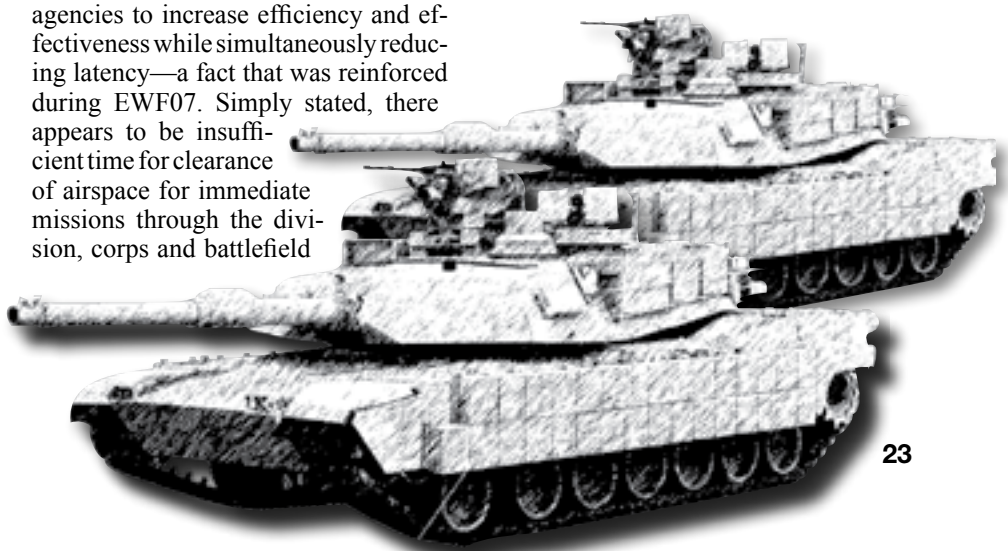
Airspace Deconfliction. When discussing AC^2 relationships in a joint environment, there appears to be a reoccurring requirement for tactical units to communicate directly with airspace control agencies to increase efficiency and effectiveness while simultaneously reducing latency—a fact that was reinforced during EWF07. Simply stated, there appears to be insufficient time for clearance of airspace for immediate missions through the division, corps and battlefield coordination detachment (BCD) to the joint task force (JTF). The time required to execute this process currently is measured in hours rather than the minutes required to execute a fire mission.

As observed during this experiment, if the division coordinates directly with the control response center (CRC), clearance of airspace for fires usually can be synchronized and executed in a timely fashion because several C^2 nodes and the air operations center (AOC) staffing process are eliminated. Currently, as stated in the air operations directive, the CRC cannot arbitrate conflicts between ground commander priorities and joint forces commander (JFC) priorities for use of airspace. By using the CRC to provide airspace clearance, the ground unit mitigates the risk of engaging friendly air vehicles. The AC^2 section at division will have better situational awareness (SA) (higher fidelity) of the airspace than the CRC. This allows the division to clear airspace internally for most missions.

The Air Land Sea Application (ALSA) Center, or another joint-chartered organization, needs to publish a joint TTP establishing the procedures for controlling a high-density airspace control zone. This TTP must define the roles and missions of each C^2 node, what authorities each node has and how to clear airspace for immediate missions.

Editor's Note: See "JFA: Redefining the Kill Box" by Major James E. Mullen III on Page 38 of this edition, which discusses a proposed multiservice TTP.

EWF07 further demonstrated the need to have exactly the same air picture or SA for all units firing munitions, flying aircraft or managing airspace. The dynamic nature of



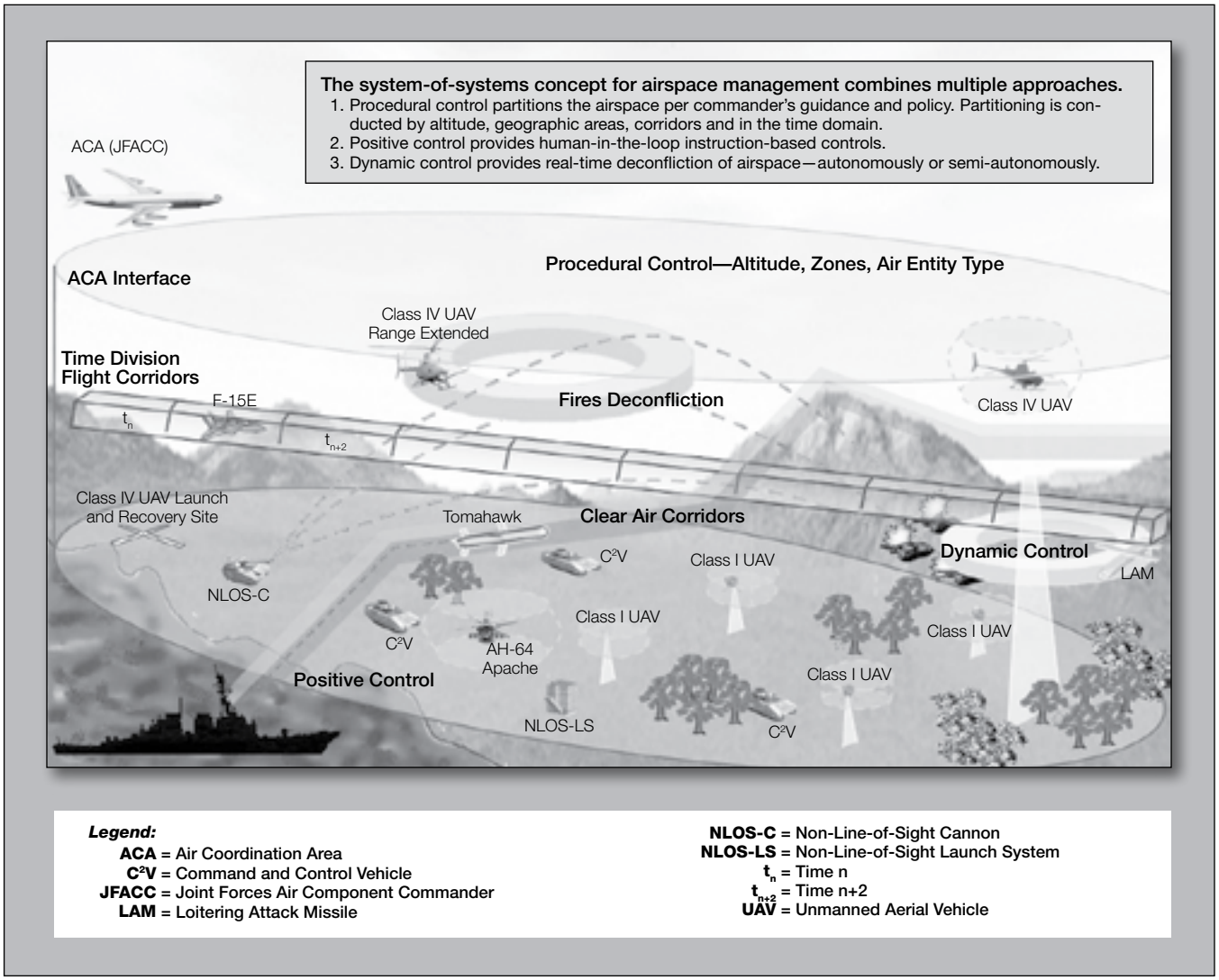


Figure 1: Airspace command and control (AC^2) is compatible with the future combat system (FCS) view of future airspace control for the FCS brigade combat team (FBCT). Future AC^2 must provide dynamic deconfliction while supporting both procedural and positive control. AC^2 will continue to use procedural and positive control methodologies to acheive many of the goals of the future battle command system.

future combat systems (FCS) operations has made airspace personnel more reliant on the air picture for deconfliction versus procedural control measures. With the introduction of air SA, airspace control nodes can implement ACMs in near-real time and direct aircraft into or away from these ACMs, thus enabling immediate fires while simultaneously protecting aircraft and ongoing missions. Near-real time active procedural control of airspace relies on full SA at all nodes, secure communications and jointly agreed upon procedures for executing this method of airspace control. SA enables decisions to be made based on current air users versus planned control measures.

Interoperability. Identification is a key feature that enables AC^2 nodes to match air users to the air tasking order (ATO) to gain mission information and priority. Highest priority missions can be approved only if the appropriate nodes know what the priorities are. Since near-real time active procedural control requires the ability to pass immediate airspace alerts to all users, AC^2 nodes must be able to communicate with all aircraft despite different communications systems. In addition to communicating with aircraft, these systems are critical to connectivity and coordination between all AC^2 nodes. The obvious solution is full data and system interoperability between the military's airspace user systems.

Vision. The experimentation team's recommendations are indicative and supportive of observations attained during current combat operations in many areas. Joint interdependency in future operations will require a vision and clarity of operations that currently is not being achieved without extraordinary effort.

If current combat operations and experimentation results are considered key indicators, then AC^2 operations are not clear, are not understood, are not implemented correctly in DoD automation systems and are not applied uniformly in combat operations. Training, doctrine and automation systems must be updated and standardized across the Services if AC^2 operations are to be effective and provide a safe environment for pilots while allowing timely accurate responsive fires. This also applies to both inter- and intraservice battle command and control systems.

EWF07 provided proof that implementation of an automated, automatic airspace deconfliction and clearance of fires system has merit and is possible but will require inter- and intraservice agreements for development with specified standards for time and space separation of aircraft and munitions.

The use of models and simulations in

combination with actual and surrogate C^2 systems provides a near-realistic environment in which to evaluate and rethink current and future concepts. The full spectrum of operations can be tested along with varied organizations, systems and approaches to ensure feasibility. If the military is going to prepare for the future, learn from the past and not fight the past, then this distributed cross-service experimentation venue not only has merit but *is* the future.

Major (Retired) George A. Durham, Field Artillery (FA), is the Director of the Fires Battle Lab at Fort Sill, Oklahoma. He was the Director of the Soviet Artillery Effects Program. Before retiring from the Army, he was the Executive Officer (XO) for a Department of the Army Special Action Team for Corps Support Weapons Systems, developing the Army Tactical Missile System (ATACMS); the XO of the 4th Battalion, 4th Field Artillery, III Corps Artillery at Fort Sill and commanded two batteries. He is a graduate of the Command and General Staff College, Fort Leavenworth, Kansas, and the Army Management Staff College at Fort Belvoir, Virginia.

- **Fires Battle Lab, Fort Sill, Oklahoma**
  Provided Overall Leadership and Represented the Fire Support Community
- **Air Maneuver Battle Lab (AMBL), Fort Rucker, Alabama**
  Represented Army Aviation
- **Air Missile Defense Battle Lab, Fort Bliss, Texas**
  Represented Air Defense Operations
- **Signal Center (SIGCEN), Fort Gordon, Georgia**
  Represented Information and Knowledge Management Operations, and the Signal Community's Technical Network Design Requirements Team
- **Space Missile Defense Command (SMDC), Colorado Springs, Colorado**
  Represented Space and Near-Space Operations
- **Battle Command Battle Lab-Leavenworth (BCBL-L) and its AC^2 Representatives, Fort Leavenworth, Kansas**
  Represented Higher-Headquarters C^2 Issues and Airspace Management Issues
- **Mounted Maneuver Battle Lab (MMBL), Fort Knox, Kentucky**
  Represented Maneuver Force C^2
- **US Air Force (USAF) Air Combat Command, USAF Doctrine Center, and USAF Flight Standards Office, Nellis Air Force Base, Nevada**
  Represented USAF

Figure 2: Earth, Wind and Fire Participants

Lieutenant Colonel (Retired) Frank T. Myers II, FA, is the Lead Operations Research Analyst for the Fires Battle Lab. He also worked on experiments for the Fires and Effects Coordination Cell in the Initial Brigade Combat Team and the Effects Coordination Cell in the Interim Division. Before he retired in 1992, he served as the XO for the 2nd Infantry Division Artillery in Korea while simultaneously commanding a provisional battalion, consisting of Headquarters and Headquarters Battery and E Battery in 25th Field Artillery (Target Acquisition) and B Battery, 6th Battalion, 32nd Field Artillery (Lance/Multiple-Launch Rocket System). He also was the Deputy Director of the Gunnery Department in the Field Artillery School. He has an MA in Human Relations from the University of Oklahoma in Norman.

PIM to be Assembled at NLOS-C Facility

The M109A6 Paladin Integrated Management (PIM) 155-mm self-propelled howitzer system will be assembled at the same plant in Elgin, Oklahoma, as the Army's Future Combat Systems' (FCS') Non-Line-of-Sight Cannon (NLOS-C), BAE Systems announced on 14 March. The 150,000 square-foot facility is scheduled to be completed in 2009, and the PIM will go into production a few years before the NLOS-C. PIM's addition to the product line will triple the facility's projected production volume during its first 10 years.

PIM. The M109A6 and M992A, which together comprise the PIM—also known as the M109 Family of Vehicles—is part of a sustainability program engineered to improve readiness, avoid components' obsolescence, reduce the logistical burden and increase sustainability of the platforms out to the year 2060. The upgrades will allow the PIM to fire Excalibur (XM982) rounds and the precision guidance kit fuzes. The sustainment program will allow maintainability and sustainability of the PIM through commonality with the FCS NLOS-C and the heavy brigade combat team's (HBCT's) Bradley fighting vehicle (See "PIM: The Next Generation Paladin" by Major Corey B. Chassé in the January-February edition of *Fires).*

NLOS-C. Projected for fielding in 2017, NLOS-C will give the BCT commander unprecedented responsiveness and lethality. The C-130 and C-17 transportable, 155-mm, 38-caliber cannon has the features common to all FCS, including the battle command system; planning, training and communications software; maintenance parts and procedures; water generation; resupply implementation; and others. It will be able to move rapidly, stop quickly, deliver lethal first-round effects on target in record time and will handle ammunition loading and firing automatically. The NLOS-C will give the Army a cannon artillery system that is fully automated, highly mobile and capable of launching multiple rounds precisely on target simultaneously (See "NLOS Cannon: Meeting the Demands of Future Combat" by Major Vincent J. Tolbert in the March-April 2006 edition of *Field Artillery).*

PIM and NLOS Cannon are complementary weapon systems supporting our Soldiers in the current and future force formations.

The Internal Research and Development (IRAD) Paladin is a BAE Systems concept of the Paladin Integrated Management's (PIM's) self-propelled howitzer. (Photo courtesy of BAE Systems)

Past, Present and Future of GMD

By Major Laura D. Kenney, AG

The interceptor blasting triumphantly out of the silo at Vandenberg Air Force Base, California, (left) that crisp September morning in 2007—to meet and destroy a training target at more than 100 miles away measured straight up—symbolized a defining and culminating moment in the history of missile defense. Such a moment only will be eclipsed with a future combat use of the system for the purpose for which it's intended—destroying a ballistic missile aimed at the United States of America.

From the beginning of missile defense theory and practice to the technological marvel represented by the "hitting a bullet with a bullet" flight test, the path to the September 2007 moment was a rocky one. This article traces the US' missile defense development from World War II (WWII) through today when the 100th Missile Defense Brigade (Ground-based Midcourse Defense or GMD) stands ready and able to defend the United States against ballistic missile attacks.

