Field Artillery

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A Joint Magazine for US Field Artillerymen

March-June 2004

Flagship Sill

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INTERVIEWS:

ARTICLES:

DEPARTMENTS:

PURPOSE: (as stated in the first ***Field Artillery Journal*** in 1911): *To publish a journal for disseminating professional knowledge and furnishing information as to the Field Artillery's progress, development and best use in campaign; to cultivate, with the other arms, a common understanding of the power and limitations of each; to foster a feeling of interdependence among the different arms and of hearty cooperation by all; and to promote understanding between the regular and militia forces by a closer bond; all of which objects are worthy and contribute to the good of our country.*

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Ed

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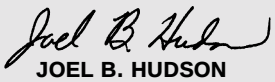

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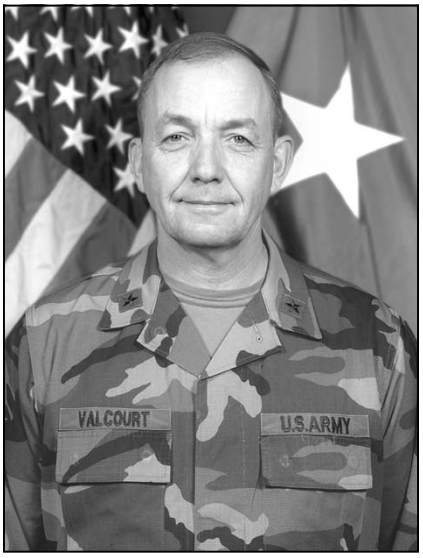
Change and Opportunity—*Steady* in the Harness!



Never before in my 30-plus years of service have I seen such a period of dynamic change and complete commitment of our Army as we see today. If change makes you uncomfortable, then certainly you must be having a hard time sleeping.

As your new Chief of Field Artillery for both Active and Reserve Components (AC and RC) units, I see this period as an opportunity. Our Army's current fight against the war on terrorism along with the corresponding mobilizations, movements and deployments on a scale not seen since the Second World War provide both the energy and resources for Army transformation.

One can readily understand the Army's frustration when our one-million-plus AC-RC force found it incredibly difficult to rotate 300,000 Soldiers forward deployed in order to fight with a fresh set of troops. Why can't the 700,000-plus who remain on the bench fall in to rotate onto the field?

I believe the answer is "readiness and relevance"—that's why the Army recently undertook the AC-RC rebalancing initiative and why we are transforming. We are rebalancing to ensure the AC can deploy and be ready to fight anywhere at any time for 30 days without having to mobilize RC units.

Historically, Redlegs have deployed and fought beside the maneuver forces they support. As we transform for the future, we will ensure that this support remains—that we are always ready, competent, flexible and relevant. I am committed to ensuring no maneuver commander even *considers* a plan that does not include his artillery.

Currently, the greatest transformation challenges are in cannon developments and organizations. In this brief column, I focus on those challenges, only mentioning rocket and missile artillery in passing. Our rocket and missile artillery are significant capabilities that also will be integral to the future force and, as such, will be discussed in future columns.

Precision Fires and Effects. Our first and most essential task is to support the close fight. This is the *raison d'etre* for our cannons. We will continue to improve our precision fires as well as more precise area effects in support of the maneuver brigades.

To achieve this precision, we must overcome the challenge of target location error (TLE). Precision munitions, such as Excalibur and other global positioning system- (GPS)-guided projectiles, will "miss precisely" if our observers can't locate targets accurately.

For the mounted observer, our standard is no more than 20 meters TLE at 10 kilometers. The fire support sensor system (FS^3) will be mounted on the Knight vehicle in early 2005 and provide that standard; currently, we have 31 Knights deployed in Afghanistan and Iraq as part of the rapid force initiative (RFI) program. The FS^3 will be a long-range advanced scout surveillance system ($LRAS^3$) with a lightweight laser designator rangefinder (LLDR) module. We must give the Bradley fire support team (FIST) this same capability.

The fire support sensor system (FS^3) will be mounted on the Knight vehicle in 2005.

For the dismounted observer, we have the current commercial-off-the-shelf Mark VII and Viper/Vector 21. These systems fielded in Afghanistan and Iraq under the RFI are lighter weight, have night vision and provide digital connectivity.

The *five requirements for accurate predicted fire* remain constant. They enable our fires to be precise. They are the science of our business, providing the "Gunnery Solution." Overcoming TLE, our bane for more than 30 years, will deliver "the keys to the joint effects kingdom" to our observers. I have made fixing TLE a priority above all others as we move to improve the responsiveness and effectiveness of our joint fires while driving down our logistical ammo tail.

Our current fight in Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) clearly dictates that we also must improve our counterfire radar capability. Our radars must become omni-directional (360 degrees) and more accurate and process data much more quickly in order to attack and destroy fleeting improvised shooters, to include those in urban areas.

The Special Operations Forces (SOF) version of the lightweight countermortar radar (LCMR) is being fielded to our forces in Iraq and Afghanistan under the RFI. The operational and organizational (O&O) plan for improving the

LCMR's range, accuracy, precision and timeliness for FA and mortar fires is being staffed. The Phoenix radar replacing the Q-37 radar will significantly improve counterfire along with the multimission radar (MMR) replacing the Q-36 radar. The MMR will not only be able to detect enemy fires and direct timely, effective counterfire, but also control aircraft and detect missiles.

M777 Lightweight 155

Common location, direction and elevation are provided by our position and azimuth determining system (PADS) and the gun laying and positioning system (GLPS). In the near-term, the improved PADS (IPADS) will replace the antiquated PADS that suffers a low readiness rate with costly repairs. Eventually, these capabilities will be embedded in weapons systems, greatly reducing requirements for conventional survey.

The solution for determining weather data is similar. The meteorological measuring set (MMS) and Profiler Block I (only 33 systems available) remain separate systems. Ultimately, determining weather data should be embedded in our weapons, reducing personnel requirements and leveraging Internet and space-based data.

Transforming Delivery Systems and Organizations. Although the decision to terminate Crusader came as a great disappointment to most artillerymen, in hindsight, Crusader would not have been relevant, given the transformational requirement for howitzers to be transportable by C-130 aircraft. However, we are leveraging many of the Crusader program's technologies in the development of our non-line-of-sight-cannon (NLOS-C). These include the projectile tracking system (PTS), the ammunition autoloader and the command console modules.

It is safe to say that until Army transformation is complete, artillerymen can anticipate providing precise and effective, timely and devastating close support fires for four different brigade formations. *Forcible-entry brigades* (82d and 101st Airborne Divisions and the 173d Airborne Brigade) will use the M119 and M198 cannons and, possibly, high-mobility artillery rocket system (HIMARS) launchers. As we see the lifespan of the M119 closing in 2010, we will conduct research and development (R&D) to procure an enhanced forcible-entry cannon in that timeframe.

Stryker brigades currently use the M198, a dependable and effective cannon. But as a towed system, it does not match the survivability and mobility of the formation it supports. The Marine Corps' M777 lightweight 155-mm cannon with towed artillery digitization (TAD) added, making it the M777A1, is an interim solution. But we will continue to pursue a self-propelled cannon for the Stryker brigade with a better 6400-mil capability, possibly the NLOS-C deployable in a C-130.

Our *counterattack corps brigades* (3d and 4th Infantry Divisions and 1st Cavalry Division) will continue to be supported by Paladins for as long as the Army fights with Bradleys and Abrams tanks—feasibly out to 2025. The Paladin proved itself during OIF with accurate, responsive effects, firing high-explosive rounds with point-detonating fuzes (HE/PD) and HE with variable-time fuzes (HE/VT) in areas where there was concern for collateral damage. According to the 3d Infantry Division Artillery (Div Arty) Commander, Paladin was the weapon of choice in the fight to take Baghdad. We will continue to make prudent improvements to Paladin to pull emerging capabilities "to the left," especially in command and control.

We are looking closely at using the FA ammunition supply vehicle (FAASV) chassis as the platoon leader's command and control vehicle and calling it the FA operations center vehicle (FAOCV). As we transform, our direct support (DS) battalions will be assigned (organic) to brigade units of action (UAs) and will change from three six-gun batteries to two eight-gun batteries (two four-gun platoons per battery). Paladin firing platoon leaders and platoon sergeants must have combat vehicles to command and control their guns.

The NLOS-C, along with the NLOS-launcher system (NLOS-LS), will form the backbone of organic fire support for the future combat system-(FCS)-equipped UA. The NLOS-C will share the same chassis as the infantry and armor FCS variants it will support. For the *first* time, our guns will have the same survivability, mobility, operational maneuver and sustainability as the maneuver forces they support—that is *significant.*

Our requirement for this cannon is a range of at least 30 kilometers firing HE with an accuracy not to exceed .55 percent of its range at low angle. It will fire six rounds per minute using an autoloader, be able to respond to a mission on the move within 30 seconds and be rearmable in less than 12 minutes with no fewer than 24 complete rounds.

We are concluding a study to determine if the NLOS-C should be a 155-mm or 105-mm cannon. This study covers much more than caliber—it is about capabilities. Just as other services have moved to smaller diameter bombs and increased precision, we, too, seek to shrink our logistics tail with increased precision while sustaining our current lethality and range in smaller, lighter, more deployable systems.

The transformed, modular and expeditionary brigade-based force must be able to attack into "white spaces" on the battlefield—the operationally significant spaces uncovered by friendly or enemy systems—and artillery that is agile intra-theater by C-130 will be essential to do that.

Those of you who have served in DS battalions will agree that, in most divisions, the DS battalions were de facto organic to the brigades. The Div Arty commanders' rule is DS battalions answer first to their supported maneuver brigades and then to the division as a whole—conflicts with that rule are few

as each Div Arty commander works closely with his brigade commanders.

Currently, the plan is to assign FISTs to the maneuver companies. But DS commanders should be responsible for the fire support function in their brigades. With that responsibility also should come the authority to train and develop those assets. I am committed to ensuring fire support NCOs and officers are absolutely trained, competent and ready—fully capable of performing their intended fire support mission. If this means reassigning FISTs back to the headquarters and headquarters battery in cannon battalions, then we'll work to do this and re-enable their training.

As the Army increases the number of maneuver brigades, most likely the number of DS cannon battalions organic to the brigades will increase correspondingly. However, "at the end of the day," our branch won't grow as I expect cannons echelons-above-division (EAD) will be realigned as DS battalions.

I use "DS battalions" as a familiar term; however, as these cannon battalions become organic to maneuver brigades, we'll need to relook names and relationships. After all, it has been one of our sacred points of pride that artillery is never in reserve, so we will examine the role of those cannon battalions assigned to maneuver brigades not committed or in reserve.

I clearly see growth in our 13F Fire Support Specialist Military Occupational Specialty (MOS) in order to provide expertise to every maneuver formation down to the company level.

At the division level, we will see, perhaps, the greatest change as the Army shifts to a brigade-based (UAs) institution. Currently, I do not see that this organization suggests brigades will deploy and fight alone; however, they will have modularity that will enable them to be task-organized "on the fly" to provide a force custom-tailored for the mission.

The division- or corps-sized unit of employment, or UEx, will be a tactical warfighting formation led by a two-star and be joint-capable. Subordinate maneuver and supporting UAs will not be assigned to the UEx but will be task organized modularly. This will include what we know as the Div Arty, which will be called the "fires unit of action." We envision that each UEx will have a fires UA(s) assigned for fighting, although not necessarily stationed with it during peacetime.

Fires UAs will be commanded by an artillery colonel and include a mix of launchers and cannons as well as counterfire radars. Additionally, the fires UA will contain a reconnaissance, surveillance and target acquisition (RSTA) company with common ground stations, an information operations (IO) element and unmanned aerial vehicle (UAV) platoons. The fires UA will be more capable than the current Div Arty. The Training and Doctrine Command's (TRADOC's) Task Force Modularity team is determining the exact make-up of the fires UA, the number of them in the force and their stationing details.

As with any change, there are many questions. What are the allocation rules for determining the number of fires UAs in the Army? Where will the fires UA be positioned? What is the relationship between the 06 fires UA commander and the FA battalion commanders in the maneuver UAs? Will the effects coordinator for the UEx be an 06 or 05? How about the role of the fire support element (FSE) soon to be called the effects coordination cell (ECC)? Will these organizations have multiple components (AC and RC)? Will there be stations in the continental US with a UEx and its subordinate maneuver UAs but with no fires UA collocated?

The FA's Future. We are proactively engaged with the TRADOC team to ensure the FA remains ready and relevant as part of the combined arms and joint warfighting team. We will not see a net growth of artillery, but there will be additional requirements for cannons inside the maneuver UAs (AC and RC) and our fire support Soldiers and fire support officers (FSOs) will remain critical effects coordinators in every maneuver formation.

We intend to train our 13F leaders and FSOs as "joint observers" capable of coordinating the delivery of all joint effects, both lethal and nonlethal. We are heavily engaged with other services, particularly the Air Force, and committed to growing "a bench" of Army joint terminal air controllers (JTACS) to provide our maneuver companies ready access to all joint effects.

For the Army to maintain readiness and relevance, we can expect to continue to see some artillery force structure converted to other capabilities, such as the current reorganization of 18 RC artillery batteries into Military Police companies. This is not a bad thing. Many of these formations were neither manned nor equipped at deployable levels—and, therefore, not "ready."

What many of you may not realize is that Field Artillery Soldiers comprise the largest MOSs in the National Guard, and all but nine states have at least one National Guard artillery battalion. As the Army rebalances, all artillery formations on our rolls will be maintained at the C-1 level of readiness, in terms of both modernized equipment and trained Soldiers. To that end, we are working closely with RC leaders.

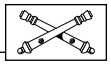
With these changes, you must remain "steady in the harness," helping the Army pull as a team and seeing change as opportunity. We are working these issues at Fort Sill, at TRADOC and in the Pentagon as well as dialoging with FA leaders in the field. If you would like to ask questions or express your concerns about this column, send an email to Redleg@sill.army.mil. I may not be able to answer all emails; however, be assured that you will have had input.

Proud Redlegs. Our artillery Soldiers have deployed to Iraq and Afghanistan and are accomplishing a wide variety of standard and non-standard missions. They have proven themselves ready and relevant—proven themselves adaptable and capable of executing Army missions across the full spectrum of conflict. Today, artillerymen also serve effectively as infantrymen to accomplish these missions: securing sensitive facilities and international borders, owning terrain as well as planning and acquiring targets, leading effects-based operations planning, shooting precise and lethal counterfire, continuing to coordinate nonlethal effects— in short, "rolling up the bad guys."

I am extremely proud of the successes of these Redlegs who have been using their unlimited imagination to rebuild Iraq and Afghanistan.

I see our future formation growing ever more joint, continuing to leverage technological advancements in precision and emergent capabilities, and carrying more effects coordination in "our rucksacks" for maneuver commanders

After all, it's about being *ready* and *relevant*…we will remain flexible, capable and loyal to our Army. If you wear crossed cannons on your collar, you have every right to be proud of your accomplishments and contributions. Your future is bright and challenging.



Lieutenant General Victor E. Renuart, Jr., USAF
J3 of Central Command during Operation Iraqi Freedom

OIF Hallmarks

Integrated Joint and Coalition Operations with Adaptable Commanders and Agile Planning and Execution

By Patrecia Slayden Hollis, Editor

Q The campaign in OIF to remove Saddam Hussein's regime was one of the most successful joint and Coalition campaigns in history. What made it so successful?

A Joint integration, Coalition integration—the key word is "integration." For many years in our military doctrine we've talked about "deconflicting," which really doesn't do justice to what we saw in this campaign. Our success was due, in part, to the very close personal and professional relationships of the leaders across the board, which allowed us to break through some barriers that have existed either in past doctrine or community prejudices.

Today's joint forces have transformed our equipment, thinking and capabilities to a degree that we can afford to break away from some of those parochial mindsets with respect to joint warfare. In this campaign, we took advantage of a place in time where everyone was configured to become truly integrated.

Why was this possible? Clearly we learned many lessons during Operation Enduring Freedom [OEF in Afghanistan]—lessons in distributed command and control; the integration of the components' planning staffs, as well as from the components to the joint force command; the importance of a theater ISR [intelligence, surveillance and reconnaissance] that is agile enough to respond to a component commander on the battlefield within minutes as opposed to hours or days. We learned it is very difficult on an underdeveloped battlefield to take advantage of technology to bring very precise firepower to bear anywhere on the battlefield on very short notice.

Then in OIF, we used the incredible power of strategic and operational lift on the battlefield to position forces very

rapidly where we needed them. And we took advantage of probably the most sophisticated logistical support train we've ever had to supply this campaign, not just linearly along the roads and lines of communication, but also across the battlefield in terms of how we supported special operations in the field. On the whole, no one was left wanting for beans, bullets or fuel, the things important to winning battles.

Q Please describe the battlespace to the west where the air component commander was supported by ground forces. What was the mission and what were the challenges?

A In the western portion of Iraq, we had the mission of countering enemy theater ballistic missiles [TBMs]—eliminating Saddam's option to threaten other nations with weapons of mass destruction [WMDs]—and the air component commander was the supported commander. To a degree, this battlefield was unprecedented because Special Operations Forces [SOF] supported the air component.

The air component "owned" the battlespace, which was unique. But we conducted detailed planning and training for that environment that made the air component commander very comfortable. The SOF and, to a lesser degree, the conventional forces were comfortable supporting in that relationship.

The air component was able to bring air and space resources to bear in a way that made the land forces agile in support of the air component's mission. Although the mission was unique, I think it's one we'll see again—the air component supported by SOF.

One challenge was to position the SOF and some small number of conventional forces to respond rapidly. So we had to communicate an operating picture that allowed them to move their light forces quickly, sometimes at night, to where they could interdict a potential Iraqi launcher. Integrating their movement and positioning into a command and control system the air component could use was challenging, but successful.

Another challenge was targeting the mobile missile launchers that can range a broad area of landmass. We had to balance the requirement for persistent ISR in that area of operations with the demands for ISR on the rest of the OIF battlefield. There were a limited number of platforms with which to conduct this critical mission.

So we had to create a means of prioritizing a variety of space-based, air breathing and unmanned ISR platforms to ensure the air component had situational awareness on the key critical launch areas—time-sensitive targets.

The air component coordinated operations with the special operating liaison element, the SOLE; the battlefield

coordination detachment, the BCD; and an element the air component crafted as a result of OEF, the ACCE, or air component coordination element, as a liaison for the other components. So each component knew what every other component knew and what they were planning and thinking.

This allowed the air component commander to flex critical resources around the battlefield in a timely fashion. Persistent ISR could be working in one area and as, maybe, a Global Hawk came on the scene, he could turn a joint STARS [surveillance and target attack radar system] in another direction to support the land component on another portion of the OIF battlefield.

Integrating the operations of the joint and Coalition Forces was a dance, a very precise dance. The integrated components and joint force command monitored and choreographed that dance.

Q *Some forces employed with the SOF in the west were Field Artillerymen with the high-mobility artillery rocket system (HIMARS). How effective was HIMARS?*

A We used HIMARS and, in some cases, Abrams tanks to bring significant firepower to bear very quickly.

HIMARS was a great success story—obviously very mobile with great standoff range.

The SOF infiltrated areas, positioned themselves to observe a target, reported that information back and then used the range, mobility and flexibility of HIMARS to very precisely strike some of the targets. During these operations, HIMARS had a huge impact on protecting our small number of forces who were significantly outnumbered on a large battlespace.

Q *How do we train to maintain and improve that level of integration for future campaigns?*

A Instead of training objectives by services and then integrating them on the battlefield, we must incorporate them into joint training, such as the Air Force Red Flag series of training exercises and at the Army National Training Center [NTC, Fort Irwin, California] rotations—at every training opportunity possible.

In the western portion of Iraq, we had the mission of countering enemy theater ballistic missiles. *(Photo by SSgt Lee A. Osbery, Jr., USAF)*

By training joint service objectives at the lowest levels, we will build a generation of leaders for whom it will be second nature to support other components in combat. For example, we need to begin to expand the circumstances where a conventional land element with high speed, mobility and firepower, such as the Stryker Brigade, supports an air component mission on one portion of the battlefield and vice versa on another portion of the battlefield.

Burning oil fields at the beginning of Operation Iraqi Freedom.

Q *Is the Air Force air tasking order [ATO] cycle of 72 hours flexible enough for the joint force commander and ground commanders' mobile targeting? How do we improve it to make it more responsive?*

A Yes, it is flexible enough for both. To a degree, some have a misperception about the ATO process. The 72-hour cycle is a *planning* cycle. We plan for the right resources to meet the joint force commander's intent over the next 72 hours.

However, targets are put in and taken out *daily*, and the air component's targeting process can respond to a target that becomes relevant "today"—in fact we did that quite a lot during OIF.

Now, we created some new doctrinal terms to make it as responsive as possible. For example, we defined *time-sensitive targets* as fleeting targets that took top priority—these were key regime leaders and weapons of mass destruction.

Time-sensitive targets were those that became visible in the course of an ATO execution, targets that were not preprogrammed, so they didn't have a mission assigned against them and were not part of an established killbox or close air support [CAS] allocation. For example, we had short-range theater ballistic missile launchers show up in an area in the east. We didn't have internal fires available, and the launchers were not in a killbox, so we inserted that target into

the ATO execution cycle to get it serviced immediately. To do that, we needed a means to alert the air component commander that a target of this level of importance had popped up and would take priority, and that was the term "time-sensitive target."

Too often "time-sensitive" was applied to targets that were fleeting but not necessarily of high priority for the joint force. Certainly, a battalion commander will have many targets on the battlefield to kill that are fleeting and of high value at the tactical level. But he has indirect fires assets organic to his ground force, mortars, Field Artillery, attack helicopters and, in many cases, killbox CAS available to him. He knows the rules of engagement [ROE], so he can attack those targets.

That battalion commander has time-sensitive targets at his level—but not targets for which we will change the ATO and move resources to kill.

At the joint force level, we established a hierarchy of timely targets. Time-sensitive targets were always highest priority. The *joint critical targets* were the next tier and allowed us to respond to targets appearing on the battlefield that were important enough to get resources to as fast as possible, but time-sensitive targets took priority.

There are a number of other targets we called emerging targets. These were targets that, if we ended up having extra resources that day, we killed them. For example, if air platforms couldn't get into one of the killboxes because of weather and the aircraft had bombs available, then the aircraft used them against emerging targets—which were fixed targets, a new division headquarters that popped up or logistical sites identified in ISR. It might be "early" to put them into the ATO cycle, but with assets available and enough targeting information to go after them, we attacked them with air assets or, in some cases, ATACMS [Army tactical missile system].

Each of the component commanders could come to the joint force command and say, "I've got target 'x', and I really need to strike it. I don't have the resources. Can you help me?" We would go to the air component, for example, and say, "Land component has target x; what do you have available?" The director of the CAOC [combined air operations center] would look at his resources and say, "I think I can get there," and enter target x as an emerging target.

It should make no difference to a joint pilot who's on the other end of the radio directing his air power. Every joint observer should be trained, certified and equipped to direct that fire to an established standard. *(Photo by SSgt Matthew Hannen, USAF)*

This process allowed the ATO cycle to be flexible yet prioritized targets.

Q *How did you manage fire support coordination lines [FSCLs] and forward boundaries?*

A Generally, the land and air components worked those across their component lines; we became involved only when there were competing issues.

The killbox concept "gridded" airspace to give the air component the most flexibility. In a grid square, the pilot maneuvers to reach whatever the desired objective is—to eliminate a logistics supply area, a maneuver unit, whatever. His targeting objectives are based on what the land component wants to occur in that grid box.

On the other hand, the land component commander oftentimes is more comfortable with some kind of linear boundary with the belief that he can control that better. So there is a natural friction between the desire for max flexibility and the desire for max control.

Through the course of OIF, we learned that the traditional linear fire support coordination line can significantly limit the land component commander as well as the air component commander. Using a gridded battlefield offers both the best flexibility: it allows the land component commander to determine the effects he wants in a particular grid box and close that grid box if he's going to maneuver through it and allows the air component the agility to maneuver to kill the land component's targets. It allows us to very rapidly change fire support coordination measures digitally.

The gridded battlefield also allows the air component commander the flexibility to operate in what we traditionally would have called BAI [battlefield air interdiction] areas, beyond the FSCL out to the forward boundary in a way that makes him more capable of meeting the joint force commander's strategic and operational requirements.

I believe we're beginning to incorporate the grid system universally across the services. It is the way we ought to go—the gridded battlefield is more rapidly responsive to the dynamics of the battlefield.

Q *AARs [after-action reports] and lessons learned indicate BDA [battle damage assessment] was not as effective in OIF as we would have liked. What was the impact on operations and how do we fix BDA for future campaigns?*

A I think the challenge in BDA, unfortunately, is numbers counting: how many "tanks" are dead and how do we prove it, which determines how we respond on the battlefield.

It was frustrating for our intelligence staff because the collection-analysis-assessment process was not agile enough to keep up with the pace of the battlefield that had thousands of targets a day. This campaign required agility on-the-run to adapt to what we saw. So the system was not up to that challenge.

What was the impact? During a period of bad weather [24-27 March in the Mother of All Sandstorms], the traditional assessment tools, such as national imagery and electro-optical kinds of tools, were ineffective. It was difficult for the component commanders to determine if they'd met the joint force commander's objectives in terms of effects on the battlefield. Ultimately, both the land and the air components had to accept risks, knowing the capabilities of their systems, and say, "We believe

we're ready to move forward." And in fact, their gut feelings were correct.

In OIF, we had to rely on a federated assessment system. No single component, no single intelligence command, has sufficient resources to process such a volume of data. We've got to bring the battlefield effects and assessment system along so it can handle that data and take advantage of, for example, weapons videos or Global Hawk and radar imagery.

The process should not necessarily determine exactly how many tanks are dead but that there are a lot of broken parts out there, providing at least a 70 percent certainty the target is gone. Then we've got to get that information to the commander very rapidly to provide him a higher level of confidence that the target was killed, a confidence level that matches his gut feelings.

We sometimes "assume away" BDA in exercises. We've got to force ourselves to put BDA into joint exercises so we train our federated systems to respond inside the time cycle of the decision maker on the battlefield.

Q *Do you support the concept of the "joint observer" from the multi-services capable of directing joint air power and ground-based fires on the battlefield?*

A Absolutely. The key is everyone has to be trained and certified the same.

Joint close air support [JCAS] in OIF, overall, worked very well. But we saw varying levels of success, depending on where you were on the battlefield.

The ANGLICO [Marine air-naval gunfire liaison company] teams did a wonderful job of integrating CAS on the run. In some cases, we had tactical air control parties [TACPs] out with maneuver units, such as the 3d Infantry Division, doing a great job of integrating fires.

In other cases, either the system wasn't mobile enough to keep up with the pace of the battlefield or we didn't have enough tactical air controllers, Marine or Air Force, to service the requirements. We've got to expand those resources.

It should make no difference to a joint pilot who's on the other end of the radio directing his air power. Every joint observer should be trained, certified and equipped to direct that fire to an established standard.

An artilleryman should be able to look through his laser rangefinder, locate the target, get GPS [global positioning system] coordinates and then, in a perfect world, data-burst the coordinates to the cockpit of some airplane to attack the target. But in the less-than-perfect world, he must be able to brief an incoming pilot using common terms and a common format on a target in his area of operations.

In OEF, we had to buy GPS-capable laser rangefinders sort of one-at-a-time. In OIF, we had proliferated them to a degree, but they certainly weren't in every artilleryman's kit bag. We must make those capabilities priorities for the future—they create a huge effect on the battlefield. We also need to ensure our communications and Blue Force Tracking IFF [identification friend or foe] equipment is user-friendly and common across all services.

Q *How did you employ information operations [IO] at the joint force level and what was the effect?*

Airman 1st Class James Blair coordinates air cover for the Army's 10th Mountain Division Soldiers during operations in the Sroghar Mountains in Afganistan. *(Photo by TSgt Brian Davidson, USAF)*

A Information operations were critical in this campaign. For example, it was important for us to ensure that Saddam believed he could be threatened from any direction in his country. While we would have liked to have had the 4th Infantry Division attack through Turkey in the north, when it was not possible, we used IO to create the perception that the Iraqis were threatened from the north.

We made the insertion of the 173d Brigade with 2,500 paratroopers and 40 SOF teams who built a coalition with the Kurdish fighters in the north look "bigger" than they were. They were perceived as having immediate access to air power that could kill Iraqis in their battle positions on demand. So focused air power in the northern battlefield allowed the very small force to seem very large and lethal—helped make them successful.

Information operations also helped protect the southern and, maybe, the northern oil fields, as well. We spent a great deal of time and effort sending the message to the Iraqi oil field workers and military assigned in those sectors that it would *not* be in their best interests to destroy their oil fields.

After combat operations, we interviewed some Iraqi oil workers who were going back to work in the fields. We asked them why they blew up only a few oil wells, set charges that never would have destroyed the wells or set no charges at all.

Their response: "You told us not to do that. We didn't want to be seen as destroying the livelihood of our country for the future. We knew we set the charges incorrectly, but that allowed us to obey orders without destroying our infrastructure." That's a powerful message, in terms of what information operations can do operationally on the battlefield.

Another non-kinetic means that can be very effective is humanitarian assistance. During OEF on the very first night of lethal operations, we dropped 75,000 pounds of bombs on targets in Afghanistan and began dropping 75,000 humanitarian daily rations out of C-17s. The people understood we weren't threatening them, that we were feeding them and killing bad guys.

In OIF, as soon as we pushed across the line of departure into Iraq, elements of the humanitarian assistance forces initially moving with the combat forces began establishing relationships with the local leaders and bringing in food, water and other assistance.

The same was true of the SOF teams in the west. As they went across Iraq, they carried humanitarian daily rations, water and medical equipment, winning friends as they attacked the enemy.

Q What message would you like to send to Army and Marine Field Artillerymen stationed around the world?

A I have been involved in CAS all my flying career and have worked closely with Field Artillerymen for many years, so I was not surprised at the professional execution of artillery fires on the OIF battlefield. In some instances, we found pieces of 155-mm rounds, ATACMS and air-delivered bombs all in the same target area. Those kinds of effects don't happen by luck—they happen because people work hard to integrate those fires.

In many areas of Iraq, those integrated fires were synergistic, creating total effects far beyond what any one of the services could have produced. We need and train to that lesson: no one component will be the key factor in battle, but integrated, we will always be decisive.

☆☆☆

Lieutenant General Victor E. Renuart, Jr., USAF, was the J3 of Central Command (CENTCOM) during Operation Enduring Freedom in Afghanistan and major combat operations in Operation Iraqi Freedom. Currently, he is the Vice Commander of Pacific Air Force at Hickam AFB, Hawaii. He commanded Joint Task Force-Southwest Asia and the 9th Air and Space Expeditionary Task Force-Southwest Asia in Riyadh, Saudi Arabia, responsible for control of CENTCOM's Operation Southern Watch. As Director of Plans of the NATO Combined Air Operations Center at Headquarters, 5th Allied Tactical Air Force, Vicenza, Italy, he supported Operation Deny Flight. He also commanded two wings and, later, the 76th Fighter Squadron during Operations Desert Shield and Storm in the Gulf. General Renuart is a Command Pilot with 3,800 hours of flight time, including 50 combat missions. He has flown the A-10, F-16, F-15, C-130 and HH-60. He holds a Master of Arts in Psychology from Troy State University in Alabama.

A Soldier's Story

SPC Greg Savage, Generator Mechanic

HHB/4th Div Arty in OIF

Specialist (SPC) Gregory S. Savage from Stillwater, Oklahoma, is a 23-year-old Military Occupational Specialty (MOS) 52D Generator Mechanic who deployed in Operation Iraqi Freedom II from April 2003 until February 2004 with Headquarters and Headquarters Battery, 4th Infantry Division (Mechanized) Artillery (Div Arty). He all but single-handedly kept the generators going so the 4th Div Arty had communications in Iraq. His Div Arty leaders see him as one of the Soldier Heroes of OIF. This is his story.

Photo by SGT Shawn P. Lowe, 444th Mobile PA Det, Fort Dix, NJ

Iraq was my first deployment. Basically, I just did my job, working on generators, making sure everybody had power. If a generator went down in the middle of the night, then they'd call me and I'd go fix it. I couldn't go to sleep until it was done. Some nights were *real* long. I'd be so tired, I could barely get any sleep. But that was my job, and I had fun at times.

Sometimes I'd get frustrated because it was so dark and I couldn't see what I was doing. I had to put my mind into it and feel what I had to do. It'd take a while, but I'd finally get the generator up and running.

It was pretty important to keep those generators running. If you don't have power, you don't have communications and a whole lot of other things, like fans. It's hot over there.

If I wasn't working on generators, I was going on convoys—they needed extra bodies to man the .50-cals and Mark 19s on top of the trucks. It could be exciting.

I learned that the Iraqis are just like other people. Some of them are rude, and others are very nice. You just had to get to know them. I had to guard a couple of Iraqis when we fixed their buildings up, and they were generous in offering us food and stuff.

When we first got in Iraq right after combat ended, it was pretty calm. Then after a couple of months, bad guys started planting bombs on the roads—things got worse. Gradually, we began to get control. I think the bad guys kind of regrouped and started planning attacks on us. But we reacted strongly and got control again.

While I was in Iraq, the 4th ID renovated a lot of schools, got children back learning. We helped the Iraqis get a new police force and ICDC [Iraqi Civil Defense Corps, equivalent to our National Guard]. I worked with a couple of the ICDC soldiers. They seemed pretty interested in serving their country, in serving with us. In one incident, one of the ICDC soldiers set an IED [improvised explosive device] bomb and they found out who it was and turned him in to us.

