

# Field Artillery

A Joint Magazine for US Field Artillerymen

July-August 2005

## Task Force Danger in OIF II

An Interview with  
MG John Batiste,  
CG, 1st ID and  
TF Danger

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#### Crater Analysis

A Primer for  
Field Artillerymen

#### BG Formica

Part II—Fallujah,  
IO and FFA HQ

#### IO for "JOE"

IO at the  
Tactical Level



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**Front Cover:** 1SG Grinston of C Battery, Task Force 1-7 FA, keeps an eye out for any suspicious activities during a site assessment in Bayji during Operation Iraq Freedom II. Part of the 1st Infantry Division, Task Force 1-7 FA served as a motorized infantry task force responsible for Bayji, one of the division's most hostile sectors. (Photo by SPC Elizabeth Erste, Combat Camera)

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# A Redleg's Parting Thoughts—Still Lots to Do

I begin this column with mixed emotions as it signals my final opportunity to speak to you as your 35th Chief of Artillery. Although it seems like just weeks ago, the time has passed in a blur; on 4 August, I will pass the reigns of the Field Artillery Half Section to Major General David C. Ralston.

As any commander or command sergeant major knows, you dread the day when the unit colors pass from your hands to another's. Your one wish is that the new command team will enjoy a successful tour and share your passion for taking care of your Soldiers and their families. I can report with confidence that Fort Sill, Oklahoma, and the Field Artillery branch will not miss a beat under the able leadership of Major General Dave Ralston and FA Command Sergeant Major William E. High.

As I prepare to "close station and march order to a new firing point and new Army missions," I would like to share a few parting thoughts. The past 19 months have seen our branch navigate through unprecedented turbulence: supporting an Army at War while becoming increasingly joint, transforming into a modular FA and Army, and leaning forward to lead the Army in developing the future combat systems (FCS). Today and for the foreseeable future, we will continue along all three of these major lines of operation while facing other challenges.

**Army at War with Joint Interdependency.** Unequivocally, our first priority has been—and will continue to be—supporting our Army, Marine Corps and Air Force at war. And we are fighting more and more joint.

Our service chiefs are the first set of joint chiefs to become general officers after fulfilling the joint requirements of the Goldwater-Nichols Act. They share an understanding of jointness that has propelled each service to examine ways to leverage joint interdependence.

In a joint fires sense, that has translated into some reduction of the Army's organic capabilities, trusting that joint fires will be there at the right time and

right place. This has left some uncomfortable. With the introduction of the networked fires capability in the FCS-equipped future force, I anticipate they will find considerably more comfort.

Meanwhile, we are building joint interdependency by developing integrated joint doctrine and joint tactics, techniques and procedures (JTTPs). In addition, we are training 13 F Fire Support Specialists in the Joint Fires Observer (JFO) Course at Nellis AFB, Nevada, with the first JFO Course at Fort Sill to start 29 August. Among the students are nine Indiana Guardsmen on their way to Iraq along with several Air Force personnel training as JFO instructors.

We also are working to initiate training to qualify our 13F Fire Support Specialists as joint terminal attack controllers (JTACs). This initiative will help supplement the limited pool of Air Force JTACs, which the Army needs down to the company level, sometimes the platoon level, in counterinsurgency operations.

**FA Transformation.** We are well on our way to growing enough Fires Battalions to be organic to each of the 43 modular brigade combat teams (BCTs), which is an increase from 33 FA battalions.

Fire support teams (FISTs) in these BCTs that, in the original design were organic to the infantry companies, are being consolidated at the maneuver battalion level. In fact, at least one Active Component division commander has directed his FISTs be assigned to the headquarters and headquarters batteries (HHBs) of the FA battalions organic to his BCTs. The combat observation lasing teams (COLTs) are being consolidated at the BCT level. These con-



solidations facilitate better standardization of fire support training and certification across the BCT.

The concept of the Fires Brigade is increasingly better understood. Although there is not a rigid, fixed structure for the two-star unit of employment (UEX), we reasonably can expect a Fires Brigade to be an integral part of the formation during UEX offensive and defensive operations—perhaps even during security operations. The great work of artillerymen in theater has documented the incredible value and versatility our formations bring to military operations across the spectrum—artillery officers, NCOs and warrant officers leading disciplined, trained and fit FA Soldiers who are well equipped.

I recently attended a Training and Doctrine Command (TRADOC) Commandants' Integrated Concepts Team (ICT) at Fort Leavenworth, Kansas, to sort out the doctrine to be published in the new Field Manual (Interim) (FMI) 3-91 UEX Operations. FMI 3-91 describes how the two-star UEX will fight. This new doctrine will be on the street not later than December—earlier, if possible.

A Maneuver Enhancement Brigade will be part of the two-star UEX. It will have the UEX's Air Defense Artillery, Military Police, Chemical and Engineers in one brigade and, like the UEX BCTs, routinely will be responsible for

its own area of operations. This organization will give the two-star UEx commander tremendous flexibility.

The new FMI 3-91 highlights the special relationship that will exist among the three of the UEx's supporting brigades: the Fires Brigade, Battlefield Surveillance Brigade (BfSB) and Aviation Brigade. These brigades will do the lion's share of shaping the UEx fight and setting the conditions for their BCTs' success. The synergistic relationship among these three brigade commanders will be key to the success of the UEx fight.

Although forms of both the Fires and Aviation Brigades have existed in the past, both of these formations will increase their capabilities under modularity. This is particularly true of the fires and effects cells (FECs) in these two new organizations.

The BfSB is an altogether new organization responsible for surveillance and reconnaissance of UEx battlespace not assigned to the BCTs or the Maneuver Enhancement Brigade.

**Recruiting, Retention and Promotions.** In terms of recruiting, we all recognize that our volunteer Army continues to be tested to get the required numbers for both enlistments as well as reenlistments. I recently had the chance to speak to some of our FA Drill Sergeants as well as some new privates who were just beginning their training here at Fort Sill's FA Training Center (FATC).

These new Soldiers represent a population unique in our Army's history: volunteers for an Army with no draft. They are Americans who have raised their right hands and volunteered to join an Army that is fighting a war. They have chosen to join the Army with the full knowledge that they, in all likelihood, will be deployed to fight for their country.

If we put this in the context of how we used to train new Soldiers at our training centers, the patriotism and spirit of these young Americans fundamentally has changed the way we train them. Not only have the programs of instruction (POIs) undergone incredible change as we embraced the Warrior tasks and drills, but also the attitude and leadership approach of our Drill Sergeants has changed. The Drill Sergeant has moved from a "push mentality" approach to one that says, "Follow my lead and, together, we will succeed in mastering these required Soldiers skills." This is powerful.



TRADOC Army Drill Sergeant of the Year Staff Sergeant Reynolds Jolly III, A Battery, 1st Battalion, 22d Field Artillery, FATC.

Retention is the second piece. A Soldier cannot become important to the organization *only* on the day that he falls into the reenlistment window. If we have not made that Soldier feel he is valued as a member of the team from the day he arrived in the unit, we are too late—the Soldier sees right through that "shell smoke."

My advice to Field Artillerymen: Do not lower your standards, but *do* make every effort to embrace the new Soldier and his family as they enter your organization. This is also very important for our National Guard artillery units that have become an operational reserve and continue to deploy on a regular basis, often serving in nontraditional roles.

From my observation post, our numbers are holding well, and our branch continues to enjoy the reputation of taking care of its own. Fort Sill's Deputy Commanding General (DCG), Brigadier General Mark A. Graham, recently traveled to speak with the ROTC cadets during Branch Day at Warrior Forge at Fort Lewis, Washington. He reports the cadets' strong enthusiasm for the branch with the realistic and dynamic Redleg training presented by Fort Lewis.

In terms of promotions, we also are having some successes. For example, this year's majors' list had a strong showing for artillerymen. We had 13 below-the-zone selectees, the most of any branch except Infantry. Congratulations to each of those outstanding

promotable captains.

On the other hand, the FA CSM High has been on the net with our NCOs concerning the recently released CSM list. Unlike officer selections, NCO selections target vacancies, and this year several NCOs remained from last year's list. I am confident we will see this turn around next year, so I ask our senior NCOs to "hang in there." Next year certainly will have better numbers.

On a brighter note, Fort Sill won the TRADOC Army Drill Sergeant of the Year for the second straight year. Staff Sergeant Reynolds Jolly III of A Battery, 1st Battalion, 22d Field Artillery (A/1-22FA), FATC, garnered that honor for the FA.

Also, on 15 July, we promoted the Army's first female combat arms sergeant major, SGM Jeanette Clement. SGM Clement is en route to be the NCO-in-charge of the division FEC in the 101st Airborne Division (Air Assault) at Fort Campbell, Kentucky, as the division prepares to deploy to Iraq.

**High-Performing Redlegs.** Artillerymen and their units are "getting it done." Recently, I visited the Army's first high-mobility artillery rocket system (HIMARS) battalion at Fort Bragg, North Carolina, the 18th Field Artillery Brigade's 3-27 FA commanded by Lieutenant Colonel Bill Turner. The Soldiers of 3-27 FA were excited to be in live-fire training with their new launchers. Combining the rapid deployment capability of the lighter, more easily transportable HIMARS with the awesome punch of the new guided multiple-launch rocket system (GMLRS)-unitary round provides component commanders tremendous capabilities. GMLRS-unitary brings "pickle-barrel" precision and scalable rocket effects (no duds) to the battlefield, including danger-close effects, from 70 kilometers away.