Origins. The need for an antimissile defense system originated during WWII with the success of Germany's short-range ballistic missiles against London and Antwerp (see "Cruise Missile Defense: Defending Antwerp against the V-1" by Lieutenant Colonel, Retired, John A. Hamilton in the January-February 2008 edition of *Fires*). The threat posed by longer-range missiles became a reality in the 1950s with the development of accurate guidance systems and nuclear warheads. The need to combat these lethal, distance-ranging missiles gave birth to antiballistic missile research and development programs.

GMD History. The GMD system, although often characterized as a new program, represents a long-term effort by the US to build a defensive capability against strategic ballistic missile threats. The 1960s saw the Union of Soviet Socialist Republic (USSR) and the US testing aspects of defensive systems that were armed with nuclear warheads and directed by elaborate radar networks.

Enormous technical challenges of the day were coupled with political minefields. A debate raged between a requirement for national defense against perceived antagonists and the opposite position that an arms race of any kind, including defensive, increased the odds of a disastrous confrontation.

(Photo courtesy of 100th Missile Defense Brigade or 100th MD Brigade)

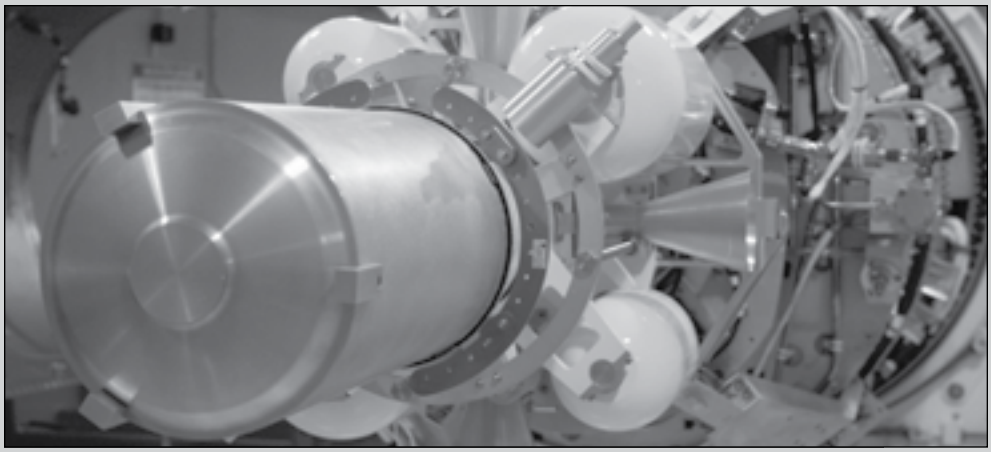
The Soviet A-350, or ABM-1 Galosh, was the first antiballistic missile system. It first was paraded in Moscow's Red Square in 1964. In 1972, the Galosh passed systems tests and was deployed operationally. In May of that same year, the Soviet-American Antiballistic Missile Defense Treaty was signed. It limited both the US and the Soviet Union to either protecting their national capitals or their intercontinental ballistic missiles (ICBM) sites, a result of the 1969 Strategic Arms Limitation Talks. The Galosh was emplaced around Moscow to protect the Kremlin from a nuclear strike. It was updated in several generations to the ABM-4 Gorgon. In 1998, Russia announced it had replaced the nuclear warheads with conventional warheads.

Nike-Zeus System. The first antiballistic missile system to emerge from the technological and political turmoil was the Nike-Zeus system. Elements of the system performed impressively in individual tests, but an overall consensus emerged declaring the system to be impractical due to its inability to discriminate between decoys and an actual threat and other limitations, such as where it could engage a target and how many separate targets could be tracked simultaneously. In 1963, the Secretary of Defense decided not to deploy the system, but use it as a building block for further research.

Project Defender. The next system to "step up to the plate" was Project Defender, featuring missiles to be launched from platforms that would orbit directly over the USSR. In response to fears raised about the consequences of exploding nuclear warheads over friendly territory, this system would deploy huge wire meshes intended to disable Soviets ICBMs in the early launch phase. Difficulties surrounding the protection of the orbiting platforms scuttled the program in 1968.

Sentinel. Sentinel followed with a goal of providing a defense against a limited nuclear strike. When President Richard Nixon was elected, he changed the name to Safeguard and decided to deploy the system around key ICBM sites in Grand Forks, North Dakota. In 1975, Safeguard simultaneously was deployed and shut down due to politics and limited technology. Only 24 hours after its activation, Congress approved its closure. Safeguard was operational for three months.

Although both systems included exoatmospheric (outside the atmosphere) intercept missiles, the Galosh and the Safeguard were proximity weapons. Unlike the GMD system, their armaments were nuclear with the concept of defeating incoming nuclear missiles with a preliminary defensive nuclear blast. These systems were conceived as a "lesser evil" with considerable environmental and safety impacts, including electromagnetic pulses that would damage all nonhardened electronic equipment.



A Detail of the Exoatmospheric Kill Vehicle (Photo courtesy of 100th MD Brigade)

Concerns about using nuclear-tipped interceptors led to the development of a radically different concept embodied in the Homing Overlay Experiment. Instead of a nuclear explosion destroying an incoming missile, a "kinetic kill vehicle" was designed to extend a structure similar to an umbrella skeleton that would destroy an ICBM reentry vehicle on collision. Three test failures were followed by a success in 1986, destroying a Minuteman reentry vehicle with a closing speed of about 6.1 kilometers per second at an altitude of more than 160 kilometers. The technology was absorbed into the Strategic Defense Initiative (SDI)—the next step in the developmental chronology.

SDI or "Star Wars." President Ronald Reagan was the driving force behind SDI, which quickly became known as "Star Wars." In response to Soviet first-strike capability, Reagan proposed a robust, multitiered system that would defend against an all-out attack versus the limited scope of earlier programs. SDI involved space-based laser battle stations, X-ray laser satellites and extremely sophisticated command and control systems.

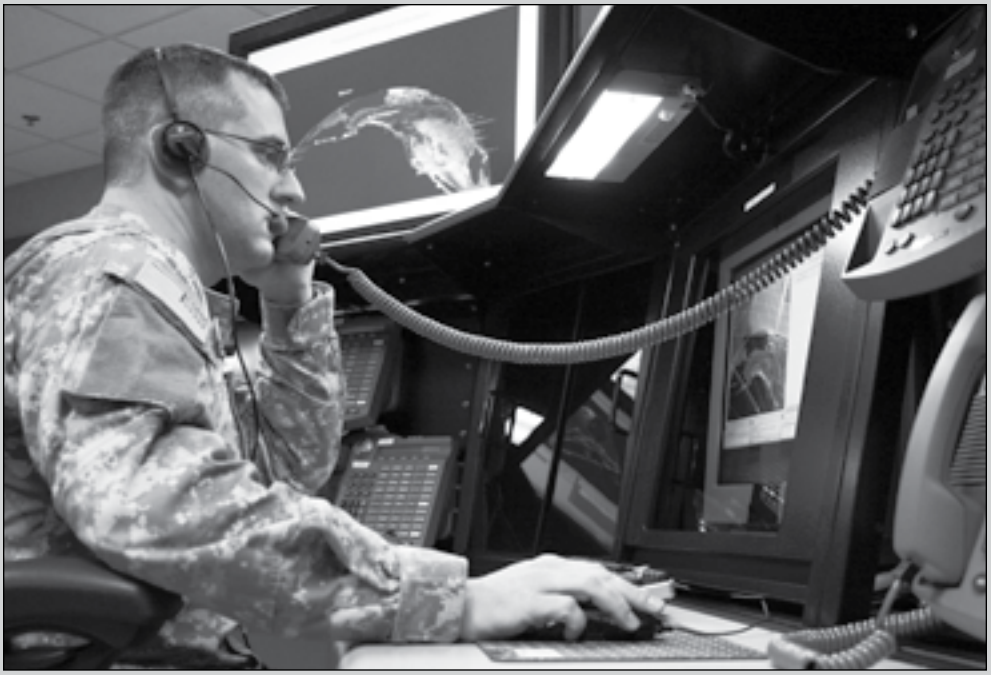
Political debate during the Star Wars era was rampant with detractors questioning the program's feasibility and whether or not the concept was strategically sound. SDI advocates prevailed, and the project was funded in 1984. The fall of the USSR, signaling the end of the Cold War, effectively removed the enemy for which the system was designed; and progress in the ballistic missile defense arena collapsed.

Terrorism. The end of the Cold War, initially hailed as "ushering in an era of lasting peace," soon devolved into rising fears of terrorism and rogue states that moved into the "threat status" left vacant with the USSR's demise. Uncertainty about the security of existing nuclear missile stocks and increasingly developed technology that made "suitcase bombs" possible created a new playing field in the 1990s and early 21st century. Missile defense goals of the time segued into preventing the US from being subjected to nuclear blackmail or terrorism.

In 1995, the National Intelligence Estimate predicted that North Korea and Iran were likely 15 years away from having ballistic missile technology and that the intelligence community would be able to detect technological advances moving toward rogue nations acquiring ballistic missile capabilities far in advance. After the National Intelligence Estimate controversy, an independent commission was established under Secretary of Defense Donald Rumsfeld.

The commission's report, published in 1998, concluded that "concerted efforts by a number of overtly or potentially hostile nations to acquire ballistic missiles with biological or nuclear payloads pose a growing threat to the US, its deployed forces and its friends and allies." While not as sophisticated as US ICBMs, they would allow the nations that developed them "to inflict major destruction on the US within five years of a decision to acquire such capability." Six days later, Iran first tested the medium-range Shahab-3 missile. Two weeks later, North Korea test launched their Taepo Dong-1, overflying Japan and demonstrating advanced capabilities, to include a third stage. Up until then most missiles had only one or two stages.

Reacting to an established threat, the National Missile Defense Act of 1999 states, "It is the policy of the



2LT Ronald Bailey, sensors operator, 49th Missile Defense Battalion (49 MD), Alaska Army National Guard, tracks incoming threat missiles to the defended area during a simulated attack on the US on the Ground-based Midcourse Defense Systems Trainer. As a battalion fire direction crew sensors operator, Bailey monitors multiple lines of communication and tracks the operational status of sensors strategically placed around the globe. (Photo by SGT Jack W. Carlson III, 49 MD)

United States to deploy as soon as is technologically possible an effective national missile defense system capable of defending the territory of the United States against limited ballistic missile attack."[1]

Patriot. The first Persian Gulf War and the success, although limited, of Patriot missiles defeating Scuds renewed interest in the "hitting a bullet with a bullet" concept. President William J. "Bill" Clinton gave qualified support to continued development of such a system, as he said in September 2000 at a speech given at Georgetown University, for "an extra dimension of insurance in a world where proliferation has complicated the task of preserving the peace." Funding and emphasis, however, lagged, and development proceeded at a commensurate pace.

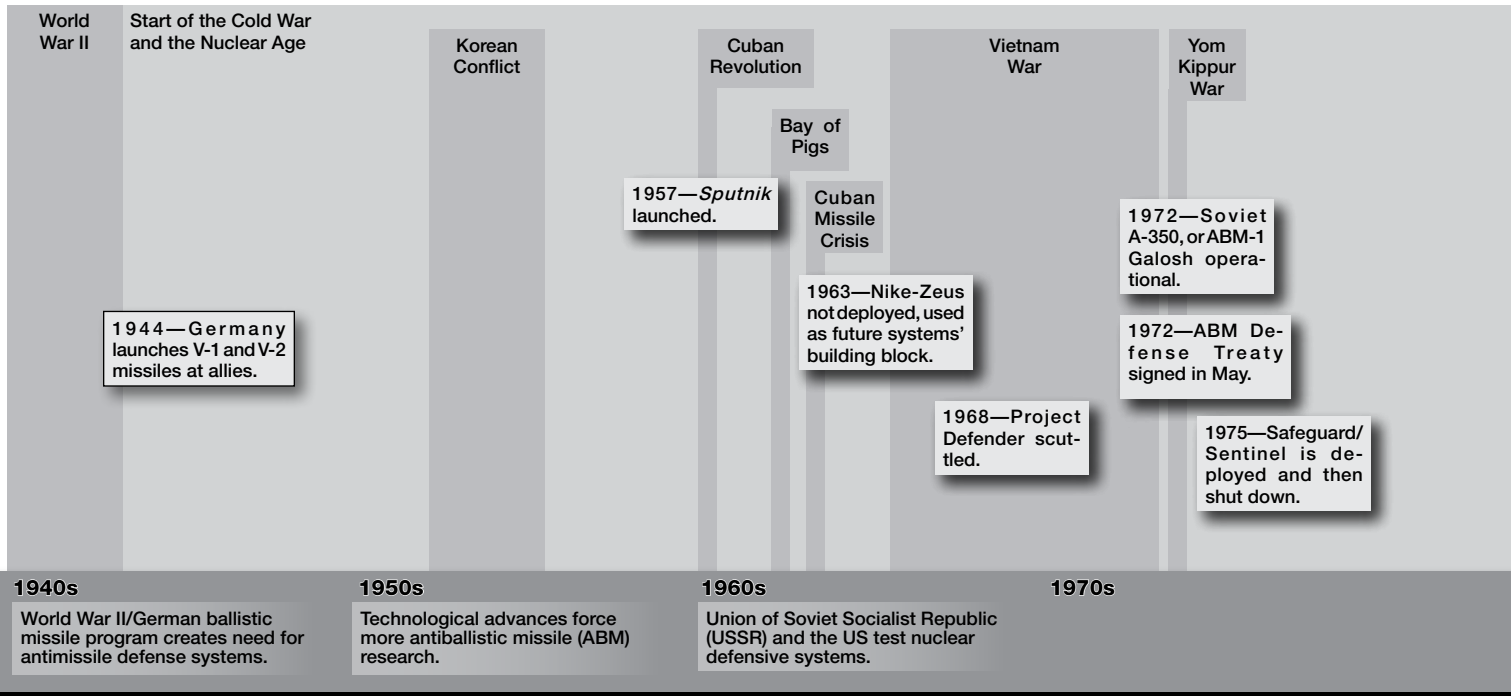
New "Day of Infamy." Then the horrific events of September 11, 2001, with a new "day of infamy," proved conclusively to this generation of Americans that we, too, can be attacked on our home soil.

A presidential directive, issued December 2002 by President George W. Bush, required the nation to field a missile defense system rapidly. The directive—a direct response to the September 11 events—effectively sped up the process for a system in development since the 1990s, but with roots in the SDI of the Reagan years.

The National Security Presidential Directive (NSPD)-23 of 2002 states, "The Defense Department plans to employ an evolutionary approach to the development and deployment of missile defenses to improve our defenses over time. The United States will not have a final fixed missile defense architecture. Rather, we will deploy an initial set of capabilities that will evolve to meet the changing threat and to take advantage of technological developments."[2]

In the NSPD-23, President Bush ordered, "The Defense Department… shall proceed with plans to deploy a set of initial missile defense capabilities beginning in 2004."[3]

Evolution of the Ballistic Missile



GMD System. The system, now named the GMD System, is part of a concept of layered ballistic missile defense, the latter of which eventually will target threat missiles in all stages of their trajectory. The GMD portion of the system is aimed at destroying incoming missiles in space during the midcourse of their flight with an exoatmospheric kill vehicle using non-nuclear kinetic warheads. The system is considered to be in "spiral development"—deployed while simultaneously being tested and improved.

On 15 June 2002, ground was broken for the missile defense complex at Fort Greely, Alaska—home to future interceptors. A small group of Soldiers began training on the system in Colorado Springs, Colorado.