I'd tell a Soldier who's going to Iraq, "Stay on your toes, and do your job. You'll learn a lot over there, especially in your job."

After almost six years and a deployment to Iraq, I'm still glad to be in the Army, serving my country.

Major General Raymond T. Odierno
Commanding General of the 4th Infantry Division (Mechanized), Fort Hood, Texas

Division Operations Across the Spectrum—
Combat to SOSO in Iraq

Interview by Patrecia Slayden Hollis

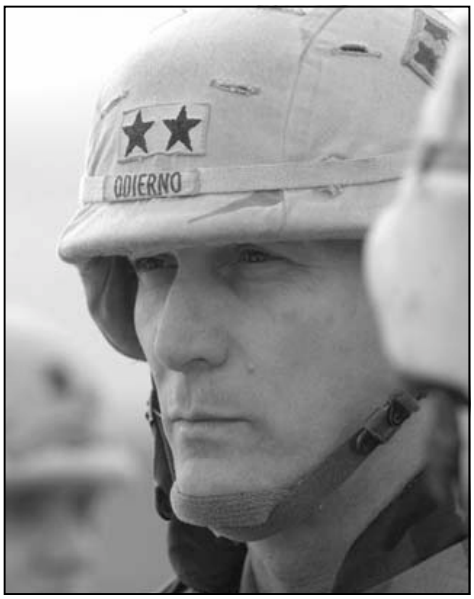
Q Having just returned the division from Iraq in March after more than a year in theater, please describe the Iraqi environment before and after major combat operations. What was the 4th ID's mission?

A Basically, our mission was to defeat noncompliant forces in theater while simultaneously conducting stability operations to stand up governments and improve the Iraqi infrastructure—that was after major combat operations.

In January 2003, we were ordered to deploy to Iraq. Our roughly 35,000-man task force, Task Force *Ironhorse*, included elements of some 22 nations and was subordinate to the CFLCC [Coalition Forces Land Component Command]. We were supposed to attack south from Turkey into northern Iraq while V Corps attacked north toward Baghdad. We never got approval to go through Turkey, so on 21 March, they decided to move us through the Suez Canal and then have us come up through Kuwait.

CENTCOM [Central Command] waited to make that decision for a couple of reasons. One, the 101st [Airborne Division] had to clear the port in the south. The second reason was the strategic deception plan. Saddam Hussein and his leadership felt the Coalition would not attack until the 4th Infantry Division was either on the ground in Turkey or Kuwait. So the Coalition surprised Saddam Hussein by crossing the line of departure in Kuwait and then moved the division south through the Suez Canal.

The first of our 37 ships arrived in Kuwait around 1 April. By the 12th of April, we were moving north. That's probably the fastest a heavy division ever has unloaded equipment, staged and moved out.



By 15 April, we had seized several airfields north of Baghdad. We then seized the cities of Tikrit, Samarra and Bayji, all by about the 18th of April. (See the map on Page 10.)

For the first 45 days after major combat operations were declared over (1 May), we still dealt with combat skirmishes with company-sized or platoon-sized elements trying to either get ammunition or gain some key terrain around Tikrit. We defeated those elements fairly easily.

Then we went into a period of conducting civil-military operations to engage the Iraqi people for another 45 or so days, meeting with their tribal leaders to see who was going to step forward to lead Iraq into the future. At that time, counterinsurgents began to organize.

We ended up conducting 11 major offensives during the next 10 months we were in Iraq. The first was "Peninsula Strike" on a peninsula formed by the Tigris River near Balad, just north of Baghdad. The mission was to defeat noncompliant forces still conducting operations against Coalition Forces.

We conducted a combined air-ground assault with a 4,000-man heavy-light force. It included our 3d Brigade out of Fort Carson [Colorado] and the 173d Airborne Brigade out of Vicenza [Italy], which was OPCON to [under the operational control of] Task Force *Ironhorse*, as well as support from Special Operations Forces [SOF] and the Air Force.

It was a complicated and, ultimately, very successful operation done with just 18 hours of planning. We got some good intelligence working with the SOF community and conducted quick air assaults simultaneously on three different objectives. We ended up capturing about 400 targeted individuals, to include several IIS [Iraqi Intelligence Service] agents operating around Baghdad. That was one of the major operations we conducted.

For the next three to four months, we conducted a series of missions to stabilize and build Iraq. We had engineer, armor, infantry, artillery and other battalions patrolling and collecting intelligence, although the FA battalions were still required to conduct counterfire. Early on, we found human intelligence was the key.

We also conducted what we called "intel-based" raids with a battalion-sized, company-sized or platoon-sized elements, depending on the size of the target. From July through when we left in March, we conducted more than 2,000 raids, searching for specific targets, such as weapons caches and individuals involved in counterinsurgency operations. Over time, with our intelligence, we were able to home in on specific targets.

What was interesting was that half the day we'd conduct a raid against insurgents and during the other half, we'd set up governments and repair or build the

Iraqi infrastructure—water, sewer, road, schools, hospitals, power generation, etc. In a nine-month period, our Soldiers accomplished 3,000 projects and we spent almost $100 million in captured Iraqi money to build Iraq.

I say, "build" instead of "rebuild" Iraq because the Iraqi infrastructure was nonexistent for the masses.

Right before Ramadan, the Muslim's religious holiday that starts at the end of October and goes through November, we continued to try to reach out to the Iraqi people. We told them we'd pull out of their cities and reduce our patrols for their holiday. We even helped them get some money to celebrate.

But the insurgents took advantage of this, and attacks rose significantly. This is when the roadside bombs really started, IEDs [improvised explosive devices], and mortar attacks increased. Our casualties went up a bit.

In this situation, as a division commander, I faced some of my most difficult decisions, walking the fine line between conducting lethal and nonlethal operations. It has to be a very careful combination of the two, understanding that I don't want to alienate the 95 percent of the Iraqi people who want to move forward but that I must deal with the insurgents conducting operations against Coalition Forces.

When Soldiers were at risk, my decision to use lethal means was easy. But there was always some danger of collateral damage and second, third and fourth order effects.

During Ramadan, I made a conscious decision to conduct some lethal operations. For about a three-week period, we used artillery and mortar H&I [harassing and interdiction] fires, CAS [close air support], and tank and Bradley direct fire on specific targets we knew were conducting these operations. Because of the amount of firepower we employed, the operations got a lot of play from the media.

Using lethal operations was very important for a couple of reasons. One, we went after very specific targets and were able to take down a large number of insurgents by doing this. Secondly, it sent the right message: "We are here to help the Iraqi people, and anytime we need to, we can raise the level of conflict to lethal." The people then understood that we weren't going to abandon them and came forward with a lot of information about the insurgency.

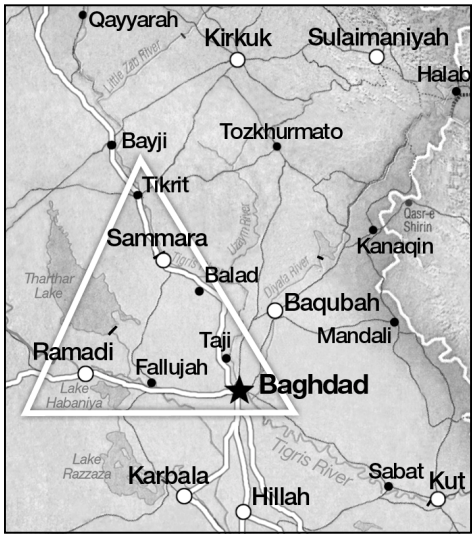
Task Force *Ironhorse* was in the center of the Sunni Triangle. From June 2003 to January 2004, we had three times more than the combined number of attacks in the rest of the Iraqi theater and at a higher level of conflict. By the time we left in March, we were having about the same number and level of attacks as other division areas of responsibility, so the attacks decreased by about 80 percent.

I think the reduction in attacks was due to our integration of lethal and nonlethal operations. We set up local governments and took down the insurgency while gaining the confidence of the Iraqi people. They understood we could and would be lethal when we had to be.

Q *You took your artillery to Iraq—how did you employ artillery in stability operations and support operations (SOSO)?*

A We took all our radars and didn't have enough of them—we must increase the number of radars available to divisions: Q-36s, Q-37s and future radars or lightweight countermortar radars (LCMRs). We need a combination of all those radars.

The division is authorized three Q-36s and two Q-37s. By the end of the operation, we were using eight Q-37s and six Q-36s and could have used a few more to cover our 500-by-400-kilometer battlespace.



The Sunni Triangle

We used our Paladins the entire time we were there. Most nights, we fired H&I fires, what I call "proactive" counterfire. One of the enemy's techniques was to try to shoot mortars or rockets at large forward operating bases [FOBs] that had a lot of our Soldiers on them. We identified areas from which we knew the insurgents were shooting mortars and shot H&I fires into those areas. When we did that, they did not shoot at us.

We also shot a lot of counterfire. We had free fire areas and became very good at clearing fires—good enough to respond with counterfire in less than a minute. We were careful about collateral damage.

Our counterfire was so successful that the enemy would only shoot one or two mortar rounds because he knew that if he stayed longer than 30 to 90 seconds, he would die. Then he started firing rockets remotely. They were linked to a timer so he didn't have to be in the area when they fired.

We also used the tactical unmanned aerial vehicle [TUAV], the Shadow, very effectively. We fired artillery using data from the Shadow. In one incident in a palm grove, the enemy was setting up mortars at night. The TUAV saw the mortarmen, and before the enemy could shoot the mortars, 3-16 FA [3d Battalion, 16th Field Artillery] destroyed them. Now *that's* proactive.

We used artillery with our OH-58-D scout helicopters as well as attack helicopters. Depending on the target, sometimes we used them to observe fires for the artillery or mortars and sometimes used them to direct fire. Our helicopter pilots became very good at calling for and adjusting artillery fires.

So, artillery plays a significant role in counterinsurgency operations.

Q *Did you have enough artillery?*

A I had four 155-mm battalions, including 1-17 FA from the 75th FA Brigade out of Fort Sill [Oklahoma] and my three Paladin battalions, plus mortars. That and our divisional MLRS battalion—the combination was probably okay for our battlespace.

In November when we were conducting many lethal operations, we even fired several ATACMS [Army tactical missile system missiles] at specific tar-

gets. The targets were out in the desert, and whenever we tried to conduct raids on them, they saw us coming and moved out. So, finally, we attacked the targets with ATACMS—very effective.

Q *What lessons did you learn about employing FA battalions in Iraq?*

A First, artillery has to be a versatile asset. The Army can no longer afford to have artillerymen just do artillery missions. So Redlegs also must be able to set up flash checkpoints, patrol, conduct cordon and search operations, etc.

Every one of my artillery battalions owned its own battlespace. My FA battalions were just like my maneuver battalions. And every one had Bradleys and tanks working for them. That's the kind of flexibility we need as we look to the future.

Our FA commanders learned it all quickly and were flexible. But we've got to train for that scenario—shoot, move, communicate plus own battlespace and conduct operations within that battlespace. We have to review our METLs [mission-essential task lists] to be sure FA units have tasks for military operations across the spectrum and then train those tasks.

And we've got to equip the FA properly for the missions. One lesson learned for the entire division is that every Soldier must be equipped like an infantryman—even if he's a medic, engineer, tanker, Redleg—whatever.

We need FA joint observers qualified to control CAS. Right now we have to have ETACs [Air Force enlisted terminal air controllers] for the ground forces to access CAS, and we didn't always have enough of them. Army fire supporters must be versatile, be joint fire supporters who are trained and qualified to control CAS.

Also we must prepare all Army leaders to conduct SOSO missions. As good as our OES [Officer Education System] and NCOES [NCO Education System] are, we still need to adjust them. We've got to train leaders and establish environments that allow officers and NCOs to think freely and promote their abilities to understand unique circumstances and be flexible. These Soldiers and leaders also must have immense discipline to change their mission and react very quickly to the changes.

MG Odierno, presents medals to members of the 1st Battalion, 508th Infantry, during the dedication ceremony for Forward Operating Base Berstein, in the area around Tuz, Iraq, 23 January 2004. *(Photo by SSgt. Jeffrey A. Wolfe, USAF)*

Q *What role did information operations (IO) play in the 4th ID's SOSO?*

A Information operations were key to everything we did. Everyone in the division was involved in IO.

We have an IO cell at the division level. Every week, we developed about 10 information operations messages—for example, "We are building your infrastructure," "We are working to stand up your government for democracy, and here's the way ahead for democracy…," and "You've got to help us with these insurgents; they are trying to keep the Iraqi people down. They don't want you to move forward."

IO messages would come down from CJTF-7 [Coalition Joint Task Force-7], and we'd develop and publish our own.

Our leaders, from the brigade to platoon levels, conducted about 300 meeting engagements with the Iraqi people a week, putting out IO messages. The battalions were responsible for using those messages within their assigned battlespaces.

In addition, we had PSYOP [psychological operations] units that transmitted the messages over loudspeakers in Arabic, etc.

Because we were so careful about collateral damage and maximized IO, over time, we found the Iraqis, for the most part, understood what we were doing and why, even when we conducted lethal operations.

Let me give you an example. We tried firing H&I less and less frequently, as long as we were not receiving mortar attacks. At one point, we went three weeks without firing H&I, the longest we had gone. But then we received some rocket attacks. So we went to the Iraqi leaders and said we were going to start firing H&I fires again—that we didn't want to have to do that, but we couldn't allow rockets to be fired at our forward operating bases.

They understood. The leaders knew what we were doing and why.

Q *How did you integrate and coordinate lethal and nonlethal effects?*

A We have an effects coordination cell (ECC)—not a deep operations coordination cell (DOCC). The DECOORD [deputy effects coordinator] plans and coordinates all effects, both lethal and nonlethal, for the division in the ECC. He runs the planning and integration meetings for the division chief of staff and myself. The ECOORDs plan and coordinate lethal and nonlethal effects for their brigades.

Each of my staff officers became "ministers" of something for nonlethal effects. For example, the financial officer

15 October 2003—MG Odierno shakes hands with one of Balad's religious leaders after meeting with the city's religious leaders to discuss their Ramadan celebration. *(Photo by SPC Justin Holley)*

was the minister of finance, my engineer was the minister of public works, my G5 was the minister of education, etc.

We developed an ETO cycle—effects tasking order cycle, a timeline for targeting, planning and integrating all effects today out to three weeks. The ministers and other staffers attended the daily meetings and worked the ETO, a process that was very effective.

The ETO included CAS, both lethal and nonlethal. In certain situations, we'd fly sorties low as added protection so the enemy would know the lethal air power was readily available…a show of force. Also, our fixed-wing aircraft see very well at night, so they'd give us timely information for our raids. They could see what was going on, on the ground and coordinate our moves. We got good enough to pass pilot-ground force CAS coordination down to the platoon leader level. We did the same with Apache attack helicopters down to the squad level.

Q *What effect did your capturing Saddam Hussein have?*

A A *significant* effect on our Soldiers, the Iraqi people, our families and other Americans at home, and our allies all over the world: his capture meant the regime was truly gone.

We had worked for six months, tracking Saddam. We knew he was in our area. We knew about the network of people helping him. We slowly took down the network in August, September, October and November. Finally, one lead brought us to him.

I don't believe Saddam was directing *anything*, much less insurgent operations, as some people claimed. He was hiding in a spider hole, running for his life. He was an expert at hiding and surviving, and I think the Iraqis thought we'd never catch him.

Saddam was a symbol. And as long as he was around, the Iraqi people were afraid his oppressive regime could come back into power.

Pulling him out of that hole made a big difference to them. Iraqis came forward and started taking responsibility for establishing governments and writing the constitution, talking about establishing sovereignty for their nation and more.

And human intelligence increased five- to six-fold. Every time we had a success, more human intelligence flowed in. I credit the influx of intelligence, starting 13 December when we captured Saddam, for allowing us to decrease the number of attacks by 80 percent in our area.

The follow-on force still has many tough challenges. Now more than ever, Iraqis are jockeying for positions of power in the future Iraq. For example Muqtada al Sadr, a Shiite extremist who has been in the news, has seen he will not have a role in the future government. So he has tried to take power by force. Coalition Forces will continue to see individuals with small followings trying to affect a fight and have to deal with those enclaves.

And the same is true in Fallujah. Extremists there have been operating against the Coalition from the beginning. They try to convince others that the US never will allow Iraq to be Islamic—which is not true.

These are all "blips" the Coalition will have to overcome over time as they move Iraq toward sovereignty.

Q *What message would you like to send Army and Marine Field Artillerymen stationed around the world?*

A I would like to thank you for your incredible service to our nation—and to thank your families who support you from the home front. You are part of a new generation of smart, young, flexible, innovative, tough leaders who I hope will stay in the Army for the future. We're going to need your talent and skills; America's armed forces are going to be busy for the next few years fighting the war on terrorism.

You make me very proud to be a Field Artilleryman.

☆☆

Major General Raymond T. Odierno commands the 4th Infantry Division (Mechanized) at Fort Hood, Texas, and deployed the division to Iraq from January 2003 until March 2004. In his previous assignments, he was the Director of Requirements and Force Management and Director of Force Programs, both in the G3 of the Army, Washington, DC. He was the Chief of Staff of V Corps and Assistant Division Commander for the 1st Armored Division, both in Germany. During Operation Desert Shield and Storm, he deployed from Germany to the Gulf with the 3d Armored Division as the Executive Officer for the Division Artillery. He commanded the 1st Cavalry Division Artillery at Fort Hood; the 2d Battalion, 8th Field Artillery (2-8 FA) in the 7th Infantry Division (Light) at Fort Ord, California, moving the battalion to Fort Lewis, Washington; and A and Service Batteries of the 1-73 FA, XVIII Airborne Corps at Fort Bragg, North Carolina. He holds two master's degrees, including an MA in National Security and Strategy from the Naval War College, Newport, Rhode Island.

Why Organic Fires?

By Colonel Robert F. Barry II

The Army's purpose is to fight and win the nation's wars, according to the "Army Strategic Planning Guidance 2006-2023." As the source of trained and ready land forces capable of decisive action across the spectrum of conflict, the Army provides the joint force commander (JFC) the ability to coerce enemies, control resources and populations, and decisively conclude conflicts on terms and a timeline favorable to US national interests.

If we believe war is an act of force to compel the enemy to do our will, then to win our nation's wars, we must leave the enemy no choice but to accede to our demands. By persistent close combat and, if necessary, occupation of the enemy's territory and key facilities, ground forces compel him to accede.

The enemy must face a persistent state of disadvantage, and friendly ground forces must be able to escalate the disadvantages of his continued resistance *quickly*. Responsive, adjustable, scalable and precise fire support is a key enabler in creating persistent disadvantage. These adjectives describe fires organic to the ground force.

Joint Publication 1-02 DoD Dictionary of Military and Associated Terms defines "organic" as "assigned to and forming an essential part of a military organization." Building on that definition, for purposes of this article, "organic" refers to maintaining a balance of indirect fires assets as part of the ground force, in general, to preclude the force from having to rely too heavily on other joint fires assets that cannot provide the required responsiveness, force protection or variety of effects that organic assets can. There also have been discussions about Field Artillery's being "organic," or under the command and control of, say, a maneuver brigade—organizationally, much the same as the howitzer battery in each squadron of an armored cavalry regiment.

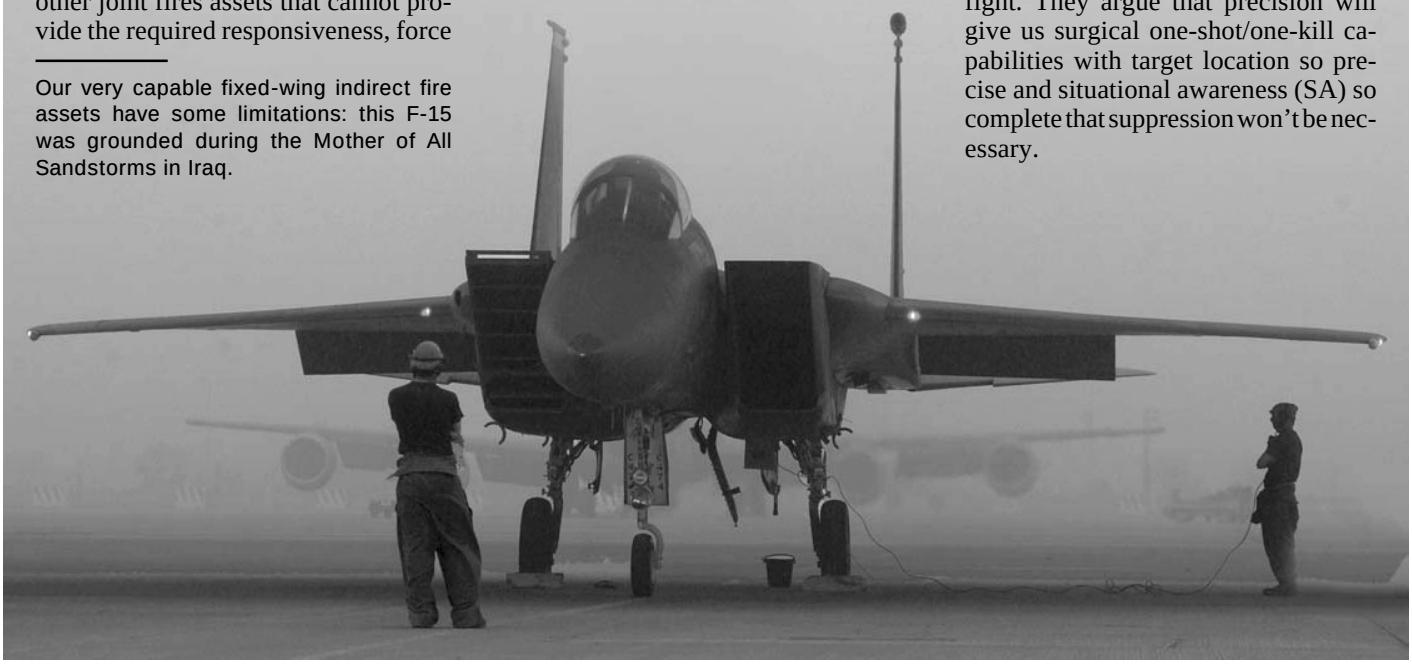
This article focuses on the joint balancing of fires assets organic to the ground force and leaves the other Army debate about the actual organization and command and control of those assets within the ground force to another article.

For the foreseeable future, only mortars, cannons and rockets organized and distributed on the battlefield along side maneuver forces can provide ground commanders responsive, all-weather, 24/7 fire support to close with and destroy the enemy. Organic fire support assets allow the ground force commander to synchronize his fires with his maneuver to destroy, neutralize or suppress enemy forces before contact or during the fight. This enabling relationship between ground-based fires and maneuver speeds the destruction of enemy forces and preserves friendly combat power.

The compelling nature of close combat is a keystone of US Army doctrine. According to *Field Manual 3.0 Operations*, close combat has but one purpose: "to decide the outcome of battles and engagements." Defeating or destroying enemy forces and seizing terrain are what decide the outcome of battles—fire and maneuver. The Army leadership historically has recognized the absolute necessity for ground force commanders to have responsive artillery fires available to them—as integral to their success—and task organized or mission tailored the force to ensure those fires were available.

The Debate: Organic Fires or Not. Today many are debating whether or not commanders need organic fire support assets. Much of this debate is fueled by the success of and continued improvements in technology, which leads some to point out the tremendous savings in resources that could be garnered by reducing what some consider to be redundant fires assets.

Some argue that because technology is providing precise intelligence, targeting and weapons, we don't need the area fire capabilities and the variety of ammunition effects that organic cannon and rocket artillery bring to the fight. They argue that precision will give us surgical one-shot/one-kill capabilities with target location so precise and situational awareness (SA) so complete that suppression won't be necessary.



Our very capable fixed-wing indirect fire assets have some limitations: this F-15 was grounded during the Mother of All Sandstorms in Iraq.

1-319 FA, 82d Division, in Afghanistan. When ground forces are in close combat, responsiveness will never be irrelevant—and the most responsive fires, today, and in the future will remain those organic to the force. *(Photo by SGT Sean A. Terry)*

They also argue that responsiveness, typically a strength of organic artillery, will be irrelevant because the joint fires network will allow all sensors equal access to all shooters. Their logic is that responsiveness is not a function of what indirect fires at each echelon bring to the fight, but rather a function of the network and the availability of joint assets. The logic continues that, because we always will be able to achieve air superiority, a large portion of these joint fires assets can be air platforms, reducing the need for organic indirect fire assets in the ground force. Those assets that the ground force retains might be something akin to the non-line-of sight-launcher system (NLOS-LS) because the force won't need area fires.

The argument goes that, surely, improvements in command and control, communications, computers and intelligence (C^4I) give commanders such unprecedented access to information and sophisticated synchronization capabilities that they virtually are assured of dominating any battlefield without organic fires.

Are they right? In each of these arguments there is some truth. Technology is impressive, and we need to continue to enhance our knowledge of the battlefield and precision strike capabilities. But we will never achieve perfect knowledge as long as humans wage war and the enemy "has a vote" on his actions—the enemy *always* has a vote, even if only to decide whether or not to surrender or die in a spider hole. The maneuver commander needs—and will continue to need—the options of precise area fires to neutralize and suppress the enemy, especially against a dispersed, dismounted enemy, such as in Afghanistan.

When ground forces are in close combat, responsiveness will never be irrelevant—and the most responsive fires, today and in the future, will remain those organic to the force.

Without a doubt, the ground force never should leave home without fixed-wing support, and the fire supporters' mission is to tap the right joint fires platform to provide the right effects to achieve the JFC's intent, including fixed-wing assets. But these very capable air platforms have limitations, creating gaps that organic cannons and multiple-launch rocket systems (MLRS) fill as joint fires options.

Mitigating the Uncertainty of War—Now and in the Future. How does the ground force mitigate information gaps, the inability to target the enemy and indecision? One way is to employ organic fires to suppress and neutralize targets. Organic fires provide both a hedge against uncertainty and a *scalable* method for refining fires as commanders refine their targeting data.

As the Army transforms to meet the challenges of future combat, one of the driving principles is information dominance. Information dominance will enable commanders to achieve the "quality of firsts" necessary for success, as outlined in the "Unit of Action Operational and Organizational Plan" (UA O&O). Network management, information assurance and operational net assessment (ONA) will enable commanders to create a common operational picture (COP) for shared SA, gain positional advantage, and conduct precision maneuver and precision attacks against the enemy. Information dominance will allow commanders at all levels to translate their superior perspective into actionable decisions within the context of a COP and shared intent. Information dominance and enhanced connectivity will bring superior effectiveness and survivability with a lighter and smaller force.

This new tactical paradigm enables the Army to restructure tactical echelons, design new combat systems and develop new tactics, techniques and procedures (TTPs) for the Future Force. As it develops new combat forces, the Army is shedding old ways of thinking and old concepts of warfare in favor of lighter, more lethal and more expeditionary organizations.

As a result, lighter more deployable future combat system (FCS) vehicles will replace heavily armored vehicles. We no longer will need to mass formations to achieve overwhelming combat power. Instead, irregular battlefield geometry and distributed operations that strike throughout the depth of enemy formations will defeat the enemy and disintegrate his forces.

Future Force organizations, such as the UA, will employ combined arms battalions capable of autonomous operations. The new tactical paradigm specifies that these battalions be able to operate in a non-contiguous battlespace.

Commanders will minimize the need for reserves by using information dominance to anticipate, plan for and quickly react to changing battlefield dynamics.

Each of these changes is based on a belief in the power of information dominance.

The ability to acquire and use information is supplanting heretofore-accepted risk mitigators, such as mass and armor protection. Armor protection is a hedge against the uncertainty of the type, location and capabilities of the enemy's weapons. Massed formations mitigate the uncertainty of command and control and faulty planning by placing forces close to, or in direct support of, decisive points on the battlefield. The ultimate hedge against uncertainty has been the reserve, whose size is inversely proportional to the amount of knowledge one has about the enemy.

Based on the commander's greater reliance on information, each of these hedges is being replaced or reduced in the Future Force. This simultaneously reduces the commander's ability to react to unforeseen circumstances. Organic fire support is the ground commander's last hedge against uncer-

tainty and a critical component of the future operational concept.

Regardless of the very powerful capabilities of information dominance—the ability to help the commander make timely decisions, deduce enemy strengths and vulnerabilities, and provide important components for retaining the initiative—the fog and friction of war will remain, now and in the future. We must ensure commanders have responsive, readily available combat power to deal with them.

Military operations ongoing in Afghanistan for Operation Enduring Freedom (OEF) and in Operation Iraqi Freedom (OIF) have demonstrated that, while we may have information superiority, there is still much we do not and will not know about the elusive enemy because we never will have perfect information. Perfect information implies that we understand not only the enemy's capabilities, but also his *intentions*. This is clearly a difficult task to execute with regularity.

During Operation Anaconda in Afghanistan in March 2002, intense reconnaissance efforts before the battle focused every available surveillance and target acquisition asset on a 10-by-10-kilometer area surrounding suspected al Qaeda locations. In spite of this massive intelligence effort, less than 50 percent of the al Qaeda positions identified in the course of the battle were discovered before ground contact. (Statistic taken from "Afghanistan and the Future of Warfare," a US Army War College Study by Stephen Biddle, 2 November 2002.) As reported by several studies and interviews with participants, most enemy fires in Operation Anaconda came from initially unseen, unsuspected al Qaeda fighting positions.

Despite the best technology available that was focused intensely on a limited area, a technologically unsophisticated enemy was able to hide from US forces until they made ground contact. This demonstrates that if the enemy knows how we are looking for him, then he can devise a means to conceal himself.

This detracts from the detail and accuracy of information available to the friendly ground commander, precluding or inhibiting his use of precision munitions in advance of ground contact. His preparatory fires must be on area targets while he relies more on developing targets in contact, which requires immediately *responsive* and *scalable* fires.

Similar incidents occurred in Iraq during the attack to Baghdad and continue today.

There is little evidence to suggest that precision and information were solely responsible for the success of Coalition Forces in OIF. Our success in OIF, in fact, was due to the superb application of the elements of combat power: maneuver, firepower, leadership, protection and information (FM 3.0).

There were multiple instances of unplanned contact with Iraqi forces, suggesting that fog, friction and uncertainty are still key elements of the battlefield. Massed combat power and armor protection allowed commanders to overcome the information shortfalls while minimizing Coalition casualties. Indeed, the successful effects of precision weapons and information superiority were critically dependent on Iraqi ineptitude. Against a less exposed, better-prepared opponent, the results may have been different. (Information taken from the 18 August 2003 War College study, "Iraq and the Future of Warfare: Implications for Army and Defense Policy" by Dr. Stephen Bibble.)

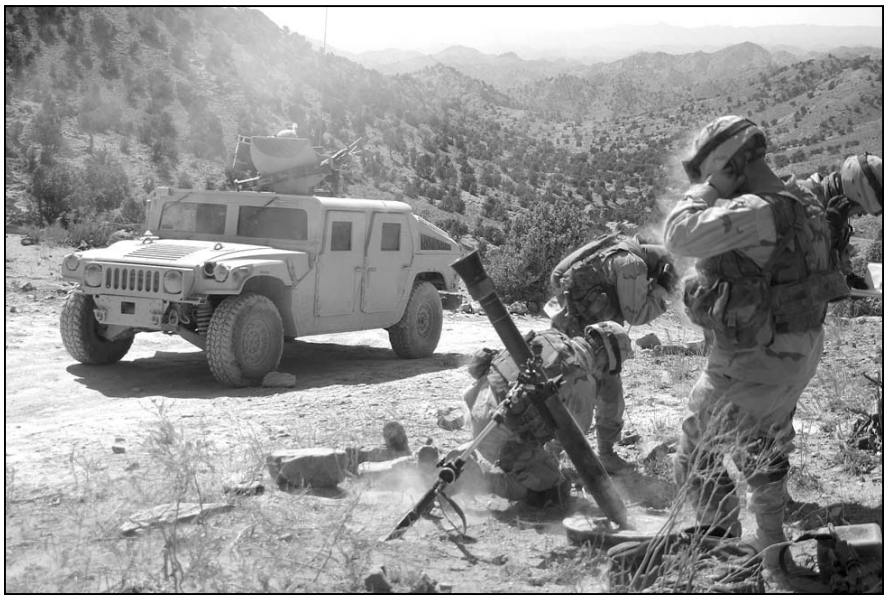
As we observe the less capable but resolute opponents in Iraq, one can conclude that our expectations for attaining the information dominance required for full-spectrum operations may be optimistic.

This is not an indictment of the new tactical paradigm or Army transformation, but, rather, it is recognition that there always will be uncertainty in military operations. Reducing uncertainty through better information management, better and more numerous sensors, and collaborative planning and execution are worthy goals, but those improvements will not *eliminate* the friction of war.

Some argue that more information makes us more, not less, uncertain. The "staring eye" of improved surveillance only will realize its full potential when our analytical tools reach similar levels of sophistication. Even then, the UA O&O acknowledges there will be times when tactical surprise is lost or the enemy does something unexpected. The ground maneuver commander needs his organic fires for just such times.

Characteristics of Organic Fires. The application of fires in support of the tactical maneuver commander in close combat requires a delivery system that is immediately responsive and accurate, but adjustable, a system that can achieve a sustained high volume of fire, employ a full suite of munitions and effects, and can do so in all weather, all types of terrain and day or night. As characteristic of cannon and MLRS fires, these capabilities allow the ground commander the freedom to maneuver his forces out of contact while setting the conditions for his next fight—allow him the flexibility to adapt to overcome the actions of an interactive, thinking enemy. On-call organic fire support brings the simultaneity of effects in close combat needed to overwhelm a resolute adversary.