Our FA National Guardsmen also are "getting it done"—they are moving out on resourcing two battlefield coordination detachments (BCDs) collocated with the Air Force Falconer air operations centers. One BCD will be at Hurlburt Field in Florida with an element at Nellis AFB, and the second will be at Hickam AFB in Hawaii. Does the Guard know how to pick the "hardship" locations or *what*?

The performance of Field Artillerymen in Iraq and Afghanistan is renowned throughout the services. Our fire supporters are the ground commanders' "go-to" guys for lethal and nonlethal



effects, including joint air power. Our officers, NCOs and Soldiers in our FA units are doing a magnificent job, many serving in nontraditional roles.

If you haven't read the blurb on the inside front cover of this magazine telling who the Soldier on the front cover is, you need to. On the cover is First Sergeant Grinston of C Battery, Task

Force 1-7 FA, 1st Infantry Division, who just returned from Operation Iraqi Freedom II. He ain't your daddy's first sergeant—he's an FA Warrior.

Versatile, capable and adaptable Field Artillerymen set the Army's standard for performance in theater. Your service to the Army—and your families' incredible support—make me proud to

be a Redleg.

As I give up the title of Chief of Field Artillery to the 36th Chief, I also must finally give up the red stripe on my dress uniform—all general officers have black stripes except for the chiefs of the branches. Rest assured that, regardless of the color of my stripe, I *always* will be a Redleg. I salute you.

## Excalibur Unitary PGM Down Range in Iraq

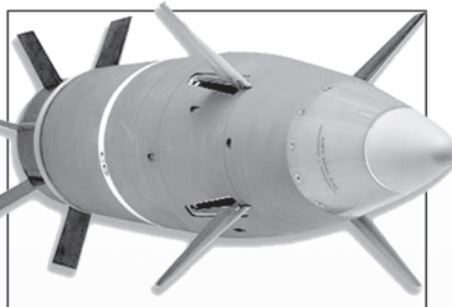
Coalition Forces often observe insurgents but cannot engage them because they lack timely, precision responses for use in an urban environment.

Precision munitions currently in theater lack the scalability and responsiveness to engage these targets that have low dwell time. Cannon munitions have the responsiveness and warhead scalability, but their inherent inaccuracies raise the potential for collateral damage to unacceptable levels. Consequently, the use of Field Artillery in contemporary urban operations has been reduced, forcing many guns to sit silent.

**Urgent Need for a Cannon Precision-Guided Munition (PGM).** In August 2004, the MultiNational Corps, Iraq (MNC-I) submitted an urgent needs statement (UNS) requesting a precision-guided cannon munition with greater range and lethality than current munitions, a round that has a circular error probable (CEP) independent of range and a fire-and-forget capability.

On 6 November and 18 December 2004 at Yuma Proving Ground, Arizona, two Excalibur Unitary rounds were fired at targets 20 kilometers away and landed 3.4 meters and 6.9 meters from the targets, respectively. Excalibur's precision demonstrated by these tests and its extended range and fire-and-forget capability made it a possible solution for the UNS. In March 2005, the Army Resource and Requirements Board at the Pentagon decided to accelerate Excalibur to satisfy the UNS. Deliveries in Iraq will begin in the Second Quarter of FY06.

**What is Excalibur?** Excalibur is a GPS-guided 155-mm unitary high-



explosive (HE) cannon munition. It uses an inductively set fuze with three modes—point detonation, variable time and delay—and base bleed to achieve extended ranges, 35 to 40 kilometers, from digitized 155-mm platforms. Excalibur maintains a 10-meter CEP at all ranges and combines a naturally fragmenting steel warhead with a near-vertical terminal trajectory to achieve greater lethality than current HE rounds. The non-ballistic trajectory and near-vertical terminal trajectory make it ideal for complex and urban terrain.

Excalibur was chosen as a solution because of the overall maturity of the program. Originally scheduled for fielding in FY08, the program was accelerated to synchronize with the fielding of the M777A2 155-mm lightweight howitzer in the 5th Stryker Brigade Combat Team (SBCT) in mid FY07.

**Technical Challenges of Accelerating the Program.** Accelerating Excalibur is not without risks and tradeoffs. To meet the specified delivery date, deviations from the program were necessary. Time constraints forced base bleed to be removed from consideration for the early fielding round, reducing the maximum range to 22 kilometers. The test schedule also was condensed, allowing little room for program slippages or delays.

When Excalibur arrives in-theater, a total system will be delivered, not just a

round. In addition to the round, firing units must have an updated version of the advanced FA tactical data system (AFATDS) software, an update to the forward observer system (FOS) software and the enhanced portable inductive artillery fuze setter (EPIAFS). Accelerating Excalibur also required accelerating these other systems or producing an interim solution.

To field the round on time, the AFATDS software update will be released as a service pack before Software Block 2. Also, an interim stand-alone fuze setter will be required to breach the gap between AFATDS software and the current automatic fire control system (AFCS) software on the Paladin. Both interim solutions are needed only for the early fielded rounds and will be unnecessary when the round associated with the program of record is fielded.

Despite the constraints on introducing the round to Iraq, an incredibly capable munition will be placed in the hands of maneuver commanders. Excalibur's responsiveness and suitability for complex terrain allows commanders to engage the enemy in today's contemporary urban environment. Its non-ballistic trajectory will deny the enemy sanctuary in his current surroundings, forcing him either to abandon his sanctuary or find increasingly risky means of delivering his harassing fires.

Excalibur will change the dynamics of current operations and reinforce the impact of Field Artillery on the urban and complex terrain battlefield.

MAJ J. Riley Durant, FA  
Assistant TSM Cannon  
Fort Sill, OK

**Major General John R. S. Batiste**

Former Commanding General, 1st Infantry Division and Task Force Danger

# Task Force Danger in OIF II

## *Preparing a Secure Environment for the Iraqi National Elections*

Interview by Patrecia Slayden Hollis, Editor

*On 16 March 2004, the 1st Infantry Division and Task Force (TF) Danger took control of north-central Iraq from the 4th Infantry Division with an area of responsibility (AOR) about the size of the state of West Virginia. The TF headquarters was at Forward Operating Base (FOB) Danger in Tikrit. (See the figure for the TF organization.)*

*In partnership with the Iraqi civilian and military authorities, TF Danger's mission was "to ensure a secure, stable and self-reliant Iraq...neutralize anti-Iraqi forces [AIF] and set the conditions for successful national elections."*

*While in Iraq, TF Danger conducted full-spectrum lethal and nonlethal operations, cleaning out pockets of the insurgency and increasing security for the Iraqi national elections in January 2005. The 1st Infantry Division and TF Danger began redeploying to Germany, Hawaii and other locations in the US in February.*

*Ed*

**Q** *What were the most significant lessons you learned in the second battle of Fallujah [November 2004]?*

**A** One is we have *great* doctrine. Doctrine tells us to attack the enemy from multiple directions at once very quickly, using the best intelligence you have and the most effective weapons systems available, including close air support [CAS].

It's all about accurate, predictive intelligence, so when you attack, you can do it quickly, precisely, violently and aggressively and be done with it. And that's exactly what TF 2-2 Infantry did in Fallujah and exactly what we did in Samarra, Baqubah, Hawijah, Bayji,



Balad and a number of other locations in AO [area of operations] Danger. [TF 2-2 IN was attached to the 7th Regimental Combat Team, 1st Marine Division in I Marine Expeditionary Force for the battle of Fallujah.] TF 2-2 had tanks, Bradleys, Paladins, LRAS<sup>3</sup> [long-range advanced scout surveillance systems], mortars, joint air—all the systems it needed. [See the article "Task Force 2-2 IN FSE AAR: Indirect Fires in the Battle of Fallujah" by Captain James T. Cobb, et al, in the March-April edition.]

At the same time, in this kind of full-spectrum operation, you don't want to kill or injure innocent people. For every one you kill or injure, there are hundreds who are related through the complex Iraqi tribal system. So it's tough work. Precision is important.

The division structure as we know it today with its three division command posts, brigade combat teams [BCTs], Div Arty [division artillery], DIVENG [division engineers], DISCOM [division support command] and separate battalions, is *very* good—the 1st Infantry Division has yet to become modular.

We've moved from an analog headquarters to a digital headquarters and have many collaborative tools, although we need more. The sheer elegance of this division headquarters is its flexibility, redundancy and agility to task organize on-the-move—with its *phenomenal* Abrams tanks, Bradley fighting vehicles, Apaches and Paladins. The key is great Soldiers with solid doctrine and equipment. We have all three.

Lesson Number Two learned in Samarra: Before the first shot is fired, you must be postured to finish the stabilization and reconstruction process in the final phase. You must be postured to fix what you broke so you can change people's attitudes and give them an alternative to the insurgency. You've got to have the reconstruction money lined up, know what the projects are going to be and have empowered commanders at the company, battalion and brigade levels to make a difference quickly.

**Q** *What were the most significant lessons you learned in Samarra [October 2004]?*

**A** Now Samarra is a tremendous case study—we could talk about Samarra for hours. In Samarra, five US battalions and six Iraqi battalions under the command and control of Colonel Randy Dragon and his 2d BCT attacked to destroy the insurgency from four different directions simultaneously on the morning of the first of October. Within 24 hours, it was over.