A ground-based interceptor, launched from the Ronald Reagan Ballistic Missile Defense Site, located in the Republic of the Marshall Islands, destroyed a mock warhead 225 kilometers above the Pacific Ocean in October 2002.

On 16 October 2003, the 100th Missile Defense Brigade stood up during an activation ceremony at Peterson Air Force Base, Colorado Springs. The brigade is staffed largely by active Colorado Army National Guard (COARNG) Soldiers.

On 22 January 2004, the 49th Missile Defense Battalion (GMD) stood up at Fort Greely, Alaska. (See "Space Artillery—Building the GMD Force of the Future" on Page 30.) The battalion is staffed entirely by Alaska ARNG Soldiers. On 22 July 2004, the first interceptor was emplaced at Fort Greely.

On 10 December 2004, an interceptor was emplaced at Vandenberg Air Force Base, California—the first for this location, which will be used for primarily testing.

Since 2002, the US has been discussing the possibility of building a third missile site in Europe that would enable defense against different missile trajectories than those provided by Alaska and California. Talks are ongoing.

Two failed interceptor tests, in 2004 and 2005, were due to anomalies and support malfunctions rather than the concept or main technology of the system.

The summer of 2006 was fraught with high-level political tension as North Korea advertised its plan to test a long-range ballistic missile in defiance of world opinion. In July, the ground-based midcourse system was brought to full-operational status in response. The Korean launch of 4 July failed, but the Soldiers and interceptors of the nation's missile defense system were ready to response when needed.

On 1 September 2006 and 28 September 2007, interceptors launched from the California site successfully intercepted and destroyed targets launched from Kodiak, Alaska.

The 100th Missile Defense Brigade stands ready to defend the United States, but the current limited defensive capability of the GMD System is just a beginning.

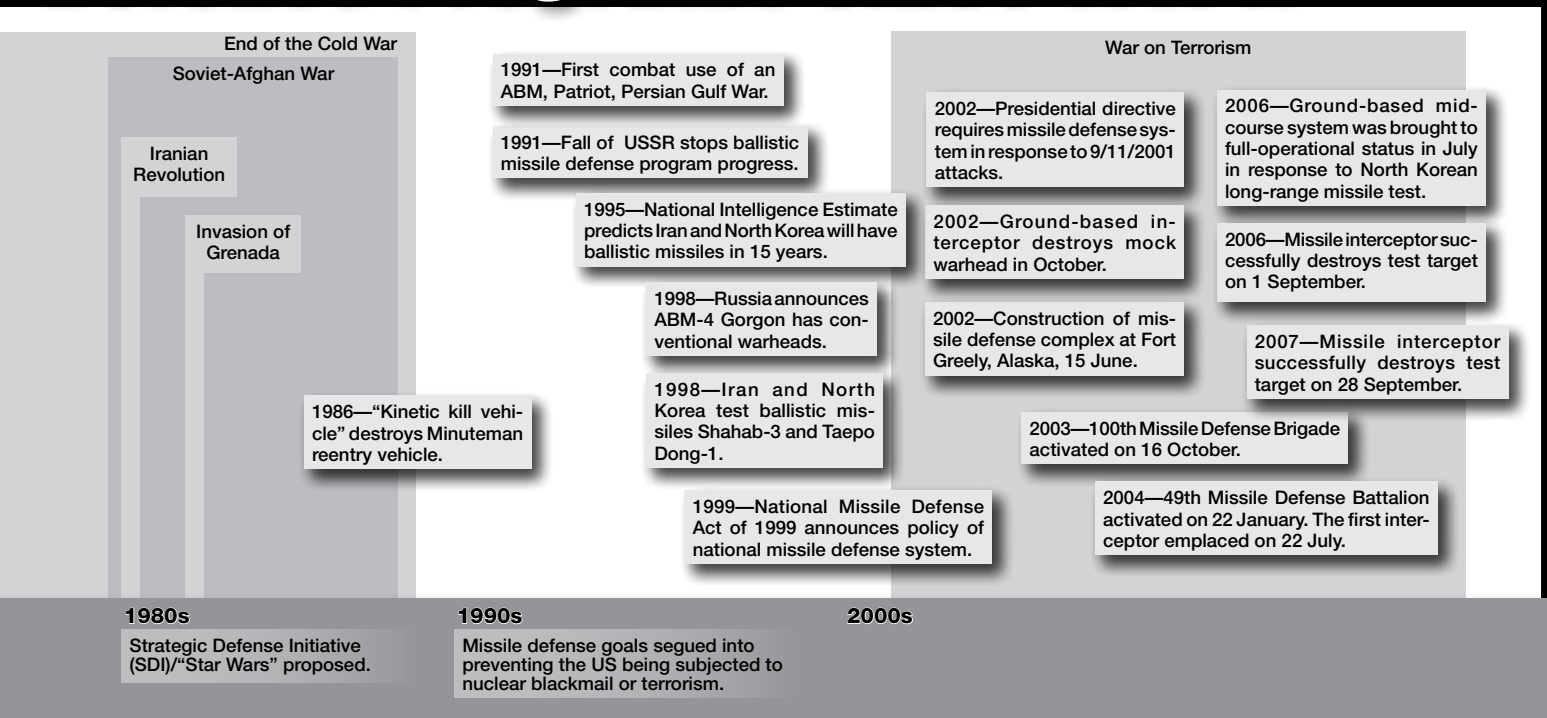
The ballistic missile defense's future includes the integration of sea-based, space-based, laser and high altitude missile systems. Each military service has a role in its deployment from satellites and radars through the sea-based Aegis Ballistic Missile Defense System.

Endnotes:
1. National Security Presidential Directive 23 (NSPD-23): National Policy on Ballistic Missile Defense, the White House, Washington DC, 16 December 2002.
2. Ibid.
3. Ibid.

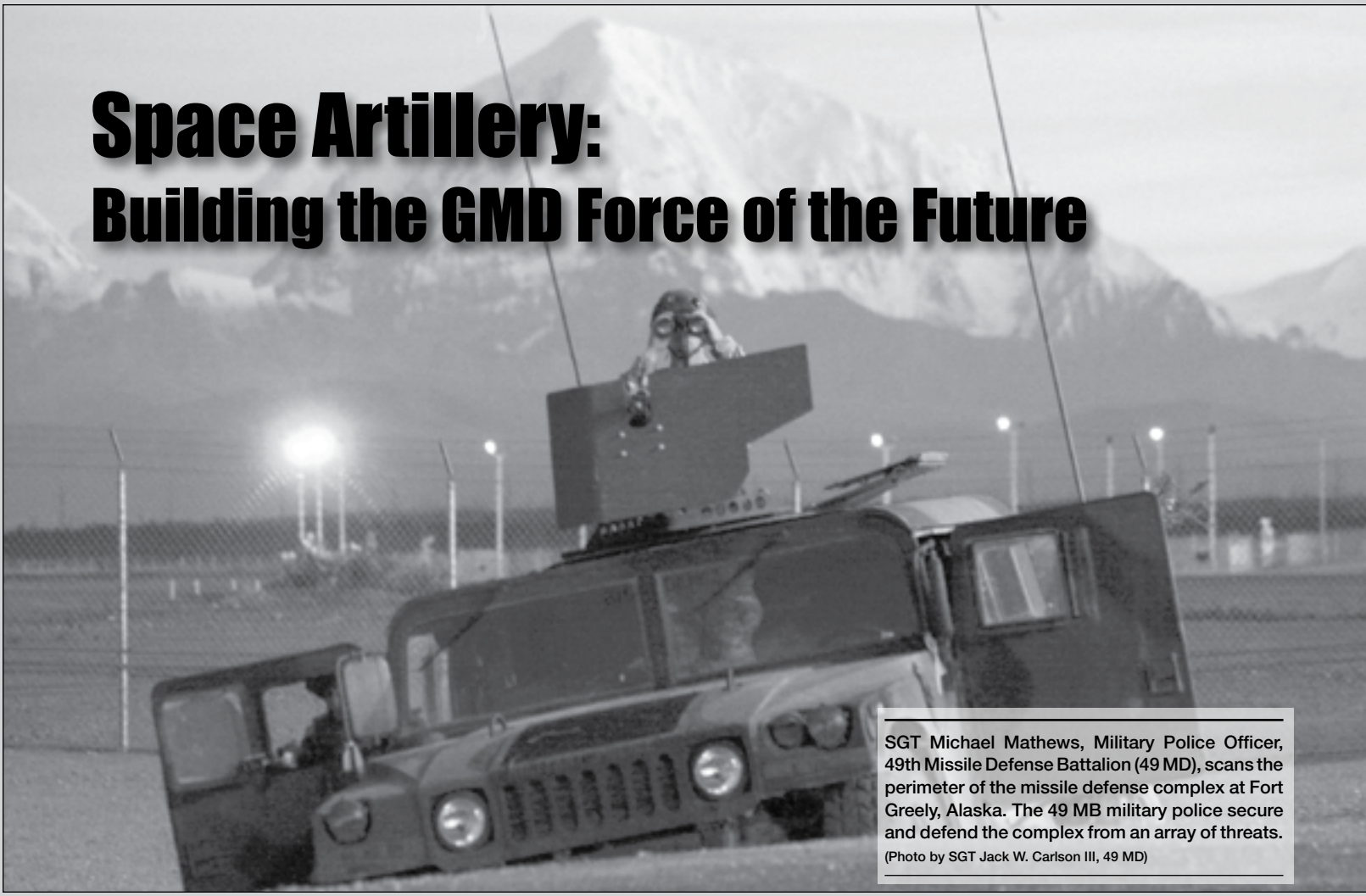
Major Laura D. Kenney, Adjutant General (AG), is the Public Affairs Officer (PAO) for the 100th Missile Defense Brigade (Ground-based Midcourse Defense) headquartered in Colorado Springs, Colorado. She has served as a Journalist with the 10th Air Defense Artillery Brigade (Hawk/Patriot) in Germany; and as an Assistant Adjutant and PAO, deploying in support of the 101st Airborne Division in Operation Desert Shield; the Deputy PAO for the American sector, deploying to Operation Joint Forge in Kosovo; and the PAO for the 78th (Training) Division in Fort Monmouth, New Jersey.

The author wishes to thank LTC Edward E. "Ted" Hildreth, Major Joseph L. Miley and Captain Timothy M. Brower, all from 49th Missile Defense Battalion, Alaska Army National Guard, for their contributions to this article.

Defense Programs since WW II



Space Artillery:
Building the GMD Force of the Future



SGT Michael Mathews, Military Police Officer, 49th Missile Defense Battalion (49 MD), scans the perimeter of the missile defense complex at Fort Greely, Alaska. The 49 MB military police secure and defend the complex from an array of threats. (Photo by SGT Jack W. Carlson III, 49 MD)

By Lieutenant Colonel Edward E. Hildreth, Major Joseph L. Miley, both AD, and Captain Timothy M. Brower, MI

Tasked with intercepting threat ballistic missiles in all phases of flight—boost, midcourse and terminal—the Ballistic Missile Defense System (BMDS) uses state-of-the-art technology and highly-trained, hand-picked Soldiers to protect America and its allies.

Cutting-edge technology is the centerpiece of the BMDS, but it is the "human-in-the-loop" Soldiers of the Colorado and Alaska Army National Guard (ARNG) that make the system work. As the Missile Defense Agency continues its BMDS spiral development, the Soldiers' mission also evolves. More Soldiers are needed for this critical national mission, and this article outlines how Soldiers are selected and trained and what their unique mission entails.

Technology. Components of the BMDS include existing technologies like Patriot Advanced Capability-3, Aegis BMDS and developing technologies, such as the Airborne Laser. An integral component of the BMDS is ground-based midcourse defense (GMD) which engages threat intercontinental ballistic missiles (ICBMs) in the midcourse phase of flight. The actual intercept occurs in the exoatmosphere (or outside the atmosphere) and is a kinetic kill, meaning no warhead is included on the exoatmospheric kill vehicle. Literally, a "smart" bullet the size of a small refrigerator, traveling at high velocity, vaporizes an incoming threat upon impact.

To facilitate an intercept, the system uses a global layered approach. Several sensors provide overlapping coverage in detecting and tracking a threat missile launch. These sensors include the Defense Support Program, Cobra Dane, the Sea-Based X-Band radar, Forward-Based X-Band radar and other sensors.

Personnel. Since September 2004, the Soldiers of the 49th Missile Defense Battalion (GMD), Alaska ARNG, and the 100th Missile Defense Brigade (GMD), Colorado ARNG, have operated the BMDS at Fort Greely and Schreiver Air Force Base (AFB), respectively.

The mission is a perfect fit for the ARNG. The ARNG Active Guard Reserve program allows Soldiers to homestead in one location and unit without the potential career penalties and shorter tours of the active component Army. Many Soldiers have been with the units since their inceptions. As a result, the 100th Missile Defense Brigade and 49th Missile Defense Battalion stabilize and maintain operational crews for longer periods of time.

Assignment. Missile defense duty at Fort Greely and Schreiver AFB precludes ARNG Soldiers from deploying for state emergencies or overseas missions, although Soldiers may volunteer for deployment after their initial tours.

Soldiers are not assigned to Fort Greely or Colorado Springs from a central point, as are active Army Soldiers, but must apply for positions and compete nationally. They come primarily, but not exclusively, from states and territories with Air Defense and Military Police units.

Interested personnel can visit **akguard.army.mil/portal/Jobs/tabid/64/Default.aspx** for more information.

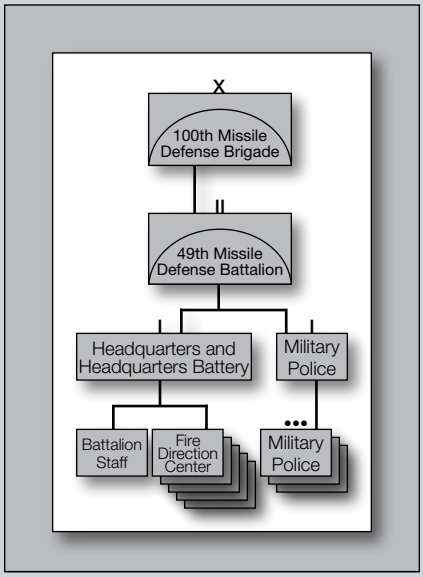
Titles 10 and 32. The mission's uniqueness requires a new approach to Title 10

and Title 32. Guardsmen are called to active duty under Title 10 for national service in missions funded by the federal government. They serve under the command of the National Command Authority (the President and Secretary of Defense) and receive all of the rights and benefits of active national service. On the other hand, National Guard units activated for Title 32 missions fall under the command of the state governor.

The commanders of the 100th Missile Defense Brigade and 49th Missile Defense Battalion are Title 10 ARNG Soldiers. However, under a special provision signed by President George W. Bush and the Alaska and Colorado governors, commanders have a dual Title 10/32 status to command Title 32 Soldiers. Soldiers switch between Title 32 and Title 10 depending on their mission status. Soldiers performing the federal missile defense mission on the missile defense complex are considered Title 10 but convert to Title 32 when off duty or when on duty in garrison.

This is a new construct for ARNG Soldiers, although the Air Force performed similar transitions for years. Air National Guard fighter pilots performing Homeland Defense missions for the Continental US North American Aerospace Defense Command Region switch between Title 32 and Title 10 status, literally, while in flight with the signature of the Joint Forces Air Component commander.