• *Organic fire support is always available to the ground commander and re-*



Without perfect information, the ground commander must rely on developing targets in contact, especially when fighting a dispersed, dismounted enemy, such as in Afghanistan.
(Photo by SPC Timothy J. Belt)

The only other US service ground force in OIF, the I Marine Expeditionary Force (I MEF), also relied heavily on its organic artillery. Its artillery task force, the 11th Marine Regiment, "engaged the enemy in every battle in the campaign." *(Photo by SGT Jose Guillen, 1st MarDiv PAO)*

sponds to his priorities. Unlike other fire support assets, the Soldiers who man cannons and mortars are always present and frequently talk face-to-face with their unit and the commander they support. Rock drills, rehearsals and habitual relationships enable a high degree of flexibility, allowing the commander wider latitude in executing fragmentary orders or contingency plans.

In contrast, naval gunfire platforms, for example, may not be able to range the land force deep inland or may be forced by a submarine or air threat to move away and be out of range. When a ground commander is fighting in close combat, aircraft may be called to support a higher priority target or prevented from attacking ground force targets by weather or the enemy's air defense artillery (ADA) or aircraft.

During OIF, the ground forces moving toward Baghdad were in the Mother of All Sandstorms that had 100-meter visibility and winds gusting up to 50 knots with thousands of Iraqi paramilitary in the area for *three* days—24 to 27 March. About organic fires assets, Lieutenant General W. Scott Wallace, the Commanding General of V Corps in OIF, said that "during that dense sandstorm, indirect fires proved most valuable. We used the lethal effects of artillery and mortars with some degree of precision, in particular HE [high-explosive area fire munitions] artillery" (interview with General Wallace, "Trained, Adaptable, Flexible Forces = Victory in Iraq," September-October 2003).

His assessment was echoed by Brigadier General (Promotable) Lloyd J. Austin III, the Assistant Division Commander for Maneuver in the 3d Infantry Division (Mechanized) (3d ID) during OIF. General Austin said, "Ground-based indirect fires were absolutely critical during the Mother of All Sandstorms" (interview with General Austin, "3d ID in OIF: Fires for the Distributed Battlefield," September-October 2003).

The only other US service ground force in OIF, the I Marine Expeditionary Force (I MEF), also relied heavily on its organic artillery. Its artillery task force, the 11th Marine Regiment, "engaged the enemy in every battle in the campaign. No other regiment can make that claim. The 11th Marines processed more than 1,900 radar missions and fired 19,883 rounds [in OIF]." (Quotes taken from the article "Cannon Cockers at War: The 11th Marines in Operation Iraqi Freedom" by Lieutenant Colonel Michael R. Melillo, USMC, September-October 2003.)

In 1973, the Israelis made the almost fatal mistake of relying too heavily on air assets for fires, assets that were soon attrited. For the first eight days of that Arab-Israeli conflict, Arab air forces and ADA neutralized the Israeli Air Force. It almost cost the Israelis the war and caused them to re-energize their cannon and mortar programs to provide organic capabilities to their ground forces.

In a similar vein during the Falkland Island conflict, the British found their sea-based forces (upon which the British were relying for fires) seriously threatened by Argentine land-based aircraft.

In both these conflicts, significant threats to the joint fires assets caused profound adjustments to ground force operations and an increase in demand for organic fires assets.

• *Organic fire support assets can bring fires in close to friendlies—closer than other joint fires assets.* The maneuver commander requires this ability to support his troops in contact. For example, a 500-pound or larger bomb simply has too large a bursting radius for friendly forces in close contact. Close air support (CAS) is difficult business and requires positive control over the attack. An aircraft at 10,000 feet or a fighter on the deck at high speeds attacking a moving enemy in close contact with friendlies leaves little room for error. At that altitude or speed, the adversary is often able to fool the attacker with decoys and the opportunity for fratricide is greatly increased.

Cannon-delivered general-purpose munitions may be adjusted to within 300 meters of friendly forces. Precision munitions, such as the Excalibur family of munitions and other sensor-fused and laser-guided projectiles, are also very lethal and even more accurate.

From the joint perspective, improved munitions launched from ground-based fire support platforms will reduce the latency in joint attacks by giving the commander more options for precision attack.

• *Organic fires assets respond to the needs of the supported commander within his decision cycle and easily can be re-targeted or re-prioritized to adjust to the changing nature of the battle.* Organic fires assets minimize the clearance-of-fires procedures and airspace coordination required when assets are not habitually part of the ground commander's forces. The additional coordination adds time and, thus, decreases responsiveness.

Fixed-wing aircraft, while very efficient in providing fires that set the stage for future fights, are less capable of supporting the maneuver commander in contact.

The maneuver commander plans his fires to be integrated and synchronized fully with his scheme of maneuver. However, the adversary strives to adapt and the fight seldom unfolds exactly as planned. As the tactical situation changes and the commander employs and adjusts

fires to adapt and react to these changes, he needs systems and procedures that can react in seconds. Fixed-wing assets are simply not that responsive in attacking unplanned targets.

A close fight is timed in minutes, and the ground force's ability to finish decisively is, in large measure, based on its ability to rapidly shift and focus overwhelming firepower at a decisive point, something that may occur more than once in the same battle. Even if aircraft are on station and weaponeered correctly (have the right munitions for the desired effects), the weather is acceptable, direct communications are established with the attacking aircraft and something is available to mark the target (often artillery-delivered smoke), the coordination necessary for effective employment is time-consuming.

Although CAS employment timelines vary based on the proficiency and availability of aircraft and observers, in the vast majority of combat scenarios, it takes longer to coordinate and employ CAS than ground-based indirect fire systems. Direct support battalion cannon fires typically are available within 60 seconds of the call-for-fire in all weather, day or night and are not limited by time-on-station or weapons mixes onboard.

In OIF, with thousands of designated no-fire areas (NFAs), it only took about six and one half minutes from the time the Firefinder radar acquired the target through the battle drill to clear the fires for NFAs and friendly forces and vet them for the rules of engagement (ROE) until the cannons or MLRS fired. Of the 91 counterfire missions the 3d ID fired in 21 days of combat, artillery fires were the most effective—even when the effects of fixed-wing assets were preferred—because accessing the fixed-wing assets took too long ("'Acquisition!' 3d ID in Counterfire in OIF" by Chief Warrant Officer Three Brian L. Borer and Lieutenant Colonel Noel T. Nicolle, September-October 2003).

Although it is true that improved joint interoperability of air-ground systems will increase the responsiveness of air power significantly, overall, fixed-wing assets will not be as responsive to the ground force commander as his organic fires assets.

• *Organic fire support assets have the ability to provide the right amount of precision, ranging from near pinpoint accuracy to target area coverage*. This precision allows the commander to apply fires to fit the tactical situation, target location/identification capabilities and limits imposed by proximity to friendly forces or noncombatants. Organic fires precision is scalable and achievable within the time limits demanded by close combat situations.

In OIF during the Mother of All Sandstorms, the 3d ID's cavalry squadron, 3-7 Cav, found itself embroiled with suicidal enemy forces while running low on ammunition. Unable to break contact with the resolute fighters, the Cav called for fires. Air Force B-52s circled above the sandstorm and dropped ordnance some distance from the four sides of the stalled 3-7 Cav, helping to prevent additional masses of the enemy from attacking the Cav.

The only joint asset in range that could fire in close support of the Cav was the 3d ID's organic MLRS, which fires dual-purpose improved conventional munition (DPICM) rockets with a large, deadly footprint. From nearly 30 kilometers away, MLRS fired a 12-rocket volley *precisely* 1,400 meters from 3-7 Cav. One volley did the job, allowing the Cav to disengage, and there were no friendly casualties from MLRS. Fortunately, the 3-7 Cav commander ensured his squadron was *always* within artillery range throughout OIF.

In OIF, with thousands of designated no-fire areas (NFAs), it only took about six and one half minutes from the time the Firefinder radar acquired the target through the battle drill to clear the fires for NFAs and friendly forces and vet them for the rules of engagement (ROE) until the cannons or MLRS fired. *(1-27 FA firing in OIF.)*

• *The ground commander requires adjustable fires with a sustainable volume and a wide variety of effects that his organic fire support assets can provide.* Depending on the tactical situation, the ground commander may not need to destroy a target with artillery. While maneuvering his forces against an adversary, the ground commander may require quickly delivered suppressive fires to get the enemy to change intentions while the commander achieves a tactical advantage.

Fixed-wing aircraft are unable to provide the sustained high volume of fires necessary against a repositioning enemy force. While target location capabilities are improving, the enemy is often fleeting and will not remain where he first was targeted or where the first rounds were delivered. For air-delivered precision-guided munitions (PGMs) to work—a single round on a single target—you *must* have accurate target identification and location at the moment the weapon is fired. In addition, you must have a sophisticated tracking/lock-on device or other designator or be certain that the target location will not change while the round is en route. Also, the target needs to be of such a nature that desired effects can be achieved with a single, discrete PGM round. Otherwise, the aircraft will have to re-engage the target—or the area in which the target is probably located—again and again. This is the classic scenario for employing area weapons.

Of joint fires available today, only Field Artillery can provide responsive and sustained area fires with diverse effects for the ground force in close combat—that is, unless the maneuver commander can be guaranteed to have a lot of CAS available at one time.

Even in the first major battle between US forces and Vietnamese regulars at Ia Drang in 1965 where the fighting was desperate and CAS was plentiful, Field Artillery fires were critical to the survival of the US battalion. The battalion commander, now Lieutenant General (Retired) Harold (Hal) G. Moore, said, "Our most effective fire support was Field Artillery…. [that during the three days of the battle, he had] "practically nonstop Field Artillery fires—*magnificent*." General Moore said "the 105-mm howitzers…five miles away fired so fast and often that some recoil mechanisms failed [and] one tube melted."

(Quotes were taken from the interview with General Moore, "We Were Soldiers Once…The Battles of Ia Drang, 1965," July-August 1999.)

An organic cannon battalion can make adjustments within 15 seconds while an air asset, at a minimum, will have to make another pass, fly out for refueling or return to its home base to rearm.

The maneuver commander often requires special munitions: smoke, illumination and scatterable mines. The Air Force, other service fixed-wing aircraft and attack aviation can deliver all these munitions, but the aircraft must depart the air base with these special munitions *onboard.* While relying on fixed-wing support, the commander may not have flexibility—he may have to attack targets with the munitions on the aircraft, regardless of whether or not they will provide the effects he desires, which could limit his ability to achieve his intent.

Cannon battalions have the full suite of munitions onboard and can change types of munitions rapidly (measured in seconds).

• *Organic fire support assets have the same endurance and persistence as the ground forces they support.* They do not have to leave the theater for retraining, refitting or any other activity more frequently than any other portion of the ground force. Given their high endurance, the ground commander can use his organic fire support assets to constantly maintain the appropriate level of fire support without gaps in coverage and with scalable effects. This is particularly important during transitions or non-contiguous operations.

• *Organic fire support brings cost-effective methods to provide effects from small-scale suppression to point destruction to area destruction.* These effects can be scaled to meet the immediate needs of the ground commander and, as importantly, can be transitioned at the same rate as the supported force requires. Thus, without significant reorganization or change in munitions, organic fire support can provide the proper mix of effects during major combat operations and then transition to stability operations and support operations (SOSO). In other words, organic assets can shift rapidly from providing fires in support of a brigade in contact to fires in support of a foot patrol, roadblock or other small-scale military operations that are highly restricted by the ROE.

This is particularly important as we look at the Future Force construct, which has multiple operations of varying intensities occurring simultaneously on the battlefield.

In addition, even with FA ammunition accounting for the majority of ground force resupply, it is still more cost-effective to employ the variety and volume of artillery-delivered effects than the same variety and volume of air-delivered effects.

• *Cannons and rockets organic to the ground forces reduce the demands on other joint assets, releasing them for operational and strategic attack missions—or when used simultaneously with other joint fires—to create synergistic effects.* The J3 of Central Command during major combat operations in OIF agrees. In the interview in this magazine, "OIF Hallmarks: Integrated Joint and Coalition Operations with Adaptable Commanders and Agile Planning and Execution," Lieutenant General Victor E. Reunuart, USAF, said, "…a battalion commander will have many targets on the battlefield to kill that are fleeting and of high value at the tactical level. But he has indirect fires assets organic to his ground force….[and] knows the rules of engagement, so he can attack those targets….[these are not] targets for which we will change the ATO [air tasking order] and move resources to kill."

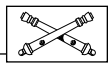
In his conclusion, General Renuart says, "In some instances, we found pieces of 155-mm rounds, ATACMS [Army tactical missile system] and air-delivered bombs in the same target area…In many areas of Iraq, those integrated fires were synergistic, creating total effects far beyond what any one of the services could have produced."

As we continue to develop and refine our force structure, equipment and TTPs to fit the new tactical paradigm, fires will play an increasingly important role. As an enabler to precision maneuver, responsive, organic fire support assets will help shape the battlefield, shield friendly forces and provide close support to isolate and destroy the enemy.

US combat will be prosecuted as fast as possible while preserving the lives of not only friendly Soldiers, but also the lives and property of innocent civilians and their infrastructure. This modern American way of war was prosecuted in major combat operations in OIF and organic artillery was critical to its success. Even in Afghanistan where artillery was not deployed initially in Operation Anaconda, the ground force quickly brought in howitzers that have moved throughout the area of operations and, today, fire daily in support of Coalition ground forces from firebases and forward operating bases.

In May 2002, then Army Chief of Staff General Eric K. Shinseki testified before Congress on the importance of organic indirect fires. He stated, "Successful ground combat against determined enemies requires responsive and timely indirect fires. Organic and inorganic indirect fire support are important to ground combat operations, *but organic fires have been indispensable to success*" (emphasis added). (The testimony was before the Committee on Armed Services on 16 May 2002.) This statement was based on not only his more than 30 years of service to the nation in peace and war, but also on his clear understanding of the enduring nature of close combat operations.

As we build the Army's Future Force, we must take advantage of every technological edge and the synergies inherent in joint operations to ensure the success of our commanders and the Soldiers they lead. However, we must heed the lessons of past and recent wars. On organic fires, the message is clear: ground force commanders need responsive, organic fires to ensure success in full-spectrum combat operations and to offset the risks inherent in those operations—now and in the future.



Colonel Robert F. Barry II is the Training and Doctrine Command (TRADOC) Systems Manager for Cannons at the Field Artillery Center, Fort Sill, Oklahoma. He also was the Senior Fire Support Trainer (Wolf 07) at the National Training Center, Fort Irwin, California. He commanded the 4th Battalion, 1st Field Artillery (4-1 FA), 1st Armored Division, at Fort Riley, Kansas. In the 3d Infantry Division (Mechanized), he was the S3 and Executive Officer (XO) of the Division Artillery and S3 and XO in 1-9 FA at Fort Stewart, Georgia. He deployed in combat to Operation Provide Comfort in northern Iraq, Operations Desert Shield and Storm in the Gulf, Operation Just Cause in Panama and for stability and support operations (SASO) in Africa and the Middle East. He is a graduate of the Army War College, Carlisle Barracks, Pennsylvania, and the School for Advanced Military Studies, Fort Leavenworth, Kansas. He holds three master's degrees, including one in Strategic Studies from the War College and a Master of Military Art and Science from the Command and General Staff College at Fort Leavenworth.

Flagship Sill

A Power Projection Platform for 100-Plus Years

By Colonel G. Keith Herring

Fort Sill, Oklahoma, was established in 1869 as a platform from which the United States Army could project military power throughout the Southwest. Today, 135 years later, Fort Sill has enhanced capabilities and developed state-of-the-art facilities to accommodate a significantly larger power projection footprint than "the Southwest."

Today, Fort Sill routinely deploys multiple units simultaneously by rail and air to military operations worldwide—strategically projecting military might quickly and cost effectively while ensuring Soldiers and their equipment are mission capable for training exercises or contingencies. Fort Sill is a flagship installation for projecting power, one of the Army's 16 Focus Areas for a Ready and Relevant Army at War.

For Operations Enduring Freedom and Iraqi Freedom (OEF and OIF) alone, Fort Sill has deployed more than 9,000 Soldiers and more than 69 million tons of equipment for both Active and Reserve Component (AC and RC) units with home stations from across the nation (as of March 2004). As the post mobilized/deployed detachment- to brigade-sized units with thousands of pieces of equipment to the Central Command theater, some 3,000 Soldiers redeployed through Fort Sill.

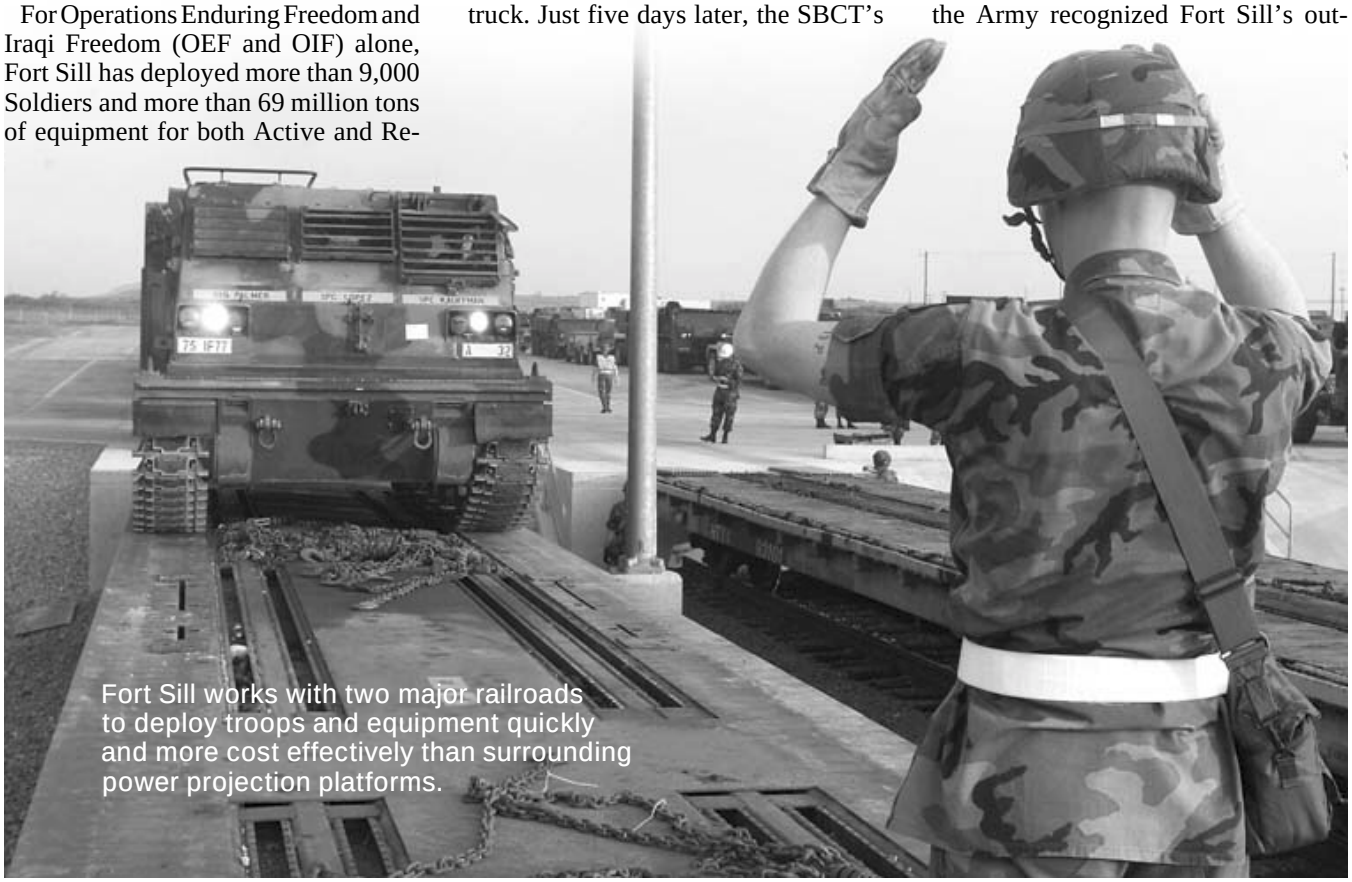
Also during that same time frame, Fort Sill deployed troops and equipment for major training exercises, such as the 2d Infantry Division Warfighter and Ulchi Focus Lens exercises in Korea and a National Training Center rotation at Fort Irwin, California. One unique exercise certified the strategic deployability of the 3d Brigade, 2d Infantry Division's Stryker Brigade Combat Team (SBCT).

On 27-28 April 2003, an element of the SBCT arrived at Fort Sill by rail and truck. Just five days later, the SBCT's

Photo by SPC Matt Meadows, Fort Sill Cannoneer

600-plus personnel and 152 vehicles (including 60 of the 19-ton Stryker vehicles) deployed by air from Fort Sill's Henry Post Field. It took 45 C-17 sorties and only 46 hours to deploy them from Fort Sill to Fort Polk, Louisiana. The brigade was certified as deployable and is now in Iraq.

Because of Fort Sill's access to transportation, facilities and services and the can-do attitude of its supporting directorates post-wide, the Chief of Staff of the Army recognized Fort Sill's out-



Fort Sill works with two major railroads to deploy troops and equipment quickly and more cost effectively than surrounding power projection platforms.

Photo by SPC Matt Meadows, Fort Sill Cannoneer

standing power projection capabilities in recent years. His "Army Deployment Excellence Award" has been awarded twice since 2001—Fort Sill won the award one year and was First Runner Up the second.

Projecting Power Today—What It Takes. For the expeditionary Army, its deployment flagship must have access to transportation assets and large, efficient support facilities; plenty of billeting and motor pool space; and enough training facilities to accommodate multiple units mobilizing for deployment. Fort Sill has them all, and more.

• *Fort Sill is geographically located within the footprint of significant numbers of III Corps units and in the heart of the nation, making it accessible by many AC and RC units.* Not only FA units have deployed from Fort Sill, but also Engineer, Transportation, Military Police and Quartermaster from as far away as South Dakota and California. Units can deploy from Fort Sill in any direction by air and deploy by rail to the south, east or west coasts for ship embarkation.

• *Air Transport—Fort Sill has access to multiple aerial transport facilities to deploy/redeploy personnel and equipment efficiently and effectively.* Fort Sill accesses three airports: Henry Post Field on post, the Lawton-Fort Sill Regional Airport just 10 minutes away and Altus AFB that's 60 miles away. In 2003, Fort Sill's Unit Movement Office loaded about 140 planes with 1.1 million pounds of equipment and 6,000 military personnel for deployments. Because the Air Force schedules limited time on the ground for loading, Fort Sill ensured that departures would not be delayed due to loading; in 100 percent of the deployments, the planes were loaded and available for early departure.

Henry Post Field's runway can accommodate C-17s or smaller aircraft (in ideal conditions, larger aircraft), and the airfield is convenient and easy as part of Fort Sill. It offers virtually unlimited space for deploying troops and equipment.

The Lawton-Fort Sill Regional Airport, only five miles away, is an excellent alternative for deploying forces. It can accommodate a wide variety of aircraft, including the C-5 Globemaster. Because of the one-of-a-kind partnership between Fort Sill and Lawton, including the Airport Authority, the airport is available 24/7. It has become the most frequent aerial port of embarkation/debarkation for forces deploying from or redeploying to Fort Sill. During the height of OIF deployments for combat operations, Fort Sill managed more than 100 aircraft through the Lawton Airport without a single mission delay.

Altus AFB in Altus, Oklahoma, is little more than an hour away and also can accommodate a wide variety of aircraft, including the C-5.

• *Rail Transport—Fort Sill works with two major railroads to deploy troops and equipment quickly and cost effectively south, east and west for sea transport to theaters.* Fort Sill works closely with the Union Pacific Railroad and Burlington Northern/Santa Fe Railroad. This allows the post to take advantage of competitive pricing and deploy equipment more cheaply than surrounding power projection platforms. For example, it is cheaper to deploy a unit by rail from Fort Sill to the NTC than it is for Fort Hood to deploy the same-sized unit by rail to the NTC. Fort Sill's coordination with these two railroads provides more options for receiving empty railcars and a more efficient and timely flow of those cars.

Because of the favorable rail access, Fort Sill can deploy forces to a variety of seaports. The port at Beaumont, Texas, outside of Houston, is often the primary port. Transit time to Beaumont is about 30 to 36 hours. East coast ports, such as Charleston, South Carolina, and Jacksonville, Florida, are equally accessible by rail. Trains coming from Fort Sill arrive at the east coast ports in about five days. Trains traveling to the west coast ports, such as to Long Beach, California, take little more time than it takes to reach Beaumont. Fort Sill can efficiently deploy forces to (or redeploy them from) the Balkans, Northeast Asia or Southwest Asia.

The Transportation Command and port authorities consistently give units moved by Fort Sill via rail high marks for the way the equipment arrives in port. During OIF deployments, no rail cars were rejected or had to be reworked for any reason at any port. The Directorate of Logistics' (DOL's) philosophy is that all equipment being transported by rail to a port will leave Fort Sill 100 percent ready for sealift to avoid causing a "domino effect" delay of the combat mission.

• *Logistical Support—Fort Sill has the logistical facilities to accommodate loading and off loading large numbers of equipment rapidly or pull maintenance on that equipment, as necessary.* To support rail operations, the installation has an unparalleled railhead with eight independent loading points and an expansive marshalling area. The new railhead has nearly tripled the throughput of railcars from 104 to 340 cars per day.

The facility has cut the time it takes to out load by two-thirds. A battalion-sized unit can load equipment and tie it down on 100 cars simultaneously in six hours. The process use to take 18 hours. With the increased railcar throughput, today, Fort Sill can out load an entire brigade in 18 to 24 hours.

In one case, a multiple-launch rocket system (MLRS) battalion was able to out load on 84 rail cars within two hours with only tie downs needed to complete the process.

Stryker Brigade Certified as Deployable. On 27-28 April 2003, an element of the SBCT arrived at Fort Sill by rail and truck. Just five days later, the brigade's 600-plus personnel and 152 vehicles (including 60 of the 19-ton Stryker vehicles) deployed by air from Fort Sill's Henry Post Field. (Photo by SPC Matt Meadows, Fort Sill *Cannoneer)*

Collocated with the railhead, the marshalling area can hold approximately 550 pieces of equipment in a ready-to-load state. The layout of the area facilitates an efficient out load as units don't have to cross their own paths during the process. The design also allows units to marshal behind units in the process of loading.

Because of these state-of-the-art rail facilities, Fort Sill can out load units as efficiently and effectively as any power projection platform in the Army.

Fort Sill DOL's Maintenance Division has processed more than 100 vehicles per week to bring deploying units' equipment up to standard—inspected and road tested. The philosophy is that all equipment deploying from Fort Sill will be fully mission capable to ensure units are combat ready as they disembark in theater.

In one case, an RC unit's 145 vehicles arrived by rail with 120 of the vehicles not mission capable. Fort Sill's DOL Team worked thousands of overtime hours to get the vehicles off loaded, brought up to mechanical standard and out loaded on railcars in seven days—tasks that usually take weeks.

• *Fort Sill has an abundance of billeting, motor pools space and training facilities to support mobilizing/deploying/redeploying units.* The installation has an overall capacity of 14,000 barracks spaces scattered across the post. The Directorate of Public Works (DPW) has active programs to maintain and renovate those barracks, particularly for mobilizing Soldiers. In addition, Fort Sill has a number of hard-top surfaces useable as motor pools—most can accommodate up to battalion-sized units.

Fort Sill offers deploying units access to excellent and relevant training areas. They can access qualification ranges for individual and crew-served weapons, approximately 49,000 acres for maneuver training and more than 37,000 additional acres of ranges and impact areas. The installation also has a convoy live-fire range.

• *Can-Do Attitude—Fort Sill personnel, both Soldiers and civilians from multiple directorates and agencies working with deployments, have a can-do attitude about Soldiers deploying for training or contingency missions in support of America at war.* It is no accident that Fort Sill was recognized twice in the two Chief of Staff of the Army's Deployment Excellence Awards. The post directorates and agencies support deploying units and the nation at war as "One Team, One Mission with No Mission Too Hard." And that same quality of teamsmanship extends out in coordination with nonmilitary service agencies and transportation providers.

Photo by SPC Matt Meadows, Fort Sill Cannoneer

Fort Sill personnel, both Soldiers and civilians from multiple directorates and agencies working with deployments, have a can-do attitude.

Projecting Power Tomorrow—Improvements to a Premier Platform. As a power projection platform of excellence, Fort Sill is planning improvements to increase its mobilization and deployment capabilities for the future. The installation has several initiatives underway to make its deployment operations more efficient.

A new unit movement facility is being built and will be completed in April. Units will have a state-of-the-art complex to plan and conduct unit movement operations. It will include an automation room for up to 25 separate units to document and coordinate movement requirements and update their databases simultaneously. This complex will triple the capacity of the current facility. Additionally, the facility will provide classrooms for up to 80 unit movement students at a time as well as facilities to prepare cargo for air movement.

Plans also have been completed for a new rail maintenance facility to accommodate depot-level maintenance on locomotives. This will prevent Fort Sill from having to send locomotives to a depot, which keeps locomotives out of service for additional months at a time. Construction of the locomotive maintenance facility is scheduled to begin in 2006.

As a result of lessons learned during recent deployments, other projects to enhance Fort Sill's power projection capabilities have been planned and are in various stages of development. These include expanding the aircraft ramp at the Lawton-Fort Sill Regional Airport to allow six wide-body aircraft to be on the ground at one time without interfering with commercial airline activities; building a facility for additional rail storage that will hold up to 100 more railcars; expanding the alert holding area for units to pre-stage up to 600 pieces of tactical equipment; and improving a variety of ranges and training areas.

Fort Sill is today and will remain in the future a premier power projection platform, one of the Army's flagships, because of the dedication and professionalism of its Soldiers and Department of the Army civilians. These are the personnel from not only DOL and DPW, but also other post agencies that support mobilization and deployment, including the Directorate of Plans, Training, and Mobilization (DPTM) and those agencies that support Soldier readiness, such as the Adjutant General (AG), Medical Department Activity (MEDDAC), Dental Department Activity (DENTAC) and others across the post.

Although 135 years have passed since Fort Sill first projected US Cavalry troops throughout the Southwest to fight Indians, Fort Sill continues to play an important role in projecting national power, only now, to fight the Global War on Terrorism.

Colonel G. Keith Herring is the Garrison Commander of Fort Sill, Oklahoma. He was the Chief of Plans Branch in the Operations Directorate (J3) at Central Command, MacDill AFB, Florida, where he was instrumental in planning both Operations Enduring Freedom and Iraqi Freedom. He commanded the 9th Battalion, 1st Field Artillery (9-1 FA) (Provisional) and when it became 2-20 FA, was the first commander of the new divisional Multiple-Launch Rocket System/Target Acquisition Battalion in the 4th Infantry Division (Mechanized), Fort Hood, Texas. In 2-7 FA, 10th Mountain Division, Fort Drum, New York, he was the S3 until he deployed to the Republic of Haiti where he was a Plans and Operations Officer in Task Force Mountain and Executive Officer for the Joint Task Force Commander. He holds an MBA from Oklahoma City University.

An FS³ mounted on a Knight vehicle for testing.

Target Location and Laser Designation via Electro-Optic Sensors

A Three-Tiered Strategy

By Major Karen P. Walters, EN

There is a significant warfighting capabilities gap between what target location and laser designation equipment the forward observer (FO) has and what he requires, a gap being reinforced by ongoing operations in the Middle East.

In response, the Field Artillery School has devised a three-tiered strategy to fill that gap. This strategy will give the FO electro-optical sensors that are handheld, tripod-mounted and platform-mounted. The handheld sensor will be very lightweight at three to five pounds for dismounted FOs—potentially the dismounted optic system (DIOPTIC).

The second tier, the tripod-mounted sensor, also used in dismounted operations, will be light, about 30 pounds, and provide significantly greater range than the handheld sensor—plus, as a stabilized system, add laser designation. The lightweight laser designator rangefinder (LLDR) is replacing the tripod-mounted ground/vehicular laser locator designator (G/VLLD).

The last tier, the platform-mounted sensor, is not weight-constrained and will be the most capable locator/designator sensor on the battlefield. The system being developed for this tier is the fire support sensor system (FS³).

Handheld Sensors. Dismounted observers have a critical and immediate need for a handheld, lightweight, eye-safe, digitally connected, day/night target location device to marry with a laser designation module. The current system, the mini-eye safe laser infrared observation set (MELIOS), is too heavy and neither digitally connected nor night-capable.

As part of the Rapid Fielding Initiative (RFI), the Army has been buying commercial off-the-shelf (COTS) products, namely the Viper/Vector 21 and Mark VII. Five brigade sets already have been bought and fielded and an additional 11 to 15 more sets are pending.

Although these COTS systems are lighter and digital with some limited night capability, they fall short of meeting Army requirements. The continuing need for a more capable handheld target location and laser designation system prompted the FA School to fina-

lize requirements for the DIOPTIC. With funding, the system could be fielded in 2007.

The DIOPTIC will be a handheld, lightweight (objective weight of three pounds) eye-safe target recognition and location system that is digitally connected and battery-operated and has a 10-kilometer range in the day and two-kilometer range at night. An FO/fire support team (FIST) Soldier will use the DIOPTIC, which will be similar in size to the standard M22 binoculars.