It was over so quickly for several reasons. We had good intelligence and a well developed and rehearsed plan. We attacked from the march to overwhelm the insurgency in a 360-degree fight with the right kind of fire control measures.



The Iraqi Army battalions that attacked with us performed very well.

In addition to employing artillery and mortars in urban operations, we employed lots of CAS with F-18s, 16s and 14s; our own Kiowa and Apache helicopters were in this fight the entire time. We employed AC-130s every time we could get them.

For the fight in Samarra, we were supported by Predator [an unmanned aerial vehicle, or UAV] at the division level. We also had Shadow at the brigade level and Raven at the battalion level. They were in the air constantly and did tremendous work.

From the division perspective, we need a near-permanent Predator-like capability that can lase and designate for timely and precise fires. The idea is to reduce the sensor-to-shooter linkage and strike with a high degree of accuracy. It doesn't even have to be a UAV armed with Hellfire as long as it can designate so we can fire Hellfire off an Apache or

a Kiowa Warrior from five kilometers away.

Divisions need a UAV that has long dwell time for operations, such as those in Fallujah and Samarra, that can designate for Hellfire in a near-continuous manner. It is all about weighting the division main effort.

In OIF II, which included a significant amount of urban operations, we used all our joint tools. For example, during our year of deployment, we fired more than 8,000 155-mm artillery rounds and thousands of mortars rounds, including in urban operations. We also fired more than 100 rockets in "ripple" rounds [rockets fired in sequence] at the enemy who was shooting at us.

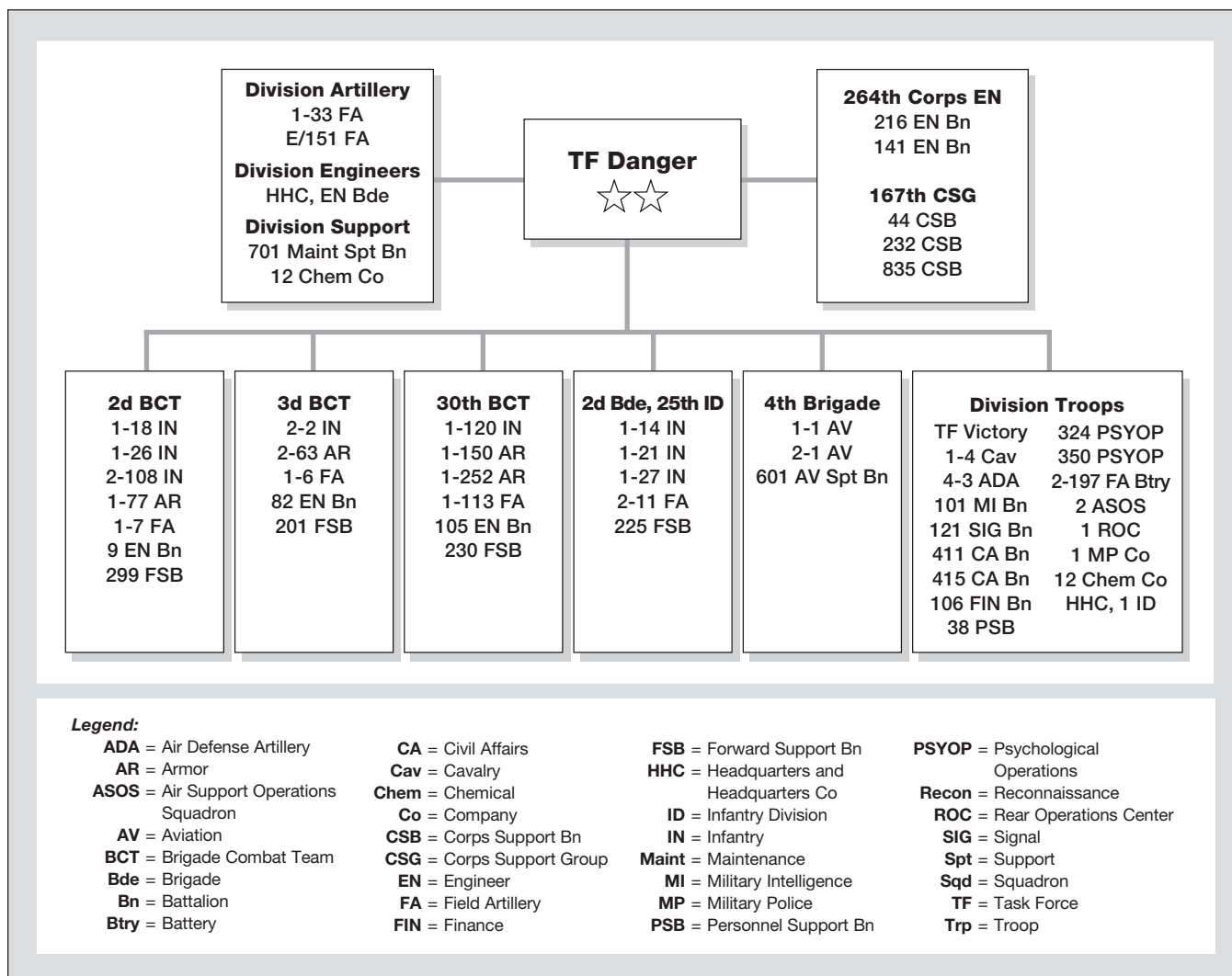
But artillery or a 500-pound laser-guided bomb is not the weapon of choice if you want to kill a small group of insurgents standing on the doorstep of a house in a crowded neighborhood. If either one of them could get there in time to kill the fleeting target, the im-

pact could be overkill and cause collateral damage that would be unacceptable in this kind of a fight. That's where the UAV that can designate for Hellfire comes in.

**Q** How did you employ joint air power?

**A** The 2d ASOS [Air Support Operations Squadron] in this division is great. Our ASOS personnel were embedded at the division, brigade and battalion levels and, in some cases, down into companies. The A<sup>2</sup>C<sup>2</sup> [Army air-space command and control] linkages we developed worked extremely well, all the way down to the platoon level in the close fight with Apaches and Kiowa Warriors in support.

However, we needed JTACs [joint terminal attack controllers] down to the company level, sometimes at the platoon level, to control CAS. In this kind of full-spectrum fight in Iraq or Af-



Organization of the 1st Infantry Division and Task Force (TF) Danger for Operation Iraqi Freedom (OIF) II

ghanistan, more often than not, we fight in platoon-level operations.

Now the Air Force ETACs [enlisted terminal attack controllers or Air Force JTACs] are wonderful, but there just aren't enough of them. There's no reason why we can't train and equip COLTs [combat observation lasing teams] and other scout organizations to do the same thing as JTACs.

In fact, we had some Soldiers controlling terminal attacks of CAS in OIF II because we worked so closely with the 2d ASOS. We treated the 2d ASOS as another battalion-level command in the 1st Infantry Division. When you do that, you build trust and confidence among all the subordinate units.

I understand the Air Force is qualifying the Army's first JTAC in July, a 13F Fire Support Specialist [Sergeant First Class Rico R. Bussey], and also qualifying him as a JTAC instructor. That's a step in the right direction.

**Q** *In March of 2006, we'll field the 155-mm Excalibur precision-guided unitary round in Iraq. It has a range of about 40 kilometers and an accuracy of 10 meters CEP [circular error probable]. It is designed for the close fight and minimizes collateral damage in urban and complex terrain. Could you have used that round in Iraq?*

**A** Oh, *absolutely*. We often were attacked by rockets from 21 or more kilometers away. And in those instances, we used ripple rockets out of MLRS [multiple-launch rocket system] to shoot back at the enemy. If we could have attacked the insurgents from 40 kilometers away with that kind of precision, it would have been terrific.

**Q** *In early June, we fielded a limited number of 15- to 70-kilometer precision-guided MLRS unitary rockets in OIF III. The rocket, which has no duds and a small footprint, can be fired very close to friendlies with confidence and is optimized for urban and complex terrain. Would you have been able to use that rocket in OIF II?*

**A** Yes. There were times when rockets were fired at us from so far away that we committed helicopters with maneuver forces to defeat the threat. That was not always a timely response to the insurgent's fire and put



Photo by SPC Elizabeth Erste, 55th Signal Company (Combat Camera)

Under the cover of night, 26 January 2005, a Soldier from 3d Platoon, C Battery, TF 1-7 FA, waves his truck forward during a barrier placement mission at a polling station in Baiji.

the Soldiers and helicopters at risk.

When we had a good acquisition of the insurgent's weapons system or, for example, confirmed that insurgents were meeting at a specific location, then I'd have fired a unitary rocket in a *heartbeat*.

**Q** *What tools did you use to see problems from the Iraqi perspective?*

**A** We engaged Iraqis all the time to spread our themes and messages, change attitudes and give the Iraqis alternatives to the insurgency. We applied "spheres of influence," which is a concept the US Army in Europe developed in the Balkans. That means that at the division level, we engaged and influenced a certain set of leaders and people. In turn, the brigade commander engaged a subset, which was his sphere of influence. The spheres went all the way down to the company commander and platoon leader levels. We never crossed into another's sphere of influence unless it was coordinated and deliberate.

So, when we got to Iraq, we knew we had to figure out the Iraqi's political, religious and tribal system and develop our spheres of influence. The tribal system is complex. There are many sheiks in Iraq, and some who you think are sheiks are not. The Iraqis also have powerful imams, both Shi'a and Sunni. We had to sort all that out and figure out

who was in charge of the people, so we could help influence Iraqi thinking.