49th Missile Defense Battalion. At the "tip of the spear," the 49th Missile Defense Battalion, Alaska ARNG, operates and secures the ground-based midcourse portion of the BMDS. To defend the US and its designated areas, the 49th conducts its dual strategic and tactical mission 24-hours a day, seven days a week, 365 days a year, and is prepared to destroy ICBMs in midcourse to defend the US and its designated areas.



49 MD Organizational Structure

The 49th Missile Defense Battalion has nearly 200 full-time Alaska ARNG Soldiers and contains a GMD battery composed of fire direction center (FDC) operators and the traditional battalion staff sections. The unit also has a Military Police company tasked with securing the missile defense complex (see the figure).

Training. Soldiers who serve on FDC crews complete extensive training to operate the GMD system. After completing basic training, these Air Defense Soldiers complete military occupational skill (MOS) qualification training at Fort Bliss, Texas. Next, they complete the GMD Operator's Course at the GMD Training and Exercise Center in Colorado Springs. This demanding course requires Soldiers to score a minimum of a 90 percent average to qualify.

After graduating from the GMD Training and Exercise Center, Soldiers receive four weeks of positional and crew training. Each Soldier must be certified both individually and as a crewmember during semiannual operational readiness exercises. Finally, after nearly 43 weeks of training, Soldiers assume duties as FDC crewmembers at Fort Greely.

Unique Challenges. Soldiers and families face many challenges in this remote duty assignment. Fort Greely lies in the interior of Alaska known for its extreme weather conditions that include temperatures that drop to negative 60 degrees Fahrenheit and winds that gust up to 90 miles per hour.

Perhaps the greatest challenge, however, is operating and securing the GMD system while continuing concurrent tests and developments to improve system capabilities. To strike a balance between program development and mission security requirements, close collaboration between the 49th and the Joint Program Office, Missile Defense Agency, continues to play a critical role in mission execution.

A true test of the GMD system came on the 4 July 2006. The 49th and 100th Air Defenders were on full alert, when North Korea launched several ballistic missiles including a Taepo Dong-2 ICBM. Shortly after the launch, BMDS sensors confirmed the missile was not a threat; the missile failed in flight. The mission gave the Soldiers invaluable experience dealing with potential rogue-nation threats.

Those who diligently man the GMD system were ready then and remain ready today to defend the nation against a limited ballistic missile threat. Despite the challenges they face, Soldiers in the 49th Missile Defense Battalion rally behind their mission—their motto—"Defending the Homeland."

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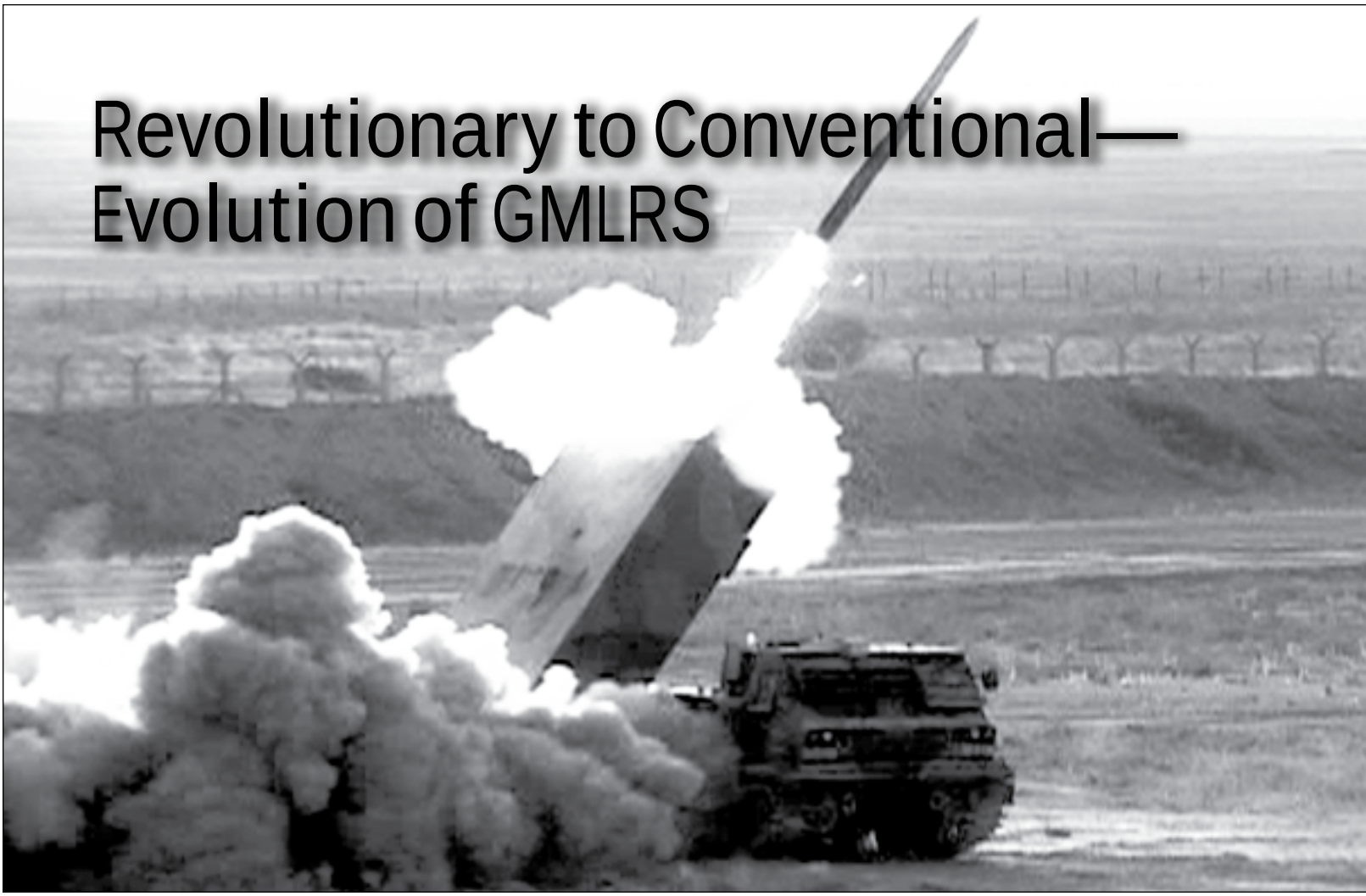
Major Joseph L. Miley, AD, is a Missile Defense Officer at Cheyenne Mountain Command Center/Missile and Space Domain, Colorado Springs, Colorado. He has served as the Executive Officer, Operations Officer and Fire Direction Center Crew Director for the 49 MD; the Army Air Defense Advisor for Continental US North American Aerospace Defense Command Region at Tyndall Air Force Base, deploying in support of Operation Noble Eagle; and the Operations Officer and Senior Intelligence Analyst for the South Carolina ARNG Counterdrug Task Force. He has an MA in Management from Webster University at St. Louis, Missouri.

Captain Timothy M. Brower, Military Intelligence, is the Intelligence Officer for the 49 MD. He served as Commander for X Company, 1-126th Armor Battalion, Michigan ARNG at Selfridge Air National Guard Base, Michigan, deploying in support of Operation Noble Eagle; and as the Intelligence Officer for the 2-27 Infantry Battalion, 3rd Brigade, 25th Infantry Division, Schofield Barracks, Hawaii. He is a graduate of the US Military Academy at West Point, New York.

Revolutionary to Conventional—Evolution of GMLRS



By Captain Matthew B. Smith, FA

What commonly was hailed as the "Future of the Field Artillery (FA)"—Guided Multiple-Launch Rocket System (GMLRS)—now has arrived, and the results are beyond initial predictions. GMLRS has been in the Central Command (CENTCOM) theater since June 2005. Its application and versatility have increased dramatically during the past few rotations because units now are arriving in theater with a better appreciation for its tactical value.

This fact is in direct correlation with an eruption of professional writings that effectively illustrate what GMLRS is, how it is used and what its role became in the current operating environment. Furthermore, in response to the brigade combat teams' (BCTs') modifying their training objectives before deploying, the National Training Center (NTC) at Fort Irwin, California, and the Joint Readiness Training Center (JRTC) at Fort Polk, Louisiana, expanded their rotations to account for and evaluate GMLRS in the close fight.

The need for precision guided munitions (PGMs) will increase in direct proportion to the success Coalition Forces demonstrate against the insurgency. The reason is straight forward—as this conflict achieves tactical, geopolitical and ideological objectives, the battlefield's size will shrink and potential targets will become more entwined with collateral damage considerations.

Keeping in perspective that resources lag results, defensenews.com reported on 14 January that GMLRS successes in Iraq and Afghanistan prompted the US Army to establish a procurement objective of 43,560 GMLRS rockets. The action is clear, GMLRS is much more than a revolutionary idea—it is a PGM that senior commanders want at their disposal. In some cases, it is *the* preferred munition.

BCT staffs and Artillerymen must understand the nuances of applying this weapon. The basics of incorporating GMLRS into a BCT are described in "GMLRS Unitary Battle Drill and the *Ready First Combat Team*" by Captain Andrew D. Lanz and Major Paul C. Weyrauch in the March-April 2007 edition of *Field Artillery* (available online at **sill-www.army.mil/famag/**). The article outlines how a direct support Artillery unit can help a BCT staff by acting as an intermediary between the BCT and the MLRS battery. While the description of the fire mission process is accurate and well-detailed, the situation has transformed significantly during the past 15 months.

The most notable change in theater during the past two rotations is the increased communications between the requesting units (including maneuver task forces) and the MLRS battery. The major benefit to this is that less time is spent routing the call for fire because the mission now comes directly from either a BCT fire support element (FSE) or from requesting unit itself.

In situations that call for preplanned strikes, this technique is much easier for both the battery and the requesting unit due to two enabling factors. First, the requesting units now immediately send a proximate grid to the MLRS battery. In turn, the battery generates a maximum ordinate and time-of-flight on the Advanced FA Tactical Data System (AFATDS) computer. The battery then distributes this data—via an internet

2nd Battalion, 4th Field Artillery Regiment (2-4 FAR) fires a Guided Multiple-Launch Rocket System round at a preplanned target for an operation in Iraq. (Photo courtesy of 2-4 FAR)

relay chat program (my Internet Relay Chat or mIRC)—to every essential unit in the clearance and firing chain process. Consequently, airspace clearance can begin while waiting for mission approval. Of important note, because the planning is conducted with widespread oversight from higher headquarters, less time is spent offering last minute explanations of a particular target's tactical validity.

Secondly, the targets' complexity and scope are changing as rapidly as the increase in units requesting PGM usage. Indeed as pointed out in the article "FA PGMs—Revolutionizing Fires for the Ground Commander" by Colonels Gary S. Kinne, John A. Tanzi and Jeffrey W. Yaeger in the May-June 2006 edition of *Field Artillery*, the initial urgent-needs statement, signed by the Commander of MultiNational Corps, Iraq (MNC-I) in October 2004, only resulted in a limited supply of GMLRS to theater.

Therefore an attitude was set in motion that GMLRS was to be used only for top-down planned targets, and the approval authority for target engagement was reserved with MNC-I.

By April 2006, A Battery, 2nd Battalion, 20th FA (A/2-20 FA) (MLRS), working in concert with 2-3 FA, demonstrated that GMLRS is suited ideally for urban warfare. Furthermore, the maneuver units within 1st BCT, 1st Armored Division, were patrolling the streets of Ar Ramadi, Iraq, constantly and winding up in direct contact with insurgents within these built up areas, now protected by a myriad of collateral damage considerations. This situation set in motion the change in who could authorize the release of GMLRS.

The (then) commander of 2-3 FA, Lieutenant Colonel Joseph T. Harrington and Lieutenant Colonel Robert Terselic, from the 1st Marine Expeditionary Force (I MEF), convinced MNC-I that the MLRS battery at Fallujah would be an ideal asset to engage insurgent strongholds in a quasidirect support role. The decision would rest with MNC-I authorizing the brigade commanders to release GMLRS. Finally, as Weyrauch and Lanz lay out in their article and I observed during our battery's relief in place with 2-20 FA in November 2006, this change is in effect.

The delegation in the GMRLS release authority, and Harrington's efforts to accomplish that, led us to where we are today in Iraq. Targets today are much more complex and much more fluid. Because of that, task force commanders and fire support officers (FSOs) are building GMLRS into their fire plans because they know that, if it's needed, it will be approved—whether deliberately or in a preplanned variety. This could not have happened without the ingenuity and tactical situational understanding of Harrington and his staff.

However, because the targets are more dynamic, bottom-up feedback often is required to finalize strike packages. In some cases, attack guidance is crafted with the help of the experts within the GMLRS firing unit. Moreover, Special Operations Forces (SOF) now can use GMLRS to engage fleeting targets because of their aggressive targeting techniques and a centralized control of unmanned aerial vehicles (UAV) or unmanned aircraft systems (UAS).

GMLRS units now are involved intricately in the development of potential strike packages. More specifically, a GMLRS representative will offer attack guidance on not only the initial engagement, but also at least two contingent sites that the enemy may congregate to. The majority of this feedback is done on mIRC, or in some cases, the GMLRS unit will have a liaison at the targeting meeting.

The technique of engaging transitory targets was refined by tracking potential targets (i.e., improvised explosive device or IED emplacement teams, vehicles with antiaircraft guns or mortars mounted, or insurgents gathering in palm groves) with UAVs. Engaging these types of targets requires crisp communication drills, extensive rehearsals and, most importantly, familiarity between the sensor and the shooter.

During the past 15 months, task force FSOs, BCT FSEs, and others improved their understanding of GMLRS while improving their abilities to engage targets actively with spectacular results. When considering that C/2-4 FAR was divided among four different locations and engaging a variety of targets throughout Iraq, it's safe to say that GMLRS delivery capabilities established a much larger footprint since June 2005. The results are that effective action was not deterred and our Soldiers' safety, while in contact with the insurgents, is not compromised.

Another significant change during the past 15 months is that the battery now performs a recomputation of the target elevation after it is sent from the originating unit. The process, commonly referred to as "GEOTRANS," uses an application program called Geographic Translator that converts geographic coordinates among a wide variety of coordinate systems, map projections and data. In this particular instance, GEOTRANS converts elevation from the *Earth Geopotential Model 96* (EGM 96)[1] to EGM 84 which is what MLRS launcher uses.

The battery fire direction officer (FDO) performs this operation simultaneously with the fire direction NCO's redundant checks of the mission data. This is a seven-step process that takes a proficient user roughly 30 seconds. Once complete, the FDO announces the adjusted elevation, and the AFATDS operator selects "Recalculate" on the AFATDS screen and manually inputs the GEOTRANS elevation. The refined elevation allows for better accuracy during target attack, eliminating impact errors caused by improper target elevation identification.

Because the MLRS unit conducts GEOTRANS, it is absolutely essential that mission refinements are not sent to the battery after the launcher is laid. After the launcher is laid, refinements sent by the initiator of the call for fire will pass through the battery's AFATDS and go directly to the launcher. And if unnoticed by the battery fire direction center (FDC) or launcher chief, the *unadjusted* altitude will be fired.

One final difference to MLRS operations during the past two rotations is the firing units' task organization and command and control responsibilities. When we deployed in October 2006, C/2-4 FAR had the mission that was, at the time, reserved for a battalion. This difference facilitated the much-needed bottom-up demand for how to make GMLRS more viable in the contemporary operating environment.