The DIOPTIC will determine the range, azimuth and vertical angle to the target and export this data to a global positioning system (GPS) device for computation of target grid location. Via a split cable, the DIOPTIC will be connected to a GPS and FO system, enabling it to transmit automated data for calls-for-fire. The FO systems will be the light forward entry device (LFED) or the pocket-sized forward entry device (PFED). (For more information on the FO systems, see the article "PFED, LWTDS and GDU-R: You Want Tactical Handhelds? We've Got Tactical Handhelds!" by Paul C. Manz, et al in the May-June 2003 edition.)

Ultimately, the DIOPTIC will transmit calls-for-fire wirelessly.

Without power, the DIOPTIC will operate as a direct-view optic to detect and engage targets and will replace both the FO/FIST's MELIOS and M22 binoculars. The objective DIOPTIC will be mated with a lightweight designator. In the future, its functions and capabilities will migrate into the Land Warrior system for every joint observer in the Army.

Tripod-Mounted. The tripod-mounted LLDR complements the DIOPTIC and is replacing the G/VLLD.

The LLDR is a fully digital target location and designation system with an internal precision lightweight GPS receiver (PLGR). It combines second-generation forward-looking infrared (FLIR) with a thermal capability to provide day and night optics superior to the G/VLLD, particularly on an obscured battlefield.

Its greatest advantage, though, lies in its weight. The LLDR weighs only 35 pounds, about one-third of the G/VLLD (109 pounds). No other system can provide these capabilities at that low weight.

A soldier using the Leica Viper/Vector 21 wired to the PFED. *(Photo by Jeffrey Weiss)*

The handheld and tripod-mounted target location/laser designation systems together provide the appropriate mix of capabilities at an acceptable weight to support forcible-entry operations. These types of operations can be the most demanding on dismounted observers, for example, when the force conducts airborne operations to secure an airfield.

Unlike the DIOPTIC, the LLDR is in production. As a result of an operational needs statement, the first 21 production models were fielded to the 25th Infantry Division Artillery in January 2004 just before the division deployed to Iraq. Unfortunately, over the last few years, funding has been stripped away from the LLDR program. This has lengthened the end date of its fielding from 2013 until 2019.

Platform-Mounted Sensors. This final leg of the sensor strategy is the FS^3. Production models of the FS^3 will be mounted on Knight vehicles in early 2005 and on Stryker vehicles in 2006.

The FS^3 optical sensor will give the force the critical ability to see a minimum of five kilometers at night and other capabilities as specified in the "Heavy-Light Fire Support Vehicle Operational Requirements Document."

The FS^3 will be a long-range advanced scout surveillance system (LRAS^3) that has been engineered to laser designate using the designation module from the LLDR. The FS^3 will provide optics superior to those of the G/VLLD through its second-generation FLIR, doubling the G/VLLD's range under obscured conditions (and, therefore, doubling the designation range) and tripling the G/VLLD's night range. FS^3 optics also will be superior to those of the M7A2 and the M3A3 Bradley FIST vehicles (and their Bradley fighting vehicle counterparts).

The other significant capability the FS^3 will provide is a small target location error (TLE). Because the FS^3 will complement the Knight and Stryker vehicles, it will take advantage of the vehicles' mission equipment packages, including the inertial navigation systems, and realize TLEs four to five times smaller than those of the LRAS^3—TLEs of less than 20 meters.

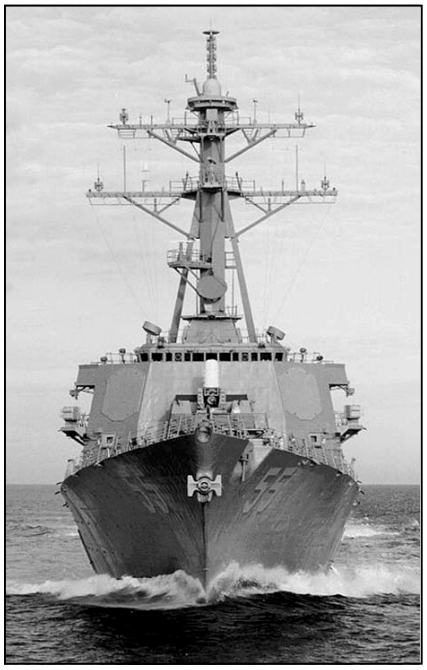
The FS^3 will give the heavy forces the flexibility they need to operate in complex and urban terrain.

This three-tiered sensor strategy—target location/laser designation capabilities for now, in the near-term and future—will provide the force a wide range of capabilities and increased accuracy and, when paired with the appropriate munitions, will help bring the commander's desired effects on targets with little or no collateral damage. This strategy fills some of the critical gaps of the FO/FIST warfighting requirements.

Major Karen P. Walters, Engineer (EN), is the Chief of the Fire Support Branch in the Training and Doctrine Command (TRADOC) Proponency Office-Sensors (TPO-S) of the Futures Development Integration Center (FDIC), Fort Sill. Oklahoma. She commanded Headquarters and Headquarters Company, 9th Engineer Battalion, 1st Infantry Division (Mechanized) in Germany, and in Camp Bedrock, Bosnia. In addition, she was the J3 Operations Officer for the Joint Task Force Provide Promise (Forward) in Zagreb, Croatia. She holds a BS in Mechanical Engineering from Widener University in Pennsylvania and an MS in Civil Engineering from Mississippi State University. Major Walters is a member of the Army Engineers and Scientists Program that places Acquisition Corps officers in critical technical positions throughout the Army, including in deployed units.

Force Protection from the Sea: Employing the SPY-1D Radar

By Chief Warrant Officer Three John A. Robinson



An Arleigh Burke-Class Guided-Missile Destroyer, DDG 55 USS Stout with SPY-1D Metal Plates

With the threat we face today from mortars and small-caliber rockets throughout southwest and central Asia as well as Africa and the Philippines, we continuously must reassess our force protection posture to minimize risks to our Soldiers, airmen and Marines, wherever possible. The Firefinder countermortar and counterbattery radars are our critical in-house systems to facilitate this effort, but in the event of amphibious operations, there is another, more advanced capability we should consider during our fire support planning process: the AN/SPY-1D(V) radar. This radar is part of the Aegis weapon system on cruisers and destroyers.

SPY-1D Radar

The Radar. The SPY-1D is multifunctional, although it was primarily designed for a littoral environment to address the threat of cruise-type missiles. It is the primary air and surface radar for the Ticonderoga and Arleigh Burke classes of warships.

When getting a Q-36 Firefinder ashore early is not tactically or logistically feasible, the SPY-1D can serve as a more than adequate surrogate. Furthermore, the "V" or variant version of the SPY-1D can pick out targets from amongst land clutter—there are no mask angle issues with the SPY-1D(V). The V-version underwent successful tests in the summer of 2003 and will be fielded aboard the Arleigh Burke-class guided-missile destroyer *USS Pinckney* in the summer of 2004.

Configured as four octagonal metal plates bolted to the ship's superstructure, the antenna contains a phased-array system, providing 6400-mil horizontal coverage and azimuth-to-wave-top vertical coverage. It can search for and auto detect targets and transition to track surface and air targets as well as support missile engagement.

While the SPY-1D has been designed primarily to detect theater ballistic missiles (TBMs) at ranges in excess of 500 kilometers, it also can track golf ball-sized targets at ranges in excess of 165 kilometers. It has the ability to track multiple targets simultaneously and help the operator determine the nature of the targets. The land-based threats of mortar, artillery and small-caliber rockets pose no detection problem for the SPY-1D.

Conceptual Employment. With a potential amphibious operation or operation using sea-based assets of naval surface or aerial fire support, the SPY-1D should be considered a first-line or complementary force protection asset. (See Figure 1.) If 5-inch/54-caliber (5"/54) naval guns are planned for fire support, there may be no need for additional naval support requests.

Cruisers have two 5"/54 guns while destroyers have one 5"/54 gun. At least one such vessel is likely to accompany amphibious landing craft or naval rotary- or fixed-wing launching vessels. As always, the first mission of the SPY-1D is to protect the fleet, but contingent upon threat conditions, this mission easily can be modified to include support for amphibious landings.

The cruiser or destroyer likely will operate from a designated fire support area (FSA), allowing it the freedom of mobility to provide coverage to both fleet and amphibious assets. If the threat condition is so benign that the ship may be allowed to anchor at a single point and provide exclusive support to the landing force, then a fire support station (FSS) may be designated. In consult with the naval gunfire liaison officer (NGLO), the joint task force (JTF) chief of fires designates either an FSA or FSS.

The ship's command and decision system monitors all targets tracked by the SPY-1D radar. Once a target is determined to be a threat, ship missiles or guns may engage a target through the weapons control system, a direct sensor-to-shooter link.

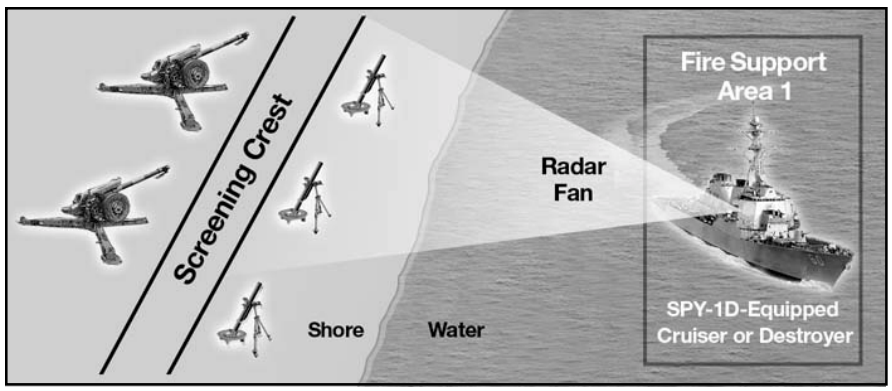


Figure 1. The SPY-1D radar can provide littoral force protection for amphibious landings.

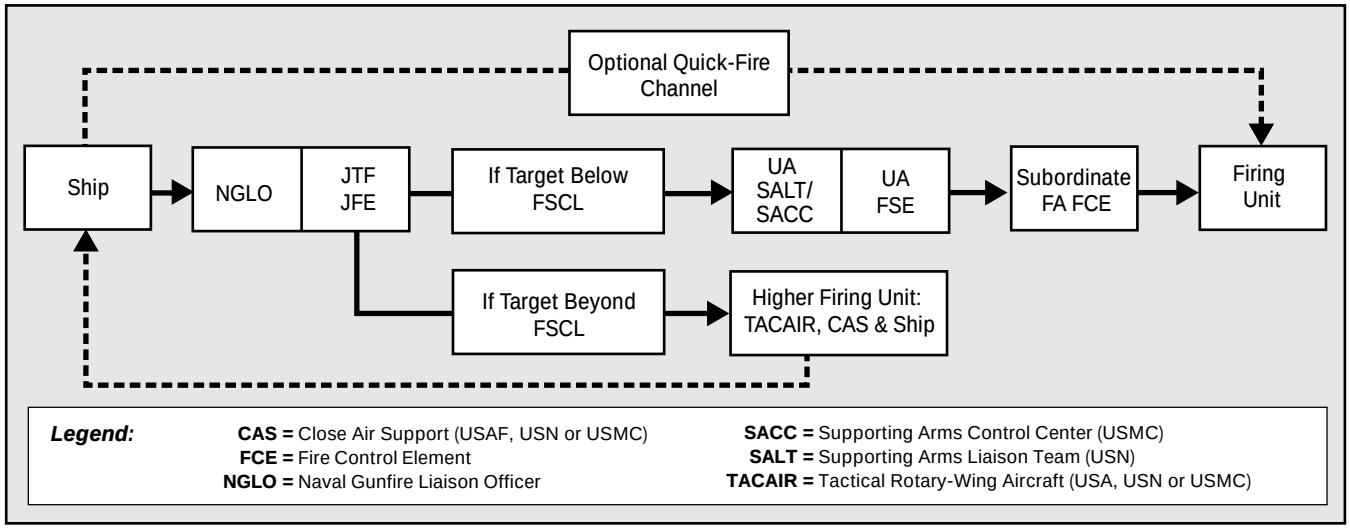


Figure 2: Clearance of Fires. The landing party, possibly controlled by either a unit of action (UA) fire support element (FSE) or joint task force (JTF) joint fires element (JFE), is responsible for clearing the fires.

FM 3-09.30 Tactics, Techniques and Procedures for Observed Fire and Fire Support at the Battalion Task Force and Below reminds us that as "direct fire is faster and more accurate, this method is used whenever possible." Ideally, if a ship in support of amphibious or near-shore operations were to detect a hostile ballistic projectile, the fastest and most efficient method of engaging the projectile would be direct fire or "ship adjust."

However, a clearance-of-fires procedure must be conducted with the landing party to protect the force from fratricide. The landing party, possibly controlled by either a unit of action (UA) fire support element (FSE) or higher JTF joint fires element (JFE), has clearance-of-fires responsibility. (See Figure 2.)

A task-organized Navy supporting arms liaison team (SALT) or Marine supporting arms control center (SACC) helps the FSE or JFE. These elements must be manned and equipped to communicate with the supporting vessel; they require high-frequency (HF) radio communications equipment that is not part of an FSE or JFE modified table of organization and equipment (MTOE).

Engagement Options. There may be vaired options available to the landing party to respond to an indirect fire threat. The ship-borne 5"/54 gun(s) is one option, but fire supporters must consider range limitations as these guns do not reach the maximum detection capability of the SPY-1D. (See Figure 3.)

Depending on what existing fire support coordinating measures (FSCMs) permit, the landing party may request rotary- or fixed-wing support, typically staged from offshore platforms. While this is a particular forte of the tactical air control specialist provided by either USAF or USMC, fire supporters should be trained and certified in terminal air control procedures for close air support (CAS), especially for circumstances such as these.

Max Range (Meters) Full Charge	Rocket-Assisted Projectile (RAP)	Max Range (Meters) Reduced Charge	Rate-of-Fire Per Tube (Max/ Sustained)	Ammo	Fuzes
23,100	29,181	12,200	20/20	HE, HC, Illumination, WP, RAP	Q, MT, VT, CVT, Delay

Legend:
CVT = Controlled Variable-Time Fuze
HC = Hexachloroethane Zinc
HE = High Explosive
MT = Mechanical-Time Fuze
Q = Quick (Flash) Fuze
VT = Variable-Time Fuze
WP = White Phosphorous

Figure 3: Naval 5-Inch/54-Caliber Guns' Capabilities. These guns cannot range the maximum detection range of the SPY-1D radar (*FM 3-09.30 Tactics, Techniques and Procedures for Observed fire and Fire Support for Battalion Task Force and Below,* Table 101-13, "5-Inch/54-Caliber Naval Gunfire").

Under Army doctrine, these types of assets normally would be approved at the JTF level, but under USMC doctrine, both rotary- and fixed-wing assets routinely are employed in direct support of landing forces. Either way, the landing party would require support to respond to SPY-1D acquisitions of hostile ballistics directed against it.

Amphibious operations will continue to remain the "bread and butter" of our brother Marines for the foreseeable future. When traveling (and assaulting) light, the Army also should look for ways to complement operations using joint assets, rather than bringing additional hardware ashore early, increasing the risks to slower-moving air or sea craft transporting the hardware.

The SPY-1D radar provides force protection, early warning and counterfire capabilities that, with quality joint and combined arms training, can complement any amphibious or near-shore operation. Think joint.

Chief Warrant Officer Three John A. Robinson is the Targeting Officer for the 19th Battlefield Coordination Detachment (BCD), US Army in Europe. Until recently, he was the 10th Mountain Division Targeting Officer and served as the Targeting Officer for both the Combined Joint Task Force-180 (CJTF-180) and CJTF-Mountain in Afghanistan for Operation Enduring Freedom. Mr. Robinson also was the Targeting Officer for the 25th Infantry Division (Light) at Schofield Barracks, Hawaii, and Counterfire Officer for the 18th Field Artillery Brigade (Airborne), XVIII Airborne Corps, Fort Bragg, North Carolina. He holds a Doctorate in Education from Argosy University in Florida.

I MEF Fires in OIF

By Lieutenant Colonel Paul M. Andrus, Lieutenant Colonel Randol D. Rule and Major Robert J. Terselic, All USMC

A Marine takes a knee on the southern Iraqi battlefield during his unit's advance toward their objective. (15th MEU)

The I Marine Expeditionary Force (I MEF) deployed to Kuwait incrementally through a series of orders for what eventually became Operation Iraqi Freedom (OIF). The command element (CE) deployed in November 2003. Major subordinate commands (MSCs) and detachments flowed into theater during the following months and, ultimately, fleshed I MEF out to more than 80,000 personnel by May of 2003.

I MEF (or any MEF) is the largest echelon Marine air-ground task force (MAGTF). By definition, it is task-organized for a specific purpose but normally will include an aviation combat element (ACE) built around a Marine air wing (MAW), one or more ground combat elements (GCEs) up to division-sized and a force service support group (FSSG) for logistics. A MEF roughly equates to an Army corps-level combat organization.

In practical terms, MAGTF aviation provides robust, agile combat power at the tactical level to support or achieve decisive combat. This power is inextricably linked to the GCE's concept of operations and the logistics required by both.

Organization for Combat. In accordance with doctrine, I MEF's standing organization was augmented by other MEFs and services, Coalition partners and the Marine Corps forces reserves (MCFR).

I MEF's standing GCE is the 1st Marine Division (1 MARDIV) with three task-organized regimental combat teams (RCTs) and the 11th Marine Artillery Regiment. Also part of I MEF was Task Force (TF) Tarawa built around a fourth RCT (it was not a MAGTF because it lacked organic aviation).

The 1st (United Kingdom) Armoured Division under the tactical control (TACON) of I MEF consisted of three brigades: the 3d Commando Brigade (Royal Marines), 16th Air Assault Brigade and 7th Armoured Brigade. Each brigade had a habitually associated artillery regiment (battalion equivalent) organized for combat under the division's Commander of Royal Artillery (CRA). Cannons include the L118 105-mm light howitzer and the AS 90 155-mm self-propelled (SP) howitzer.

The 1st Armoured Division had the Mamba/Arthur counterbattery radar, which is roughly the equivalent of our TPQ-46A radar. The UK division also had the Phoenix unmanned aerial vehicle (UAV), which is launched from a truck and recovered by net. The Phoenix is an intelligence, surveillance, target acquisition and reconnaissance (ISTAR) asset at the UK division level. For more information, see the article "1st (UK) Armoured Division in Iraq, January to April 2003" by Brigadier Andrew R. Gregory in the January-February 2004 edition.

The 1st FSSG provided combat service support to the MEF CE and MSCs. A new MSC joined the MEF: the MEF engineer group (MEG). The MEG was built around three Navy Seabee regiments with a two-star admiral com-

manding them. The MEG provided significant general engineering and construction support that were invaluable throughout all phases of the operation.

Equally important was the Patriot coverage from the Army's 108th Air Defense Brigade.

Subordinate to TF Tarawa and the 3d Commando Brigade were Marine expeditionary units (MEUs) complete with their own air, ground and logistics elements. This was a nonstandard organization. Normally, MAGTFs are not contained within other MAGTFs. But for a limited duration, this organization made sense.

The 3d MAW from Marine Corps Air Station (MCAS) Miramar in San Diego, California, was the ACE for I MEF. Subordinate elements included flying, support and control groups. The aircraft mix was 60 F/A-18 Hornets, 74 AV-8B Harriers, 10 EA-6B Prowlers, 58 AH-1W Cobras, 18 KC-130 Hercules, 30 UH-1N Hueys, and 122 medium- and heavy-lift helicopters. Assuming standard planning factors of 80 percent availability of aircraft on any given day and an average of 2.5 sorties per aircraft per day, the 3d MAW could plan to execute 384 strike sorties per day.

The 3d MAW performed a wide variety of tasks too numerous to mention and showed amazing agility by operating fixed- and rotary-winged aircraft from forward operating bases (FOBs) as far north as Salman Pak just outside of Baghdad.

I Marine Expeditionary Force (I MEF) in Operation Iraqi Freedom

Combat Operations. When Iraq began setting fire to oil wells in the southern Rumaylah Oil Fields, I MEF commenced OIF. The MEF prosecuted the "Opening Gambit" on 19 and 20 March with a combination of air and surface fires against Iraqi naval coastal defense forces on the Al Faw Peninsula, observation and border stations on Safwan Hill and along the Kuwaiti-Iraqi border, and III Regular Army Corps command and control (C^2) and long-range fire support units. (See the map.) Fires included fixed-wing aviation from the 3d MAW; artillery from the 11th Marine Regiment, TF Tarawa and 1st (UK) Division; and Army tactical missile systems (ATACMS) from V Corps to the west.

After crossing the line of departure (LD) on the Kuwaiti-Iraqi border on 21 March until approximately 22 March, the I MEF MSCs focused fires on the destruction of III Regular Army Corps, including the corps C^2 and long-range fire support capabilities, the 11th Infantry Division, the 51st Mechanized Infantry Division and the 6th Armored Division. The MEF focused its deep shaping fires on the destruction of the IV Regular Army Corps arrayed along Route 6 in the vicinity of Al Amarah and the Baghdad Republican Guard Infantry Division in the vicinity of Al Kut.

From 22 March to 3 April, 1 MARDIV progressed north, destroying the Baghdad Infantry Division, while TF Tarawa battled Ba'ath and Fedayeen in An Nasiriyah and the 1st (UK) Division fought for possession of Basrah, the second largest city in Iraq. I MEF focused its aviation and V Corps ATACMS deep shaping fires on the 10th Armored Division in Al Amarah and Republican Guard units defending the southeastern approach into Baghdad, including the II Republican Guard Corps.


When Iraq began setting fire to oil wells in the southern Rumaylah Oil Fields, I MEF commenced OIF.

By this time, I MEF was receiving significant numbers of Coalition Force Air Component Command (CFACC) sorties.

From 3 to 11 April, 1 MARDIV crossed the Tigris River and attacked north along Route 6 into Baghdad. TF Tarawa attacked east into Al Amarah, and the 1st (UK) Division pushed into Basrah and north along Route 6, ultimately, linking up with TF Tarawa to secure the northern Rumaylah Oil Fields. The large influx of USAF A-10s, USN F-14s and F-18s, and Royal Air Force GR-8s to provide close air support (CAS) for the attacks augmented the 3d MAW.

The MEF focused MAGTF and CFACC aviation and V Corps ATACMS deep fires on elements of the Al Nida Republican Guard Ar-

I MEF gunners firing near Qasr, Iraq, in the opening phases of OIF. *(Photo by Cpl Anthony R. Blanco)*

mored Division in the vicinity of Baqubah and the 3d Regular Army Armored Division farther north.

After defeating all Iraqi forces in the MEF area of operations and securing all major cities in southern Iraq, I MEF was given the additional mission of securing Tikrit north of Baghdad. TF Tripoli pushed north from Baghdad and secured Tikrit by 15 April. TF Tripoli was composed of several RCTs and light-armored reconnaissance battalions from I MEF.

Overall, I MEF defeated the III and IV Regular Army Corps that had six divisions and the II Republican Guard Corps. In the II Republican Guard Corps, I MEF defeated the Al Nida and Baghdad Divisions and two brigades from the Medina Division.

The Targeting Process. In OIF, the corps-level MAGTF was I MEF, which included other MAGTFs as MSCs. But the targeting process is the same for any MAGTF.

The future fires section consists of the plans and target information sections. Together, they conduct all planned fire support coordination functions, including supporting operational and contingency planning (OPLANs/CONPLANs) as well as deliberate targeting and developing fragmentary orders (FRAGOs).

The plans section develops the MAGTF commander's concept of fire support in coordination with G3 future operations and future plans. This section works closely with MAGTF representatives at the CFACC and the Coalition Force Land Component Command (CFLCC) deep operations coordination cell (DOCC).

The target information officer (TIO) organizes and conducts the *MAGTF targeting board* for the MAGTF chief of staff. Based on the MAGTF commander's targeting guidance, the TIO recommends targeting objectives, target priorities and asset allocation for approval or modification by the targeting board.

The Coalition Force Commander (CFC) and CFACC requirement to produce an air tasking order (ATO) every 24 hours drove the MAGTF targeting cycle. This process presented a considerable challenge as the force fires coordination center (FFCC) had to harmonize the MAGTF commander's event-driven fire support requirements within a time-driven ATO cycle.

MAGTF-level targets most often are attacked by air although there are other assets available to service targets, such as artillery and naval surface fire support (NSFS). During OIF, UK ships provided NSFS to I MEF on the Al Faw peninsula. I MEF received more than 90 ATACMS from the Army's 214th Field Artillery Brigade.

Fire support planning begins with the MAGTF commander's guidance. During the planning process, the fires plans officer becomes intimately familiar with the guidance and intent of both the MAGTF commander and that of higher headquarters (HHQ). Using his knowledge of the assets available to the MAGTF and their capabilities, he develops an initial concept of fires, initial targeting objectives and initial fire support coordinating measures (FSCMs) and advises the target information section of likely future requirements. It is within this future operations planning cycle that lethal and nonlethal fire support plans are developed and harmonized.

The TIO, in coordination with the target intelligence officer from the G2, uses the MAGTF commander's guidance and targeting objectives to develop target priorities. A weight of effort or apportionment recommendation is also developed based on the MAGTF commander's guidance. This recommendation takes into account current capabilities, projected requirements and previous fire support guidance.

For MAGTF aviation assets, the ACE commander provides the number of fixed- and rotary-wing strike sorties available and recommends an apportionment between CAS and air interdiction (AI). The TIO recommends apportionment, tactical missions and additional support sorties from other fire support assets available.

A Marine AH-1W Cobra in a forward aircraft refueling point in OIF. *(Photo by LCpl C. H. Fitzgerald)*

Target development is the process of determining and identifying those nodes of enemy capabilities, which, if struck, will achieve the MAGTF commanders' objectives. The end product of target development is a single prioritized list of targets against which fire support assets are applied. MSCs and the MAGTF battlestaff provide input for prioritization and recommend changes.

Once the objectives are prioritized, all target categories are ranked against each other from the most to least important. If the number of targets exceeds the number of assets, this process ensures the most critical targets are attacked. The battlespace shaping matrix (BSM) summarizes this prioritization process in tabular form.

The daily MAGTF targeting board is the forum for the FFCC to present the MAGTF commander a fire support plan for the scheme of maneuver for 72 hours in the future. At the targeting board, the MAGTF commander approves the BSM target prioritization and air apportionment recommendation. The TIO then creates the final prioritized target list (PTL) from the approved BSM.

The TIO, assisted by subject matter experts (SMEs), provides an initial recommendation as to which fire support assets are best suited to service the PTL within the required time and synchronizes the timing and effects of those fires. This is normally done at the *synchronization working group (SWG)* that meets after the targeting board. The result is a PTL recommended for attack for each MAGTF fire support asset with guidance and direction on sequencing, timing and coordination. Additional assets required are identified and considered for request.

During force application, MSC fire support personnel apply assets against the list of targets approved for attack. The result of this portion of the targeting cycle is an ACE direct support ATO, a fire plan for the surface fire support assets (often a refinement of the initial plan) and an obstacle/barrier plan. It also includes a list of targets recommended for common source assets available from joint or Coalition resources. These may include CFACC aviation, Tomahawk land-attack missiles (TLAMs), ATACMS, etc. The MSCs also report whether or not there are enough assets to address all targets recommended for attack. This feedback allows the SWG to modify the plan, if required, and refine subsequent plans.

Combat assessment and battle damage assessment (BDA) are used to modify guidance and priorities as the targeting cycle continues.

Execution begins with the implementation of the ATO and schedules of fires. About 12 hours before execution of the fire plan, the FFCC prepares a reactive attack guidance matrix (RAGM). At the *RAGM working group*, the FFCC determines if any changes in priorities are necessary to the plan approved at the targeting board about 48 hours prior, based on updates to the scheme of maneuver or enemy order of battle. FFCC has three key responsibilities during force execution: validate planned targets, monitor execution of the plan and respond to emerging requirements.

Fire support requires constant, accurate assessment to evaluate the effectiveness of the fire support plan. Under the cognizance of the MAGTF G2, the combat assessment process occurs within the *intelligence operations center (IOC)* and compares targeting results with the MAGTF commander's original objectives and guidance.

The document that guides the assessment effort is the attack guidance matrix (AGM), which is produced in advance of hostilities. The AGM helps to determine the level of destruction required to have the desired effects against enemy battlefield operating systems (BOS). The G2 determines if the desired effect on the enemy is being achieved and whether or not deliberate or immediate re-attack is required.

Combat assessment and battle damage assessment (BDA) are used to modify guidance and priorities as the targeting cycle continues.

Lessons Learned. There were processes and equipment that performed well, and those that require improvements.

Cross-boundary fires were a great success. I MEF received more than 90 ATACMS fires from the 214th Field Artillery Brigade. A multiple-launch rocket system (MLRS) battalion was scheduled to be TACON to the MEF, but it flowed too late into theater for major combat operations. However, I MEF requested and routinely received preplanned ATACMS fires from V Corps. Also, approximately three-fourths of I MEF's immediate requests for ATACMS were filled.

Cross-boundary procedures were honed during command post exercises (CPXs) before the war and extensive real-time coordination during the war. On occasion, the MEF provided 3d MAW sorties in support of V Corps. Cannon cross-boundary fires were frequent and coordinated at the lowest level possible.

Although not a system of record, the automated deep operations coordination system (ADOCS) software went a long way toward helping warfighters. This application was easy to use for target nominations, gave system-of-record capabilities in a laptop platform and tied systems together in a user-friendly format.

I MEF was unable to track its air support requests (ASRs) submitted through the advanced FA tactical data system (AFATDS). In transfer from system to system, data fields appeared to be lost. Once submitted, the ASR number usually could not be tied to a mission on the ATO. Target numbers, descriptions and coordinates systems

varied, so they were not useful to correlate requests to missions. I MEF often resorted to guessing how many of its targeting objectives were being met, based on which area missions were tasked against.

Another challenge was the ability of the AFATDS to handle large geometries. The system would lock up while attempting to process the approximately 13,000 targets on the no-strike list (NSL) and restricted target list (RTL).

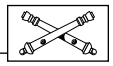
Collateral damage estimation (CDE) and mitigation was an important and necessary procedure to analyze potential damage to noncombatants. However, the process was time-consuming and difficult and seemed to be designed with strategic targeting in mind, making it a challenge for operations at the lower levels.

The process was not well suited for joint fires, such as the MEF's deep shaping of mobile, fleeting targets. It may work well for a small number of targets, but the process must be able to scale up, perhaps through decentralization, to the large number of battlefield targets serviced in an operation as large as OIF.

Attacking conventional military high-payoff targets (HPTs), such as missile launchers, was much easier than the gray- or black-list HPTs. Using fires to prosecute individuals designated as HPTs creates several challenges. The first challenge was to establish positive identification (PID) of the individual HPT. Information latency and the fleeting nature of these targets complicates efforts to carefully establish PID and perform CDE.

During major combat operations from 21 March through 15 April 2003 in OIF, I MEF swept from Kuwait up through Iraq into Tikrit. Although I MEF targeteers faced several challenges, overall combat operations accessed joint and Coalition fires in one of the most effective, integrated military operations in history.

US forces must continue to improve these capabilities by training and equipping joint forces to be synergistic in defeating any future enemy on any future battlefield.



Lieutenant Colonel Paul M. Andrus, USMC, is the Force Fires Coordinator (FFC) for I Marine Expeditionary Force (I MEF) at Camp Pendelton, California, and deployed with the MEF for combat in Operation Iraqi Freedom (OIF). He is an F-18 pilot and was deployed to the Persian Gulf aboard the *USS Constellation* for Operation Southern Watch. He has five combat missions in the No-Fly Zone over Iraq. He also flew 31 combat missions during Operation Desert Storm (ODS).

Lieutenant Colonel Randol D. Rule, USMC, is the Assistant FFC for I MEF and deployed in OIF as the MEF Information Operations Liaison Officer (LNO) to the Coalition Force Land Component Command (CFLCC). As a Field Artilleryman, he also served as the Combined Marine Forces Component Commander Representative to the Combatant Commander's Combined Forces Command Korea Targeting Board. He deployed to the Gulf in ODS; Beirut, Lebanon, for peace enforcement operations; and Grenada for Operation Urgent Fury.

Major Robert J. Terselic, USMC, is the Targeting Officer for I MEF and deployed for combat in OIF. He is a Field Artilleryman who has commanded four companies and batteries, including Headquarters and I Batteries in the 3d Battalion, 11th Marines, 29 Palms, California. He also was a staff officer for the Defense Language Institute in Presidio of Monterey, California, and an Acquisitions Officer at the Marine Corps Systems Command, Quantico, Virginia, responsible for fielding the AN/TPQ-46A Counterfire Radar.

Types of Joint Close Air Support Controls

In *Joint Pub 3-09.3 Joint Tactics, Techniques and Procedures for Close Air Support (CAS)* (3 Sep 03), the terms for direct and indirect terminal attack control changed to Types 1, 2 and 3. The three are not ordnance-specific but based on risk assessment. Ground commanders consider the risks in a situation and issue guidance to joint terminal attack controllers (JTACs) based on the level of acceptable risk. Commanders have the flexibility to determine what type of control best accomplishes the mission. The 9-line brief to the pilots is required for all three types of control.

Type 1 Control. This requires JTACs to visually acquire both the attacking aircraft and target. It involves close coordination and detailed integration. Examples requiring this control include close proximity of the target to friendly forces, language barriers with coalition pilots, difficulties in target acquisition, troops in contact and conditions with adverse weather.