At the division-level, we met with a three different groups. Monthly we met with the governors from the four provinces in north-central Iraq. Often, they would be accompanied by the directors of their provincial joint coordination centers [JCCs]. The Task Force Danger brigade commanders and I met with this group for a half-day each month over lunch to share ideas and cross talk.

We convened a sheiks' council once a month. When I left Iraq, the council had about 12 senior sheiks on it. It took us about six months to figure out who the real power brokers were across the four provinces. This, of course, is a work in progress.

Third we met every two weeks with an Iraqi Senior Advisory Council made up of about 40 professors, ex-military, doctors, lawyers, etc., including a couple of women. We broke them into four groups and gave each

group a problem set to work and then tell us how they would solve the problem. So the council helped us to see problems and solutions through Iraqi eyes. I relied on this group to help us understand Iraqi attitudes and to spread our themes and messages.

Commanders at all levels met with government, tribal and religious power brokers and professionals who influence the Iraqi people and understand the challenges in their areas of operation. Even the section and squad leaders have spheres of influence via their face-to-face engagements with the Iraqi people on the street.

All these meetings had second and third order of effects. That's why it was important for the Division FEC [fires and effects cell] to publish biweekly talking points and messages, so that the entire chain of command was talking off the same "sheet of music."

It was powerful—all those levels engaging the Iraqis to solve problems and change attitudes.

**Q** *Please describe your FEC and how you employed it.*

**A** The Div Arty commander was chairman of the FEC. It was a planning cell with all the normal maneuver and fires participants that you would expect for kinetic operations. But the FEC also determined how to



synchronize lethal and nonlethal fires and effects, recommended measures of nonlethal effectiveness (a tough one) and helped me to interpret the reactions of the Iraqi people. So the FEC included civil affairs, PSYOP [psychological operations], public affairs, IO [information operations] and CMO [civil military operations] and the whole range of infrastructure repair engineer staff. The Div Arty commander chaired the FEC and, in concert with the Chief of Staff, briefed me every two weeks or so on the important effort to synchronize lethal and nonlethal fires with the scheme of maneuver.

For example, in Samarra, the FEC had to determine the plan for nonlethal effects before, during and, most importantly, after combat operations. We planned to get the “shooting” done as quickly as possible and then reestablish Iraqi control, put the proper Iraqi police back in control, help the hospital get what it needed and fix the water, electricity, etc. These nonlethal effects all had to be integrated to leverage one to help the other. The process is very complex.

The FEC was the most important battle staff planning group in the division.

**Q** *How did you employ your Div Arty, both traditionally and nontraditionally?*

**A** The Div Arty commander wore three hats: the more traditional hat as the commander of the force FA headquarters [FFA HQ]; the traditional hat of FSCOORD [fire support coordinator] but expanded to effects coordinator [ECOORD] as the chairman of the FEC, which we have talked about; and the less traditional hat of providing the division the flexibility to task organize for unique missions, such as FA battalions as motorized task forces or the Div Arty as a maneuver BCT headquarters.

As commander of the division’s FFA HQ, I turned to the Div Arty commander for technical FA expertise—an extremely critical function. He provided expertise on artillery, fire control measures and radar positioning and maintenance. For example, when you have 29 radars critical to counterfire spread over an AO the size of West Virginia, you must know when to change their radiating direction and work to keep the repair parts flowing. Our radars were fundamental to our success, and the Div

Arty team maintained the highest OR [operational readiness] in theater.

We brought about one-third of our guns and some MLRS, with us to Iraq and spread this capability out to protect the force in more than 28 base camps. The scheme of fires had to be tied to the guns, mortars and radars, so we could respond quickly to insurgents shooting at us. The price of shooting rockets or mortars at the 1st Infantry Division was very high.

We didn’t mass guns very often, although we did in Fallujah and Samarra. Because we were spread out so far, when we massed, it usually was four guns at a time.

The FFA HQ did all that extremely well.

Another nontraditional mission was task organizing the Div Arty headquarters into a maneuver BCT. During OIF II, I used the Div Arty as a BCT headquarters for about six weeks, and it performed very well. On the fly, the Div Arty picked up an infantry battalion from the 25th Infantry Division, an engineer battalion, a Salvadorian battle group (battalion-sized unit), an engineer battalion and several companies and went down to An Najaf to conduct full-spectrum operations.

We task organized the Div Arty’s 1-6 FA [TF 1-6 FA] into a motorized infantry battalion with responsibility for Baqubah and, similarly, TF 1-7 FA with responsibility for Bayji. These task forces had two of the toughest sectors in the 1st Infantry Division AOR. TF 1-6 employed lethal fires in support of its close fight in the city of Baqubah, and TF 1-7 also had a very lethal, dangerous fight in Bayji. Both battalions performed very well.

On top of all that, we task organized 1-33 FA, MLRS, with the right amount of engineers and other assets for the CEA [captured enemy ammunition] mission. 1-33 FA did a bang-up job. It picked up stockpiles of enemy ammunition that we either inherited or found—and we found an awful lot—and destroyed an incredible amount of CEA over time, some 30 million pounds. This great effort kept the ammunition out of the hands of the insurgency.

In terms of missions, the Div Arty was the most versatile brigade in the division and the most dispersed to conduct those missions. The capabilities resident in the Div Arty allow the division incredible flexibility and the agility to task organize the FA on the move, as we did in OIF II.

**Q** *What were the biggest challenges of Field Artillery battalions as maneuver task forces?*

**A** The first challenge was to reconfigure, not only with respect to their organization and equipment, but also their thought processes. For example, gun section leaders found themselves as infantry squad leaders in mostly platoon-level operations in the middle of Baqubah or Bayji.

I was very proud of both 1-6 FA and 1-7 FA because they made that change so quickly. Those battalions developed great instincts. In terms of the organization of the FA task forces, we scrambled. The entire structure of the FA battalion had to change into a motorized infantry battalion, including having its own FSE [fire support element]. Some functions formerly performed by the FA battalion FSE to support the BCTs had to be performed by the brigade FSE, not only for the infantry task forces but the FA task force as well.

Having an FFA HQ allowed us the flexibility to reconfigure the FA and shift functions. We must be careful in our modular redesign to ensure an FFA HQ capability remains in the force.

**Q** *What should we change to ensure the FA battalion is effective as a motorized rifle battalion?*

**A** Although the FA task forces operated as maneuver task forces, I would not change the FA battalion’s METL [mission-essential task list]. The FA METL and training must maintain core competencies of providing or massing accurate fires when and where we need them—that’s a fulltime job. But the training should emphasize deliberate troop-leading procedures with young leaders in tough positions where they have to solve problems, rehearsals and basic infantry battle drills—skills *all* Soldiers need.

For the kind of insurgency fight we have now, the FA battalion needs to focus on the dismounted role in the close fight, clearing buildings, training snipers and those kinds of things about six months before the mission.

However to accomplish the mission, we do need a TOE [table of organization and equipment] shift. The FA battalion needs M4s with all the proper optics for the scopes, LRAS<sup>3</sup>, sniper rifles, breaching equipment—all the tools needed for the counterinsurgency

missions—in its TOE. TF 1-6 and TF 1-7 didn't get that equipment until we were already in Iraq.

**Q** *I understand you trained Iraqi security forces to protect the Iraqis during the very successful 30 January national elections. How did you prepare them for that responsibility?*

**A** Everything we did in OIF II was to build a secure environment for the elections, including equipping and mentoring the Iraqi Security Forces: the Iraqi Army, Iraqi Police and the Department of Border Enforcement on the Iranian border. At the beginning of our OIF mission, we partnered a US battalion with an Iraqi Army battalion (or police department or whatever) and established clear tasks, conditions and standards for the battalion to achieve increasing responsibility over time. The idea was to get the organization to the point where it was self-sufficient before the elections on 30 January.

We also stood up 25 JCCs throughout the provinces. They served as Iraqi command posts, at the provincial, district and city levels. We trained the Iraqis to operate those command posts.

At first the JCCs were no more than little rooms, each with a desk and a phone in it. Within 12 months, we'd expanded that into multiple desks, LNOs [liaison officers] from all the Iraqi Security Forces in a given region, a direc-

tor in charge, computers on every desk, maps on the wall, internet capability linking all 25 JCCs together and to Baghdad, phones, 911 lines—the whole nine yards. And the Iraqis were using the JCCs.

These JCCs were fundamental to the success of the elections. For example, in the provincial JCC in Baqubah on 30 January, the governor, deputy governor, chief of police and Iraqi Army brigade commander were all there along with assorted other operators and planners; they knew precisely what was going on in their polling stations and commanded and controlled quick reaction forces to solve problems. The euphoria in the room was *phenomenal*.

The 25 JCCs maintained absolute situational awareness of all the 900-plus polling stations in our AOR and made a big difference in the elections.

In addition, prior to the elections, we trained and equipped the Iraqi Security Forces, put them through the military planning process for the elections, helped them figure out how to perform security and mentored them to rehearse at all levels.

We were able to surge a lot of equipment on them about 30 days before the elections: new AK-47s, vehicles, radios, uniforms, helmets and body armor. Their confidence and morale went off the charts. As a result, they gained the Iraqi people's confidence on election day.

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

**A** My advice to commanders is never go into a fight without your Field Artillery—and take as much as you can get with the longest range and most accuracy and precision you can get. I say to Field Artillerymen, “When you come, bring your *radars*.”