At the conclusion of our July 2006 rotation at the NTC (discussed in Major Christopher W. Wendland's Letter to the Editor in the January-February 2007 edition of *Field Artillery*), C/2-4 FAR was selected to fill a short-order requirement to deploy to Fallujah, Iraq, and replace 2-20 FA. The initial package called for our battery to be under the tactical control of I MEF in MultiNational Force-West (MNF-W). However, we were under

the operational control of MNC-I. This change to our command support relationship, ultimately, enabled our battery to expand beyond the parochial interests of MNF-W and provide coverage in multiple locations throughout MNF-I.

To account for the lack of a battalion staff, the battery was augmented with an organic higher headquarters made up of a major, a captain, a maintenance technician (chief warrant officer two), a fire direction NCO (normally Master Gunner qualified), and two parts load list (PLL) clerks. This element provided liaison to supported units, relieving the battery's requirement to provide liaison teams. This command and control team also was valuable in garnering theaterwide support of GMLRS by traveling to maneuver and SOF elements headquarters to explain the munitions and current tactics, techniques and procedures (TTPs) for planning and initiating GMLRS fires.

The battery specifically was tailored and heavily task-organized in a manner that would be conducive for 24-hour sustainability and limited split-battery operations. With seven M270A1 launchers and trained and qualified crews bettering 13, launcher manning was never a concern. The battery's FDC, however, was manned with only 11 personnel and had to work three eight-hour shifts. Splitting this entity could not be done for a sustained amount of time. Finally, the battery deployed with a maintenance platoon capable of providing both organizational and direct support maintenance.

Soon after our battery's transfer of authority, it was clear that we were capable of engaging time-sensitive, preplanned and various other targets with the same efficiency as a battalion. By January 2007, plans were in place to augment the battery with one more M270A1, more FDC personnel and a leadership package that mirrored a battery headquarters.

This decision accomplished two objectives for MNC-I's planning staff. First of all, the additional personnel gave the battery the requisite number of Soldiers to perform operations in up to four different locations effectively and simultaneously. Secondly, it set the plan in motion for 2-4 FAR to assume this enduring mission. This allows the leadership of 2-4 FAR to plan, train and resource this task force properly.

Furthermore, with weekly video-teleconferences between the MLRS units in Iraq and the battalion staff at Fort Sill, Oklahoma, batteries are given up-to-the-minute insight on what currently is happening and what the future holds. This fact was evident by B/2-4 FAR's efficient relief-in-place (RIP) with C/2-4 FAR in December 2007. B/2-4 FAR was ready to shoot shortly after its equipment arrived. And, in just six days, it completed RIP and engaged its first target—an IED safe house—securing the handover.

Several factors contributed to the orderly RIP between C/2-4 FAR and B/2-4 FAR, and critical among them is that one battalion headquarters provides the forces. Communications between deployed, deploying and training batteries allow for quick mission and TTP adjustments and clear intent across the force. The battalion also serves as a central focal point to push out information to deploying BCTs and training centers.

Units slated to conduct a mission readiness exercise at NTC, JRTC or any other location should consider taking a partial or complete GMLRS firing capability with them. A great stride can be made synchronizing precision-guided, surface-to-surface fire support before deployment. The benefit that a brigade FSO can gain from observing how to manage a GMLRS capability is worth the investment. Additionally, the training centers are taking steps to understand current GMLRS TTPs and effects better and establishing viable replication capabilities.

GMLRS is no longer a revolutionary concept that is "going to change" the way Artillery fights. Today, engaging insurgent strongholds and urban targets with GMLRS is simply a conventional tactic. The more a deploying task force headquarters or brigade FSO knows about incorporating GMLRS into plans the better; it's that simple. Combat units target effectively; when they do so in today's battlefield, GMLRS is the most logical attack solution more often than not.

At the time of this writing, Artillery units are firing GMLRS from five different locations throughout the Operation Iraqi Freedom area of operations. Approximately 400 GMLRS rounds have been fired by units from 2-4 FAR—largely within the past two months. From November 2006 to present, GMLRS missions have more than quadrupled since arriving in theater in June 2005. And with the commitment to supply, the most misrepresented problem associated with GMLRS is eliminated—availability.

Make no mistake about it, military operations are changing rapidly—changing every day, and in some cases, every minute. Integrating available resources into a combat operation continues to be a challenge to commanders at all levels. However, given the increasing complexity of the current geopolitical situation coupled with recent successes, the battlefield soon will amalgamate into one collateral consideration. As such, technology will be the catalyst in striking our enemies—in some cases that technology will be a precision-guided, surface-to-surface munition. With the arrival of PGMs to the Field Artillery, we undeniably have reasserted our claim as the *King of Battle*. In short, PGMs, such as GMLRS and Excalibur, are products that "speak for themselves."

It's the Artilleryman's responsibility to know his capabilities and to be prepared to support the fight. Major General Jonathan Bailey (British Army, Retired) reminds us in an article that "maneuver operations require less fire support, as they may in counterinsurgency….. Meanwhile it is precisely in these sorts of operation that the new precision of Artillery will become more telling and relevant."[2] Speed is important, but accuracy is essential. The demise of the Field Artillery, like the long-predicted demise of the tank, is still a dangerous delusion.

Endnotes:

1. EGM96 is a geopotential model of the Earth consisting of spherical harmonic coefficients complete to degree and order 360. It is a composite solution, consisting of: 1) a combination solution to degree and order 70; 2) a block diagonal solution from degree 71 to 359; and 3) the quadrature solution at degree 360. This model is the result of collaboration between the National Imagery and Mapping Agency, the NASA Goddard Space Flight Center and Ohio State University.
2. Major General Bailey had a distinguished career in the British Army; his last post being Director General of Doctrine and Training. Before that he was the Director of the Royal Artillery. Currently he is the Director of the Centre for Defense and International Security Studies in the UK. He is the author of the definitive book "*Field Artillery and Firepower.*" This quote is taken from his article "Artillery in Decline? The Future of Field Artillery" that can be found at www.rusi.org/downloads/assets/Artillery_in_Decline.pdf.

Captain Matthew B. Smith, Field Artillery (FA), is an FA Observer/Trainer for the Battle Command Training Program at Fort Leavenworth, Kansas. He was the Battery Commander for C Battery, 2nd Battalion, 4th FA Regiment (C/2-4 FAR), 214th Fires Brigade, Fort Sill, Oklahoma, deploying in support of Operation Iraqi Freedom. He has served as the Battalion S3 and the Battalion Maintenance Officer for 2-4 FAR. Captain Smith also served as a Firing Platoon Leader, Support Platoon Leader and Battery Operations Officer for 1-94 FA (Multiple-Launch Rocket System/Target Acquisition) in Idar-Oberstein, Germany.

2nd Battalion, 27th Field Artillery Regiment (2-27 FAR), 18th Fires Brigade, fires a High-Mobility Artillery Rocket System (HIMARS) during training and qualifying at Fort Bragg, North Carolina. (Photo by GMG3 Jonathan Kammen, US Navy, Retired)

HIMARS—Precision Today and Tomorrow

By First Lieutenant Andrew M. Russo and Major Joseph E. Hilbert Jr., both FA

The Multiple-Launch Rocket System (MLRS) originally was fielded in 1983 as a general support or reinforcing weapon system. Designed to deliver rockets carrying a payload of dual-purpose, improved conventional munitions (DPICM) and scatterable mines at ranges up to 30 kilometers, the weapon system and its munitions were ideal for providing the maneuver commander with suppression of enemy air defense fires in depth beyond the forward line of troops and reinforcing fires in support of conventional cannon artillery.[1]

System Modifications. Throughout the 1990s, modifications in the weapon system and its munitions increased its lethality through the extension of rocket ranges out to 45 kilometers and through the introduction of the Army Tactical Missile System (ATACMS) with an impressive range of 300 kilometers. This system and its munitions proved themselves during Operation Desert Storm, earning a reputation for delivering "Steel Rain" on its adversaries.

This capability, however, was not without its limitations. As Lieutenant Colonel Jeffrey L. Froysland accurately described in an article in *Field Artillery*,[2] the ability to deliver scatterable munitions, while beneficial in supporting large formations in maneuver warfare, is questionable, at best, when supporting stability and counterinsurgency (COIN) operations.

Additionally, with a weight of 30 tons (including munitions), the M270 and M270A1 launchers presented significant challenges for repositioning within a theater of operations and were of little value to light-forcible and initial-entry forces. To mitigate these limitations, the Army identified the requirement for guided, unitary munitions and a lighter, more rapidly deployable delivery system. This requirement led to the parallel development of the Guided MLRS (GMLRS)-Unitary rocket, the ATACMS-Unitary Missile and the High-Mobility Artillery Rocket System (HIMARS).

Limitations Bridged. Through numerous validation exercises and operational deployments, HIMARS and its precision guided munitions (PGMs) have bridged these limitations *and* redefined the role of rocket and missile systems within the Field Artillery (FA). HIMARS, combined with the M31 GMLRS-Unitary and the M48 ATACMS-Unitary Missile, provides the maneuver commander a rapidly deployable, all-weather fire support platform for all roles and missions within FA, usable in environments ranging from complex, rapidly-changing forcible-entry operations to static COIN and stability operations.

HIMARS Fielded. Fielded as a prototype in 1998 and in its final design in 2005, HIMARS was designed to provide a long-range fires capability to light and forcible-entry headquarters. Unlike its much heavier predecessor, the M270A1 launcher, HIMARS weighs in at nearly half the weight, 17.5 tons. This results in a system that is light enough to be transported by a C-130 aircraft, even when fully uploaded. Additionally, as a wheeled vehicle, the system does not require heavy equipment transports for forward movement or for in intertheater stability operations. Finally, HIMARS is based on the family of medium tactical vehicles, reducing the number of system-specific parts and mechanics required to maintain the system.

With an air-transportable platform, the HIMARS allows for a unique capability referred to as the "hot panel." The launcher's global-positioning system (GPS) can link into the transporting aircraft's GPS antenna via a cable attachment. This capability allows the launcher to remain fully GPS-aided while in flight and, therefore, fire-mission capable immediately upon landing. Initial testing of this capability yielded very positive results.

The maneuver commander can deploy an uploaded launcher with a guided munition and have a rapid-response fire support platform available immediately upon insertion. While this capability originally was intended for forcible-entry operations, it also can be used in operations where the repositioning of assets across great distances is time critical.

GMLRS-Unitary Warhead Designed. In conjunction with the fielding of HIMARS, the Army began stockpiling the GPS-aided GMLRS DPICM rocket. While well designed for destroying mass formations of armor and infantry, the original DPICM rockets were limited because the many DPICM bomblets in the rockets' payload could create unnecessary collateral damage and clutter the battlespace with unexploded submunitions. Subsequently, the Army began developing the GMLRS-Unitary warhead designed to provide the warfighter with a precision strike capability where collateral damage and rules of engagement were of utmost importance. Congress had early directed procurement of the M48 ATACMS-Quick-Reaction-Unitary (QRU) missile in 2001.

Benefits in COIN and Stability Operations. These munitions have three key components that are essential for employment in COIN and stability operations. First and foremost, both munitions can engage targets with extreme accuracy, allowing commanders to engage targets with lethality yet limit and even prevent collateral damage. This results in the second benefit—the commander can employ them against targets in urban environments, where unintended collateral damage to surrounding civilian structures is of great concern. Lastly, as GPS-aided munitions, the munitions are not limited by weather concerns; and, because of their flight paths' altitudes and speeds of flight, both systems can attack their targets with little or no attack signature. These capabilities allow the GMLRS-Unitary and the ATACMS-QRU, when combined with the HIMARS platform, to bring an unimaginable capability to FA and to the modern battlefield.

The GMLRS rockets increased the flexibility of response by increasing the accuracy, range and payload of their predecessors. GMLRS rockets using GPS technology can strike within meters of their intended targets. Another key modification to the rocket was an increase of range, giving commanders the ability to engage targets out to 70 kilometers. The final modification to the rocket, making it indispensable, was the removal of the DPICM bomblets that were replaced with a unitary high-explosive warhead.

As GPS-aided munitions, the firing unit now has the flexibility to assign specific aimpoints for each rocket. In HIMARS' case, this allows the firing unit to strike up to six targets in close proximity almost simultaneously. The launchers only would need to park once, lay, arm and fire, and the launcher automatically would adjust to hit each individual target. Tests conducted in association with Lockheed Martin proved very promising—rounds impacted on cardboard boxes, destroyed soda cans and left neighboring structures covered in dust, but intact. Similar tests of the ATACMS-QRU proved equally accurate.

The ATACMS-QRU gives the HIMARS a much heavier warhead and much greater range. Its high-explosive warhead easily can strike within meters of targets at ranges from 70 to 270 kilometers, and the missile's speed approaches Mach 3 before its strike. These factors result in a strike that nearly is impossible to detect by the target on the ground. The ability to strike undetected allows for the engagement of high-value targets and time-sensitive targets who may flee or hide at the first sounds of a fixed-wing platform moving in overhead. The larger warhead allows for the destruction of entire structures with only one round, making it extremely useful for quick precision strikes. Though HIMARS is limited to only one ATACMS per launcher (in comparison to the M270A1's two), it overcomes this limitation through the ability to reload and be ready to fire within five to eight minutes.

Capabilities for Maneuver Commanders. When combined with PGMs, HIMARS offers the commander capabilities beyond the previously accepted, traditional roles of rocket and missile

A reduced-range practice rocket leaves the tube of a HIMARS during 2-27 FAR training and qualifying at Fort Bragg, North Carolina. (Photo by GMG3 Jonathan Kammen, US Navy, Retired)

systems. For example, in forcible-entry scenarios, both littoral and airborne, the ground force commander can bring the launchers and their ammunition into the airhead or the amphibious objective area while stabilizing the lodgment before the introduction of follow on forces. Combined with internal reconnaissance forces as well as tactical and global intelligence, surveillance and reconnaissance platforms, this fire support platform will become central to the commander's plan for expanding the beachhead or airhead line.

Unlike previous rocket and missile systems employed in reinforcing, general support and general support reinforcing (GSR) roles, these units now can be employed in a direct support (DS) role to the maneuver commander. The rockets' and missiles' extensive ranges allow the HIMARS unit to operate from already-secured airfields and beachheads, reducing the requirement for additional security forces as the airhead or beachhead line is expanded. Furthermore, because the system is all-weather capable, the maneuver commander is not dependent on air platforms and clear skies for deep fires.

Under this concept, the commander can synchronize his rocket and missile fires with initial-entry cannon and mortar fires as he expands the airhead or force beachhead line even when the weather does not support close air support or air interdiction.

HIMARS' Proven Value. Since its introduction into the force in 1998, HIMARS has proven its value through both peacetime forcible-entry exercises and on operational deployments in the Central Command (CENTCOM) area of responsibility (AOR). As the first unit to field HIMARS, 3rd Battalion, 27th Field Artillery (3-27 FA), tested integrating the system in air-land operations during quarterly joint forcible-entry exercises conducted in support of the 82nd Airborne Division.

During these operations, the battalion conducted the air-land operation with second- and third-echelon forces and immediately integrated rocket and missile fires into the ground commander's operation. Initially, the battalion deployed in a GSR role, working in support of the brigade's DS cannon artillery battalion. Later operations saw the battalion DS to the brigade.