Type 1 control is the default method unless the 9-line states otherwise.

Type 2 Control. Type 2 is when the JTAC remains in control of each attack but visual acquisition of the attacking aircraft at weapons release is not possible or required. This procedure occurs during night employment, adverse weather or with the use of standoff weapons. Type 2 control depends on the tactical risk and timely, accurate targeting data.

Type 2 is anticipated to be the most common control procedure used in CAS and should greatly increase clearance for Maverick or laser-guided weapons as employing these systems puts aircraft well beyond ground forward air controllers' (GFACs') visual limits.

Type 3 Control. This control is used when the tactical assessment indicates that CAS attacks impose a low risk of fratricide. This procedure allows a blanket clearance to employ air support on targets in a pre-determined area of the battlefield.

Using Type 3 control, the JTAC passes the 9-line brief and defining limits for the attack clearance along with any other restrictions to the attacking aircraft. Defining limits often will be a readily identifiable geographic features.

The JTAC then provides a "Cleared to Engage" call. This means the flight lead may initiate the attack within the parameters imposed by the JTAC. After the attack, the a pilot provides an "Attack Complete" call with the time, ordnance expended or number of targets engaged. The JTAC still maintains situational awareness on the attacks and retains overall abort authority.

Type 3 controls facilitate attacking targets well beyond the closest friendly troops safely but allow the ground commander control of the systems operating in his battlespace.

Ground forces must understand the details of the types of controls to maximize the flexibility of air power while minimizing risks.

CPT Raymond E. Johnson, Jr.
GLO, 51st Fighter Wing, Osan Air Base, Korea

CAS Training at the NTC

During the last several years, the trend at the combat training centers (CTCs) is for Army units to come to rotations untrained or poorly trained in integrating close air support (CAS) in ground operations. The National Training Center (NTC), Fort Irwin, California, is the one place where air and maneuver come together with dedicated time, the enemy and enough battlespace to train in CAS. The NTC has begun reforming its CAS training with a number of initiatives.

Train Observer/Controllers (O/Cs). The NTC Operations Group is focusing on CAS train-the-trainer to improve airspace management at the division level and live CAS. The NTC has developed CAS planning and execution Wolf MasterCards as training aids.

In the train-the-trainer program, O/Cs have gone to the Joint Firepower Course at the Air-Ground Operations School (AGOS), Nellis AFB, Nevada, or AGOS has sent a mobile training team (MTT) to the NTC, resulting in 105 O/Cs and 11th Armored Cavalry Regiment staffers trained in CAS.

Also, the NTC has sent representatives to Joint Forces Command (JFCOM) CAS symposiums and conducted CAS professional development training for fire supporters and for integrating brigade fire support and Air Force trainers.

The Lizard Team, which replicates the 52d Infantry Division, also has formed an Army airspace command and control (A^2C^2) cell to develop airspace graphics for the division A^2C^2 overlay and the air control order (ACO). This cell deconflicts the division's airspace by using high-density airspace control zones (HIDACZs) over brigade combat team (BCT) sectors; building minimum risk routes (MRRs) from rear areas over HIDACZs to areas beyond the brigade's forward boundary; and building division airspace coordination areas (ACAs) using terrain, boundaries and airspace requirements beyond the brigade forward boundary out to the division forward boundary. These measures support division essential fire support tasks (EFSTs). The Operations Group has found that HIDACZs still force brigades to deconflict airspace within their areas of operation (AOs) while requiring higher echelons to coordinate to maneuver and attack within the airspace.

Additionally, the Operations Group is working with USAF Air Warrior Exercise planners to update the special instructions (SPINS) in the NTC air tasking order (ATO) to include the Q-37 and Q-36 Firefinder radars as sources for positive identification for Type 2 control of CAS. (Type 2 is when the terminal air controller controls the attack but visual acquisition of the aircraft or weapons release is not possible or required.)

Joint Effects Training (JET). In an effort to show units how to plan and integrate CAS with artillery to standard, the Operations Group has introduced JET, a crawl-walk training program. JET begins with the Leader Training Program (LTP) (Phase 1, crawl). LTP teaches unit leaders what CAS done right "looks like" before their rotation, so they can incorporate CAS training at home station. (See the figure.) Phase 2 is Home-Station Preparation (crawl).

CAS Training:

- Orientation/How-To Briefings by both NTC Leader Training Program and Air-Ground Operations School (AGOS) Personnel
- A Planning and Execution Practical Exercise for Integrating CAS

CAS and Airspace Deconfliction Tools:

- Maximum Ordinate Tables
- Joint, Army and Air Force Publications
- Air Force Smart Cards and How-To Briefings

Close Air Support (CAS) Leader Training Program (LTP), Phase 1 of the National Training Center's (NTC's) Joint Effects Training (JET)

After the unit arrives at the NTC for its rotation, Phases 3 and 4 of JET take four days. Phase 3 is JET Force-on-Force Training (walk) for dry CAS at the NTC. Units have some classroom instruction followed by a one-day reception, staging, onward movement and integration (RSOI) exercise. In the RSOI, the brigade combat team (BCT) deploys its collection and acquisition assets to collect visual and signal signatures provided by opposing force (OPFOR) vehicles and the 52d Division's joint surveillance and target attack radar system (JSTARS) and unmanned aerial vehicle (UAV) feeds. The collection assets include Prophets (MLQ-40s), ground surveillance radars (GSRs) and Traffic Jammers (TLQ-17s). The acquisition assets include USAF enlisted terminal air controllers (ETACs), brigade reconnaissance teams (BRTs), combat observation lasing teams (COLTs) and task force fire support teams (TF FISTs).

This allows the BCT staff and effects team to integrate their observation and effects in a controlled, coached environment to build a CAS fire plan and execute that plan dry. The BCT staff gets hands-on training in airspace deconfliction, targeting and CAS integration in a relatively unconstrained setting.

Phase 4 is JET Live-Fire CAS Training (walk). The RSOI exercise is the dry rehearsal for live-CAS training on Training Day 11 of the rotation, using artillery and fixed- and rotary-wing aircraft.

The NTC's first iteration of JET was in January 2004 and paid dividends during BCT live-fire operations.

As we move forward on certifying and qualifying Army joint tactical air controllers (JTACs) to ensure ground forces have ready access to all joint fires, including fixed-wing fires, we also must ensure units can plan for and integrate those fires safely and most effectively. Only by getting into the details of CAS "how to" with a command focus on CAS at home station training and advanced-level training at our CTCs can the Army expect to harness the power of joint fires to provide the greatest effects in ground operations.

LTC Mark L. Waters (Wolf07)
MAJ James A. Frick (Bronco27)
NTC, Fort Irwin, CA

3ID COLT Employment in OIF

By Major Benjamin M. Matthews and Captain A. J. Seidensticker

It was 24 March 2003, and the 1st Brigade Combat Team (BCT) Reconnaissance Troop, 3d Infantry Division (Mechanized), was less than 100 kilometers from Baghdad. The day started with high winds and progressed into a shamal (sandstorm), reducing visibility to less than 100 meters. Ground surveillance radar (GSR) teams began to receive acquisitions of what appeared to be an unknown enemy force coming our way.

With visibility becoming limited, the level of security heightened, so the combat observation lasing team (COLT) pulled back into a tighter formation and established a hasty defensive position. The COLT platoon was task organized to the brigade reconaissance team (BRT), which also consisted of two scout platoons and two GSR teams. This was one way of integrating the COLTs and the BRT during Operation Iraqi Freedom (OIF). The COLT established observation posts (OPs) and manned all crew-served weapons, getting ready for whatever was coming.

As before morning nautical twilight (BMNT) approached, visibility continued to increase as the first spot reports were sent to the brigade fire support element (FSE). During the next two hours, visibility improved to almost three kilometers, and the COLT platoon began to acquire Iraqi reconnaissance elements.

Within the next two hours, the COLT destroyed two T-55 tanks, three BMPs and two technical trucks with Saddam Fedayeen fighters by employing indirect fire support from the 1st Battalion, 41st Field Artillery (1-41 FA).

Much has been written and discussed about how to employ COLTS most effectively—many battles have been fought at the National Training Center (NTC), Fort Irwin, California, with COLTs task organized or not. Do the COLTs operate as an autonomous platoon? Are they attached or under the operational control (OPCON) of the BRT or some combination of both?

This article describes the tactics, techniques and procedures (TTPs) the 3d Division developed in support of OIF based on its NTC rotation and reception, staging, onward movement and integration (RSOI) into Iraq for major combat operations (MCO). The division employed the TTPs during combat operations with much success.

The Plan. After NTC Rotation 03-02, the 3d Division changed the way it employed the COLT platoon. Previously, the COLT platoon was OPCON to the BRT but worked as a separate platoon. The new plan called for integrating the COLTs into the scout platoons—in essence, giving each scout section a COLT, providing the BCT commander a more direct form of fire support for the BRT.

The integration began shortly after the division arrived at Camp Pennsylvania in Kuwait. TTPs and standing operating procedures (SOPs) were devel-

Photo by SSG Joseph Roberts

oped and trained. The concept for the integration was simple: integrate highly trained forward observers (FOs) with highly trained scouts, providing additional force protection and the capability to provide the brigade commander with timely, accurate and lethal fires.

The division broke the two scout platoons down into three sections, including a command and control (C^2) section with two vehicles per section. Integrating a COLT into each scout section increased the section's vehicles from two to three.

In movement formations, the COLT vehicle positioned behind the lead scout vehicle of that section. This enabled each COLT to call-for-fire in the event of contact with enemy forces. The COLT gave each scout section an indirect fire support capability and gave the BCT commander "eyes forward" for early warning of enemy troop movements to shape the battlefield with indirect fires.

Integrating a COLT into the scout section provided the BRT a complementary effect: the scouts became another set of "eyes" for the acquisition of high payoff-targets (HPTs), and the COLTs made each scout section more lethal with the means to call-for-fire.

Using this TTP allowed the COLT platoon to make the most of the platoon leader's C^2 nodes, provide line-of-sight analysis for OP locations and expertise on the capabilities and limitations of fire support, and help clear fires and process fire missions. It also gave the troop commander a dedicated fire support officer (FSO)/fire support NCO (FSNCO) to synchronize artillery and close air support (CAS) in his scheme of reconnaissance or maneuver.

As part of RSOI in Kuwait, the scouts fielded the long-range acquisition scout system (LRASS). LRASS allowed each scout section to positively identify and engage targets out to 10 kilometers and observe targets out to 20 kilometers. The COLTs' ground/vehicular laser locater designator (G/VLLD) only could identify targets out to five kilometers and observe targets out to 10 kilometers. The LRASS enhanced COLT operations, virtually doubling the target acquisition range.

Execution. On 20 March, the BRT scouts and COLTs were on OPs ready to observe the initial artillery rounds of OIF. At 2000 hours, the ground war began with the COLTs and BRT scouts observing the first artillery rounds as they destroyed enemy OPs along the Kuwaiti-Iraqi border. (See the map on Page 23.)

During the next 48 hours, the division pushed north, and the BRT reconnoitered routes for the BCT. The first missions fired in direct support of the BCT occurred when the BRT entered the town of As Samawah. The BRT moved along two routes with the remainder of the BCT.

As the BRT/COLTs maneuvered through the town, they were ambushed. While breaking contact, a COLT called for an immediate suppression mission followed by a fire-for-effect mission on a bunker complex, destroying the bunkers and 25 enemy soldiers, thus validating the TTP.

After breaking contact, the BRT/COLTs conducted a forward-passage-of-lines with Task Force 2d Battalion, 7th Infantry (TF 2-7 IN). The BRT continued to reconnoiter Route Jackson through the southern portion of As Samawah.

For the next several days, a fully integrated BRT/COLT unit provided security and screened the BCT's front line of troops. It also provided observation for the assault on the town of Al Kifl. A COLT team and scout section called for 300 artillery rounds to support the BCT's seizure of a vital bridge across the Euphrates River.

As the BCT continued its attack, the BRT and COLTs received a task organization change, attaching them to TF 2-7 IN for its attack to destroy enemy forces on Objective Hannah around the town of Al Mussayib on the Euphrates River about 65 kilometers south of Baghdad. The integrated COLT and BRT destroyed two technical vehicles and several air defense weapons and killed more than 40 enemy soldiers—many enemy soldiers abandoned their fighting positions and fled.

The Integration. Integrating COLTs into the BRT proved successful in several areas, but it had its challenges at times. Based on the need to maintain the initiative throughout OIF, the increased security for the individual COLTs was extremely beneficial. It proved worthwhile when screening the BCT's northern flank at Objective Raiders less than 100 kilometers from Baghdad when the threat of a counterattack was most likely.

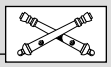
Another advantage to integrating the BRT and COLTs: whenever the BCT made enemy contact, indirect fires could be placed upon the enemy, thus keeping the main effort from becoming decisively engaged.

Although the integration was very successful, there was one major disadvantage to the COLT and BRT relationship that became apparent during combat operations. Being attached to the BRT meant that when the BRT became OPCON to other units or another BCT, the brigade commander lost control of his most highly trained and maneuverable FOs–releasing control had to be a conscious decision. A task organization change would have resolved this problem, but without additional force protection, the COLTs most likely would have been ineffective.

Integrating the COLT platoon into the BRT was effective during 23 days of combat in OIF. The complementary effect each had on the other wreaked havoc on the enemy.

We don't advocate giving up the COLT platoon to the BRT in all situations. There are many TTPs on how best to employ the COLTs in different combat scenarios.

Yet in OIF, with more observers and a better force protection, the Field Artillery used the eyes of the COLT and proved, again, the Field Artillery is the greatest killer on the battlefield.



Major Benjamin M. Matthews is the Executive Officer of 1st Battalion, 41st Field Artillery (1-41 FA), 3d Infantry Division (Mechanized), Fort Stewart, Georgia. During Operation Iraqi Freedom (OIF), he was the 1st Brigade Combat Team Fire Support Officer (FSO), also in the 3d Division. His previous assignments include serving as Aide-de-Camp to the Commanding General of the 1st Cavalry Division at Fort Hood, Texas; and Commander of A/3-82 FA, Assistant S3 of 3-82 FA and Task Force FSO for 1-5 Cav, all in the 1st Cavalry Division. He holds an MA in Human Resource Management from Webster University, Missouri, and is a graduate of the Command and General Staff College, Fort Leavenworth, Kansas.

Captain A. J. Seidensticker served as the 1st Brigade Combat Team, 3d Division, Combat Observation Lasing Team (COLT) Platoon Leader throughout OIF. Currently, he is a student in the Field Artillery Captain's Career Course at Fort Sill, Oklahoma. His previous duties include serving as a Firing Battery Platoon Leader in C Battery and Battalion Reconnaissance and Surveillance Officer (RSO) and Company FSO for C/2-7 IN, all while assigned to 1-41 FA. Captain Seidensticker is a graduate of the Illinois Institute of Technology with a BA in Biology.

Members of MET Alpha removing radiological sources from the Karbala Military-Industrial Complex.

75th FA Brigade

SOSO in OIF and BCT at the NTC

By Lieutenant Colonel Vincent L. Price, Major Dale E. Owen and Chief Warrant Officer Three Richard L. Gonzales

On any given day, the 2,100 Soldiers of the 75th FA Brigade are preparing for National Training Center (NTC) rotations at Fort Irwin, California, Warfighters and other exercises designed to measure wartime readiness. However, combat operations and the increasing number and diversity of postwar stability operations and support operations (SOSO) are straining current readiness strategies.

Success in modern warfare depends on "flexibility" and "the ability of units to conduct small unit and infantry type operations," according to the "Initial Impressions Report" of Operation Iraqi Freedom (OIF) by the Combined Arms Assessment Team 01 (CAAT 01) from Fort Leavenworth, Kansas. The 75th FA Brigade's preparation, execution and postwar activities surrounding OIF underscore the need to reassess current force structures and capabilities. For an Army at war, units must not only be proficient in their traditional tasks, but also have instilled in Soldiers and leaders the flexibility to accomplish *any* mission.

After 11 September 2001, the 75th FA Brigade fought in major combat operations in OIF, transitioned to SOSO missions and sent elements to the NTC as a brigade combat team (BCT). Although executing combat operations in Iraq was within the bounds of the brigade's traditional mission, leading the military search for weapons of mass destruction (WMD), providing security and screening operations along the Iran-Iraq border, policing the battlefield and then serving as a BCT were all missions the 75th had never done before.

If recent operations are any indication, FA units will continue to be called upon to lead unique missions, partly because many of the traditional tasks become secondary in a SOSO environment. Thus, our continued success will depend on whether or not we can adapt and operate efficiently in the changing operational environment in places such as the Balkans, Afghanistan and Iraq.

In October 2002, the brigade was realigned with the 4th Infantry Division (Mechanized) (4th ID). The brigade headquarters participated in the 4th ID's mission rehearsal exercise (MRX) in preparation for the attack on Iraq from Turkey. With only a few weeks' notice, the 75th Brigade commander had to reassess, reorganize and reassign key personnel and equipment to facilitate interoperability and develop tactics, techniques and procedures (TTPs) to support the Army's most modernized digital division.

As the MRX concluded, the brigade headquarters was directed to form the first task force (TF) ever to hunt for WMD during combat operations while still deploying 1st Battalion, 17th FA (1-17 FA) (Paladin) and 6-27 FA, a multiple-launch rocket system (MLRS) battalion, to support the 4th ID. In less than 90 days, the brigade mission had evolved from reinforcing the 1st Cavalry Division, to reinforcing the 4th ID, to forming the Army's first sensitive-site exploitation (SSE) TF, known as "Exploitation TF." The brigade had about 60 days to form, train and deploy to Camp Udairi, Kuwait, while simultaneously deploying two battalions to execute autonomous missions in support of TF Iron Horse with the 4th ID.

Exploitation TF. The 75th FA Brigade established an intelligence exploitation base to fuse current and historical intelligence and provide command and control (C^2) to eight weapons hunting teams searching for evidence of WMD in Iraq. Exploitation TF included Active and Reserve Components units and Coalition partners totaling more then 400 personnel. (See Figure 1.)

The unique organization included Soldiers and civilians from the 52d Explosive Ordnance Detachment, 1-147 and 1-159 Aviation Battalions, 87th Chemical Battalion, 513th Military Intelligence Brigade, various Coalition partners and teams of experts from the Defense Threat Reduction Agency (DTRA) and the Defense Intelligence Agency (DIA)—in addition to the Soldiers of the 75th FA Brigade.

Resembling a typical BCT headquarters, Exploitation TF included a Combined Joint Military Operations Center (CJMOC) as well as the traditional tactical operations center (TOC). The CJMOC consisted of intelligence, chemical-biological-radiological-nuclear (CBRN), explosive ordnance and technical escort experts. The CJMOC performed the centralized plans and intelligence functions, including conducting daily targeting meetings, providing tactical and technical SSE mission briefings and fusing intelligence.

The Exploitation TF commander directed SSE operations from the TOC. From there he also coordinated SSE missions with other major subordinate commands (MSC), directed logistical support and synchronized operations with the Coalition Forces Land Component Command (CFLCC), the theater command at Camp Doha, Kuwait. The CFLCC planned the majority of the deliberate SSE missions.

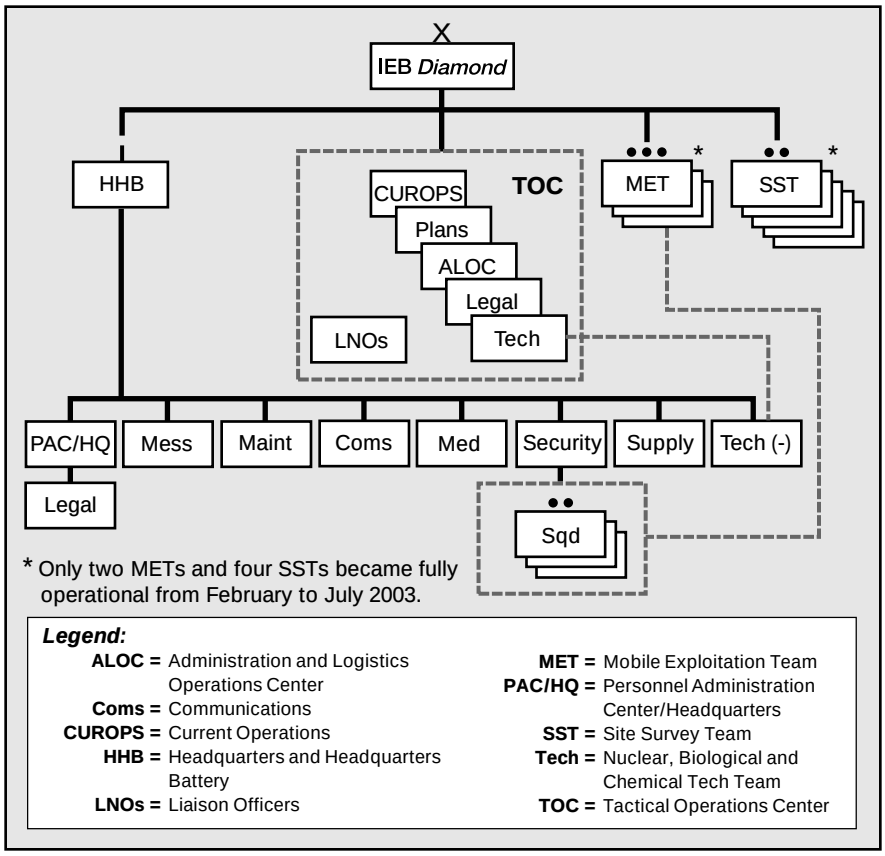


Figure 1: Task Organization of the 75th FA Brigade's Intelligence Exploitation Base (IEB), known as Exploitation Task Force

Leadership, security, communications and medical personnel for the weapons hunting teams came from the 75th FA Brigade. Although a number of the brigade had backgrounds in special operations or other unique qualifications, the majority of the officers, NCOs and enlisted Soldiers had little expertise in conducting non-conventional operations. These Soldiers were the core of the US Army's TF hunting WMD.

The sensitive-site teams (SSTs) led the hunt for WMDs in Iraq. The SSTs were task-organized direct support (DS) to the 1st Marine Expeditionary Force (I MEF) and the 3d Infantry Division (Mechanized) (3d ID) initially to assess designated WMD sites. Technical experts from DTRA assigned to the SSTs surveyed the sites, assessed WMD intelligence and reported preliminary findings to the Exploitation TF as the units they were attached to sped across southern Iraq.

The CJMOC intelligence fusion cell analyzed the SST reports and made recommendations to the commander about whether or not to launch mobile exploitation teams (METs) to the sensitive sites for more detailed analysis. Based on the size and disposition of a sensitive site and the maneuver forces' ability to secure it, surveys typically lasted from several hours to an entire day.

Mobile Exploitation Team (MET) Alpha poses after its final training mission before deploying to the first WMD sensitive site identified in southern Iraq, March 2003.

Free rockets over ground (FROG) missiles were discovered by one of the weapons hunting teams in Iraq.

METs Alpha and Bravo, consisting of roughly 25 Soldiers each, operated in the 101st Airborne Division and 3d ID sectors and entered Iraq shortly after the ground war began on 19 March 2003. Aided in their search by SST reports and other intelligence tips, the METs systematically exploited potential WMD sites.

Joined on occasion by technical experts from the Exploitation TF, the composition of the teams changed slightly with each mission, depending on the mission's requirements. For instance, when MET Alpha was conducting a mission at a military-industrial complex near the city of Karbala, it was joined by a team of nuclear experts from DTRA. The nuclear and radiological DS team (DST) experts examined potential radiological, or "rad," sources and tried to determine the existence of, or whether or not the site was linked to a WMD program. Teams modified their equipment and personnel to account for the unique aspects of each site.

As WMD-related intelligence was collected, METs transmitted the information to the supported MSC and Exploitation TF for analysis and disposition instructions. MET exploitation missions were more detailed then SST surveys, typically lasting much longer. This was the case near Karbala where MET Alpha spent nearly two weeks exploring the vast complex that spanned more than 100 square kilometers.

Commanding the weapons hunting teams and managing volumes of intelligence information were different from anything an FA brigade had done. The 75th's transformation from an FA brigade headquarters to an Exploitation TF, including integrating unfamiliar organizations and practices, strained C^2 and intelligence management.

Equipment based on a traditional organization was reconfigured to facilitate many tactical requirements of the Exploitation TF headquarters and weapons hunting teams. Although the brigade made the most of the existing equipment and did what it could to acquire the shortages, a deficit still existed.

Shortages of personnel with WMD expertise, linguists, intelligence analysts and other technical experts limited the number of teams and placed the burden of gathering, analyzing and exploiting sites and information on non-experts. The lack of trained specialists caused Soldiers to improvise "on the move." Discipline, ingenuity and dogged trial and error compensated for the many equipment and personnel shortages that plagued the 75th's Exploitation TF.

These Soldiers faced several challenges while searching for WMD.

• The Iraqis looted or destroyed WMD sites and evidence. Widespread Iraqi paranoia and active counterintelligence efforts made it difficult to interpret information gathered from the people and evidence salvaged from sites looted or deliberately destroyed. When MET Alpha left its temporary headquarters in a large weapons manufacturing plant in Qadisiyah south of Baghdad with the 101st Airborne Division, the plant was in excellent condition. By the time the team flew over the same site nine days later, it literally was stripped to the frames and burned.

For many desperate Iraqis, the security vacuums created by advancing maneuver forces unable to secure rear areas made sensitive sites irresistible targets.

In addition, materials and documents were deliberately dispersed and destroyed. Targeted destruction of specific items was evident at nearly every site.

On one occasion at an Iraqi intelligence services' headquarters in Baghdad, the team found Iraqis destroying materials even while US forces were scouring the

As units transitioned to SOSO, they gathered information from local Iraqis to accomplish multiple missions, such as screening the Iran-Iraq border.

area. One suspect detained by MET Alpha during the exploitation of the intelligence headquarters compound had passports and false identification from three countries and refused to answer any questions other than to claim he had forgotten something in the building.

In an urban environment—without adequate security—the job of eliminating looters, stopping deliberate destruction, safeguarding the team and completing the mission was very difficult.

• Many Iraqis with WMD knowledge feared retribution from Saddam Hussein's followers and did not trust the Coalition Force's capabilities to protect them. Toppling the Iraqi regime intensified the disorganization and paranoia in Saddam Hussein's compartmentalized, secretive, incompetent government. These factors limited the number of informants willing to come forward and cast doubt on intelligence gathered from those who did.

In many cases, those directly involved in WMD programs fled to avoid retribution or capture.

The shortage of maneuver forces jeopardized security for the teams as well as for potential informants. The teams had difficulty convincing informants of our resolve to safeguard cooperative Iraqis.

• Equipment and personnel shortages hindered the weapons hunting teams. Exploitation TF deployed without the ability to move itself or send secure information across the vast distances of the Iraqi desert. Equipment shortages forced a permanent reduction in the number of weapons hunting teams from eight (three METs and five SSTs) to six (two METs and four SSTs).

The plan to move MET teams by rotary-wing aircraft was not executable due to aircraft shortages and bad weather. Vehicles were assigned double and triple duty, serving as transportation for security platoon personnel, MET teams, and personnel and equipment from the Exploitation TF headquarters. On one occasion, vehicles and personnel supporting MET Alpha had to be recalled to the Exploitation TF headquarters, nearly 150 kilometers south of their location, to move the headquarters from its base of operations in southern Iraq to the Baghdad International Airport.

• The METs needed secure communications. Each of the teams deployed with standard single-channel ground and airborne radio system (SINCGARS) and tactical satellite (TACSAT) radios designed for conventional operations. However, the sensitivity of much of the intelligence necessitated a more secure and reliable means of relaying the information to the headquarters. On many occasions, even the TACSAT radios proved to be unreliable or inadequate due to the sensitivity and quantity of information. On several occasions, the teams were without communications.

Exploitation TF handed over C^2 to a largely expanded Iraqi Survey Group (ISG) in July 2003. Although media accounts focus on the failure to discover stockpiles of WMD, the 75th Brigade *Diamond* Team Soldiers along with their joint and Coalition partners were instrumental in identifying the scope of the Iraqi WMD programs.

In the nearly five months in Iraq during the first critical phases of the war, the TF established the framework for future SSE operations.

The TF disbanded in Kuwait with a departure as unceremonious as its arrival.

1-17 FA (*Copperheads*)—A Maneuver Task Force. Throughout its preparation for and participation in OIF, the *Copperheads* were attached to TF Iron Horse, a 26,000-plus force centered on the C^2 of the 4th ID. The roles and missions assigned to 1-17 FA spanned a wide range during its yearlong deployment.

The first mission for 1-17 FA was to provide DS fires to the division cavalry squadron, 1-10 Cav, that led the 4th ID into Iraq 14 April 2003. This TF, TF Saber, cleared and secured a large portion of the area of what would be the 4th ID's zone of operations. As the rest of the division closed into the zone, TF Saber executed a road march to the east to screen the division's eastern flank along the Iran-Iraq border.

Later, two division priorities dramatically altered 1-17 FA's mission. First the 4th ID leadership decided to employ 1-10 Cav elsewhere in the division's battlespace. The 4th ID also focused on establishing Iraqi security forces. These decisions led to the formulation of TF *Copperhead* commanded and controlled by 1-17 FA. (See Figure 2.) TF *Copperhead* recruited, trained and equipped Iraqi forces, including border police and customs for the Diyala Province and an Iraqi Civil Defense Corps (ICDC) battalion. In addition, the task force served as the 4th ID's lead on collective operations and training with the 1st Battalion, New Iraqi Army.

Given the size of the zone (larger than Massachusetts) with an Iranian border trace of more than 250 kilometers, TF *Copperhead* counted on the contributions of professional Iraqi organizations.

With these non-standard missions, TF *Copperhead* looked to Army programs and references for guidance. 1-17 FA fell back on the military decision-making process (MDMP) to figure out what to do and how to do it. The TF developed a list of objectives envisioned for these organizations and then identified associated key tasks and strategies to achieve those objectives. The TF then referred to appropriate Army doctrinal manuals, standing operating procedures (SOPs) and administrative regulations to formulate the standards for implementation. This same analysis process was used to establish and develop other programs and processes in OIF, to include the political ones, such as selecting mayors and city councils.

- **Team Apache**
  - A/1-17 FA
  - Scout Section
- **B/1-17 FA**
- **C/1-17 FA**
- **C/1-10 Cav (-)**
- **2d BCT BRT**
- **Team Wolfpack**
  - Service/1-17 FA
  - 244th EN Bn Contact Team
  - Laundry/Bath Team
  - 204th FSB Contact Team
- **Team Eagle**
  - HHB/1-17 FA
  - Team Bersheid CA
  - Team Doner CA
  - PSYOPS Det
  - 411 MP Co (-)
    - 1st Plt Grizzly 16/17
    - 2d Plt Grizzly 26/27
  - THT Jupiter 53
  - SEN Team

Legend:

BCT = Brigade Combat Team
Bn = Battalion
BRT = Brigade Reconnaissance Team
CA = Civil Affairs
Co = Company
Det = Detachment
EN = Engineer
FSB = Forward Support Battalion
MP = Military Police
Plt = Platoon
PSYOPS = Psychological Operations
SEN = Small-Extension Node
THT = Tactical HUMINT [Human Intelligence] Team

Figure 2: Task Organization of 1-17 FA's Task Force *Copperhead*

The credit for executing these key tasks goes to the company-grade officers, NCOs and Soldiers of TF *Copperhead*. By the time TF 1-17 FA redeployed, it had created in its zone a border police of more than 1,300 and an ICDC battalion of more than 900 members plus worked with an Iraqi Army battalion of 600 soldiers and four municipal governments (mayors and city councils).

6-27 FA—Policing the Battlefield. The 6-27 FA *Proud Rockets* deployed in April 2003 with the mission to reinforce the fires of the 4th ID Artillery. Based on its arrival time, its mission was changed to supporting TF Bullet I (41st FA Brigade, V Corps) and TF Bullet II (17th FA Brigade). For eight months, the *Proud Rockets* executed the critical but nonstandard mission of policing the battlefield—securing and clearing cached Iraqi weapons, equipment and munitions as well as providing site security, executing cordon and search operations and providing medical and humanitarian relief.

Like the other elements of the brigade, 6-27 FA discovered the fundamentals of doctrine remain valid for planning and executing these tasks, but internal adjustments to task organization and the modified table of organization and equipment (MTOE) were required. Additionally, the battalion's Soldiers and leaders clearly demonstrated they were adaptable to the changing roles and environment.

As they executed their mission analysis, they determined what previous training remained valid and identified those tasks that were new. They established training programs, executed detailed mission rehearsals and implemented appropriate risk mitigation actions to ensure Soldiers could safely accomplish the mission.

The *Proud Rockets* transported and helped destroy more than 1.5 million pounds of ammunition, provided humanitarian relief and helped recover missing American Soldiers. Their efforts helped make the country safer for Iraqis and Coalition Forces.

NTC 03-09—An FA Brigade as a BCT. In August 2003, a few days after downloading equipment returning from OIF, the brigade reorganized, reconfigured and deployed from Fort Sill, Oklahoma, to the NTC. The brigade deployed its Headquarters and Headquarters Battery (HHB) (-) and 1-77 FA (MLRS) (-). The unit became the first FA brigade headquarters to complete an NTC rotation as a BCT headquarters.