I have a lot of respect for the Army's very *versatile* Field Artillerymen.

**Major General John R. S. Batiste, until recently, commanded the 1st Infantry Division in Germany, deploying the division and other elements to comprise Task Force Danger to Iraq for Operation Iraqi Freedom II. Currently, he is the Deputy Commanding General of V Corps, US Army Europe and Seventh Army, also in Germany. He has served as the Deputy Director for Joint Warfighting Capabilities Assessment, J8, on the Joint Staff and as the Senior Military Assistant to the Deputy Secretary of Defense, both at the Pentagon. He was the Assistant Division Commander of the 1st Cavalry Division, Fort Hood, Texas; Assistant Chief of Staff for Plans and Policy, CJ5, in the Headquarters, Allied Forces Southern Europe in Italy; and commander of 2d Brigade, 1st Armored Division, deploying the brigade combat team to Bosnia-Herzegovina for Operation Joint Endeavor. He deployed to the Gulf as the S3 of the 197th Infantry Brigade (Separate) assigned to the 24th Infantry Division for Operations Desert Shield and Storm.**

## Redleg Roll Call—1st ID

*These are the Field Artillerymen who lost their lives while serving in the 1st Infantry Division and Task Force Danger in Iraq from September 2003 through January 2005. We honor these Redlegs and their fallen brethren in TF Danger. The Army's greatest asset is the Soldier, who implements American international policies around the globe on the dangerous frontlines and can pay with his life—as each of the 117 Soldiers lost in TF Danger did. God keep them.*

SGT Jack Bryant, Jr.  
HHB/1-6 FA  
20 November 2004

SPC Peter G. Enos  
HHB/1-7 FA  
9 April 2004

SFC Raymond E. Jones  
C/1-7 FA  
9 April 2004

SPC Michael A. Martinez  
B/1-6 FA  
8 September 2004

SPC Thomas J. Sweet II  
HHS/1-5 FA  
27 November 2004

CPT Christopher S. Cash  
A/1-20 IN, 30th Brigade  
(NCARNG), Attached to 1-6 FA  
22 June 2004

SPC Adam D. Froelich  
C/1-6 FA  
25 March 2004

SPC Tracy L. Laramore  
B/1-18 IN, 1st ID,  
Attached to 1-7 FA  
15 March 2004

SPC Clint Matthews  
B/1-18 IN, 1st ID,  
Attached to 1-7 FA  
17 March 2004

SPC Allen J. Vandayburg  
C/2-2 IN, 1st ID,  
Attached to 1-6 FA  
9 April 2004

SPC Daniel A. Desens, Jr.  
A/1-20 IN, 30th Brigade  
(NCARNG), Attached to 1-6 FA  
22 June 2004

SPC Joshua J. Henry  
A/1-7 FA  
20 September 2004

PFC Jason N. Lynch  
C/1-6 FA  
18 June 2004

GPL Marcos O. Nolasco  
B/1-33 FA  
18 May 2004

SPC Nicholas Zangara  
C/1-7 FA  
24 July 2004

SPC Morgan N. Jacobs  
B/1-18 IN, 1st ID,  
Attached to 1-7 FA  
7 October 2004

SSG Toby W. Mallet  
C/1-7 FA  
9 April 2004

PFC Ernest H. Sutphin  
B/2-11 FA, 25th ID,  
Attached to 1st ID  
19 March 2004



# A Soldier's Story

## SFC Erick Macher, Scout Platoon Sergeant TF 1-7 FA, 1st ID, in OIF II

*Sergeant First Class (SFC) Erick R. Macher from Fairfield, California, is a 13B Cannoneer serving as the Platoon Sergeant for 2d Platoon, A Battery in Task Force 1st Battalion, 7th Field Artillery (TF 1-7 FA), 1st Infantry Division (1st ID) in Germany. He deployed to Operation Iraqi Freedom (OIF) II (February 2004 to February 2005) and served as a Scout Platoon Sergeant for Task Force 1-7 (Motorized Infantry) in Bayji, about 30 kilometers north of Tikrit, one of the largest and most hostile areas of operation (AO) in the 1st ID's sector. SFC Macher was awarded a Purple Heart and a Bronze Star, the latter for his overall leadership and actions during more than 400 combat patrols. This is his story.*

About 72 hours after we got to Kuwait, we learned our FA battalion that was deployed as an infantry task force needed a scout platoon. That platoon would have to operate independently using infantry tactics. It was an honor when our platoon was selected to be the scout platoon.

We had trained in the basic Soldier skills and had some training in Kuwait, but operating as a scout platoon was new for everyone. The types of missions we conducted were area reconnaissance, movements-to-contact, QRF [quick reaction force], raids for high-value targets (including two with Special Forces), cordons, MSR [main supply route] security, Iraqi infrastructure security and NAI [named area of interest] surveillance.

The last three or four months of the deployment, we primarily conducted raids in Ash Sharqat, about 75 kilometers north of Tikrit. On 20 September 2004, we were on a mission in Ash Sharqat for the weekly meeting with the city police chief. When the meeting ended, we started back to FOB Summerall; mine was the trail vehicle in the convoy.

Suddenly, we were fired upon at three o'clock. Our Soldiers returned fire, and then the radio reported shots being fired at the front of the convoy and at nine o'clock. Next, we began receiving fire from the rear—the platoon was in a 360-degree firefight.

Most fire was 10- to 15-second bursts from enemy rifles, but we also had RPGs [rocket-propelled grenades], machine guns and mortars fired at us. It was continuous fire, which meant this

was a serious engagement...a very deadly engagement. It, literally, was as if each vehicle had its own "battle" going on.

Our training paid off. Every NCO and team in each truck fought their way through the engagement—I was proud of them. One team identified an enemy machine gun nest up the hill, and my gunner concentrated his .50 caliber fire on it.

All of a sudden I heard, "Man down!" on the radio. When a Soldier is injured, my vehicle automatically moves up the convoy to MEDEVAC [medically evacuate] the Soldier because the platoon medic rides with me. When you hear "Man down!" your adrenaline starts pumping—he is one of yours—so you react.

I radioed, "I'm coming down the left side, clear your fire!" We raced to the injured Soldier, Specialist Joshua Henry, the platoon leader's driver. We saw some insurgents about 50 meters away running away with their machine guns.

At this point, our job was not to take the fight to the nearly destroyed enemy, but to evacuate Specialist Henry, who was seriously hurt. I called for the front of the convoy to concentrate fire to clear a path for the platoon to push out. We put Specialist Henry in my vehicle. Then I went back to get his helmet and stuff lying on the ground about 20 meters behind. I just couldn't let the enemy grab the helmet and have his parents see some insurgent wearing it on CNN.

At that point, most of my platoon was about 75 meters in front of me, concentrating fire in front and moving out. All of a sudden, I heard, "Vehicle down!" on the radio. That meant a HMMWV [high-mobility multipurpose wheeled vehicle]

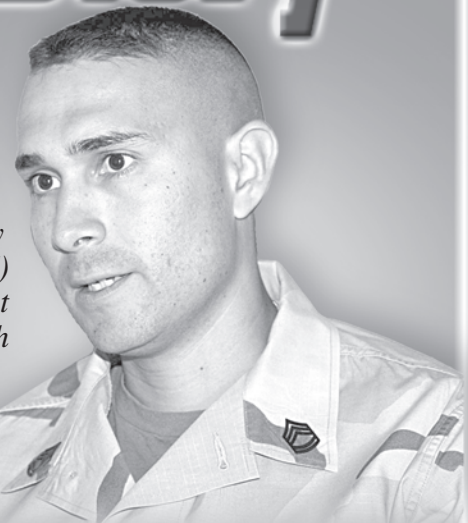


Photo by SGT W. Wayne Marlow, 1st ID PAO

had been shot in the engine and couldn't move.

My mind was racing. I thought, "I've got to get this kid and platoon out, and now I have a vehicle down with Soldiers in danger because they can't move." Sergeant Collin Macinnes immediately took action. He rammed the disabled HMMWV from behind and pushed it about 300 meters out of the kill zone. Soldiers quickly strapped the vehicle to another HMMWV and towed it back.

Meanwhile, I raced to the closest patrol base with Specialist Henry, about 15 minutes away at ASP [Ammunition Supply Point] Tinderbox, looking for the MEDEVAC chopper the platoon leader had called for digitally—we were too far away for radio communications.

I held Specialist Henry's hand in the HMMWV and went with him in the chopper to the nearest hospital. About two hours later, he died. That was tough, not only on the platoon, but also on the entire battalion. He was a good Soldier.

Specialist Henry and the other members of the platoon were responsible for the deaths of 11 insurgents that day.

As a Platoon Sergeant, my job is to train and take care of Soldiers to ensure they can handle anything they face. It's all about Soldiers. Although we sadly lost Specialist Henry that day, the platoon's Soldiers took action independently while under fire to repel the enemy and accomplish the mission.

Soldiers make it happen. As their Platoon Sergeant, I am just their "Point Man."

**Brigadier General Richard P. Formica**

Former Commander of the Force FA Headquarters (FFA HQ) and  
Joint Fires and Effects Coordinator, MultiNational Corps, Iraq (MNC-I)

# Part II: Joint Effects for the MNC-I in OIF II

Interview by Patricia Slayden Hollis, Editor

*This is the second of two interviews with BG Formica based on six hours of discussions in March after he returned in February from 13 months in Operation Iraqi Freedom (OIF) II. Part I appeared in the May-June edition and focused on the operational environment, organization of his MNC-I Joint Fires and Effects Cell (JFEC), the integration of joint fires and counterstrike operations.*

Ed

**Information Operations (IO) in the MNC-I.** IO is tough, and we had to work at it. As the guy responsible for integrating IO at the corps level, every time I heard someone say, “We are losing the IO war,” I cringed.