Shortly after fielding, as the US prepared forces for the invasion of Iraq, 3-27 FA deployed its prototype HIMARS to Operation Iraqi Freedom to provide DS fires in support of a maneuver task force. During this deployment, the advantage of the system's mobility was evident as the battalion maintained the momentum of its supported maneuver force and provided both close and deep fires using both MLRS rockets and ATACMS missiles. Integrating the battalion's liaison officer cell with the supported maneuver commander facilitated a common situational awareness of the commander's battlespace and responsive fires from the firing unit.

By 2005, the Army completed the testing and development of the XM31 GMLRS-Unitary round and the M48 ATACMS–Unitary round and fielded them to forces in Iraq for employment. Initial results were impressive. The guided-unitary warheads provided ground force commanders an extremely accurate, responsive lethal munition. In addition, operational employment of this weapon proved that, contrary to initial fielding concerns, this weapon was effective in urban environments—collateral damage was minimized through its accuracy and angle of attack.[3]

Once the systems were validated, guided munitions were deployed with MLRS A1 launchers into Iraq and, later, with HIMARS to the CENTCOM theater of operations. The systems' responsiveness enable ground commanders throughout the CENTCOM AOR to respond lethally and accurately in support of an array of targets from counterfire strikes against mortars, to fires in support of troops- in-contact, to engaging high-value, time-sensitive targets.

HIMARS Training. In support of operations in the contemporary operational environment, the Field Artillery should reconsider employment considerations for HIMARS complemented with PGMs. Through training exercises and operational deployments, HIMARS has proven its responsiveness and lethality as well as its ability to function as DS to maneuver forces.

Maneuver commanders with forcible- and initial-entry forces should train regularly on HIMARS, GMLRS and ATACMS-U employment. Understanding these capabilities will lead to better integration of fires in support of initial-entry forces and dispel any myths related to responsiveness and collateral damage associated with rocket and ATACMS fires.

Finally, liaison sections in rocket artillery units need to ensure that they are proficient not only in technical fire direction and tactical weapons employment, but also in the employment of fires in support of maneuver forces. This is especially true of those in HIMARS battalions. Because HIMARS is a delivery system for PGMs and a rapid-deployment fire support platform, HIMARS battalion liaison sections will find themselves more frequently integrated into the maneuver battalion's and brigade headquarters' fires cells. Therefore, HIMARS liaison sections need to understand how best to integrate their weapons system and its capabilities into fires from all platforms supporting the ground force commander.

Marines from F Battery, 2nd Battalion, 14th Marines, fire a Guided Multiple-Launch Rocket System rocket from a HIMARS in Iraq. (Photo by Sgt Andrew D. Pendracki, USMC)

Endnotes:

1. US Army, Redstone Arsenal, "MLRS," available at www.redstone.army.mil/history/systems/MLRS.html.
2. Jeffrey L. Froysland, "Transformation: Bringing Precision to MLRS Rockets," *Field Artillery*, March-April 2003.
3. Ibid., for a brief discussion of initial fielding concerns about employing GMLRS in urban environments.

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The JFA: Redefining the Kill Box

By Major James E. Mullin III, AR

Since Operation Desert Storm, the US military has used "kill boxes" to coordinate joint fires from different Services to destroy enemy targets while ensuring the safety of friendly forces. The military still employs kill boxes on the modern battlefield, including during initial operations in Operations Enduring Freedom and Iraqi Freedom. Coordinating joint fires is a complex process that needs standard tactics, techniques and procedures (TTPs) all of the armed forces understand and follow.

Developing the TTP. Through practice and lessons learned in combat, kill boxes have evolved from a "good idea" to a practical application on the battlefield. To standardize kill box procedures, the Air Land Sea Application (ALSA) Center at Langley Air Force Base (AFB), Virginia, published a multiservice TTP (MTTP)[1] on the employment of the kill box.

ALSA's Kill Box MTTP is published, but *it is not doctrine*. At press time, this is the only published kill box TTP available for use. Though it has not been approved yet, the Joint Fires Coordination Measures (JFCM) Joint Test and Evaluation (JTE), at Nellis AFB, Nevada, has provided a way ahead for this document to become part of joint doctrine through the creation of the Joint Fires Area (JFA) TTP.

Testing the JFA TTP. The Office of the Secretary of Defense chartered the JFCM JTE to develop, test and evaluate new TTPs and make recommendations to improve the effectiveness of kill boxes by standardizing operational TTPs.

The specific test issues are 1) To what extent do JFCM-developed joint TTP command and control (C^2) processes to plan and implement kill boxes as fires support coordinating measures (FSCMs) enable the joint forces commander to integrate fires with maneuver? and 2) To what extent do current and near-term C^2 systems enable the joint forces commander to integrate fires with maneuver, in accordance with JFCM-developed joint TTP C^2 processes, when planning and implementing kill boxes as FSCMs?

The JFCM first sought to align the term "kill box" doctrinally with other FSCM naming conventions and redefined it as a JFA. In other words it aligns with other FSCMs such as no-fire area (NFA) and free-fire area (FFA), and it supports the military decision-making process and targeting process.

The JFCM has developed one set of TTP for the JFA based on data gathered through a series of test events. The test schedule consisted of two rehearsal-of-concept drill events, two minitests, a risk-reduction event and the capstone field test, Talisman Saber 07.

The field test was completed in July 2007, and JFCM currently is completing the analysis of the data and will use that data to finalize the JFA TTP, submitting it to ALSA for an update to the MTTP. The validated JFA TTP will be submitted to Joint Forces Command for inclusion in *JP 3-09 Doctrine for Joint Fire Support*.[2] If approved, the JFA concept will become doctrine when it is integrated into *JP 3-09*.

The final product that JFCM produces will benefit the warfighter in several ways. First, warfighters will have a TTP that defines JFA procedures and how to integrate fires at the operational and tactical levels. Second, standardized JFA procedures will have a direct impact on Service training and joint exercises. Third, C^2 procedures will be leveraged to increase the visualization of the operational area. Finally, as an FSCM, the JFA will increase the effectiveness of fires, decrease the amount of coordination and reduce the risk to friendly forces.

Based on the information gathered, the JFCM defined the JFA and developed several core TTPs that further illustrate the specific characteristics of a JFA. The following sections of this article discuss the definition of a JFA, its core TTP, its two attributes, and how to name, locate and establish a JFA.

Defining a JFA. A JFA is a three-dimensional (3-D) FSCM used by the joint forces commander and his component commanders to facilitate engaging targets with fires without additional coordination (all coordination is complete before establishment). The two attributes of an FSCM are location and time. As a 3-D FSCM, the JFA location is comprised of an effects area and airspace. The effects area and airspace must be defined concurrently to build a JFA in collaborative, fire support and C^2 systems. Defining these attributes concurrently facilitates component coordination, deconfliction and integration.

The joint forces commander may standardize joint attributes depending on the operational environment. The attributes discussed in this article define a JFA and set the conditions for effectiveness and efficiency while reducing the risk to friendly forces. Two key aspects to this definition are critical to understanding what constitutes a JFA. First, it is permissive in the sense that a JFA allows the engagement of targets, and it is an FSCM—meaning that it is a part of a deliberate joint targeting process. The second critical aspect of this definition is that a JFA supports the joint forces commander by enabling his component commanders to accomplish his objectives.

For example, during Phase II operations (Seize the Initiative), the joint force air component commander (JFACC) is normally the supported commander for the joint forces commander's theater-wide air-interdiction campaign across the entire operational area. Normally this interdiction campaign begins before the introduction of land forces into the theater, and the JFACC is the establishing authority for all JFAs over land, unless included in a maritime area of operations (AO). Once ground forces are introduced, land AOs take effect and the supported land component becomes the establishing commander. Outside these AOs, the JFACC normally remains the establishing commander until ground forces occupy the entire operational area or the conflict enters Phase IV (Stability).[3]

Core TTPs. Three core TTPs complement the JFA definition and expand on the JFA's purpose and use. These TTPs are integral to understanding what a JFA does and how the JFA's proper use can be a combat multiplier.

1. The JFA's purpose is to increase the ability of the joint forces commander, component commander and/or joint task force commander to integrate fires and achieve effects in support of a ground component's scheme of maneuver and joint forces commander's campaign plan.

2. The joint forces commander sets theater conditions to enable the effective employment of a JFA. The joint forces commander directs the use of a reference system and may delegate JFA establishing authority. For example, the joint forces commander may delegate authority to establish the JFA short of the forward

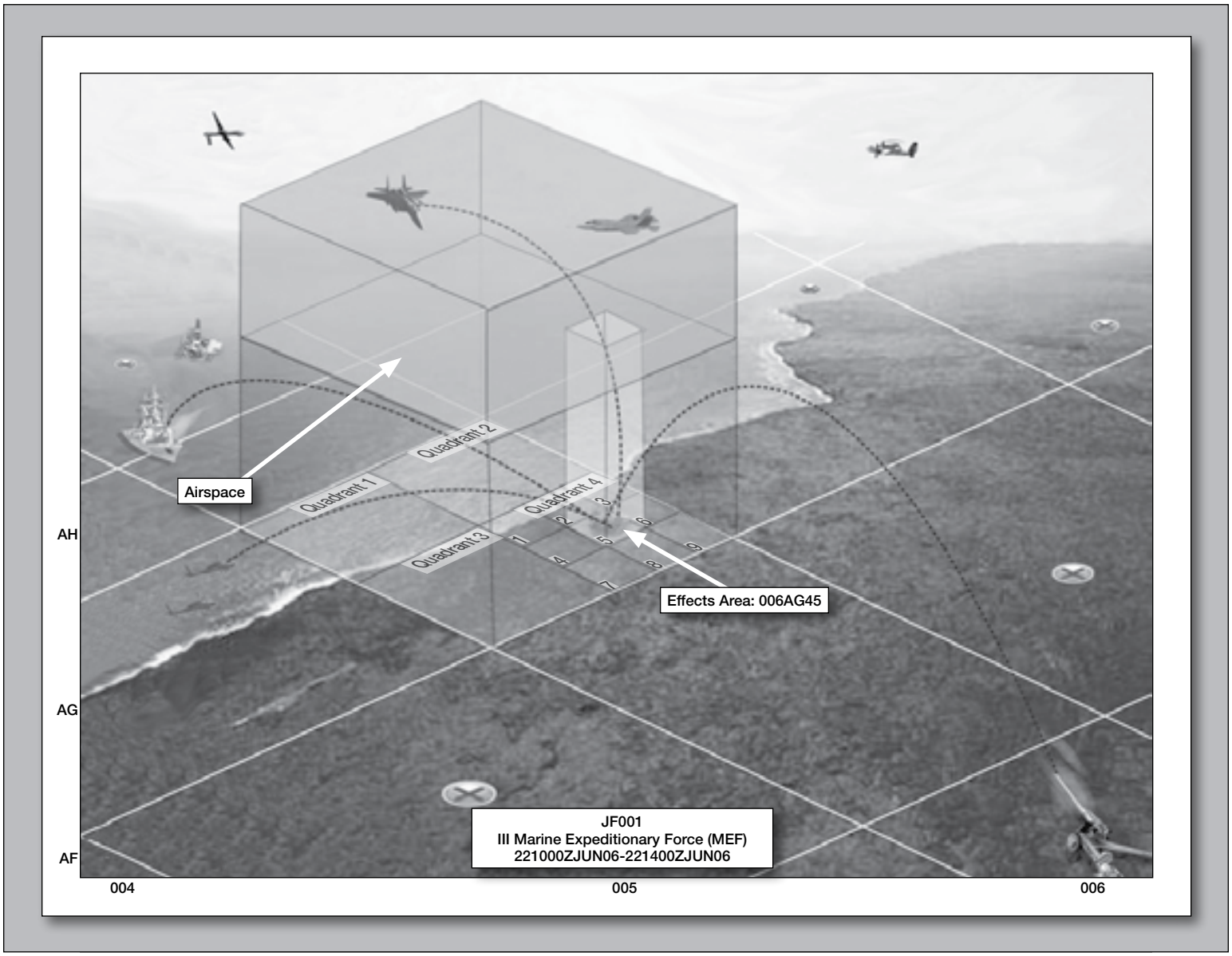

Figure 1: Three-Dimensional Representation of a Joint Fires Area (JFA) Using the Global Area Reference System (GARS)

boundary and in nonlinear battlespace to the supported commander; to the air component long of the forward boundary; to the maritime component over water; and to the special operations component in a joint special operations area.

3. To plan and establish a JFA, both attributes must be defined. The attributes may be tailored and usually start with joint defaults to make planning more efficient.

JFA Attributes. Figure 1 is an example of a 3-D JFA with the effects area, airspace and time noted.

Effects area is the area on the surface or subsurface that extends to the floor of the airspace where weapons effects are desired and permitted. The location of the effects area is defined at the keypad level by the establishing commander using the joint forces commander's directed area reference system (i.e., Global Area Reference System or GARS). The JFA's minimum size could be a single keypad (5-minutes x 5-minutes), constructed of multiple, adjoining keypads or the entire cell (30-minutes x 30-minutes). The effects area can be adjusted smaller than the airspace to reduce the risk to friendly forces.

Airspace is an area above the effects area in which maneuvering aircraft delivering air-to-surface fires into the effects area are protected. The airspace location is defined using the joint forces commander's designated area reference system (i.e., GARS). The associated airspace normally would be constructed at the cell level by the airspace coordination authority and could include multiple, adjoining cells or be designated at the keypad level. The parameters of the airspace are defined to enable safe and effective delivery of air-to-surface fires while providing a reasonable degree of protection from surface-to-surface indirect fires, surface-to-air fires and other aircraft.

Time is the period that the JFA is to be in effect. JFAs are "planned," "in effect" or "cancelled." JFAs will be opened or closed to fires or effects based upon time or an event trigger.

JFA Naming Convention. Once a JFA is built, the user must make it distinguishable from other FSCMs to avoid confusion. All JFAs are aligned with the joint FSCM naming convention. The four basic parts of a named JFA are: 1) the label of "JF," which tells the user that it is a JFA; 2) a number that tells the user the order in which a particular JFA was established; 3) the name of the establishing command that has responsibility for that JFA; and 4) the effective time, which shows when the JFA will be in effect. For example, the JFA in Figures 1 and 3 is named "JF001 III MEF 221000ZJUN06-221400ZJUN06."

Locating the JFA: GARS. Because all components use JFAs, it is imperative that the Services have a common area reference system to locate where a JFA exists on the battlefield. The system approved by the Department of Defense is GARS.[4]

GARS uses lines of longitude and latitude as its base and allows for joint force situational awareness (SA) to facilitate air-to-ground attack coordination, deconfliction, integration and synchronization. GARS ensures a common language among the Services and is used as a battlespace management tool as opposed to targeting or navigation.

The basic GARS design divides the globe into 30-minute by 30-minute cells. Each cell is given a five-character designation. For example, the cell is defined as "006AG" in Figures 1 and 2. The first three characters "006" indicate a 30-minute wide longitudinal band. Starting at the 180-degree meridian and moving eastward, the bands are numbered from "001" to "720."

The next two characters "AG" indicate a 30-minute wide latitudinal band. Starting from the South Pole and moving northward, the bands are lettered from "AA" to "QZ" (omitting "I" and "O").