The brigade maintained its traditional counterfire responsibilities while assuming tactical control of a TF that consisted of one light infantry battalion and one FA battalion, one engineer and two armor companies, one each light FA and air defense artillery (ADA) batteries, and a regimental support squadron.

The brigade staff was, once again, thrust into an unfamiliar role as it grappled with the fact that no collective training, staff integration or coordination was possible before forming the TF. The SOSO scenario, again, challenged the expertise and training readiness of the staff to manage a maneuver TF and strained the brigade communications, automation and tactical equipment's ability to facilitate C^2, logistics and intelligence functions.

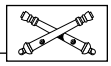
Questions for the Future. The *Diamond* Team's experiences after two years and several nonstandard missions has made clear that to maintain relevance, units must be modular and flexible enough to perform just about any unexpected role. The question about how the Army prepares units to go to war is not whether or not it needs to continue to refine training and its organization—clearly it does. The real question is, "How can the Army focus and prioritize limited training time, supplies and other resources to accomplish the dramatically expanded range of readiness objectives?"

This requires changing military thinking and adopting flexible, modular units that can perform the new varied missions of modern warfare.

Tenacity and ingenuity, not pre-deployment training, often overcame the challenges of unfamiliar nonstandard missions. The growing number of these missions necessitates a review of the fitness of current organizational and training paradigms to maintain and sustain unit preparedness to execute full-spectrum operations.

The increasingly complex task of preparing units for the contemporary operational environment (COE) raises a few key questions. Do current mission-essential tasks account for the full range of operations artillery units are performing in the Balkans, Afghanistan and Iraq? Do stopgap pre-deployment training plans and MRXs fill the void left by mission-essential task list-(METL)-focused training that fails to account for the full range of combat and SOSO? If not, how can units include the variety of unique tasks as part of the unit METL without distracting from the core combat competencies? How can we organize and train units modularly enough to "plug and play" in any environment without degrading the ability to perform traditional roles?

Field Artillery will remain useful as long as it adapts traditional military paradigms to meet Army operational needs.



Lieutenant Colonel Vincent L. Price has commanded 1st Battalion, 17th FA (1-17 FA), 75th Field Artillery Brigade, III Corps Artillery, Fort Sill, Oklahoma, and in Iraq since June 2002. Previous assignments include serving as the Executive Officer and Deputy Fire Support Coordinator of the 4th Infantry Division (Mechanized) Artillery and Operations Officer and Brigade Fire Support Officer (FSO) in 3-82 FA, 1st Cavalry Division, both at Fort Hood, Texas. He was a Brigade FSO deployed to Bosnia for Operation Joint Endeavor and an Assistant S3 during Operation Desert Storm (ODS), both with the 1st Cav. He holds a Master of Public Administration from Harvard.

Major Dale E. Owen is the S3 of the 75th FA Brigade at Fort Sill, Oklahoma. He served as the Executive Officer and S3 of 1-17 FA, deploying to Iraq for Operation Iraqi Freedom (OIF), and earlier, as the Assistant S3 for the 75th FA Brigade. Previously he was an Observer-Controller/Trainer in the 1st Training Support Battalion at New Cumberland, Pennsylvania. He commanded B Battery, 3-82 FA and served as the Assistant S3 and a task force FSO, all in the 1st Cavalry Division. Major Owen deployed to the Gulf for ODS as a Platoon Leader and, later, Executive Officer in Howitzer Battery, 3d Squadron, 2d Cavalry Regiment.

Chief Warrant Officer Three Richard L. Gonzales, until recently, was the 75th FA Brigade Counterfire Officer. Currently, he is a Targeting Observer/Controller at the Joint Readiness Center, Fort Polk, Louisiana. During OIF, he served as the Officer-in-Charge of Mobile Exploitation Team (MET) A, Exploitation Task Force, 75th Brigade. In the 1st Armored Division, he was the Targeting Officer for TF Falcon deployed to Kosovo for Operation Allied Force, and a Firefinder Radar Technician in C/25 FA deployed to Bosnia for Operations Joint Forge/Joint Guard. As a Fire Support NCO in the 2d Battalion 75th Rangers, he deployed to Panama for Operation Just Cause and to the Persian Gulf for ODS.

Target Selection at CFLCC
A Lawyer's Perspective

By Lieutenant Colonel James K. Carberry, USMC, and M. Scott Holcomb

Lawyers now play a greater and increasingly more visible role during military operations. As experts in international and operational law, Judge Advocates (JAs) help commanders and their staffs navigate the maze of laws, regulations, directives, orders and rules that impact combat operations. In addition to conducting legal reviews of operational plans and providing guidance on issues from the field, operational law attorneys play a *supporting* role to the commander during the targeting process.

Targeting decisions are critical events for a commander because incorrect decisions can have devastating strategic, operational and tactical consequences. As a member of the targeting board, the judge advocate helps the commander make the right decision by highlighting and addressing important issues, such as military necessity, proportionality and collateral damage.

The targeting process is, perhaps, the most rule-driven area of combat operations because decisions must comport not only with the commander's intent, but also with the Law of War, the rules of engagement (ROE) and the collateral damage methodology. As members of the targeting review process, JAs are instrumental in advising commanders on these matters.

Like any other staff officer, the JA provides the commander an analysis and recommendation so he can make a well informed decision. Contrary to recent suggestions that lawyers are approving or disapproving certain combat operations, it is *always* the commander (not the lawyer) who makes the final decision to strike or not to strike a target.

This article addresses the legal issues and discusses the JA's responsibilities in the Deep Operations Coordination Cell (DOCC) at the Coalition Forces Land Component Command (CFLCC) during Operation Iraqi Freedom (OIF). We describe the general targeting rules while illustrating the JA's function in preparing, presenting and training the rules and cover the specific responsibilities of the JA. Finally, we propose recommendations for future conflicts based on lessons learned during OIF.

Targeted T-72 in Iraq

Judge, what are the rules? Central Command's (CENTCOM's) intent for OIF was to rapidly defeat the enemy to deny his use of weapons of mass destruction (WMD) while preserving critical infrastructure to facilitate the post-conflict rebuilding of Iraq. To accomplish this, CENTCOM limited the authority of subordinate commanders to strike infrastructure, economic objects and lines of communication (LOCs). These constraints were to ensure the CFLCC and Coalition Force Air Component Command (CFACC) plans were synchronized and complementary and to minimize damage.

As the operational-level headquarters responsible for all ground forces, CFLCC had an immediate interest in preserving bridges that would support both combat maneuver as well as the follow-on mission to deliver humanitarian supplies to the Iraqi people. Further, as the lead component for post-hostility operations, CFLCC had a long-term interest in minimizing collateral damage to the greatest extent possible. The degree to which the Iraqi people welcomed the Coalition Forces was viewed as directly proportional to the level of collateral damage inflicted during combat operations. Moreover, because the Coalition ultimately would be responsible for overseeing the reconstruction of Iraq, the plan was to carefully select targets that furthered the military mission while minimizing damage to civilians and their infrastructure.

The Law. The primary sources for the Law of War and the law specifically related to targeting are customary international law: the Hague Regulations, Geneva Conventions and the Additional Protocols to the Geneva Conventions.[1] The law of targeting requires belligerents to discriminate between military and civilian objects and only attack military objectives in order to spare noncombatants as much as possible from the effects of the war.[2] When engaging military objectives, force should not be employed in a manner that is calculated to cause unnecessary suffering.[3]

Furthermore, the principle of proportionality requires that the anticipated loss of civilian life and damage to civilian property, or collateral damage, incidental to attacks not be excessive in relation to the concrete and direct military advantage expected to be gained.[4] (For more information, see the article "The Law of War and Fire Support: A Primer for Fire-Supporters" by Captain Jon D. Holdaway, JA, in the May-June 2001 edition.)

Iraqi forces frequently misused protected property for military purposes. Here an anti-aircraft gun sits atop a university building.

These laws create a permanent and continuing obligation for military commanders to determine that a proposed target is a valid military objective and that the military advantage gained by engaging the target outweighs the likely injury to civilians or damage to non-military property. Consequently, target lists must be reviewed and updated regularly to ensure that a commander's decision is based on the latest and most accurate information available.

For the CFLCC, discrimination and proportionality were the most common Law of War issues during OIF. Iraqi forces frequently misused protected property for military purposes. It was not uncommon to discover that schools, mosques or hospitals were being used as Iraqi command posts, supply depots or hiding places for regime leaders. Consequently, the protections that these objects typically enjoy were lost when misused for military purposes.

Coalition Forces wanted to preserve these structures and, at times, accepted greater risk than the law requires by delaying strikes on these valid targets until absolutely necessary in self-defense. As members of the targeting boards, JAs helped commanders determine when to use force under these circumstances.

The ROE. The ROE are the commander's primary tool to regulate the use of force. ROE are defined as directives issued by a competent authority to delineate the circumstances and limitations under which its own naval, ground and air forces will initiate and (or) continue combat engagement with other forces encountered.[5] While the ROE for OIF remain classified, they can be described generally as robust for forces in contact with the enemy and more restrictive for pre-planned strikes.

Forces in contact can always engage the enemy under the inherent right of self-defense even if the authority to strike a certain target is withheld to a higher commander. The problem, as is often the case, lies in the interpretation of "in contact." What are the boundaries for self-defense fires, and how should "in contact" be defined? Naturally, if you are being fired upon, you can return fire. But what if the enemy is not firing at you but you are within range? More likely than not, you can engage the enemy.

However, what if the enemy is within range, not firing at you and located next to a protected site that is on a restricted target list and cannot be struck without higher command approval? This is a difficult question that must be answered by the commander on the ground, using his best judgment as to whether or not to seek approval from higher headquarters to conduct the strike or approve the strike under the inherent right of self-defense. If the ground commander orders the strike in self-defense, he must be able to articulate the reasons for his decision.

Doctrinally, the JA is tasked with being the principal assistant to the Director of Operations (J3/C3) or the Director of Plans (J5/C5) during the ROE development process. At the CFLCC, the JAs worked closely with the command group, especially the C3 and C5, as the ROE were being drafted. CENTCOM led the drafting process and solicited input from the component commands. CFLCC proposed various modifications to help the ground forces

with input from V Corps and the I Marine Expeditionary Force (I MEF).

Once the ROE were approved and published, the JAs presented training briefings to all soldiers before hostilities started. In addition, the CFLCC Staff Judge Advocate (SJA) prepared an ROE card for all CFLCC forces. The CFLCC commanding general approved the card, and it was issued to every CFLCC soldier as a training aid.

While these tools are helpful, they do not replace real-world situational training. When it comes to applying the ROE, training is vital.[6]

Collateral Damage Methodology. The ROE for OIF specifically referred to the "collateral damage methodology." This methodology provides the commander a process to estimate and mitigate unintended, unnecessary damage to noncombatant persons, property or the environment in the conduct of combat operations.

On 8 March 2003, CENTCOM published the collateral damage methodology for OIF. Although partially classified, the methodology provided standardized procedures for determining potential collateral damage, options available to mitigate that damage and approval authorities for strikes based on anticipated collateral damage during the conduct of operations. See the figure for the unclassified introduction to the collateral damage methodology.

At CFLCC's request to CENTCOM, the collateral damage methodology did not apply to immediate target engagements under the inherent right of self-defense. This exception, like that in the ROE, permitted the ground commander to approve strikes as necessary in self-defense.

This exception did not, however, eliminate the requirements to positively identify all targets, use force proportional to the threat and minimize collateral damage to the extent feasible, given the situation at the time. If a target did not satisfy the self-defense exception or if approval was required by a higher commander, the ground commander was required to request approval from the commander or government official with strike authority.

Like the ROE self-defense exception, this was an area that caused some confusion and consternation among commanders. Primarily, the confusion stemmed from the imprecise nature of this concept and the lack of defined parameters. This is an area of the targeting process that needs to be refined for future conflicts.

Other Sources: Fires Appendix, Special Instructions (SPINS), Orders, Etc. Members of the targeting cell had to be familiar with the fires appendix to the operations order (OPORD), SPINS of the air tasking order (ATO) and fragmentary orders (FRAGOs). Each document contained additional information relevant to the targeting process.

For example, the CENTCOM Fires Appendix contained critical targeting information relating to targeting priorities, desired effects and the rules for time-sensitive targets (TSTs).[7] This information was highly relevant for calculating military necessity, proportionality and collateral damage.

The CFACC published SPINS daily. SPINS contain a section on ROE intended for pilots; however, the SPINS sometimes contain guidance that is applicable to ground forces, such as procedures for requesting close air support (CAS). Consequently, SPINS were another vital source of information for the targeting cell.

Judge, what do you do? US policy requires that commanders comply with the Law of War during all operations; the JA's role is to help the commander comply with the Law of War.[8] In the targeting process, the JA reviews targets for military necessity, proportionality and collateral damage. If a proposed target is not a valid military object, the JA recommends not striking the target.

At the CFLCC level, this was the exception rather than the rule as operational fires were almost exclusively focused on military units. Symbolic targets, such as a statue of Saddam Hussein, were deemed to be valid military objectives because they were symbols of the regime.[9]

Typically, the likelihood of excessive collateral damage is the issue most often identified by the JA and brought to the attention of the commander. The commander takes this information into account and decides whether or not to attack a target.

The CFLCC JA's major role during operations was to review target nominations. *All* pre-planned targets were reviewed for compliance with the Law of War, ROE and collateral damage methodology. In the process, each tar-

In its most basic form, the collateral damage methodology is considered and applied by every warfighter at every level within the chain of command. The high value our nation and society places on the preservation of human life guides each of us to apply collateral damage mitigation to every target we engage. The methodology boils down to five simple questions that must be answered before attacking any target on the battlefield.

1. Can I positively identify the object or person I want to attack as a legitimate military target authorized for attack by the current rules of engagement (ROE)?
2. Is there a protected facility (i.e., no strike), civilian object or people, or significant environmental concern within the effects range of the weapon I would like to use to attack the target?
3. Can I avoid damage to that concern by attacking the target with a different weapon or with a different method or approach?
4. If not, how many people do I think will be injured or killed by my attack?
5. Do I need to call my higher commander for permission to attack this target?

"US Central Command Collateral Damage Estimation Policy and Methodology," 8 March 2003

Al Muthenna Intermediate School in Samawah in southern Iraq was damaged when Iraqi troops took shelter in the school. *(Photo by Thomas Hartwell)*

get was vetted for military necessity, proportionality, collateral damage and the presence of restricted/no-strike targets in close proximity to the fixed-wing aircraft's desired mean point of impact (DMPI) for precision-guided munitions. The CFLCC JA was responsible for conducting this analysis and raising any potential concerns to the DOCC.

In addition, the CFLCC JA forwarded the analysis to his counterpart at CFACC. This was crucial because the perspective of the air component often differed from that of the ground component, especially with regards to the importance of a target to the ground forces. Furthermore, the analysis helped the air component select the appropriate ordnance and angle of attack.

CFLCC DOCC. At the CFLCC, the DOCC was responsible for targeting. The JA was a member, and readily available to help with any targeting issues. In addition to around-the-clock support to current operations, the JA participated in the daily effects board (DEB) and the candidate target list (CTL) review.

During the daily effects board meeting, the deputy commanding general for operations (DCG-O) reviewed the battle damage assessment (BDA) and approved targeting objectives and provided guidance for them. The JA, while a standing member of the DEB, was largely a passive observer. At times, the DCG-O or other staff members asked questions regarding the ROE or collateral damage methodology; however, a discussion of legal issues during the DEB was the exception rather than the rule.

The operational law attorney earned his pay during the CTL review. The CTL consisted of the target nominations from the CFLCC and its subordinate commands, V Corps and I MEF. This list contained CFLCC target nominations to CFACC for shaping the battlefield. The DOCC JA reviewed every proposed target on the CTL for legal sufficiency.

There was rarely a question as to the legitimacy of CFLCC's proposed targets as the vast majority were Iraqi military units. There were, however, often concerns about collateral damage, especially when seeking to destroy a target in an urban area. (See the article "Legal Issues with Fires in COE Populated Areas" by Lieutenant General Burwell B. Bell III, et al in the January-February 2003 edition.)

With sophisticated software and imagery, the JA reviewed the proposed targets and their potential for excessive collateral damage. Protected sites were of special concern: schools, mosques, bridges, hospitals and water treatment facilities. Knowing that medical supplies were scarce and most of the water in Iraq is polluted, Coalition Forces took great care to avoid any harm to these facilities.

After noting all the protected sites near a potential target, the JA advised the deputy DOCC chief about the collateral damage considerations. The deputy then decided whether or not to raise the issue to the DCG-O or the DOCC chief to remove the proposed target from that day's CTL or to forward the target to CFACC with a notation of the collateral damage concerns.

More often, the target nominations were forwarded to CFACC with an explanation of collateral damage considerations. The explanation included the proximity and function of the concerned facility. For example, a hospital 400 meters or a water treatment plant 200 meters away from the DMPI would be noted. The CFACC then used this information to help select the proper weapon with which to engage the target.

How do we simplify the process? One of the greatest challenges with targeting during OIF was navigating all the sources for the rules. As noted, the commander and his staff had to be familiar with many documents to make targeting decisions. At the CFLCC, the JA maintained a list of all rules in effect and distributed the rules to the command group, DOCC and the liaison officers from V Corps and I MEF. The JA regularly briefed the rules, provided guidance and relayed legal concerns to the JAs at CENTCOM.

In the future, serious thought should be devoted to simplifying and streamlining the process so all information is readily available, perhaps by publishing it in one source document or by using technology to post all of the rules on a single secure Internet protocol net (SIPRNET) web page.

Publish the Rules Sooner. Political and military leaders should strive to finalize and approve the ROE and collateral damage methodology in a more timely fashion. Although the planning process for OIF began in February 2002, the ROE were not published until late February 2003 and the collateral damage methodology was not published until 8 March 2003.

The publication so close to the start of hostilities on 19 March 2003 presented major challenges for the components and their subordinate units. It takes time for the information to be disseminated, and it takes even more time for it to be properly trained and understood. If time is available, then this information should be published sooner rather than later.

Intelligence is the Key. The validity of a target is more a question of intelligence than a question of law. This was especially true during OIF when Iraqi forces purposefully violated the Law of War by, among other things, fighting in

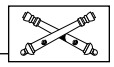
civilian clothes and misusing protected property, such as schools and hospitals for command posts and ambulances as mobile command and control facilities.

Because of the superiority of the US armed forces, our enemies will continue to violate the Law of War to gain a short-term tactical advantage. As the force-on-force combat model decays, asymmetric threats will increase.

Intelligence will be the antidote to this duplicity. With positive identification, US forces can engage a cheating enemy with long-range fires instead of waiting until contact with the enemy triggers the right of self-defense.

Only the commander can order a strike. The JA's role is to ensure the order is the result of a well informed decision, taking into account the relevant Law of War considerations of necessity, humanity, discrimination and proportionality. In doing so, the JA facilitates the commander's success.

In the modern era of war, when the media immediately transmits both our targeting successes as well as our failures, the commander can only benefit from having more information.



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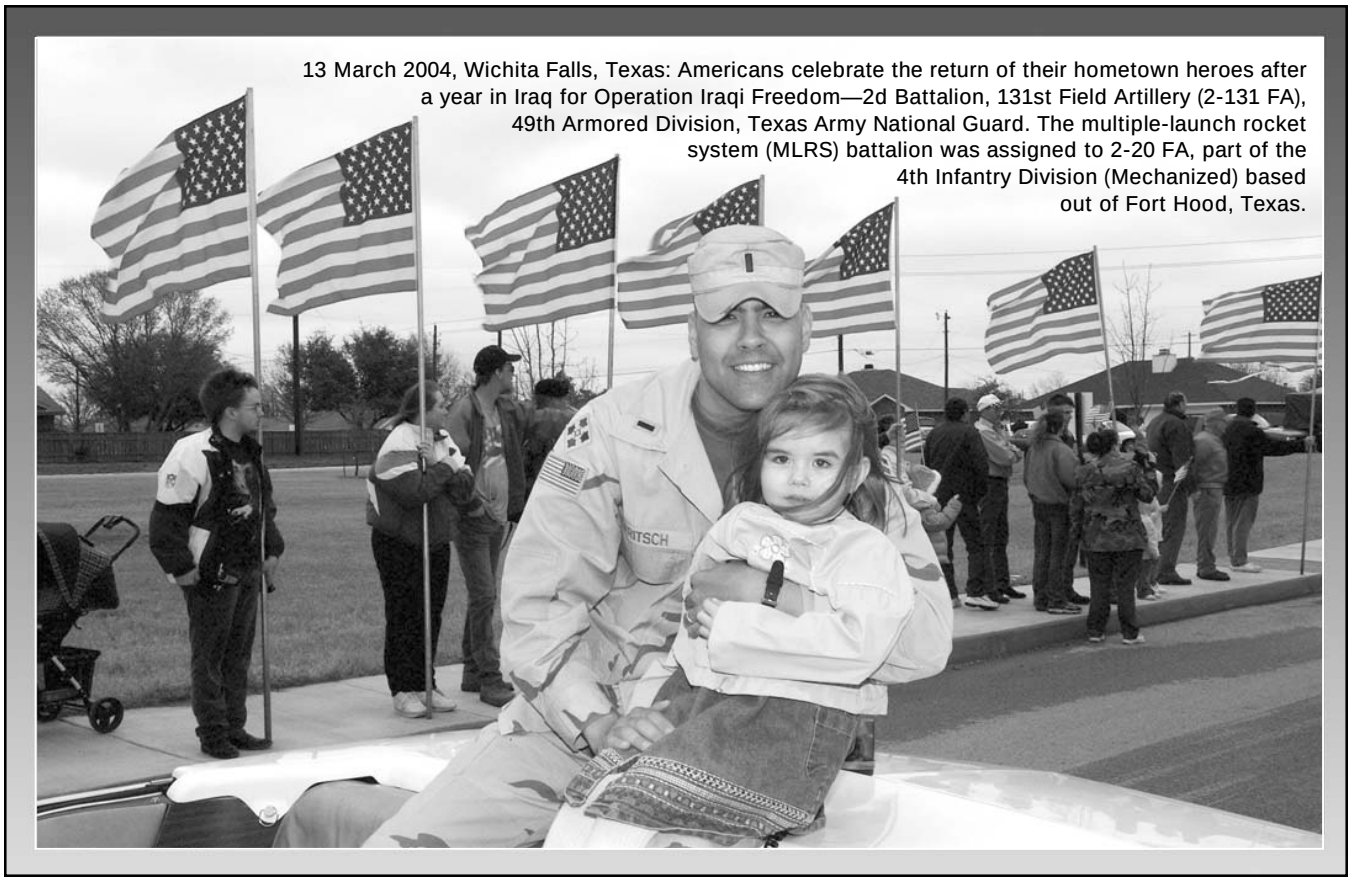
M. Scott Holcomb, until recently, was a JA Captain in the Army and deployed with the CFLCC for OIF, serving in the Targeting, Plans, and Current Operations Cells. Currently he is a lawyer with Sutherland, Asbill and Brennan in Atlanta, Georgia. He also deployed with the CFLCC for OEF in Afghanistan and was the legal advisor to the Operational Planning Group. Before being assigned to the CFLCC, Captain Holcomb served as the Division Artillery Trial Counselor in the 3d Infantry Division (Mechanized) at Fort Stewart, Georgia, and deployed to Bosnia for Stabilization Force 8 (SFOR 8). He holds a Juris Doctorate from West Virginia University.

Endnotes:

1.The United States has not ratified the Geneva Protocols but considers many sections to be legally binding as customary international law.
2. Protocol 1, Article 52(2) defines military objectives as "those objects which by their nature, location, purpose, or use make an effective contribution to military action and whose total or partial destruction, capture, or neutralization, in the circumstances ruling at the time, offers a definite military advantage."
3. Hague Regulation, Article 23e.
4. Protocol I, Article 51.
5. *Joint Pub 1-02 Dictionary of Military and Associated Terms.*
6. See generally Major Mark S. Martin's "Rules of Engagement for Land Forces: A Matter of Training, not Lawyering," *Military Law Review* (Winter 1994), 143.
7. Time-sensitive targets (TSTs) are defined as targets of such high priority to friendly forces that the joint force commander (JFC) designates it as requiring immediate response because it poses (or soon will pose) a danger to friendly forces or it is a highly lucrative, fleeting target of opportunity, *Joint Pub 3-60 Joint Doctrine for Targeting* (17 January 2002) vii. The JA reviews TSTs for collateral damage concerns and compliance with the ROE.
8. *DoDD 5100.77 DoD Law of War Program*, 9 December 1998.
9. During OIF, striking statues was forbidden from the air because the potential for high collateral damage exceeded the military advantage anticipated by the attack. In this case, the anticipated advantage was to undermine the regime's control of the Iraqi people. The ground forces, less constrained by collateral damage concerns, were authorized to tear down the symbols of the deposed regime.



13 March 2004, Wichita Falls, Texas: Americans celebrate the return of their hometown heroes after a year in Iraq for Operation Iraqi Freedom—2d Battalion, 131st Field Artillery (2-131 FA), 49th Armored Division, Texas Army National Guard. The multiple-launch rocket system (MLRS) battalion was assigned to 2-20 FA, part of the 4th Infantry Division (Mechanized) based out of Fort Hood, Texas.

Photo by MSG Lek Mateo, 49th Armored Division Public Affairs

OH-58D Kiowa Scout helicopter on patrol near Balad Air Base, Iraq.
Photo by SSgt Aaron Allmon II, USAF

Deconflicting Army Aircraft and Indirect Fires: Brigade-Level A^2C^2

By Lieutenant Colonel Daniel A. Pinnell and
Majors Victor S. Hamilton, AV, and Michael T. Oeschger

Day Six of the fight. It has been a nasty one with horrible weather, rough terrain and lots of casualties. The guerrillas are hugging us close and wreaking havoc on our lines of communication.

The most damaging loss to the brigade combat team (BCT) has been the destruction of the platoon of UH-60s and two Kiowas—40 crew and passengers dead or wounded and $20 million-plus in equipment destroyed during the last 72 hours. The worst part of it is, we shot them down accidentally with our own indirect fires.

Sound like a freak occurrence? Not at Joint Readiness Training Center (JRTC), Fort Polk, Louisiana, rotations. The typical aviation fratricide at the JRTC takes one of two forms: over-flight of a unit (FA, mortar) while it is firing and flying through the sheaf of an indirect mission as it is being delivered on a target.

A typical over-flight incident involves assault and utility aircraft conducting resupply missions inside the airhead/forward operating base (FOB). These aircraft operate without formal constraints (routes/corridors), even though they fly to and from the same four locations all week; they are lulled into a sense of security because the firing units are quiet most of the time. When the artillery does fire, their tactical operations centers (TOCs) validate that they are clear of the impact point, but the TOCs never think to check the origin points. Eventually, the pilots' luck runs out.

In a typical terminal effects incident, a ground company commander or fire support officer (FSO) clears a fire mission for ground elements and forgets the Kiowa Warrior orbiting overhead or does not clear the Kiowa Warrior to a realistic minimum distance from the indirect fire sheaf. The high volume of fire delivered in small areas at the JRTC coupled with the use of variable time (VT) as the preferred fuze lead to a high probability that a helicopter inside the sheaf footprint will be damaged or lost.

The cause of these incidents is that 90 percent of the BCTs don't plan for Army airspace command and control (A^2C^2) inside their areas of responsibility (AORs)—they just take the plan division gives them. They don't plan standard-use Army aviation flight routes (SAAFRs) or air-corridors to deconflict air and ground operations in intensive-use areas for aircraft conducting repetitive resupply missions or transiting to and from combat operations in their AORs. They don't plan restricted operating zones (ROZs), restricted operating areas (ROAs) or informal equivalents to keep aircraft outside the surface danger area around firing units. Finally, they don't establish fire support coordinating measures (FSCMs), airspace control measures (ACMs) or clearance-of-fires tactics, techniques and procedures (TTPs) for the Kiowa Warriors in support of the close fight in their AORs.

The average brigade S3 air literally takes the division A^2C^2 annex and publishes it as his own with no additions or refinements for the requirements of his AOR. Most FSOs don't know the dangers presented by the lack of an A^2C^2 plan or the doctrinal measures to correct them.

The average pilot is flying with a map that has outdated (or *no*) maneuver graphics, has no FSCMs or firing-unit locations posted on it and no ACMs. The pilot believes that, essentially, there are no constraints on his actions and no threat to his activities from friendly operations. He has received only a minimal situational awareness briefing before taking off and has no idea of the likely friendly maneuver or fires operations (and thus high-threat areas) for that day. He also has no visibility of active firing units and target areas because he is not monitoring the fires net. He is unaware, unconstrained and unafraid.

The failure to create and enforce effective A^2C^2 plans at the brigade level has three basic causes. First, most brigade senior leaders and staffs don't understand A^2C^2 requirements and don't know they are responsible for planning and coordinating A^2C^2 at their and their subordinates' levels. Second, combat arms leaders are not taught A^2C^2 doctrine and techniques in our schoolhouses. Third, based on this lack of leader knowledge, units fail to integrate realistic A^2C^2 training and events into their home-station training. This, in turn, leads to a lack of awareness of the dangers and required A^2C^2 corrective techniques needed in combined arms operations in combat

A number of useful field manuals and joint publications are available to guide brigade and lower level staffs to create A^2C^2 plans—fire support elements (FSEs) should keep them handy and review them regularly. (See Figure 1.)

FM 3-52 Army Airspace Command and Control in a Combat Zone clearly states that the brigade staff performs A^2C^2 at the brigade level and below. It further states, "Since no formalized A^2C^2 element exists at brigade, the brigade staff extracts information from various sources to perform A^2C^2. The brigade commander may form a brigade A^2C^2 element from the air defense artillery [ADA] liaison officer [LNO], the brigade FSO, the air liaison officer [ALO] and the Army aviation LNO (when he is not present, the S3 air performs his duties)."

When a brigade is operating semi-autonomously as part of an early-entry force and (or) receives insufficient detail in an A^2C^2 plan from higher, it must assume responsibility for the A^2C^2 planning that its higher headquarters normally would perform. Brigade staffs are *responsible* for the planning (or refining) and executing A^2C^2 within their AORs.

- *FM 3-09.4 Fire Support for Brigade Operations (Heavy)* (Jan 90)
- *FM 3-52 Army Airspace Command and Control in a Combat Zone* (Aug 02)
- *FM 3-52.1 ICAC² Multiservice Procedures for Integrated Combat Airspace Command and Control* (Jun 02)
- *Joint Pub 3-52 Doctrine for Joint Airspace Control in the Combat Zone* (Jul 95)

Figure 1: Publications to Guide Brigade and Below Staffs in Creating an Army Airspace Command and Control (A^2C^2) Plan (Online at http://www.train.army.mil)

While all ACMs should be (and in some cases are required to be) forwarded to a higher headquarters for approval, the brigade can enforce ACMs below the coordinating altitude as informal measures until approved by higher—ACMs such as routes, corridors and firing battery ROZs. Bottom line: the brigade always submits the A^2C^2 plan and modifications to higher headquarters for approval and inclusion, but it doesn't wait for approval before taking control of its airspace.

In this article, we offer TTP for brigade-level A^2C^2 planning for small-scale contingencies (SSC) to help units translate the doctrinal guidance in Army and joint A^2C^2 manuals into viable, executable plans for both training and combat.

Deconflicting Aircraft in the AOR. The brigade staff deconflicts aircraft conducting logistics and assault operations inside the AOR using air corridors built on a network of air control points (ACPs). To do this, the staff first links the routes from the division or joint task force (JTF) logistics nodes to the brigade logistics nodes.

Next the staff links the brigade nodes to battalion nodes as well as to planned or potential future assault and medical evacuation (MEDEVAC) landing zones. ACPs and routes should be constructed to provide the most direct route from node to node while remaining outside the surface danger zone around artillery and mortar units and avoiding areas where large volumes of indirect fire are likely to be delivered, according to plan. To eliminate aviators' concerns that repetitive use of a small number of corridors might increase their risks of ambush, the staff provides a number of alternate corridors and periodically alters which ones are active.

Figure 2 shows a typical A^2C^2 plan given to a brigade by the 21st Division

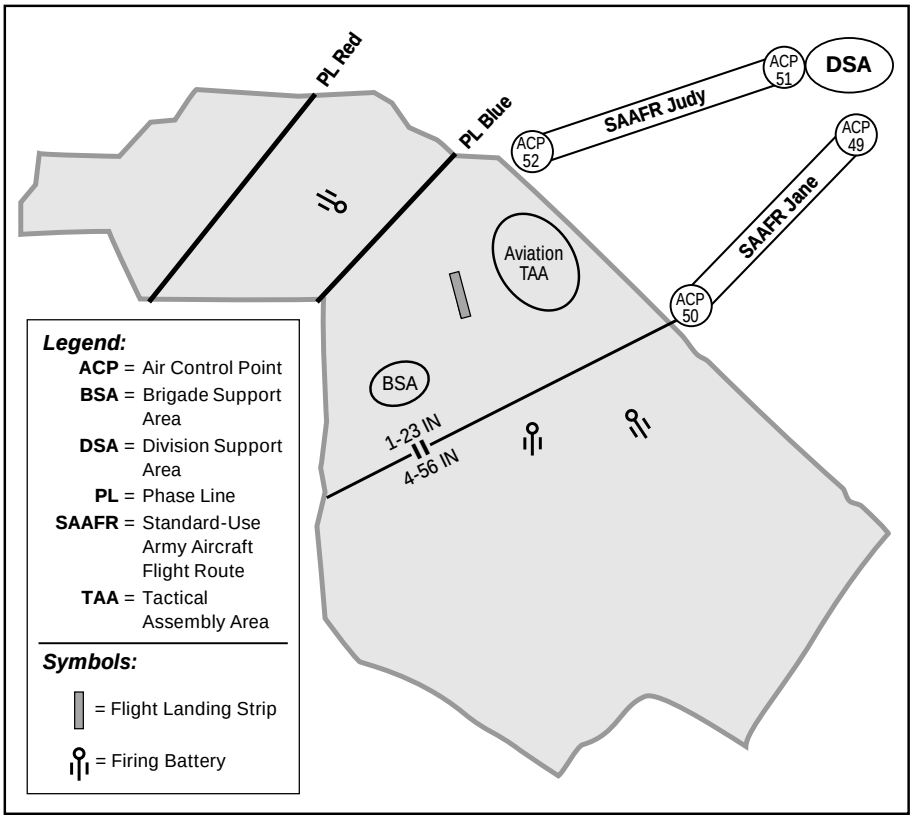


Figure 2: This is a typical division Army airspace command and control (A^2C^2) plan given to a brigade at the Joint Readiness Training Center (JRTC).