We go into IO with what seems to be a disadvantage. Coalition Forces are made up of values-based societies that value truth and integrity. The bad guys weren’t tied to them. They use their resources to gain control of the Iraqi people with total disregard for Coalition Forces or Iraqi civilians as human beings and little regard for accurately portraying activities as they occurred.

Now, to gain the advantage in IO, we would *not* forsake our values. In the long term, in the big picture, because we are values-based, truth-based—it is a strategic advantage. But Coalition Force IO takes time, effort and care, and every setback takes time to recover from.

Another fundamental difference between us and the bad guys is that we have an open society. The great strength of our freedom of the press helps make us open...and invites vulnerabilities. The bad guys don’t have an open society—have no inhibitions about *using* the press (which we won’t do), and, therefore, are not as vulnerable to our IO themes and messages as we are to theirs.



TSC, Fort Sill, OK

*An IO Axiom.* In my 13 months in Iraq, I observed what I consider to be an IO truth. Our success in IO is based 80 percent on *who* we are, 15 percent on what we *do* and five percent on what we *say*—yet we spend most of our time and energy on what we say.

Now my numbers may not be exactly right and not everyone agrees with me, but that formula, with its general proportions, seems to me to be right. Given that all three are intertwined, who we are influences what we do and say and vice versa, let me explain what I mean.

*Who* we are has a tremendous impact on our ability to conduct IO—our ability to have an effect on the Iraqi people. The Coalition Force saying something—by handbill or radio or a uniformed person face-to-face, while worthwhile and important aspects of our IO program—does not have anywhere near the effect of an Iraqi spokesman, leader or soldier saying the same thing.

We knew that and would have loved to have had an Iraqi spokesman a long time ago. But if you were an Iraqi, you didn’t want the job of standing up in front of the media communicating strate-

gic messages about making Iraq a free and democratic nation everyday because it was dangerous for you and your family.

As we transitioned to Iraqi sovereignty in July 2004, more Iraqi government officials began speaking out because they had ownership in the process. The same message articulated by the Iraqi Prime Minister, National Security Advisor, a governor, mayor or provincial councilman was far more effective.

The second part of that axiom is what we *do*. Perfect example: in the first battle of Fallujah [April 2004], a couple of our legitimate targets were in mosques—bad guys were using them to kill Marines and Soldiers. When we attacked an enemy position in a mosque with a 500-pound bomb, we could say all we wanted about how legitimate the target was, how carefully we vetted it during the targeting process and minimized collateral damage, and how much we respect Islam as a religion—regardless, the bad guys could turn our action against us. “We must *defend* our mosques—they are attacking them!”

In terms of IO, we choose lethal targets very carefully—we might decide not to attack an enemy position in a mosque unless it poses a significant threat to our forces. Those are tough choices that can have IO implications, choices often made by junior leaders on the frontlines on the spot.

Third is what we *say*, which is the part of IO we spend a lot of time and effort on. I am not saying we don’t need to be careful about what we say, quite the contrary. What I am saying is that as an inherently values-based force that respects the lives and rights of others, we can craft what we say effectively and still focus more effort on the other two more important aspects of IO: getting the supported people invested in the process and taking care not to set our



efforts back by what we do.

As we saw the transition to Iraqi sovereignty and, especially, as we got closer and closer to national elections in January, the Coalition delivered fewer messages and the Iraqi leaders delivered more—and made the strategic and operational decisions about the future of their country. *Who* the IO messenger is has a significant effect on the reception of the message. And as Iraqi Security Forces [ISF] began executing more military operations, what we *did* changed. The calculus had changed.

*Corps IO Operations.* There's a difference in the IO perspective at the strategic level, the multinational force and higher, and IO in the corps and divisions—all the way down into the battalions where *everybody* does IO.

The challenge at the tactical level is units faced different threats and levels of Iraqi support, depending on the area of operations. So, at the corps level, we decentralized much of IO execution down to the major subordinate commands [MSCs].

The role of the corps IO was to facilitate MSC engagements and develop talking points or other products consistent with MNF-I's [MultiNational Force-Iraq's] strategic communication themes and to share those themes to meet IO challenges across the MSC boundaries. If an IO challenge did not cross MSC boundaries, was unique to one MSC, then that MSC was better qualified to work the unique IO issue in its own battlespace. But it was a corps IO solution to provide talking points to our MSCs that articulated actions in another MSC, so they could integrate the talking points into their respective IO programs.

IO is very, very important for lethal and nonlethal operations across the spectrum. Our corps or three-star UExs or UEys, our operational level fighting headquarters, each must have an IO component robust enough to conduct operations effectively. That component must be resourced with trained joint personnel and stabilized—not an *ad hoc* organization. In my view, IO with related components, such as CMO [civil-military operations] and PSYOP [psychological operations], should be in the JFEC, the corps' effects organization.

#### **The Second Battle of Fallujah [November 2004].**

The second battle of Fallujah was a tremendous success. The IMEF [I Marine Expeditionary Force] was absolutely *brilliant* in planning the opera-

tional/tactical-level fight in Fallujah across the spectrum of operations: CMO, IO, lethal effects and tactical ops.

IMEF used the full array of combined arms and was fully joint. For example, IMEF fought with Army infantry platoons inside Marine battalions and Marine infantrymen inside Army BCTs [brigade combat teams].

There was a lot of joint individual augmentation. For example, the IMEF's 1st Marine Division needed a targeting officer, so one of our Army captains from the corps FSE [fire support element] worked in the 1st Marine Division's FSE for the entire battle of Fallujah. That kind of thing happened all over the force.

In Fallujah, Iraqi Security Forces were integrated into the IMEF's tactical fighting formations. In the western part of Fallujah, one of the first operations in the campaign was the Iraqis' recapturing a hospital. The ISF fought well in Fallujah.

The joint and Coalition integration and the cooperation among the US Army's 1st Infantry and 1st Cavalry Divisions, our Iraqi and other Coalition Forces, US Special Operations Forces [SOF] and IMEF in Fallujah demonstrated trust and confidence across the force as a truly multinational force—it is one of the things I am most proud of as I consider the corps' successes in Iraq.

Although we truly operated as a multinational force, it took *a lot* of work to develop that confidence and knowledge of each other, specifically when integrating joint fires. The IMEF had Marines fixed-wing, rotary-wing and Army and Marine FA inside the MEF. It also had Navy air support, and the 9th Air Force from CENTCOM's [Central Command's] Air Component Command provided air fires for a surge capability. In Fallujah, we brought every joint asset to bear to take away the enemy's safe-havens.

Simultaneously, we had corps operations going on throughout the battlespace. And we knew insurgent activities from Fallujah would spill over into other areas. So, at the MNC-I, the ASOC [air support operations center] established procedures to provide CAS [close air support] rapidly in response to troops in trouble in key areas on the ground, such as in Mosul, Baghdad and out to the west by Al Qaim. That allowed IMEF air assets to focus support on Fallujah.

The corps ALO [air liaison officer], Colonel Dave Belote, did a *tremendous*

job of working with the MEF's Marine air wing to support the air battlespace over Fallujah. As a result, the MEF was able to optimize the capabilities and employment of joint air assets and UAVs [unmanned aerial vehicles] and have the right airspace control measures in place. One of the corp's strengths in Fallujah was the integration of joint fixed-wing assets, including the incredible AC-130 CAS platform that worked so well with our SOF and at night. Air power was responsive and precise in Fallujah.

We also shot a lot of precise Army and Marine Field Artillery in Fallujah, most of it in very close support of troops in urban operations. When you only are shooting a couple of guns at a time (as in Fallujah)—not a battalion six [all guns, six rounds]—you can be *very* precise with your fire. Marine artillery fired danger close to Soldiers and Army artillery fired danger close to Marines.

The MEF employed FA in a nonstandard technique that was very effective in urban operations. FA shot VT [variable time] fuze munitions two blocks from advancing Coalition Forces, providing air bursts to suppress the enemy at their strongpoints. This also minimized collateral damage.

During shaping operations, there was tension between the tactical, operational and strategic levels of targeting in Fallujah. The tactical units wanted to attack every target on the ground with air-delivered munitions; at the operational and strategic levels, decision makers had to be careful not to win the tactical battle yet lose the strategic war for Fallujah. Not every valid tactical target warrants a 500-pound inside the city limits of Fallujah.

Fallujah was a great study in strategic, operational and tactical levels of command.

**IO Threshold in the Battle of Fallujah.** This was a phenomenon we observed in the second battle of Fallujah—Lieutenant General [Thomas F.] Metz [Commander of the MNC-I] coined the term “IO threshold.” It describes the level of intensity in combat operations that we had to stay below to win the IO fight.

The two battles of Fallujah serve as great examples. In the first two or three days of the first battle (April 2004), our decisive operations were below the IO threshold. But then every time we attacked certain targets or caused a level of destruction, there were protests in the

streets or we were criticized in the Arab and other international media.