Each 30-minute by 30-minute cell is divided into four 15-minute by 15-minute quadrants. These quadrants are sequential, numbered from west to east, starting with the northernmost band. The northwest quadrant is number "1," the northeast quadrant is number "2," the southwest quadrant is number "3," and the southeast quadrant is number "4." The quadrants are designated using a six-character nomenclature. The first five characters of "006AG4" are the cell designation, and the sixth character "4" identifies the quadrant number.

Each 15-minute by 15-minute quadrant is divided into nine 5-minute by 5-minute areas. These nine squares are numbered in the same order as the numbers displayed on a telephone keypad, and thus are called keypads. The first six characters of "006AG45" name the quadrant, while the seventh character "5" is the keypad number.

To find a particular effects area using GARS the user first must read right (along the numbers) and then read up (to get to the desired letter designation). In Figure 2, the point of origin is in the bottom left-hand corner of the grid. The numbers along the base of the grid show the east-west axis, while the letters rising from "AA" to "AH" demonstrate the north-south axis. In the example shown, to find effects area "006AG45," the user first would look right across the grid to the numbers "006", and then look up to find the letters "AG" to find the cell "006AG." To find the quadrant, the user would break cell "006AG" into four quadrants, with quadrant "4" located in the southeast corner. To find the keypad the user breaks down quadrant "4" into nine keypads, with the number "5" being in the middle of the keypads.

Using GARS helps avoid confusion between the land, air and maritime components. It also enables the attack of targets and increases accurate communications and synchronization throughout the joint operations area and provides proper SA, reducing the risk to friendly forces.

Establishing the JFA. The supported component commander establishes and adjusts JFAs in consultation with supported, supporting, subordinate and affected commanders. JFA establishment authority is an extension of the existing support relationships established by the joint forces commander.

A JFA is established by the component commander having jurisdiction over an assigned operational area or area of responsibility (Air Component) as delegated by the joint forces commander. The establishing commander coordinates JFA airspace with the airspace control authority. The joint forces commander, in conjunction with the JFACC, makes the final determination for airspace in the event of a dispute over airspace between the JFA establishing commander and the airspace control authority. Requests for cross-component support are adjudicated by the first common commander where cross-component coordination can be affected.

A JFA is established when the establishing commander confirms the JFA attributes have been defined through coordination, deconfliction and integration and disseminates the confirmation to all affected commanders. As a permissive FSCM, after all coordination is complete, the JFA permits the delivery of air-to-surface fires, surface-to-surface indirect fires, and maritime fires and effects without additional coordination with the establishing commander.

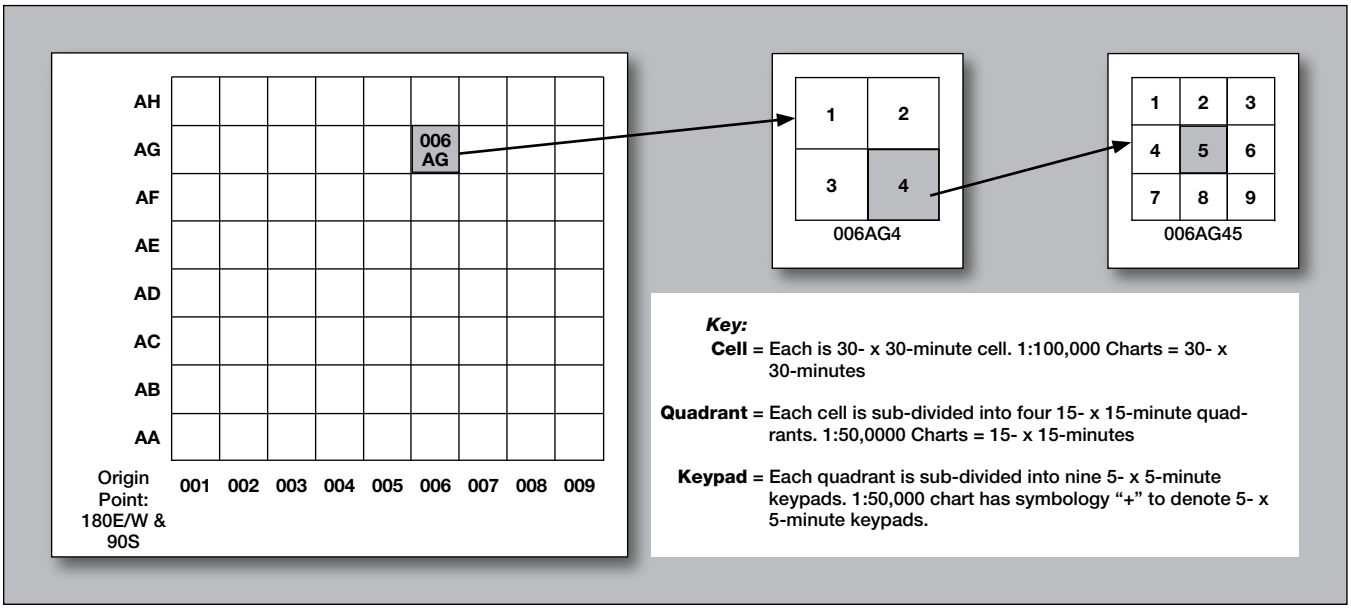

Figure 2: GARS Overview Example "006AG45"

Aircraft and the trajectories of air-to-surface and surface-to-surface fires not in support of the JFA are not permitted to pass through the JFA without coordination with the establishing commander. Key to a JFA's establishment is the deliberate planning process, which is part of the joint targeting process.

Planners can execute a hasty planning process to expedite the formation of a JFA if there is a heightened sense of urgency. A JFA can be scheduled (where it is triggered by a time) or on-order (where it will be triggered by an event). It is important that planners keep the joint forces commander's objectives, intent, scheme of maneuver, guidance on FSCMs and the rules of engagement (ROE) in mind when planning a JFA.

Component commanders are authorized to establish JFAs to support their individual schemes of maneuver and fire support plans, while at the same time supporting the joint forces commander's objectives and overall campaign plan. These commanders are the JFACC, joint force land component commander (JFLCC), joint force maritime component commander (JFMCC) and the joint force special operations component commander (JFSOCC). Once a commander establishes a JFA, planners publish the JFA in an order so that all agencies have proper SA.

Considerations. JFAs support the commander's objectives and concept of operations. As such, all target engagements within a JFA must adhere to the establishing commander's designated target priorities, effects and timing of fires.

Published Orders. The ROE, collateral damage estimation restrictions and special instructions remain applicable to operations conducted within JFAs.

Friendly Forces. Once the commander establishes a JFA, forces will *not* maneuver within or enter into a JFA effects area during effective times. The JFA may contain other FSCMs within its boundaries. A JFA will not supersede any restrictive FSCM located within its boundaries. If circumstances require protection of a friendly force (i.e., Special Operations Forces teams, reconnaissance patrols or littoral operations) within a JFA, then a restrictive FSCM will be used.

JFAs can facilitate the integration of joint assets for interdiction of maritime threats.

It is recommended that the portion(s) of the JFA where close air support (CAS) is being conducted be closed during the CAS operations. The establishing headquarters approves CAS within the JFA on a mission-by-mission basis, and there are no restrictions to ground forces employing direct fire weapons.

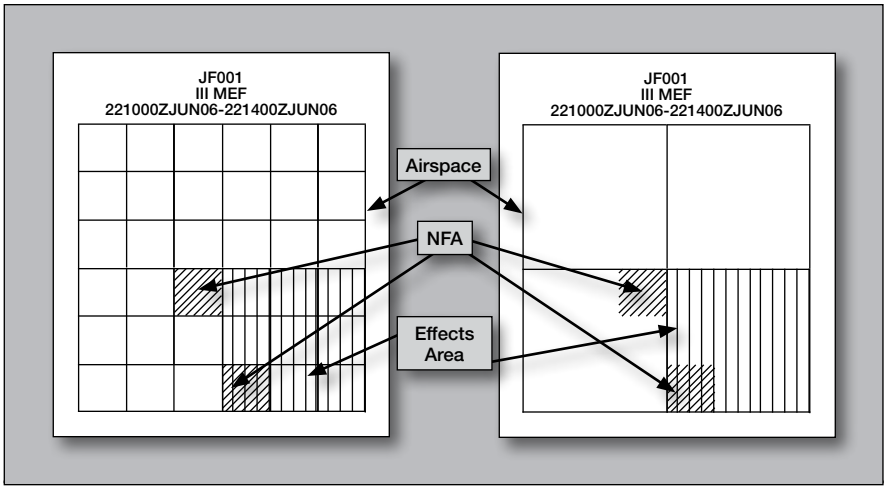

Figure 3: Commanders publish JFAs indicating effects areas (vertical lines) using two methods: quadrants turned off with keypads turned on (left) or quadrants turned on with keypads turned off (right). No-fire areas (NFAs) on the JFA are indicated with diagonal lines.

When the establishing commander publishes a JFA, it will be disseminated throughout a variety of systems where operators can identify the FSCM visually. There are two methods to denote a JFA graphically as shown in Figure 3. One method has the quadrants turned on with the keypads turned off, while the other presents the quadrants turned off with all 36 keypads of the JFA turned on.

Note that the entire cell contains the airspace for the JFA, and vertical lines represent the effects area. Other FSCMs, such as NFAs, also can be represented graphically to increase the user's SA, such as an NFA within the effects area in quadrant "4."

JFA Tenets. JFAs have several tenets that answer frequently asked questions and outline some basic premises of the JFA. They are: a JFA is an FSCM, not a reference system; a JFA is planned to support fires and maneuver; JFAs facilitate air interdiction regardless of location in the operational area; weapons release may occur outside the confines of the JFA where effects are intended; direct fires are not restricted by the JFA's establishment; and CAS may be conducted within a JFA with specific considerations.

The JFA is an important aspect of the combined arms and joint component fight on the modern battlefield. By understanding a JFA, the Services can deliver timely and accurate fires on the enemy while simultaneously ensuring the safety of friendly forces. If the joint Services approve the JFA TTP, all Services will have a common operating picture and a way ahead for training. Arriving on the next joint battlefield with this common understanding will enable warfighters to take the fight to the enemy efficiently and effectively and save the lives of the most valuable asset, the *warfighter*.

Endnotes:

1 Air Land Sea Application Center, *Field Manual 3-09.34 Multi-Service Tactics, Techniques and Procedures (MTTPs) for Kill Box Employment*, (Langley AFB, VA: 2005). The Marine Corps' version of this TTP is MCRP 3-25H; The Navy's version is NTTP 3-09.2.1; and the Air Force's version is AFFTTP (1) 3-2.59.

2. Joint Forces Command, *Joint Publication (JP) 3-09 Joint Fire Support*, (Washington, DC: November 2006).

3. Joint Forces Command, *JP 3-0 Joint Operations*, (Washington, DC: September 2006).

4. National Geospatial Intelligence Agency, Global Area Reference System, 2006, available at earth-info.nga.mil/GandG/coordsys/grids/gars.html#zz.

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Rear Detachment Leaders —The Unsung Heroes of Deployment

The 4th Battalion, 25th Field Artillery (4-25 FA), 3rd Brigade Combat Team (3 BCT), 10th Mountain Division, deploys February 2006. The Soldiers and family members—left behind in Fort Drum, New York—were supported by fellow Soldiers of the unit's rear detachment. (Photo courtesy of 4-25 FA)

By Lieutenant Colonel Michael J. Forsyth, FA

A deployed unit's rear detachment is a critical element that can enable or detract from the unit's mission accomplishment forward. Not long ago these *ad hoc* organizations were considered an irritating task and were established in the final days before the deployment. Most leaders now realize the criticality of this organization and the importance of its structure, training and operations.

This article offers some thoughts, based on experience, on how to structure the organization and how the Army should codify this in a modified table of organization and equipment (MTOE) and doctrine. Foremost, this piece discusses items that defy quantification, such as how to select the right individuals to populate the organization and what intangible qualities they *must* have to function as the rear detachment leaders and staff.

- Listening Skills
- Ability to Communicate in a Respectful Manner, Yet Remaining Firm and Resolute When Required
- Compassion for Others
- High Tolerance for Stress
- Ability to Take Verbal Abuse (Humility)
- Managerial Skills
- Motivational Skills

Figure 1: Rear Detachment Leaders' Skills

Selecting the Leaders. What criteria should commanders use to select the rear detachment leaders? This is a difficult decision for commanders because assembling a good team takes leaders away from the deployed unit. There is no guide for selecting leaders, and most of the required qualities for the individuals are not military traits *per se*.

Leaders' Traits. I believe rear detachment leaders must have the traits listed in Figure 1. First and most importantly, a selected leader must have good listening skills. A leader that speaks too much instead of listening is perceived as uncaring and dictatorial by the families he is trying to help. Family members, especially those in grief, many times just need someone to listen. Good listening skills help identify needs and allow the rear detachment to deal with problems before they become a crisis.

Hand-in-hand with listening is the ability to communicate clearly and concisely because, as part of the chain of command, a rear detachment leader's job is to disseminate critical information to Soldiers and family members. It is easy to skew information, and a rear detachment leader with poor communication skills who struggles with disseminating information can hurt unit morale and efficiency.

Compassion for others is not a talent that most military leaders look for in a superior or subordinate. The Army gravitates to tough guys who are unafraid and can accomplish any mission. However, an abrasive leader in a rear detachment can hurt a grieving family through "ham-handedness," and he also can give the Army a "black eye."

A rear detachment leader must be cognizant that the stress on deployed Soldiers' families is enormous and that the loss or wounding of a Soldier has a deep impact on his family members' lives. Knowing this, a leader must act accordingly in times of crisis by expressing and exuding compassion when speaking to and/or assisting families. Leaders should *never* make families feel that their issues are a nuisance to the rear detachment. Rather, family members must feel confident that the rear detachment is there for them whenever a need arises, especially with the loss of a Soldier.

Rear detachment leaders routinely suffer verbal abuse from stressed family members who perhaps just received news of a tour extension, are coping with a serious illness in the family, or just are dealing with daily living during a unit's deployment. This raises a leader's stress level and lowers his tolerance for dealing patiently with issues. A competent rear detachment leader, even when jaded, will never lash out or become short or brusque with a family member. In short, a competent rear detachment leader serves with humility, meaning that he subordinates his opinion and pride selflessly, understanding that the mission of caring for families is more important than his personal sensibilities.

Challenging Tasks. Rear detachment leaders—who normally do not receive much training for their challenging assignments—must be able to manage a plethora of varied tasks with a small staff. Tasks include caring for and overseeing the progression of wounded warriors through the Army medical system, turning in leave-behind equipment, helping families of the fallen and preparing replacements for forward movement.

In the course of carrying out these tasks, the thin rear detachment can become jaded at times by the stress and workload. Therefore, leaders need intangible motivational skills as well as managerial skills. Maintaining the rear detachment's morale during 15-16 months can tax the best of leaders, but high morale is as critical to mission accomplishment as the preparation of replacements to maintain balance during the long haul.

- Conduct casualty notification and assistance.
- Coordinate and assist family readiness group.
- Process and train new Soldiers for forward movement.
- Turn in leave behind equipment (LBE).
- Move to new unit footprint (if required during the deployment).
- Represent unit at off-post activities.

Figure 2: Rear Detachment Mission Essential Tasks

Team Selection. Team selection should not wait until the last moment. The commander should develop a slate for the rear detachment's structure in conjunction with all other personnel projections including company command or the field grade slate. The rear detachment team should be selected six months before deployment so it can begin training. By three months before deployment, the rear detachment should be operational with a derivative unit identification code for all personnel transactions and for executing administrative duties.