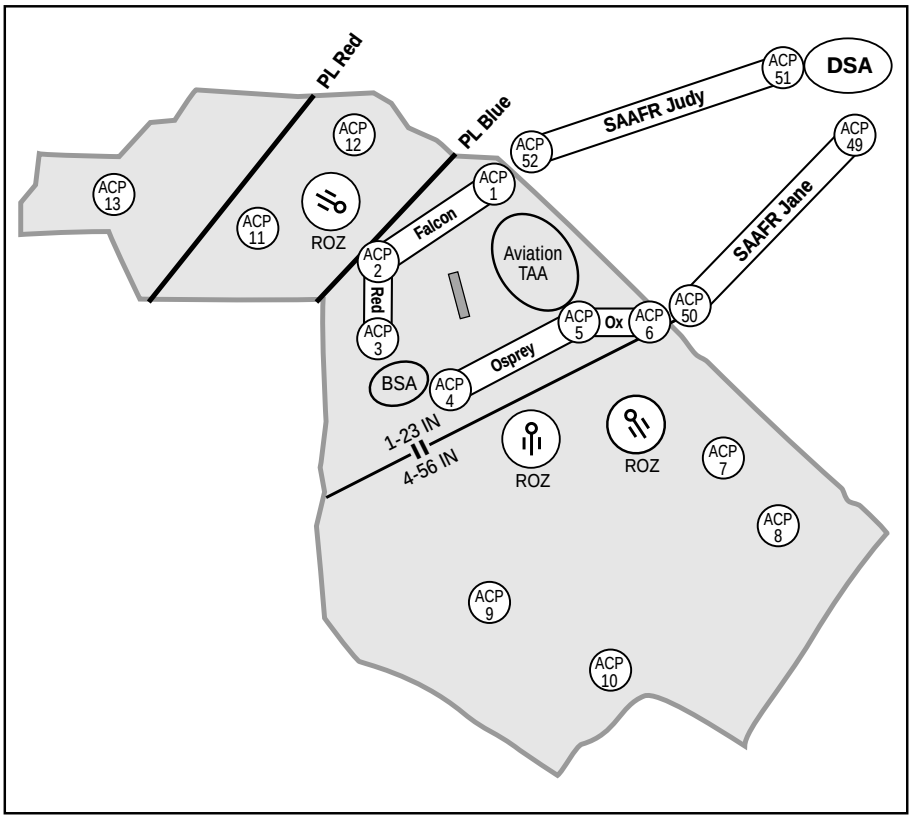


Figure 3: Brigade and Battalion Air Corridor Nodes. The brigade and battalion nodes must be connected to the division's SAAFRs by air corridors: Falcon, Red, Osprey and Ox. The firing batteries have restricted operating zones (ROZs) around them. The plan includes additional ACPs (7 through 10) for building new corridors, as required.

at the JRTC. It consists solely of two division-directed SAAFRs linking assets in the division rear area to the edges of the brigade AOR. Figure 3 shows the various brigade and battalion nodes connected by air corridors and connected to the division SAAFRs at the brigade boundaries.

Deconflicting Air Operations Around Major Firing Units. During many stability operations and support operations (SOSO)/counterinsurgency operations, FA batteries and, to a large extent, battalion mortar platoons remain fairly static for long periods. They occupy hardened firebases distributed across the AOR.

This predictability lends itself to deconfliction using ROZs/ROAs. Assuming a coordinating altitude of 300 feet above ground level (AGL), the trajectory tables for the weapon determine the average range and highest charge expected to be fired that distance from the battery at which a projectile fired at low angle will "climb" above 300 feet AGL on its trajectory toward the target. That distance, plus additional safety factors as desired, becomes the radius of the circular ROZ around the firing unit. The minimum altitude is surface, and the maximum altitude is the coordinating altitude of 300 feet AGL. This ROZ is closed to all fixed- and rotary-wing aircraft operations. The same basic principle applies to mortar positions.

In the example shown in Figure 4, a 105-mm battery is firing Charge Five at a range of seven kilometers. Both the target and the battery are at the same altitude, which is near sea level.

According to the data from the trajectory tables, the projectile will pass above 300 feet AGL (approximately 100 meters) within the first 500 meters of the trajectory. Based on this, the brigade can construct a circular ROZ with a 500-meter radius that has a minimum altitude of surface and a maximum altitude of 300 feet—the coordinating altitude.

In this example, the angle of fall of the projectile as it nears the target is just slightly steeper than its angle of departure from the tube. That means the brigade can use the same rough 500-meter radius cylinder to envision the danger area *along the gun-target line* at the terminal end of the trajectory, using informal airspace coordination areas (ACAs) around the target. Dimensions will vary based on several factors.

Deconflicting Attack Helicopters in SSCs. This is a little more complex. If the aviation task force (AV TF) has been given its own AOR, such as between the airhead line and the coordinated fire line (CFL) or in a security zone in the defense, and a tactical task to accomplish (i.e., screen), then its parent headquarters must clear fires within that AOR. No special ACM/FSCM are required at the brigade level inside the AV TF AOR in this case, but the aircraft should be restricted to air corridors when transiting to and from their AOR and other locations.

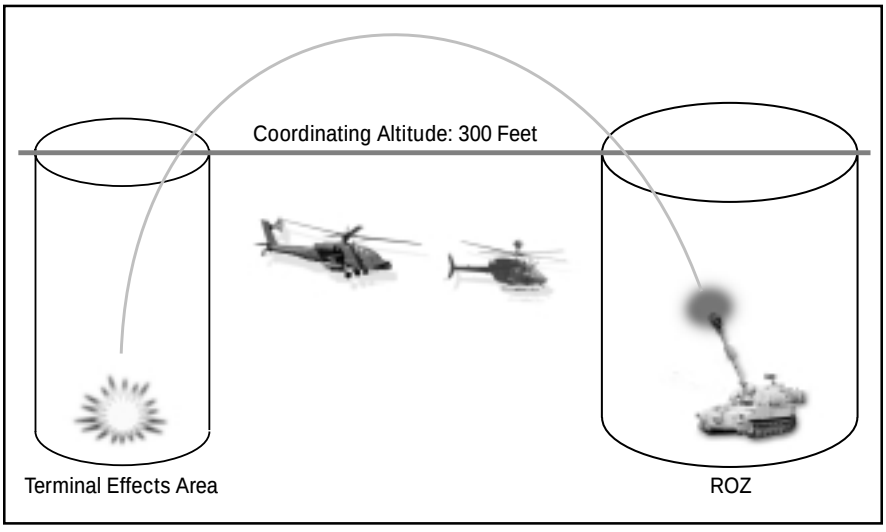


Figure 4: Example of a ROZ. This 105-mm battery is firing Charge 5 at a range of seven kilometers. The trajectory tables allow the brigade staff to build a circular ROZ with a 500-meter radius that has a minimum altitude of surface and a maximum altitude of 300 feet, the coordinating altitude.

When attack helicopters are placed under the tactical control (TACON) of another battalion task force and operate inside that subordinate unit's AOR (i.e., in and around the terminal effects pattern), additional measures are required. First, when flying inside another unit's AOR, the aircraft must maintain a communications link with the unit that owns the AOR (battalion, company, etc.). When TACON to that subordinate unit, the aircraft's primary net should be either the controlling unit's command or fires net and the aircraft should execute movements only under the positive control of the supported unit. To affect this control, commanders and FSOs should first use existing graphic control measures (GCMs), such as phase-lines (PLs) and company/platoon boundaries, to separate aircraft from the effects of fires.

When indirect fires are requested, aircraft can be ordered easily to move beyond the effects range of the system by directing them to "Stay east" of a certain PL or outside of a specific unit's AOR until end-of-mission. Informal control measures, such as an informal ACA, can achieve the same end state, but they carry a higher risk of error in repeated use because not all leaders and aviators will have the same graphics posted to the same degree of fidelity on their maps.

Figure 5 shows the integrated A^2C^2 plan for a brigade AOR using a combination of ACMs and FSCMs to deconflict indirect fires from aviation.

Controlling/Deconflicting Measures for Military Operations in Urban Terrain (MOUT). Additional formal and informal measures help control and deconflict indirect fires and attack helicopters in high-intensity operations concentrated in small areas, such as MOUT. Two techniques, the holding area (HA) and the Kiowa Warrior cross, enable the combined arms attack of targets in village fights as well as in live fire at the JRTC. Both are examples of time and lateral separation techniques for executing the formal and informal ACAs described in Appendix D of *FM 3-09.4 Fire Support for Brigade Operations (Heavy)*.

In the HA technique, the FSO determines that attack helicopters and indirect fires cannot safely conduct simultaneous attacks on a small objective due to terrain, foliage and (or) enemy air defense capabilities. During the military decision-making process (MDMP), he and the aviation LNO decide to use

As the attack unfolds,the ground commander, through his FSO, sequences indirect fires and attack helicopter fires into the objective.

time separation in the form of HAs to facilitate the attacks. Together, they select four one-kilometer-in-diameter circular HAs for the aircraft located outside the effects area (and off the gun-target line) of the planned targets in the objective.

To ensure these HAs are protected from unintended attack by indirect fires, they are further designated as ACAs and built into the advanced FA tactical data system (AFATDS).

All HAs are distributed as part of the brigade's GCM/ACM/FSCM plan in the brigade operations order. In this case, the HAs are roughly two kilometers from the target area or approximately 60 seconds flying time at 60 knots.

As the attack unfolds, the ground commander, through his FSO, sequences indirect fires and attack helicopter fires into the objective. As he prepares to deliver indirect fires using an "At My Command" mission, he orders the attack helicopters to occupy one or more of the HAs. Once the aircraft have reported occupation of the HAs, he issues the command to fire to the firing unit. At the report of "Rounds Complete" (plus time of flight), he clears the helicopters to depart the HAs and conduct

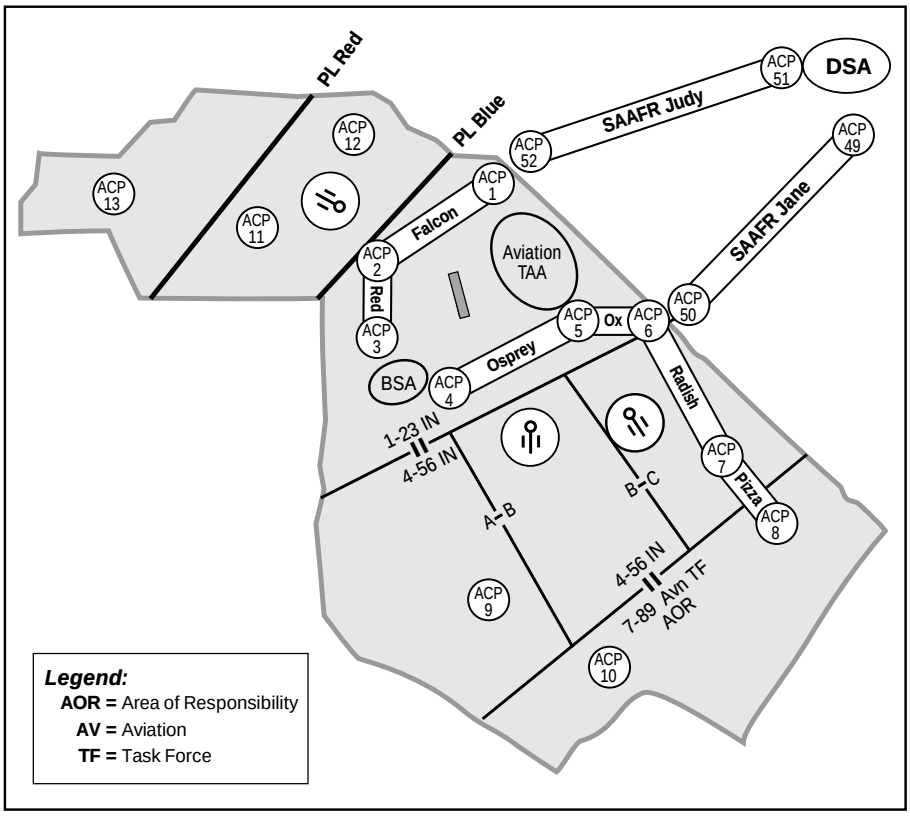


Figure 5: Integrated Brigade A^2C^2 Plan. The plan includes a combination of airspace control measures (ACMs) and graphic control measures (GCMs) to deconflict indirect fires. It also includes aviation air corridors "Pizza" and "Radish" to support the movement of the 7th Squadron, 89th Aviation (7-89 AV) into its sector.

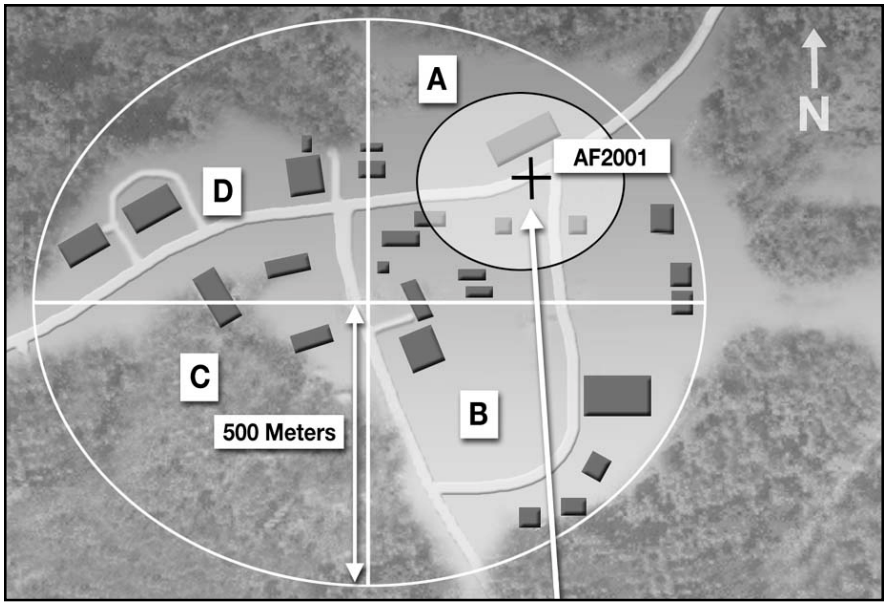


Figure 6: Kiowa Cross Deconfliction Method. This deconfliction measure is used in high-density operations concentrated in small areas, such as those found in military operations in urban terrain (MOUT). The arrow on the right indicates the gun-target line. The 350-meter-diameter circle around the target (AF2001) is the risk estimate distance (RED) of the munition's impact. The unit is firing standard ammunition at about one-third of its maximum range and using a converged sheaf.

their attack on the objective in accordance with previous guidance.

The Kiowa cross technique divides up the battlespace around a high-intensity objective into sections and then assigns a letter or number to each section. (See Figure 6.) This provides a number of formal control measures in a small space to facilitate moving aircraft quickly and efficiently from one area to another and separating them laterally from the effects of fires. Attack helicopters can operate in one quadrant of the "cross" while indirect fires are delivered just outside the risk estimate distance (RED) in another portion of the cross. Where possible, the "arms" of the cross should be placed on easily identifiable terrain (roads, waterways, etc.) so they can be explained to aircrews and ground observers.

In Figure 6, the battalion FSO in control of fires for the attack on this village needs to attack a strongpoint in the northeast portion of the city (Target AF2001). Because of the size and complexity of the target (one T-72 tank being used as a pill-box, exposed troops at heavy machine gun positions on the roof opposite the tank and a heavy machine gun position inside the second story of a high-rise building), he uses multiple fire support assets to achieve his commander's desired effects. The FSO chooses to attack the target with a combination of 105-mm howitzer and OH-58D fires.

Thinking ahead, the brigade FSO and ALO created a circular control measure during course-of-action (COA) development and imbedded it into the brigade's larger GCM plan. They divided the circle into a cross with four quadrants labeled A through D. The radius of the circle is 500 meters, and it is valid from the surface to the coordinating altitude (300 feet). The gun-target line of the supporting battery is roughly south to north (indicated by the arrow in Figure 6), and the unit is firing standard ammunition at roughly one-third of its maximum range. The battery has met the five requirements for accurate, predicted fire and had adjusted on this target as part of harassing and interdicting fires earlier in the battle. Additionally, it fires using a converged sheaf (all rounds aimed at the same central grid of the target).

Using a probability of incapacitation (PI) of 0.1 percent, the battalion FSO determines that the proper RED for this mission is 175 meters (see FM 3-09.4, Appendix A, for a complete discussion of REDs). The FSO does a quick plot on his map and cross overlay and determines the terminal trajectory and RED of the sheaf as it impacts (depicted by the 350-meter-diameter circle over the target) potentially will affect quadrants A and B. Based on this determination, the FSO (with the concurrence of his commander) "closes" A and B to helicopter use during the fire mission and advises the commander to have the helicopters conduct their simultaneous attacks from battle positions outside of those two quadrants.

Because the FSO devised a simple, standardized control measure, he quickly could separate artillery and attack helicopters in space but deliver their effects in a simultaneous, combined arms manner.

A^2C^2 within a brigade's AOR is the responsibility of the brigade S3 and staff. Failure to take responsibility could result in predictable, avoidable and unacceptable casualties in combat. The staff must be willing to accept the challenge and commit to finding workable real-world solutions based on doctrinal and TTP references.

Lieutenant Colonel Daniel A. Pinnell is the Senior Brigade Fire Support Observer/Controller (O/C) for the Fire Support Division, Joint Readiness Training Center (JRTC), Fort Polk, Louisiana. He commanded the Operations Detachment, 6th Psychological Operations (PSYOP) Battalion (Airborne) at Fort Bragg, North Carolina, and in Central Africa; a Tactical PSYOP Company in the 9th PSYOP Battalion (Airborne), also at Fort Bragg; and B Battery, 2d Battalion, 8th Field Artillery (B/2-8 FA), 2d Infantry Division, Fort Lewis, Washington. He takes command of 1-76 FA in June as the Army stands up the battalion as part of the 4th Unit of Action (UA) in the 3d Infantry Division (Unit of Employment, or UE) at Fort Stewart, Georgia.

Major Victor S. Hamilton is the Brigade Comand and Control Aviation Liaison Officer (LNO) at the JRTC. While stationed with the 25th Infantry Division (Light) at Schofield Barracks, Hawaii, he commanded an Attack Helicopter Company in the 125th Aviation Regiment and served as Assistant Division Aviation Officer and 2d Brigade's Aviation Officer. Prior to that, he was the Aviation Officer for the 505th Parachute Infantry Regiment (PIR), Fort Bragg.

Major Michael T. Oeschger, until recently, was the Senior Aviation Fire Support O/C at the JRTC. Currently, he is a student at the Command and General Staff College, Fort Leavenworth, Kansas. He commanded A/3-319 FA and the Advanced Airborne School, both at Fort Bragg, and the 10th Field Artillery Detachment (Target Acquisition), 10th Mountain Division (Light Infantry), Fort Drum, New York. He served as the Fire Direction Officer for 2-17 FA, 2d Division, in Korea; and Fire Control Officer for the 82d Airborne Division Artillery, Fort Bragg.

4th ID: Clearing Airspace for Counterfire in Iraq

On a typical day in Iraq in the 4th Infantry Division (Mechanized), Redlegs conducted raids, patrols and multiple flash checkpoints plus civil-military operations (CMO). At the same time, Field Artillerymen had to provide harassing and interdiction (H&I) fires and counterfire against an agile foe.

These fires occurred near airfields, helipads and air routes used by friendly aircraft from different divisions, service branches and nations within the Coalition. The aircraft often are unable to communicate with each other or units on the ground.

To safely fire under these conditions, the division fire support element (FSE) devised tactics, techniques and procedures (TTPs) to leverage its digital equipment to provide the right fire support for operations in Iraq.

The Mortar Threat. With the threat of Coalition high-explosive (HE) shells incoming, the insurgents often set their mortar systems up days in advance and camouflaged them. This put the equipment at risk for early discovery by a Coalition patrol.

After shooting the mortar, the insurgents abandoned their equipment or moved it out as fast as possible before taking counterfire or getting killed or captured by a quick-reaction force (QRF).

All insurgent fire missions were shot without accurate meteorological data or accurate weapons and ammo data. Because of counterfire, insurgents were barely able to get first-round fires-for-effect (FFEs) off. So Soldiers serving in the Task Force (TF) *Ironhorse* area of operations (AO) were under the threat of mortar fires, but not *adjusted* mortar fire.

The AO for TF *Ironhorse* was noncontiguous with brigades, battalions and companies operating dispersed over a battlespace the size of Vermont. Terrorists often targeted logistics areas and forward operating bases (FOBs) with mortars because of the relative ease of using mortars against such fixed targets. This caused a need for indirect fire in an area commonly used by aircraft.

The traditional airspace coordination area (ACA) didn't apply because some aircraft in the area were just traveling though and had nothing to do with the operations. The trick was to keep "nonparticipating" aircraft out of the area.

Airspace Control Measures (ACMs). The 4th Infantry Division FSE combined advanced FA tactical data system (AFATDS) geometries with ACMs to keep aircraft away from areas where there was a likelihood of indirect fire. The measures combined were the position area hazard (PAH), target area hazard (TAH) and restricted operating zone (ROZ).

Battalions conducted intelligence preparations of the battlefield (IPBs), selected likely targets and established a PAH/TAH over the area in AFATDS. In its simplest form, this is a circle with the firing unit in the center and a radius corresponding to the range the units are likely to fire. Although not typically considered fire support coordinating measures (FSCM), the PAH/TAH not only allowed the aircraft of TF *Ironhorse* to operate across the battlespace without having to worry about fratricide from artillery or mortars, but also facilitated rapid 6400-mil firing.

The division FSE and G3 air had to translate this geometry in AFATDS into a ROZ. This control measure is used by aviators and is not in AFATDS programming. The ROZ was used as a permissive FSCM akin to unit boundaries.

The ROZ was added to the airspace control order (ACO) from the Coalition Joint Task Force-7 (CJTF-7), so all fixed-wing and helicopter pilots in the Iraqi theater could look at the ACO and avoid the ROZ and any danger of being shot down by friendly indirect fire.

Each artillery ROZ on the ACO had a point of contact (POC) from the FSE that established the ROZ, so aircraft that needed to fly into the ROZ could coordinate with the FSE. This allowed for the safe delivery of fires and cleared airspace. When ROZs overlapped with Class D airspace near airfields, the FSEs communicated with the aircraft control towers.

The safe delivery of fires was made easier by situational awareness (SA) from the division's digital equipment. AFATDS connectivity was essential and a great improvement over the lengthy voice transmissions of the FSCMs.

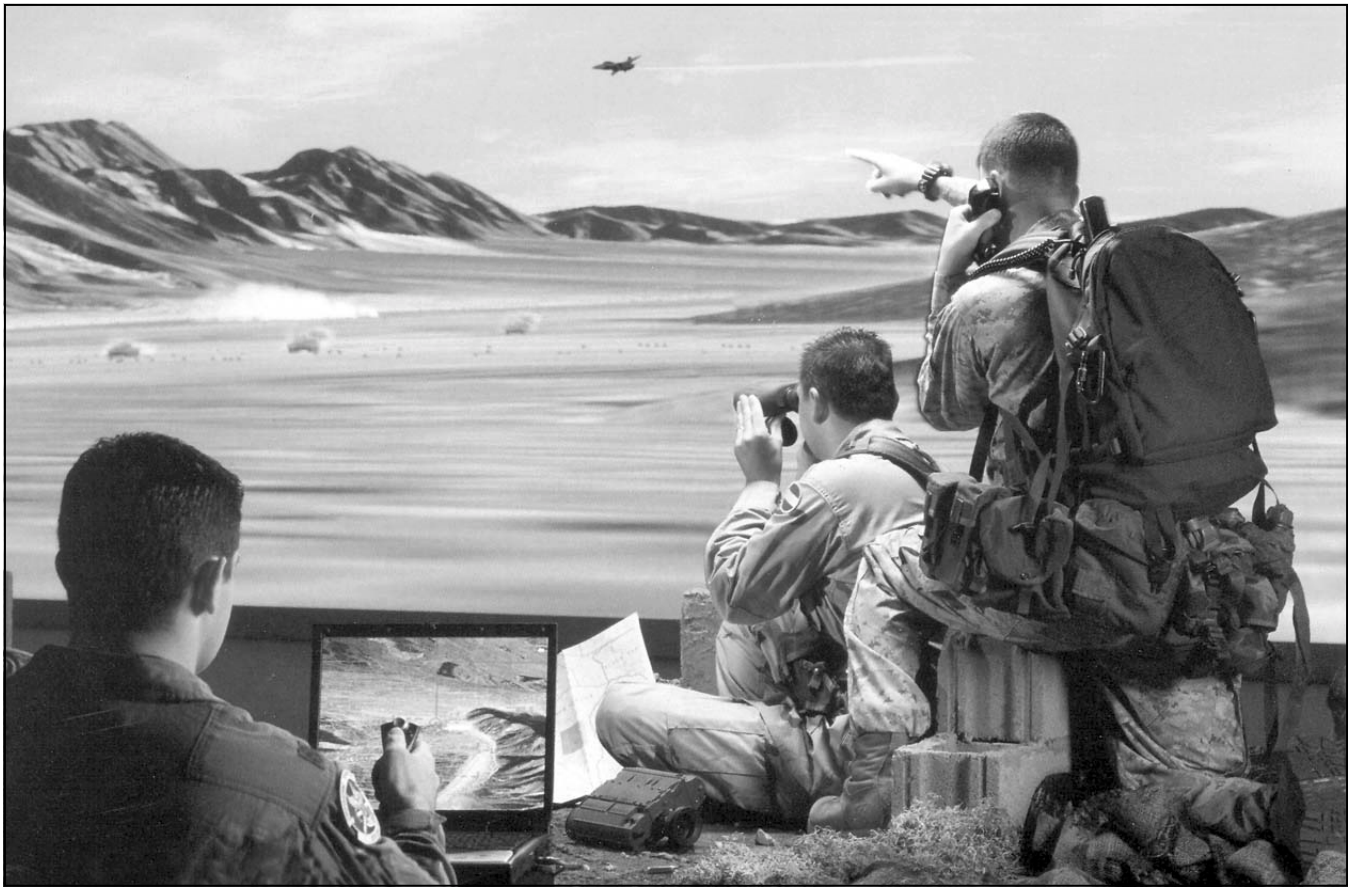
An additional tool TF *Ironhorse* FSEs used is My Internet Relay Chat (MIRC), a computer program to set up a civilian-style chat room. Brigade FSEs communicated via MIRC with relative ease among themselves, the division FSE and the Army airspace command and control (A^2C^2) element. This greatly enhanced clearing fires and SA.

Another SA tool used is the automated deep operations coordination system (ADOCS) software. It displays the ACO and was used by the division FSE and aviation liaison officers (LNOs).

H&I fires suppressed enemy mortar strikes in Iraq. One TF *Ironhorse* brigade went from a mortar attack per night to none within a week after starting nightly H&I fires. The 4th Infantry Division FSE in Iraq carried on a long tradition of supporting its maneuver arms.

MAJ Michael Donahue
CPT Carl F. Robinson
Division FSE, 4th ID (Mech) in OIF

4 ID fires an ATACMS unitary missile at a terrorist training camp in the desert as part of Operation Ivy Cyclone.



Indirect Fire-Forward Air Controller Trainer (I-FACT), Courtesy of FATS, Inc.

Army JTAC Training—
The Way Ahead

By Lieutenant Colonel Steven P. Milliron, AV

As the Army transforms, one of the key challenges will be to train and qualify a core of Soldiers to employ joint surface-to-surface and air-to-surface supporting fires. These personnel will be integral to the Army's new modular organizations and must be skilled in delivering artillery, naval surface fire support (NSFS), attack helicopters and fixed-wing aircraft, the latter providing close air support (CAS).

As the Chief of Staff of the Army stated in the white paper, "An Army at War—A Campaign Quality Army with a Joint and Expeditionary Mindset" (March 2004), "All of our modular solutions depend on enabling even our smallest combat formations to leverage joint fires through…'joint effects control teams.' To facilitate more effective employment of close air support in a noncontiguous battlespace, we need universal standards for observation, designation and target acquisition."

> ***Separate ground, sea and air warfare is gone forever. If ever again we should be involved in war, we will fight it in all elements, with all services, as one single concentrated effort***
>
> President Dwight D. Eisenhower
> Address to the US Congress
> 3 April 1958

Effective 3 September 2003 with the publishing of *Joint Publication (JP) 3-09.3 Tactics, Techniques and Procedures (TTP) for Close Air Support*, the joint community codified the requirements for an individual to direct the actions of combat aircraft engaged in CAS and other air operations. This position, called a "joint terminal attack controller," or JTAC, was created to standardize the certification and qualification process for terminal attack controllers to ensure a common capability across the services. The Army needs to develop Soldiers who, from a forward position, can deliver joint indirect fires and direct the actions of joint combat aircraft engaged in operations in close proximity to friendly forces.

The training and development requirements set forth in JP 3-09.3 and the soon-to-be-signed JTAC Memorandum of Agreement (MOA) between the Army

and Air Force are clear: a JTAC candidate must complete the service academic and practical training requirements of a core JTAC curriculum and undergo a comprehensive evaluation.

To begin training Army JTACs, we will have to leverage one of the established JTAC schools: the Air Ground Operations School (AGOS) at Nellis AFB, Nevada; Expeditionary Warfare Training Group Atlantic Fleet (EWTGLANT) at Little Creek Naval Amphibious Base, Virginia; USMC Expeditionary Warfare Training Group Pacific Fleet (EWTGPAC) at Coronado Naval Amphibious Base, California; and the Naval Strike Air Warfare Center (NSAWC) at Fallon Naval Air Station, Nevada.

The Army must establish a standardization program, build an Army JTAC curriculum, identify the Army candidates to become JTACs, equip Army JTACs and provide resources to the school that will train Army JTACs. This article addresses those requirements for creating a core of Army JTACs—which is the way ahead.

Army JTAC Standardization Program. Before the Army qualifies its first JTAC, we must have a document that establishes the regulatory requirements for Army JTACs. At a minimum, it must address personnel entry qualifications; content and maintenance of individual JTAC training records; the certification, qualification, currency and proficiency training to attain and maintain JTAC status; and the process to be certified as a JTAC instructor. The document must be similar to the "Air Force Instruction 13-112 Terminal Attack Controller Training Program" to ensure consistency of JTAC training and development cross the services and provide the appropriate policies and responsibilities to enable Army JTAC training.

Army JTAC Curriculum. The curriculums at the four established schoolhouses train personnel who are already familiar with CAS operations and the terminal control of CAS aircraft. These are Air Force enlisted terminal attack controllers (ETACs) and special tactics team personnel; Marine Corps flight officers serving as ground forward air controllers (FACs); Navy Sea, Air and Land (SEAL) personnel; and Air Force, Navy and Marine Corps forward air controllers (airborne), called FAC(As).

Currently, none of these curriculums are sufficient to qualify Army JTAC to serve as a terminal air controller. We must create a new curriculum to supplement the Army JTAC candidate's knowledge in the CAS mission area.

Terminal Attack Controller's Course (TACC). This three-week course at AGOS provides academic and hands-on instruction to Air Force JTAC candidates. The training consists of classroom instruction on service doctrine, the theater air-ground system (TAGS), CAS mission planning and control, integrated combat airspace command and control, aircraft capabilities and limitations, weapons effects, suppression of enemy air defenses (SEAD) and other subjects. It also provides simulation training in terminal control, as well as a minimum of four live, graded controls at the National Training center (NTC), Fort Irwin, California.

But TACC is only one part of a three-part training regimen for Air Force JTACs. Air Force JTAC candidates progress from Initial Qualification Training (home station and TACC) through Mission Qualification Training (home station) to Combat Mission Ready status. The Air Force JTAC receives his home station training under the supervision of a terminal air control instructor (TAC-I) during both Initial and Mission Qualification Training in accordance with the tasks listed in "Air Force Instruction 13-112" (See Figure 1 on Page 52). The Air Force JTAC eventually is rated as Combat Mission Ready when he passes a formal performance evaluation conducted by a TAC-I and is signed off on by the JTAC's unit commander signs.

Army JTAC Qualification Course (JTACQC). TACC provides an excellent core of instruction for the eventual qualification of an Army JTAC. With the addition of two weeks of training, TACC can provide the foundation for a JTACQC.