Frequently in the first battle of Fallujah, we were attacked by insurgents in mosques. It legally eliminated the protective status of the mosque and made it a legitimate target—and we went through great pains to avoid destroying a mosque. But we did use precision air-delivered bombs on some mosques that had insurgents inside who were killing our troops.

Every time we did, we crossed the IO threshold. No matter what we said, the IO effect was troublesome, especially with the Iraqi and other Arab populations.

So the intent in the second battle of Fallujah was to employ precision munitions for shaping fires at a level of intensity that stayed below the IO threshold. Then we would employ a lot of combat power, everything available to us, in decisive operations for a period of days, recognizing that we would exceed the threshold for that time. Next we would bring the intensity of combat operations down below the IO threshold before it could have a negative impact on our ability to execute any decisive ops. That way, the 1st Marine Division could win the battle for Fallujah, and we could still get down below the IO threshold.

But, in my judgment, we never exceeded the IO threshold in Fallujah, even during decisive ops. In hindsight, I think the MEF's very precise shaping operations in conjunction with SOF and the broader strategic to tactical IO campaign from April to the second battle of Fallujah in November raised the IO threshold. People—Iraqis, regional neighbors, Coalition, US—recognized that Fallujah was a terrorist safe haven, a problem that had to be dealt with. People understood why we were in Fallujah and, therefore, we didn't exceed the IO threshold, even when our operations were intense.

We realized that when we first hit an enemy position in a mosque. There was no negative reaction to it, and we didn't have to defend our actions.

Decisive operations, again, were so well orchestrated and so focused by the IMEF that they occurred in a short period of time, which contributed. As a result, Coalition Forces in Fallujah won the IO war.

Our evaluation of the IO threshold caused us to adjust the meter of lethal fires; it became a mechanism for integrating lethal and nonlethal effects—a very powerful concept.

### **Force FA Headquarters (FFA HQ).**

I am convinced of the necessity for FFA HQs at every level of the tactical and operational force. The FFA HQ is required for two critical functions and brings a third benefit, a bonus of command and control flexibility, to the operational level of command. As we move toward modularity, we must retain the FFA HQ's capabilities.

First the FFA HQ is the core of the JFEC. It integrates and synchronizes joint fires and effects for the force. At all levels, the FFA HQ must integrate or apply joint fires and plan and execute IO that is integrated with other nonlethal means and do them all seamlessly.

For example, we found that the four- and five-man battalion and brigade FSEs in Iraq were responsible for IO and CMO in addition to their lethal requirements—they were meeting themselves coming and going. When the unit needed mortar, FA or air fires, the FSE had to coordinate for them. And when there was a countermortar or counterrocket fight—and most brigades and battalions had them—then the FSE had to manage that.

All that might be okay when we're fighting an insurgency, but a four- or five-man team's fulfilling those critical roles around the clock in more high-intensity military engagements will be impossible.

Second, the FFA HQ at every level commands and controls FA assets for the force. For example, when the DS [direct support] FA battalion served as a maneuver battalion, it was challenged to also perform its functions as the FFA HQ. It still had to ensure the brigade's Hot Platoon or Hot Battery met the five requirements of accurate, predicted fire; the unit was certified to fire; the "gunner" was trained well enough to step up to the "section chief's" position if the section chief was injured by an IED [improvised explosive device]; the targeting process that leads to the delivery of fires was executed correctly; and the radars available to the BCT were maintained and positioned for maximum coverage. These are all functions of the FFA HQ and core competencies of the FA.

Third, the bonus benefit, the FFA HQ gives the operational level headquarters the flexibility to employ a command and control headquarters without having to pull one of its maneuver units away from conducting its missions.

For example, at the corps level in August 2004, the Iraqis requested help in Al Kut near the Iranian border as the

Muqtada Al-Sadr militia threatened stability in Iraq. So MNC-I shifted 1st Battalion, 23d Infantry (1-23 IN), 3d Stryker BCT, 2d Infantry Division, from Mosul to Al Kut—an extremely well trained and disciplined unit. It was reinforced with six Kiowa Warrior helicopters from 1-25 AV in the 1st Cav and SOF.

MNC-I sent the corps FFA HQ to Al Kut to serve as the command and control headquarters for that force: Task Force Thunder. The headquarters was built around the MNC-I corps artillery group, including the command judge advocate and the corps artillery G3, G2 and G6 sections. We were augmented with additional officers and NCOs from the corps ALO, IO cell, civil affairs, public affairs, intel and logisticians.

For about two weeks, I commanded Task Force Thunder at Al Kut. We provided the enablers that facilitated 1-23 IN's tactical operations with joint fires, lethal targeting, nonlethal effects and logistical support. We also interfaced with the Ukrainian brigade and multinational division in the area, the local provincial government and the Iraqi police and National Guard.

Although there never was a major fight in Al Kut, I believe the presence of the very visible, combat-capable Stryker task force, in conjunction with SOF, conducting multiple operations throughout the province plus the CMO and IO effects on the local populace drove the Sadr militia to ground.

The FFA HQ at the operational level provided that additional command and control capability. In his article in the May-June edition, the 1st Infantry Division Artillery Commander Colonel Rich Longo relates a similar capability that his FFA HQ provided in An Najaf.

All in all, we left fairly satisfied with the work we did in Iraq as a joint fires and effects cell and as an FFA HQ for MNC-I. We are confident that the XVIII Airborne Corps Artillery will continue to improve the operations, and we'll learn from them.

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**Brigadier General Richard P. Formica commanded the Force FA Headquarters and Joint Fires and Effects Cell in the Multi-National Corps in Iraq during Operation Iraqi Freedom II. While deployed, he conducted split-based operations as the Commander of III Corps Artillery at Fort Sill, Oklahoma, a command he relinquished in June. Currently he is the Director of Force Management in the Army G3 at the Pentagon.**



During the last year, the doctrine community, led by the Air, Land, Sea Application (ALSA) Center, Langley Air Force Base, Virginia, tackled the development of kill box doctrine. ALSA brought together service and joint doctrine developers with subject matter experts (SMEs) from the combatant commands, including personnel with recent experience in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF).

The result of that effort, *Field Manual 3-09.34 Multi-Service Tactics, Techniques and Procedures (MTTPs) for Kill Box Employment*, introduces the kill box as a new fire support coordinating measure (FSCM). The FM gives it the following definition: "A kill box is a three-dimensional FSCM used to facilitate the expeditious air-to-surface lethal attack of targets, which may be augmented by or integrated with surface-to-surface indirect fires."

For the first time, the services have one definition of kill boxes and agreed upon MTTPs for employing them. As of June 2005, the kill box became the first new FSCM to be recognized by all the services in more than three decades.

The kill box is primarily applicable at the operational level. The target audience for the new publication includes commanders as well as the operations sections (current operations, fires and future plans) and intelligence sections of service components and their main subordinate elements (i.e., Army corps, Marine expeditionary force, Navy numbered fleet and Air Force wing) and their counterparts on the joint force commander's (JFC's) staff.

FM 3-09.34 was signed 13 June and is being printed as this magazine is being printed. The Air Force pub number is AF TTP(I) 3-2.59, the Marine pub number is MCRP 3.25H and the Navy pub number is NTTP 3-09.2.1.

This new FM 3-09.34 facilitates air-to-surface attacks, recognizing the increasing demands for rapid joint fires integration, deconfliction, responsiveness and component coordination while, at the same time, minimizes the risk of fratricide. It standardizes and codifies the kill box as a coordination measure, multiple versions of which have been developed in standing operating procedures (SOPs) and combat operations during the last 20 years and used by virtually all combatant commands.

**Kill Box Basics.** The primary purpose of a kill box is to allow air assets to

# KILL BOX

## The Newest FSCM

By Lieutenant Colonel  
Karl E. Wingenbach

conduct interdiction against surface targets without further coordination with the establishing commander and without terminal attack control.

Kill box boundaries normally are drawn using an area reference system, but they could follow well defined terrain features or may be located by grid coordinates or a radius from a center point.

The kill box is a permissive FSCM; however, it also restricts the trajectories and effects of surface-to-surface indi-

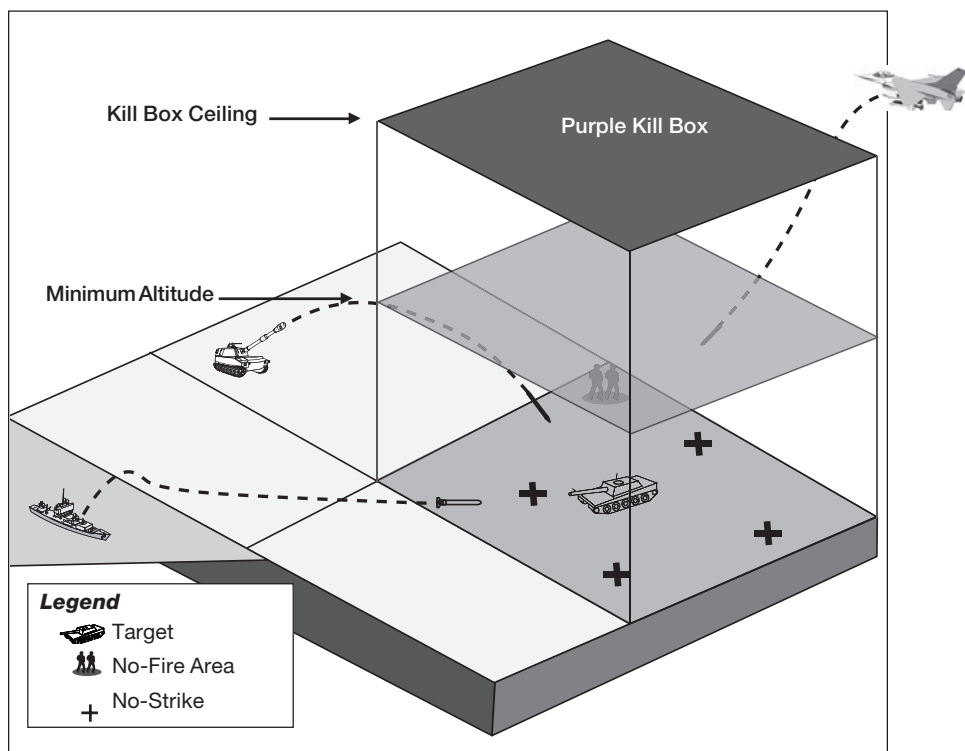
rect fires.