The rear detachment should remain intact until 90 days after the redeployment date or 30 days after the unit returns from block leave. This will ensure management continuity of wounded warriors, rear detachment personnel and families while helping the chain of command with the difficult transitions during deployment and redeployment.

Team Structure. The rear detachment has several mission essential tasks (see Figure 2). Therefore, the command must establish an organization specifically tailored to accomplish all tasks with proficiency. (Figure 3 shows a suggested minimum adequate structure to conduct sustained operations.)

If the Army is serious about establishing functional rear detachments, then the best way to prove this is through codification. Rear detachments should exist in MTOEs and receive appropriate discussion in Army Regulation 600-20 Command Policy and other doctrinal manuals.

Rear detachments currently are established *ad hoc* "out of hide." Filling a rear detachment with good personnel hurts the organization if it is to function effectively, because the same people would make outstanding contributions if deployed. A standard organization established by MTOE would prove a prudent step to alleviate this dilemma for commanders. Certain positions could be filled by contract personnel using funds approved from the operational budget thus reducing the strain on uniformed personnel. Regardless of who fills these positions, the Army must source them to ensure proper attention is paid to such critical duties in rear detachments.

Standing Operating Procedures (SOPs) and Training. Well before the established deployment date, the unit must develop and publish two SOPs. The first is the operations SOP establishing the standards for routine daily functions. Such operations include personnel accounting procedures, fleet maintenance, property accountability (especially organizational clothing and individual equipment) and family issues tracking.

The second and more critical SOP is the casualty notification SOP outlining the step-by-step procedures for all types of casualties. The casualty SOP is a "zero-tolerance-for-mistakes" SOP so it must receive special attention for clarity in writing and several rehearsals before deployment.

Rear detachment training should begin six months before the unit's deployment and should include all rear commanders as well as the family readiness support assistants (FRSAs) and family readiness group (FRG) leaders. Events must have a hands-on component that challenges and stresses the rear personnel, using role players as family members in difficult circumstances, including the loss of a Soldier.

Role playing is the only way to determine if designated rear personnel have the maturity, composure and mettle to handle stressful situations. If a rear detachment leader demonstrates loss of control or an uncaring attitude in training, he should be removed from the position immediately. Negative traits demonstrated in training will manifest themselves in real situations.

Regular training events should occur monthly until the unit departs. This will ensure the repetition needed to inculcate the philosophy fully and make the handling of tough circumstances routine. The best opportunity for rear detachments to train is during the unit mission rehearsal exercise. Thus, a well-developed and resourced training plan that includes addressing chains of concern, handling and tracking family issues, and dealing with casualty notification is essential to maximizing this opportunity.

Routine Operations. It is during routine operations that the intangible traits of compassion, humility and motivational leadership come into play. As the de-

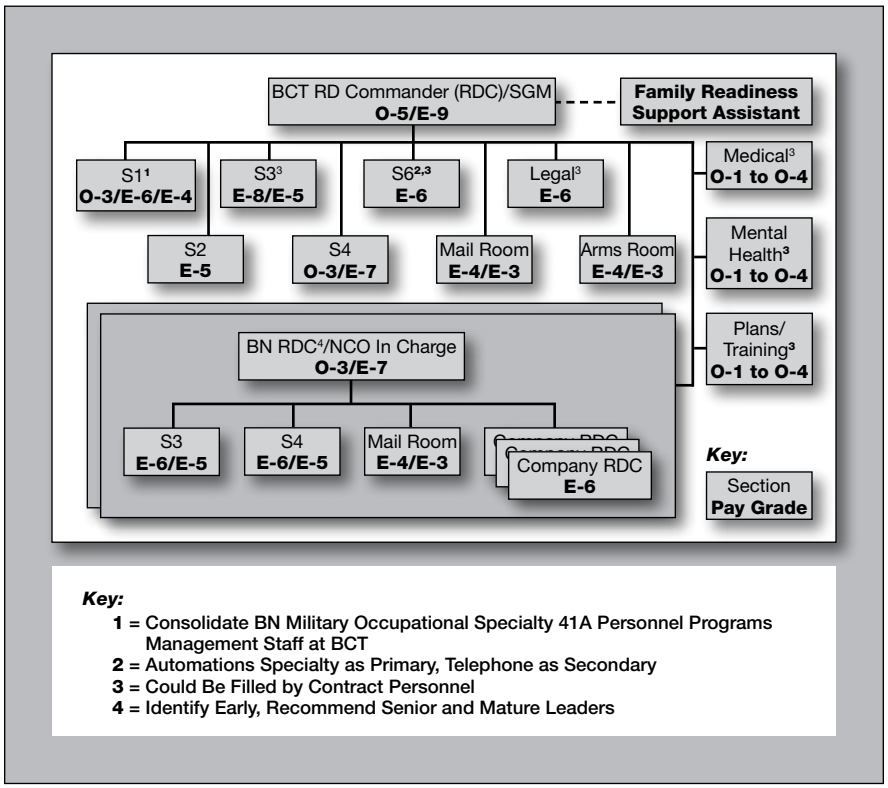

Figure 3: The author suggests these minimum structures for brigade combat teams (BCTs) and battalions (BNs) to conduct sustained rear detachment (RD) operations.

ployment grinds into its final months, rear detachment personnel can become disgruntled, but a mature command team can keep the detachment focused.

The four biggest tasks facing the rear detachment in routine operations are family issues tracking, casualty tracking, wounded-warrior care and FRG communication. The command team deals with aspects of each of these elements every day, and all require care and maturity to handle properly.

Family Issues. Family issues start before the unit deploys and continue through the redeployment. Each battalion rear detachment must maintain an accurate running log of family issues so problems are recorded, tracked and followed up on to ensure closure.

In attending to family issues, rear detachment personnel must exercise three imperatives with every family—listen without prejudging, interact with politeness and respect (never express disdain), and always follow-up on every issue until it is closed. The tracker (with sample entries) shown in Figure 5 is a tool used to monitor the status of each issue. It is color coded to depict the urgency of need and contains a journal of actions taken to alleviate the issue.

The brigade rear detachment should have a weekly family-issues meeting to bring together the subordinate units' rear detachment commanders to discuss issues and generate ideas to solve problems. All attendees must understand that the information discussed is confidential and the focus is on helping families help themselves. The rear detachment cannot replace the deployed spouses, rather it should help family members develop coping skills by giving them a nudge in the right direction.

Casualties. Casualties may occur during the course of a deployment. The rear detachment functions as the conduit of information between the unit forward and

Status	Priority	Code	Start Date	Issue	Unit	Status/Solution	End Date	Days
	A	HM	11 October	Spouse phoned MPs in reference to possible intruder. Spouse is unsettled and is having trouble sleeping. She called RDC for additional assistance.	C Company, 2nd Battalion, 87th Infantry (C/2-87 IN)	Sent unit physical security NCO to inspect quarters. He ensured all window and door locks are operational. Locks have been changed.	11 October	1
	B	H	18 October	SM and wife in Gouverneur, New York. Wife has diabetes and needs to see a doctor three times a week. The closest doctor is in Watertown, New York. SM will deploy soon and wants wife to be closer to doctor.	B Company, 3rd Brigade Special Troops Battalion (B/3 BSTB)	Assisted family in filling out EFMP packet which was submitted 21 October. Next board convenes 2 November. UPDATE: SM has new government housing in Watertown. SM is still clearing current house. SM will move into new house soon.	4 November	1
	C	FB	10 November	Family debt exceeded ability to pay utility bills.	Headquarters and Headquarters Company, 1st Battalion, 32nd Infantry (HHC/1-32 IN)	Budget established through financial readiness. Debtors have accepted allotments within the family's budget. Utilities are being paid, and family has funds for basic subsistance.	20 November	10
	A	H	8 October	Family member had a 6-month-old child hospitilized over the weekend for pneumonia.	B Company, 3rd Brigade Special Troops Battalion (B/3 BSTB)	Doctors have moved the child into the ICU. The child is stable, but considered in critical condition. SM has been notified. FRG and neighbors are supporting family.		

Issue Codes:

AER = Army Emergency Relief (Loan Required/Received)
B = Benefits (ID Card, Defense Eligibility Enrollment Reporting System [DEERS], TRICARE)
CP = Casual Pay (Soldier's CP Causing Hardship On Spouse)
C = Congressional (Unit Received Congressional)
D = Divorce (Divorce Paperwork Initiated)
EL = Emergency Leave (Soldier Returned from the Deployment)
EML = Environmental Moral Leave (Soldier in Transit/on EML/Issues)
FB = Family Budgeting (No Pay Mistakes, Budgeting Help Needed)
FN = Family in Need (Involving Serious Issues, Child Protective Services)
F = Finance (Starting/Stopping Allotments and Entitlements)
G = General Inquiry (Basic Question, Family Readiness Group Contact Info)
HS = Harassment (Spouse/Child Feeling Harassed)
H = Health (Illness of Child/Spouse)
HC = Housing; Civilian (Issues With Landlord, Rent, Pet)
HM = Housing; Military (Moving, Mowing, Snow Removal, Pet)
IG = Inspector General Complaint (Unit Received IG Complaint)
I = Immigration Issues (Photos, Update Paperwork)
K = KIA (Killed in Action)
LES = Leave and Earnings Statement (Needed by Spouse/Requires Access to MYPAY)
NB = New Baby
O = Orders (Spouse Needs)
P = POA (Power of Attorney: Special [SP] or General [GP])
PG = Pregnancy (Pregnancy Related Issues)
R = Red Cross Message (Received by Soldier)
S = Support (Support to Child and/or Spouse)
W = Wounded In Action (Very Seriously Ill or Injured [VSI], Seriously Ill or Injured [SI])

Priority Codes:

A = Meets Division/Brigade Commander's Critical Information Requirements (CCIR); Requires Immediate Response
B = Requires Response Within 24 hours
C = Monitor/Continue to Report

Status Codes:

= Complete (Green)
= On Track/Progessing (Amber)
= Stalled, Requires Additional/ Higher Level Assistance (Red)

Legend:

EFMP = Exceptional Family Member Program
FRG = Family Readiness Group
ICU = Intensive Care Unit
MP = Military Police
RDC = Rear Detachment Commander
SM = Servicemember

Figure 4: Family Issue Tracker (with Sample Entries)

the FRG and facilitates assistance to family members, if the family so desires.

Army regulations governing casualty notification are strict and allow no deviation. The unit rear detachment conducts notification only in wounded cases, and that occurs only after the casualty assistance center has confirmed the information. Notification of families in killed-in-action (KIA) cases is done by a designated casualty notification officer who generally is not a member of the affected unit. Once the notification has occurred, the unit can help a family that suffers a KIA.

In casualty situations, maturity is essential when handling each family. Each family deals differently with the emotion and shock stemming from loss. Some lash out and seek to place blame, others prefer to endure stoically and some just need to talk to an individual who cares and listens. Regardless of how a family deals with grief, the rear detachment must apply the imperatives noted earlier to ensure that each family is treated with dignity.

Wounded Warriors. As a deployment progresses, wounded warriors may begin returning from theater. Some return to the unit while others are admitted to hospitals around the continental US (CONUS). For those returning to military hospitals, the rear detachment should plan to make regular visits to see these patients. The dual purpose is to ensure proper care for these Soldiers and to demonstrate to them that the unit has not forgotten them.

Soldiers returning to the unit for rehabilitation and recovery require special care. The unit must ensure that they are case-managed by medical professionals and not swept under a "bureaucracy rug." This requires the rear detachment to track each Soldier meticulously, using a wounded-warrior tracker. If a Soldier's ability to recover from a profile is problematic, he might require transferral to the post's warrior transition unit. This, again, requires the rear detachment to pay close attention to make the transfer smooth and timely.

FRG Communications. The key throughout a deployment is the bond between the rear detachment and the FRG. The rear detachment has to work smoothly with the FRG to assure success because a relationship characterized by mistrust or friction is detrimental to the unit forward and families at home. The rear detachment has to cultivate trust and cooperation by maintaining open communication, and its leader's character traits, noted earlier, are critical to developing a good team.

The rear detachment communicates through a variety of mediums including face-to-face meetings, paper and email newsletters and internet postings on the virtual-FRG (vFRG) website. The unit FRSA helps in this arena by acting as the liaison to the FRG, managing contacts at the post and with extended families and disseminating the information through all media.

Many families move away from post during a deployment, but they and single Soldiers' families, living elsewhere, want information about the unit. The best way to reach these distant families is through digital means, such as email, electronic newsletters and the vFRG website. The rear detachment, the FRSA and FRG leaders have to work together and maintain up-to-date information. The rear detachment should never allow the information to grow stale or send outdated news. Information needs to be updated constantly to be both timely and pertinent, giving families peace of mind.

Redeployment. Even though the Soldiers are coming home, a unit's redeployment can be a tough time for Soldiers and their families. Many families mistakenly believe the issues that existed before the deployment disappear during the deployment. In reality, the separation only defers the problem. So again, the family-issues tracker comes into play as a critical tool to identify and mitigate problems before they reach a crisis point when Soldiers return.

After using the tracker to determine which families and Soldiers may have issues upon redeployment, the rear detachment conveys this information to the forward unit commander; who, in turn, ensures the Soldiers receive counseling or other help to deflect a crisis. Conversely, the unit forward needs to identify vulnerable Soldiers and inform the rear detachment so it can prepare any needed garrison resources. The cross-talk between forward and rear is essential to a unit's safe and uneventful redeployment.

Unit property accountability upon return is another important issue. The redeploying unit has a plethora of sensitive items that each Soldier hand carries home. The forward unit must develop accurate sensitive-item manifests at least 48 hours before each return flight and disseminate the list to the rear detachment. The rear detachment uses this manifest to account for each returning sensitive item, enabling rapid processing that allows a quick release of the Soldiers to their families.

The rear detachment also has to prepare the families for redeployment by offering a series of family training events at various times and iterations. Different venues, speakers and presentations have the best chance of reaching a wide audience. The training should include an overview of what families should expect upon the Soldiers' return, including how to identify potential health issues in their Soldiers, how to make reunions a better experience and how to find additional helpful resources. The greater emphasis placed on reunion preparation, the better the results.

An important area of redeployment that should not be overlooked is wounded-warrior care. These special Soldiers can be forgotten as the rear detachment becomes absorbed in redeployment planning and execution. Because these Soldiers did not receive a welcome home ceremony when they returned, invite them to march in with their company or have a place of honor at one of the unit's ceremonies, which ensures they are remembered appropriately. This solidifies their bond with their unit and keeps them in the unit leaders' consciousness.

Selecting rear detachment team members and leaders with good listening skills, compassion, maturity and a sense of selflessness, among other qualities, is one of the most critical decisions a commander can make. It is also one of the hardest because the same people would be invaluable in the forward unit.

People with the right qualities for the job along with a comprehensive training plan are needed so the team can meet all the challenges a rear detachment faces before, during and after deployment of their forward unit. A successful rear detachment pays huge dividends in mission accomplishment during the long haul.

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A Ground-based Midcourse Defense interceptor missile is emplaced at Fort Greely, Alaska, on 18 December 2005. Interceptors are also in place at Vandenberg Air Force Base, California. The two sites provide a limited defensive capability as part of the nation's missile defense program. (Photo by SGT Jack W. Carlson III, 49th Missile Defense Battalion)

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