The Army Joint Support Team-Nellis has developed a plan to train Army JTACs at AGOS (see Figure 2 on Page 53). This proposal has four phases: Phase I Initial Certification Training, Phase II Certification Training, Phase III Advanced Certification Training and Phase IV Mission Qualification Evaluation. In accordance with the proposal, the Army JTAC will be fully mission qualified after he completes the training and passes a formal performance evaluation by a TAC-I, as "signed off" by the Army JTAC's unit commander.

• Phase I Initial Certification Training certifies an Army JTAC in basic controller duties and validates his ability to serve as an Army JTAC. The training consists of five days of introductory academics at AGOS on the tasks listed in Figure 2 as well as supervised simulated CAS controls provided by a TAC-I. Completing Phase I to standard is mandatory for advancing to Phase II. This first week of training provides the knowledge base required for TACC in Phase II.

• Phase II Certification Training consists of the three-week TACC at AGOS. This teaches the Army JTAC the joint mission tasks associated with the CAS mission area and provides the fundamentals for planning and executing CAS operations. This phase uses the indirect fire and forward air control trainer (I-FACT) simulator to provide hands-on training in calls-for-fire and terminal control procedures. It also includes four supervised live controls at the NTC. Successful completion of Phase II is mandatory for Phase III.

• Phase III Advanced Certification Training certifies an individual as an Army JTAC. It consists of one week of advanced classroom instruction and field academics coupled with additional supervised and graded live and simulated terminal attack control missions conducted at AGOS and the NTC.

It focuses on CAS practical exercises (PEs) using I-FACT. The PEs are comprehensive training on CAS planning, coordination and execution and designed to have Army JTAC candidates demonstrate the correct TTP for various types of CAS controls. The PEs also allow the Army JTAC candidate to rehearse a mission before conducting it live.

In addition to the advanced PEs, the Army JTAC candidates conduct eight supervised live controls using both fixed- and rotary-wing aircraft in all three control types.

• Phase IV Mission Qualification Evaluation at home station are conducted by Air Force TAC-Is from the local Air Force air support operations squadron (ASOS) until the Army can qualify TAC-Is (takes two or more years). In the absence of a standardization and evaluation capability within the Army, Army JTACs will depend on Air Force TAC-Is to provide any additional training as part of the local "top off" and eventual rating as fully mission qualified.

After the Army JTAC candidate completes a unit training program developed in conjunction with the local

Training Item	Phase I	Phase II
1. CAS Mission Preparation		
a. Mission Planning	B	3c
b. ATO Information	B	3c
c. Weather	B	3c
d. Range Procedures	B	3c
e. Equipment Preparation	B	3c
f. Airspace Requirements	B	3c
2. Target Analysis		
a. Target Suitability	B	3c
b. Identification	B	3c
c. Description	B	3c
3. Aircraft Weapons and Tactics		
a. Air to Ground Weapons and Effects	B	C
b. CAS Aircraft Capabilities and Tactics	B	C
4. Ground to Air Threats	B	C
5. Mission Coordination		
a. S2	B	3c
b. S3	B	3c
c. FSE/NGF LNO	B	3c
d. Aviation LNO	B	3c
e. ADA LNO	B	3c
f. Ground Commander	B	3c
g. Other Agencies	B	3c
6. CAS Integration		
a. Ground Maneuver	1b	3c
b. Surface Fire Support	1b	3c
c. Localized SEAD	1b	3c
d. Attack Helicopters	A	3c
e. JSTARS	1b	3c
f. Joint/Combined C^2 Integration	A	B
g. ISR Integration (UAV and Rivet)	A	B
h. SOF Operations	A	B
i. ADA and IADS	1b	3c
7. Develop CAS Briefing		
a. 5/6/9/15-Line Brief Requirements	1b	3c
b. Additional Remarks	1b	3c
8. Initial Contact	B	3c
a. FAC(A)/TAC Interface	A	b
b. Mission Check-In	1a	3c

Training Item	Phase I	Phase II
9. Marking	B	C
a. Target with Indirect Fire	A	B
b. Target with Laser	A	B
c. Target with IR Systems	A	2b
d. Friendly Locations	B	3c
10. Final Attack Control	B	3c
a. Day	1a	3c
b. Night-Visual		3c
c. Night System Aided		3c
d. Night-NVD		3c
e. Ordnance Selection and Adjustment	1a (Live Mission)	3c
f. Clearance (Dry or Live)	1a	3c
g. Abort Procedures	1a	3c
h. Minimum Safe Distances	A	C
i. Attack Headings/Angles	1a	3c
11. Post Attack Procedures	1a	3c
12. TAC		
a. TAC Mission #1	1a	2b
b. TAC Mission #2	1a	2b
c. TAC Mission #3	1a	2b
d. TAC Mission #4	2b	3c

Legend:

ADA = Air Defense Artillery
ATO = Air Tasking Order
C^2 = Command and Control
FAC(A) = Forward Air Controller Airborne
FSE = Fire Support Element
IADS = Integrated Air Defense System
IR = Infrared
ISR = Intelligence, Surveillance and Reconnaissance
JSTARS = Joint Surveillance and Target Attack Radar System
LNO = Liaison Officer
NGF = Naval Gunfire
NVD = Night-Vision Device
SEAD = Suppression of Enemy Air Defenses
SOF = Special Operations Forces
UAV = Unmanned Aerial Vehicle

Standard Level	Value	The Individual—
Task Performance	1	Needs to be told or shown how to do most of the task. (Limited)
	2	Needs help only on the hardest parts. (Partially Proficient)
	3	Needs only spot checks of completed work. (Competent)
	4	Can tell or show others how to do the task. (Highly Proficient)
Task Knowledge	a	Can name parts, tools and simple facts about the task. (Nomenclature)
	b	Can determine step-by-step procedures for doing the task. (Procedures)
	c	Can identify why and when the task must be done and why each step is needed. (Principles)
	d	Can predict, isolate and resolve problems about the task. (Advance Theory)
Subject Knowledge	A	Can identify basic facts and terms about the subject. (Facts)
	B	Can identify relationships of basic facts and state general principles about the subject. (Principles)
	C	Can analyze facts and principles and draw conclusions about the subject. (Analysis)
	D	Can evaluate conditions and make proper decisions about the subject. (Evaluation)

Figure 1: Air Force JTACs receive Mission Qualification Training on these tasks (to the standards indicated) at home station under the supervision of a TAC instructor. (Taken from Table 2.1 of the "Air Force Instruction 13-112 Terminal Attack Controller Training Program.")

ASOS, the ASOS' standardization and qualification section administers the formal performance evaluation and provides the Army JTAC's commander a recommendation that as to whether or not he should sign off that the Army JTAC is fully mission qualified.

At this point, if the commander signs off, then the candidate is an Army JTAC, fully qualified to perform unsupervised terminal attack control of CAS missions.

Army JTAC Personnel. The Army must identify the personnel to perform the terminal control function. The Army Joint Support Team-Nellis recommends that the Army use an already established military occupational specialty (MOS). The logical choice is the FA 13F Fire Support Specialist. Already trained in delivering artillery and naval surface fires, 13Fs have the requisite base of knowledge and, more importantly, are best located on the battlefield to control CAS.

However, because we will not "grow" Army JTACs out of 13F basic training and through their initial utilization tours, we have to establish minimum entry standards to offset the Soldiers' lack of experience in the CAS mission area.

The Army Joint Support Team-Nellis has developed proposed standards for individuals to become Army JTAC candidates. Unit commanders designate 13Fs or specified 18 series (special operations) for entry into Phase I JTAC training who are at least staff sergeant (or above) and serving in an operational company, battalion, brigade or regiment, to include Ranger and Special Operations Forces (SOF), or an organization that provides direct support to ground maneuver forces. The individual must have a minimum of 48 months of operational experience in his duty MOS and have served a minimum of 12 months as a company fire support NCO (FSNCO), combat observation lasing team (COLT) chief or as a member of an operational detachment alpha (OD-A). In addition, the 13F JTAC candidate must have a minimum of a Secret clearance, normal color vision, vision correctable to 20/20, a General Test (GT) score of at least 105 and an English comprehension of Level III or higher.

Once the Army JTAC candidate completes Phase II of the JTAC training, he must serve in a JTAC-coded position with a minimum of two years' retainability.

If the Army creates a "universal observer" who provides targeting information and terminal guidance rather than terminal control, then the optimum progression would be from universal observer to JTAC, if the universal observer meets the minimum entry requirements.

Equipping the Army JTAC. Performing the CAS control mission will require more than just an FM radio. The Army JTAC will need a communications suite that provides both voice and data in UHF, VHF, HF plus satellite communications (SATCOM). He will need target acquisition, marking and coordinate generation capabilities and interoperable information management tools that will expedite and increase the accuracy of air power and maintain situational awareness.

Although the Army is lagging in determining what equipment is required, both the Air Force and Marine Corps have equipment proposals the Army could leverage. In the end, if the Army wants to develop JTACs, then it will have to commit to providing the appropriate equipment for the mission.

Army Resource Support for AGOS. The Army will have to dedicate personnel and other resources to conduct Army JTAC training at AGOS. The small contingent of Army personnel in Army Joint Support Team-Nellis at AGOS

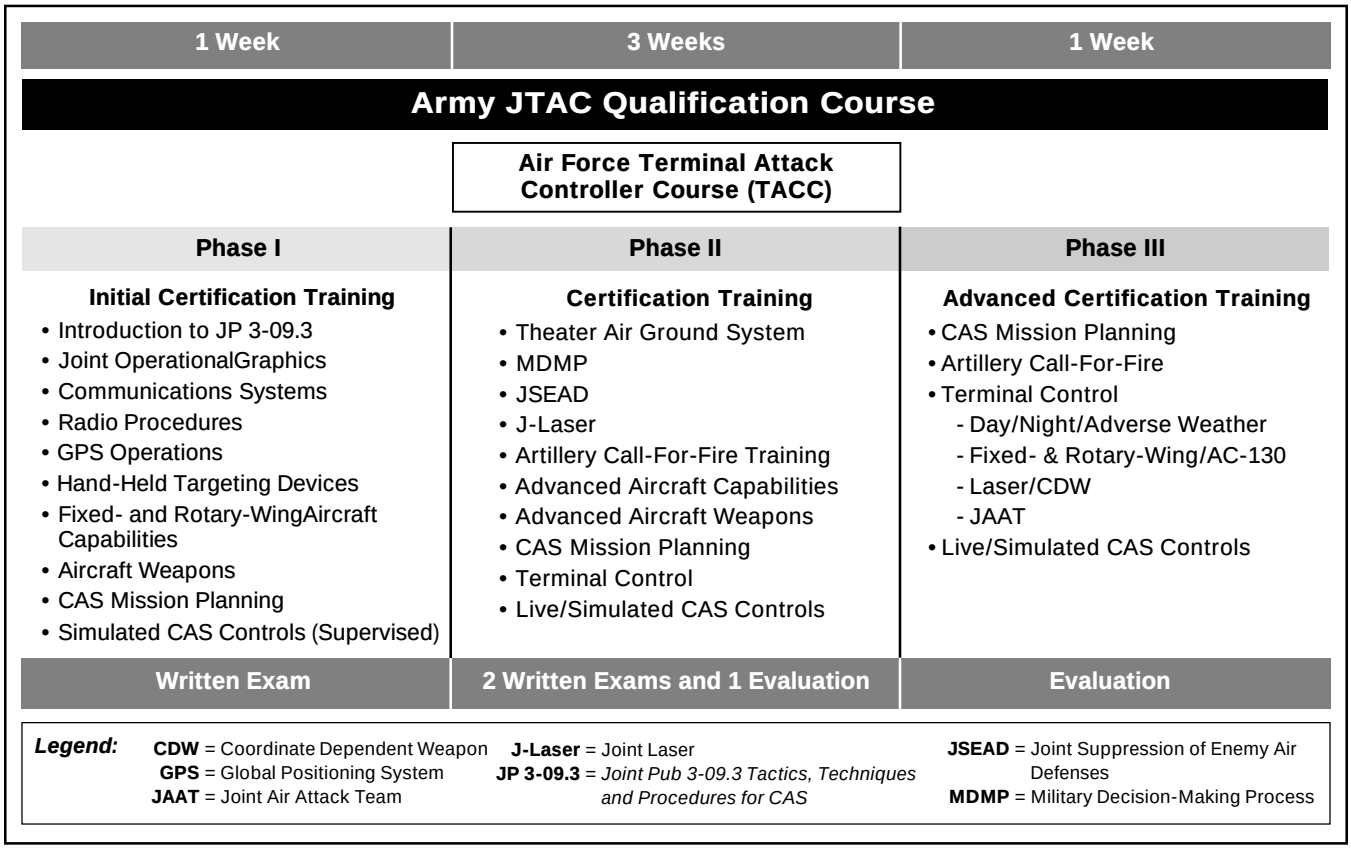


Figure 2: Proposed Five-Week Training Program for Army JTACs

(three instructors) are not qualified as TAC-Is.

With a student-to-teacher ratio of 3:1, AGOS can train 12 Air Force JTACs per course. For AGOS to increase the throughput of both Army and Air Force JTACs from 12 to 24 (assuming the Air Force continues to train 12 JTACs and the Army trains 12) the Army will have to provide, at a minimum, four additional instructors. With the addition of four 13F30/40s who would be trained as JTACs and, with a waiver from the Commander of Joint Force Command (JFCOM), qualified as TAC-Is, AGOS could sustain the student-to-teacher ratio and meet the student training requirements in less than six months.

For an Army JTAC to leave AGOS certified after Phase III, the JTAC candidate must conduct 12 live, graded controls successfully. As defined in the pending JTAC MOA, a "control" consists of at least one aircraft attacking a surface target. The control begins with a CAS briefing (9-line is the JP 3-09.3 standard) from a JTAC and ends with either an actual or simulated weapons release or an abort on the final attack run. No more than two controls can be counted per CAS briefing per target.

Based on Air Force Instruction 13-112's definition of "controls," AGOS currently counts one 9-line briefing as one control, regardless of the number of aircraft attacking the target on the same briefing. The JTAC MOA's definition could effectively double the number of controls for JTAC students for every two or more aircraft attacking per 9-line briefing.

Using the 13-112's definition and based on the average number of controls provided by two aircraft attacking per 9-line briefing and the average control attrition per TACC student, AGOS currently must provide 17 aircraft, or 34 sorties, for every 10 students to achieve *four* successful controls.

Applying the more lenient JTAC MOA criteria for a control and based on the same number of aircraft per 9-line briefing and JTAC student control attrition, AGOS would have to provide nine aircraft, or 18 sorties, for every 10 students to achieve four successful controls.

But even applying the more lenient control definition, the total number of sorties available still is insufficient to certify Army JTACs in the required 12 controls. The additional week of training for Army JTACs would allow them to use existing sorties and help offset the delta, but in the end, AGOS will need additional resources for this training proposal to work.

An important component of this training proposal is our ability to leverage Army aviation to help train JTACs at AGOS. Although the Army doesn't conduct CAS operations with its rotary-wing fleet, it does perform close combat attack (CCA) operations using the same established procedures, e.g., the 9-line brief. If we want Army aircrews to be able to receive a 9-line from any JTAC on the battlefield and conduct attacks consistent with that information and, at the same time, develop JTACs (Army or Air Force) who can direct the actions of rotary-wing aircraft from a forward position, then logic dictates we train those personnel at the same time. Using Army rotary-wing aircraft to train JTACs provides resources for AGOS to train Army JTACs and develops more capable Air Force JTACs—a win-win situation for both services.

With the addition of four AH-64s or OH-58Ds helicopters to AGOS training, we not only would meet the requirements for training Army JTACs, but also provide joint synergy to better train Army aircrews and Air Force JTACS.

If we used Army rotary-wing aircraft for four of the 12 required controls, a JTAC candidate would only require eight fixed-wing controls. Eight fixed wing controls means AGOS would need 104 controls, which equates to about 18 flights of two aircraft, or 36 sorties. That is roughly the equivalent of what AGOS currently receives.

However, for this proposal to work, we must adjust the JTAC MOA to mandate a minimum of eight fixed-wing controls and four rotary-wing controls (vice the 12 fixed-wing controls) for certification.

This change remains consistent with the proposed JTAC MOA's "Joint Mission Task List" for providing terminal air control for CAS missions: "Control day/night/adverse weather CAS missions fixed- and/or rotary-wing in support of the ground maneuver plan" (Duty Area 7, Subparagraphs 7.1 and 7.2). More importantly, this proposal falls within the intent of the JTAC MOA's creation of a common standard for training JTACs across all services.

In an environment where the US armed services are seeking joint interdependence, the training program for JTACs could serve as a model. Ultimately, if we want to train Army JTACs at AGOS, the Army will have to reach into it rotary-wing fleet to make the training happen.

There is no joint mission area more contentious than CAS, so the expectation exists that many who read this article will disagree vehemently. However, for those who find issue, or for that matter, for those who agree, the intent of this article is to show just one way ahead for developing Soldiers who can safely and effectively employ joint surface-to-surface and air-to-surface supporting fires for the ground force.

Warfare is changing rapidly, and we must understand that jointness *is* the future. As Secretary of Defense Donald Rumsfeld stated in his testimony to the Senate Armed Services Committee, 9 July 2003, one of the key lessons learned from recent operations is "the importance of *jointness* and the ability of US forces to fight, not as individual deconflicted services, but as a truly joint force—maximizing the power and lethality they bring to bear" [emphasis added].

In the end, Army JTACs only will supplement, not eliminate, the requirement for Air Force air power experts—Air Force air liaison officers (ALOs) and ETACs. These personnel will remain the cornerstone for planning and executing CAS in support of the ground commander's scheme of maneuver.

However, fully mission capable Army JTACs will provide the Army an additional capability as well as increase the overall effectiveness of the tactical air control party (TACP) and air power in general.

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Modular Charge Artillery System (MACS)

From the dawn of the Field Artillery, soldiers have had to measure how much powder to load into their artillery pieces. This required Cannoneers to cut bag charges and then dispose of the unused increments. Until recently, even though advances in chemistry and technology have changed the way we live and fight, soldiers still had to cut bag charges and burn the unused increments. MACS is changing that archaic practice for 155-mm cannons.

Currently, there are four different types of bag charges used with 155-mm howitzers: the M3 (Green Bag), M4 (White Bag), M119 (Charge 7 Red Bag) and the M203 (Charge 8S Combustible Case). All but the M119 and M203 charges require Soldiers to burn unused powder.

The Army has begun fielding MACS—Soldiers no longer will waste unused powder. MACS consists of two propelling charges, the M231 and M232, and associated packaging. (See the figure.) The system is compatible with all current and planned 155-mm weapons.

MACS uses a "build-a-charge" concept in which all M231 increments are identical in the lot and all M232 increments are identical in the lot (never mixing the two charges), eliminating the need to dispose of unused increments. Unused increments are retained for future use.

The M232 and M231 increments have a center core igniter and main charge granular propellant enclosed in a rigid combustible case. The M232 includes additives to reduce flash, gun wear and barrel coppering. For ease in loading, the center core igniter is bi-directional. The large surface area of the igniter is compatible with all current cannon primers and planned laser ignition systems.

The M231 is fired either singularly (Charge 1) or in pairs (Charge 2) to engage targets from three to 12 kilometers. The M232 is fired in groups of three or more increments from Charge 3 (three M232s) to Charge 5 (five M232s). Charges 3 through 5 can be fired from all weapons to engage targets to ranges exceeding 29 kilometers.

M231s are green and M232s are light brown. To facilitate night operations and preclude a mix up of M231 and M232 increments (Cannoneers cannot mix M231 and M232), M231 increments have smooth surfaces with black bands in contrast to the M232 increments that have no bands and four bumps on each end. Increments are packed in plastic sleeves allowing quick removal and easy manual loading.

The MACS packaging system facilitates handling and supports long-term storage. Canisters have easily opened lids for faster access. All M231 canisters are green and have a solid lid handle. The M232 canisters are tan and longer than the M231 canisters and have a hole in the lid handle for tactile identification during night operations.

MACS propellants are transported and handled in the same manner as other conventional propellants.

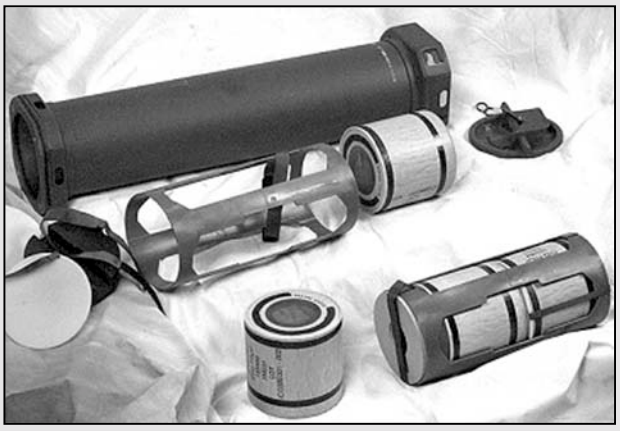
MACS fielding began in two phases. Phase I M231 fielding began in June 2003. While there is a limited number of the M231 MACS available for training, units will continue to use current "bag" propellants until they are depleted.

Phase II M232 fielding began in March 2004. However, due to the vast number of M119 and M203 charges in the inventory and the M232 production rate, the M232 will not be available to for training until late 2004.

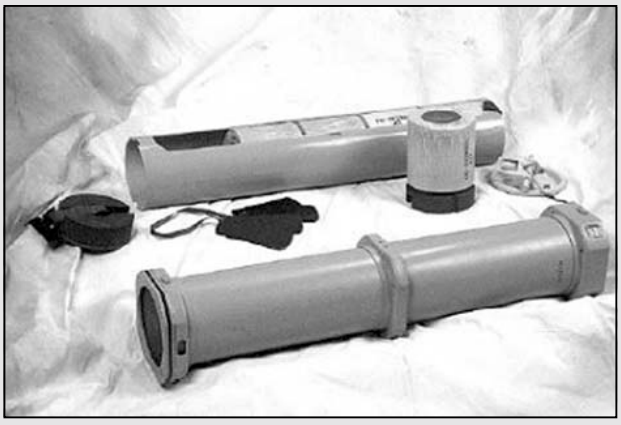
An exportable new equipment training (NET) package for training both the M231 and M232, including an interactive courseware program and dummy charges, is being issued instead of deploying a NET team. During Phase I fielding, MACS support and training materials were provided through the installation, marked for delivery to units, plus separate packages for the installation ammunition supply point and range control. Support and training materials for Reserve Component units are being shipped directly to the units.

Training for the affected military occupational specialties (MOS) and areas of concentration will be integrated into existing institutional courses.

MACS will require new fire control solutions for the M198, M109A5 and M109A6 howitzers. Automated fire control solutions are being provided to the gaining commands and installations by the appropriate program managers for the Paladin automatic fire control system (AFCS) and tactical



M231



M232

data systems. Graphical firing tables (GFTs) and tabular firing tables (TFTs) also are being provided through standard distribution channels. The advanced FA tactical data systems (AFATDS) Version 6.3.1 supports tactical and technical fire control while the battery computer system (BCS) Version 11.024 and Paladin AFCS software Version 11M also support firing MACS.

For additional information about MACS, contact the author at DSN 639-3389 or commercial (580) 442-3389 or email him at pearsons@sill.army.mil.

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MLRS Safety Data Calculator (SDC) Fielding Now

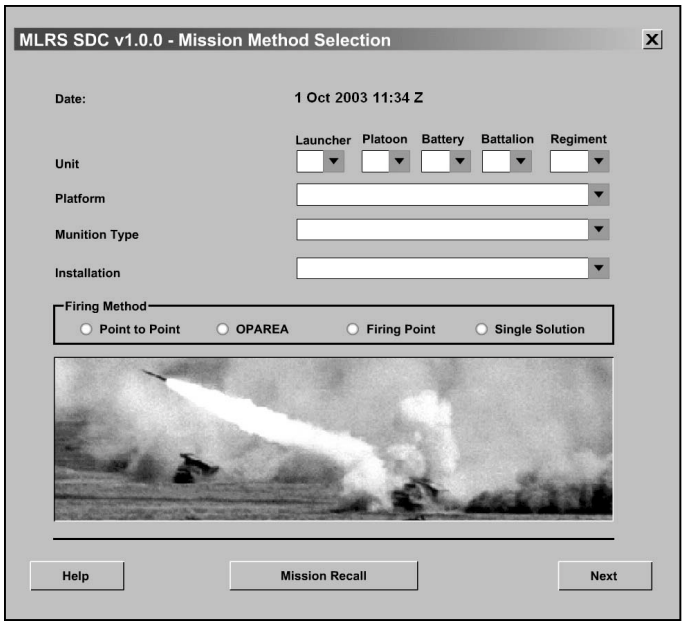
Since the first fielding of the multiple-launch rocket system (MLRS) in the early 1980s, safety procedures for unit live-fire training exercises have been tactically unrealistic, administratively labor-intensive, time-consuming and expensive.

The safety procedures contained in *FM 3-09.60 (FM 6-60) Tactics, Techniques and Procedures for MLRS Operations* articulate the need for MLRS launchers to be used as "check-launchers" when other launchers are conducting live-fire exercises. The check-launcher checks the data of the firing launcher's technical firing solution. The comparison of the launcher's firing solution to the check-launcher's solution validates the data before the launcher fires the mission. This ensures the safe firing of MLRS reduced-range practice rockets (RRPRs).

Tthe introduction of the MLRS SDC eliminates the need for check-launchers; the SDC started fielding in May.

The SDC. It is a Windows-based (98 through XP) software program installed on either a desktop or notebook computer (hand-held device as a future capability) that facilitates MLRS live-fire operations by computing safety data. The SDC can compute safety data for all current and future MLRS firing platforms: M270's improved position determining system (IPDS), M270A1 and high-mobility artillery rocket system (HIMARS).

The algorithm software in SDC is identical to the software in the launcher's fire control system (FCS). The SDC program generates safety "T" data for all methods outlined in FM 3-09.60—operations area (OPEREA), point-to-point and firing point—and creates the graphics for each firing method.



Computer meteorological (Met) data is entered manually by the operator or received electronically from an advanced FA tactical data system (AFATDS) or fire direction system (FDS). Modems and cables issued with either the command and control tactical trainer (C^2TT) (active) or the tactical proficiency trainer, digital enhancement unit (TPT-DEU) (National Guard) connect the SDC computer (laptop) to the command and control device. Standard Met is a selectable option and may be used for training purposes. Mission data can be filed in the system for pre-planning and historical use and also can be printed.

Cost Savings. According to the Project Manager for Precision Fires Rocket and Missile Systems, it costs approximately $1,600 per hour to operate a launcher. Many units are using two to four launchers to check the firing data of other launchers during MLRS platoon/battery certifications, which usually take one to two days. These certifications require current Met data—data that has a four-hour life span and requires a new safety T for each new Met.

The Army expects considerable cost savings in using SDC vice check-launchers.

Safety First. With the use of SDC, MLRS live-fire safety will be computed in a manner similar to that used by cannon units. The fire direction officer (FDO) verifies the fire mission data entered by the operators into AFATDS and the SDC. The SDC creates the safety T that is compared to the launcher's data at the firing point. If the launcher's solution falls within the limits of the safety T, it is considered safe and the launcher may fire. This process satisfies the requirement for two independent sources (SDC and the launcher) to compute the fire mission data and validates that the data is entered correctly.

The SDC program has undergone extensive testing. Side-by-side testing using M270, M270A1, HIMARS and SDC has produced results that have consistently been accurate to within plus or minus five mils.

The SDC is user friendly. Every MLRS unit will be issued the system software, a multimedia disc and user's manuals. A new safety appendix to FM 3-09.60 will be published, addressing the use of SDC.

The SDC will be used in 4th Quarter FY04 to support the initial operational test and evaluation (IOT&E) of HIMARS. During the test, HIMARS will fire more than 700 M28A2 rockets. A training package will be furnished to the Field Artillery School for possible inclusion in the curriculums of Military Occupational Specialty (MOS) 13P MLRS Operations/Fire Direction Specialist, MOS 13M MLRS Crewmember and 13A FA Officers.

T. J. Johnstone, Project Officer
MLRS Training & Operations
Titan Corporation

A Soldier's Story

SSG Jarvis Bass, Forward Observer

HHS/2-20 FA (MLRS/TA), 4th Infantry Division in OIF

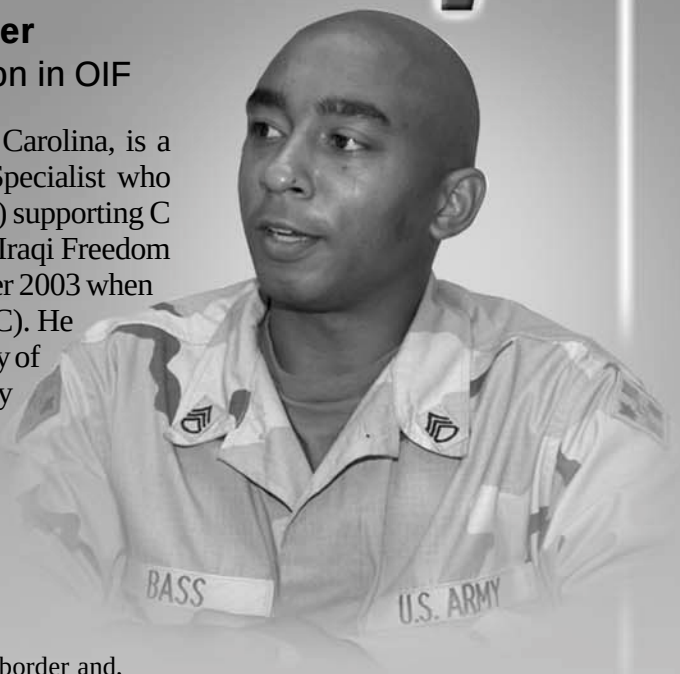


Photo by SGT Shawn P. Lowe, 444th Mobile PA Det, Fort Dix, NJ

Staff Sergeant (SSG) Jarvis M. Bass from Durham, North Carolina, is a Military Occupational Specialty (MOS) 13F Fire Support Specialist who served as a Forward Observer on the Fire Support Team (FIST) supporting C Troop, 1st Squadron, 10th Cavalry (C/1-10 Cav) in Operation Iraqi Freedom (OIF). He was deployed to Iraq from April 2003 until December 2003 when he returned stateside to attend the Basic NCO Course (BNCOC). He is part of Headquarters, Headquarters and Service (HHS) Battery of the 2d Battalion, 20th Field Artillery (2-20 FA), the 4th Infantry Division's divisional multiple-launch rocket system (MLRS)/ target acquisition (TA) battalion. He is 26 years old, is married and has a daughter, and is working on a computer science degree. The 4th Division considers him a Soldier Hero of OIF. This is his story.

When we first arrived in Iraq, we did what we were trained to do as a FIST with the division's Cav squadron. We led the way and secured occupation sites for the division during combat operations. I was very proud to be there, and the Iraqis were happy to have us there.

After the President declared major combat operations over [1 May 2003], we settled in the Kurdish city of Khanaqin. It's northeast of Baghdad near the border with Iran. My FIST team was sent to the border where we conducted reconnaissance operations and shot DPICM [dual-purpose improved conventional munitions], HE [high-explosive munitions] and M825 Smoke as shows-of-force for the Iranians.

We enjoyed Khanaqin. We helped the city establish a police force and set up a border patrol. We also conducted joint patrols with the PUK [Patriotic Union of Kurdistan, or Peshmerga]. Outbursts of violence in Khanaqin was rare.

In August, we moved south with C/1-10 Cav to Camp Caldwell near Ba'qubah. We conducted mounted patrols and reconnaissance operations around the camp. Then we received orders to police illegals entering the country from Iran. There were hundreds of Iranians crossing into Iraq on pilgrimages to Karbala. My troop policed a long section of the border and, later, received help from other troops in the squadron until the border patrol was large enough to patrol its own border.

That was one of the hardest things we had to do—establish a police force when we weren't police-qualified…establish a border patrol when we weren't border patrol-qualified. We trained the Iraqis on any of our Soldier skills that applied. Some Soldiers had previous police experience and some had a little knowledge of border patrol operations, so we put those guys in charge and helped them train.

The first time I heard that one of the Soldiers in my unit was killed, it was like a reality check, like "it really can happen." It made me put my guard up even more on dismounted patrols and in convoys, looking to the left and right, making sure my finger was near the trigger and looking out for my Soldiers and the Soldiers around me.

By the time I got back to Fort Hood, I had learned how to be a better Soldier, a better person. In Iraq, I had a lot of time to think, on guard duty and other times, about things I would change—everything from my time management of day-to-day activities to taking training more seriously. Soldiers tend to take going to the field or the NTC [National Training Center, Fort Irwin, California] for granted. Given the atmosphere in Iraq, I don't think I'll ever take training for granted again. When we train, we need to *train.*

The training we received at Fort Hood before deploying was outstanding. But, I'd like to learn more about infantry tactics and procedures, close air support [CAS] and naval gunfire. 13Fs need to know how to bring in all fires for the ground force, whenever the force needs them.

I'd advise other Soldiers going to Iraq to ask plenty of questions, find out as much as they can, especially if they are married. They must prepare their families, prepare themselves.

I'd also tell them to get into the right frame of mind. That means going in focused on their mission.

Discipline is important. It was so hot in Iraq that Soldiers wanted to take off their gear, even their body armor. We would go out on patrols in that gear at 0700, and when we returned around 0900, our entire uniforms would be drenched with sweat. We all had to stay hydrated—but we also had to wear the body armor to protects us from small arms fire.

Soldiers have to have the discipline to stay hydrated and in the right uniform, even when they are miserable.