There are two types of kill boxes: blue for facilitating the air-to-surface attack of targets and purple for facilitating air-to-surface attacks while integrating surface-to-surface indirect fires. The purple box employs altitude, lateral or time separation techniques for limiting surface-to-surface indirect fires, protecting friendly aircraft.

When integrating air-to-surface and surface-to-surface indirect fires, the kill box will have appropriate restrictions. The goal is to reduce the coordination needed to fulfill the support requirements with maximum flexibility while preventing fratricide.

In a linear battlespace, kill boxes can augment use of traditional FSCMs, such as fire support coordination lines (FSCLs) or coordinated fire lines (CFLs). They can help the commander focus the effort of air and indirect fire assets. Typically, within the land component's area of operations, kill boxes will be established short of the FSCL to eliminate the coordination required by air assets when striking interdiction targets to support the land component's concept of operations.

In a nonlinear battlespace, when traditional FSCMs are not useful or are less applicable, the kill box can be another method for identifying areas to focus



There are two types of kill boxes: blue for facilitating the air-to-surface attack of targets and purple for facilitating air-to-surface attacks while integrating surface-to-surface indirect fires.

air and indirect fire assets.

The kill box is a unique FSCM that may contain other measures within its boundaries. For example, a kill box may include no-fire areas (NFAs), restricted operations areas (ROAs) and airspace coordination areas (ACAs). Restrictive FSCMs and airspace control measures (ACMs) always have priority when established in a kill box.

No friendly ground forces should be within or maneuvering into established kill boxes. If circumstances require otherwise—such as long-ranges surveillance patrols (LRSPs), special operations forces (SOF) teams, etc.—then NFAs must be established to cover those forces, or the kill box must be closed.

A kill box won't be established specifically for close air support (CAS) missions. However, this does not restrict CAS missions from being executed inside kill boxes if all the CAS requirements are met.

The JFC normally delegates the authority to establish and adjust kill boxes to component commanders responsible for the battlespace. The component commander establishes and adjusts a kill box in consultation with superior, subordinate, supporting and affected commanders; the kill box is an extension of the existing support relationship established by the JFC. (See the kill box responsibilities figure.)

Most of the information in this sec-

tion, "Kill Box Basics," was either taken directly from or a paraphrase of FM 3-09.34. A copy of the approved FM may be downloaded from Reimer Digital Library, requiring an Army Knowledge Online (AKO) account: <http://www.train.army.mil>. Another source for ".mil" domain users is the ALSA Homepage: <https://wwwmil.alsa.mil/index.html>.

**Kill Box Doctrine Development.** In the last year, the service doctrine centers worked to resolve differences and answer the following questions: What is a kill box? Is a kill box an area reference system? Is it an FSCM? Is it used to facilitate air-to-ground attacks? Does it indicate component commander responsibilities? These may seem like simple questions, but joint and service doctrine has differed and combatant commanders have developed similar, but distinctive SOPs.

The development of specific, detailed doctrine and tactics, techniques or procedures (TTPs) for kill boxes began in March 2004. Much of the early discussion centered on whether the kill box was an FSCM, an ACM, both or a new hybrid measure with specific attributes. Many SMEs argued that it could be any of these, depending on a color code, similar to the various theater SOPs. However, the joint working group decided that the kill box was most closely related to FSCMs, although it had ACA attributes.

*Joint Publication 1-02 (JP 1-02), De-*

*partment of Defense Dictionary of Military and Associated Terms* defines a kill box as "a three-dimensional area reference that enables timely, effective coordination and control and facilitates rapid attacks."<sup>1</sup> The joint pub includes little description and no TTPs.

*Air Force Doctrine Document 1-2 (AFDD 1-2) Air Force Glossary* defines a kill box as "a generic term for a preplanned ACM and (or) an FSCM used by the joint force to integrate and synchronize air and surface operations and deconflict joint fires in an expedient manner or on an asymmetric battlefield."<sup>2</sup> The term is not officially defined in Army, Navy or Marine Corps doctrine.

Reviews of combatant command SOPs yielded more kill box definitions and uses. In Korea, there are several restrictive and permissive kill box types. Some are essentially restricted fire areas (RFAs) protecting friendly troops, while others are ACAs focusing air assets on an indicated area.<sup>3</sup> In US Army Europe (USAREUR), kill boxes are ACMs used to enable joint fires.<sup>4</sup> In Central Command (CENTCOM), the kill box interdiction/CAS (KI/CAS) concept of operations uses kill boxes to indicate areas for rapid air-to-ground attack, CAS and where ground forces are located.<sup>5</sup> Color coding is used to indicate the type of kill box (for example, green for areas where ground forces are located, red for re-

Blue/Purple Kill Box	Establishing Commander <sup>1</sup>	Component Coordination Requirements
Outside JFC-Designated AOs	JFC or JFACC (When Delegated) <sup>2</sup>	JFACC: No additional coordination required once established.
		Other Components: Must coordinate with JFACC.
		Purple Kill Box Restrictions: Altitude, lateral or time separation as specified when established.
Inside JFC-Designated AOs	Land, Maritime or Service Component Commander <sup>3</sup>	JFACC: No additional coordination required once established except changes in establishing commander's target priorities, effects and timing.
		Establishing Headquarters: Must notify the JFACC when opening, closing, canceling or changing the type of kill box or changing due to the establishing commander's changes in target priorities, effects and timing.
		Other Components: Must coordinate with establishing headquarters.
		Purple Kill Box Restrictions: Altitude, lateral or time separation as specified when established.
<p><b>Notes:</b></p> <p>1. The JFC may be the establishing commander for any FSCM within the AOR.            2. The JFC normally will delegate to the JFACC the authority for establishing kill boxes in unassigned areas of the JOA.            3. The JFSOCC is the establishing commander for kill boxes inside a JSOA.</p>		
<p><b>Legend:</b></p> <p>AOs = Areas of Operation            AOR = Area of Responsibility            FSCM = Fire Support Coordinating Measure</p> <p>JFACC = Joint Force Air Component Command            JFC = Joint Force Commander            JFSOCC = Joint Force Special Operations Component Command</p> <p>JOA = Joint Operations Area            JSOA = Joint Special Operations Area</p>		

Kill Box Responsibilities (FM 3-09.34 Multi-Service Tactics, Techniques and Procedures (MTTPs) for Kill Box Employment, Table II.1)



stricted areas and black for special operations forces locations).

For those familiar with the definitions of fire support and ACMs<sup>6</sup> and their attributes, all these definitions and uses may seem confusing and overlapping. How can one *kill* box allow air assets to attack ground targets without coordination (permissive), while another protects friendly ground troops from those same fires (restrictive)?

What complicates matters in every theater, is that the kill box is used as a measure to facilitate rapid attack of targets and as an area reference system (also known as common area reference system, common grid reference system or common geographic reference system). Within theater SOPs, the area reference system and the kill box are interchangeable. In fact, joint doctrine also confuses the ideas by stating that "...area reference systems are often described as...kill boxes..."<sup>7</sup>

**The Kill Box is a Stand Alone FSCM.** One of the first things the joint working group (JWG) realized was the necessity to de-link the kill box from the area reference system.<sup>8</sup> The two clearly can be related but are not synonymous. OEF and OIF proved the usefulness of the area reference system beyond facilitating rapid air-to-ground attack of targets.

The various combatant commands use a color code (green, black and brown kill boxes) to identify areas where ground forces are located, but these are RFAs and not "kill boxes"; any fires into them must be coordinated. If the area reference system was just a reference system and not a kill box system,

then the area reference system could be used to delineate any required areas, such as RFAs, NFAs, ACAs or named areas of interest (NAIs). The area reference system merely would be a simple way to refer to and identify those areas. Of course, the various coordination and control measures still could be drawn using grid coordinates or radius from a point, but the area reference system would provide simplicity and brevity.

**Way Ahead.** The next step for kill box doctrine development is to officially establish the kill box as a jointly recognized FSCM during the revision of *JP 3-09 Doctrine for Joint Fires*<sup>9</sup> and write it into the revision of *FM 3-09 Doctrine for Fire Support*. Although the various combatant commanders sent representatives to the working groups to help develop FM 3-09.34, the kill box has only been approved by the services and will not be officially "joint" until the entire joint doctrine development community (which includes the five services, joint staff and the combatant commands) decides to add it to JP 3-09.

Additionally, experiments are planned for kill boxes as they relate to other changes in the areas of command and control systems, organizations and training. For example, the Office of the Secretary of Defense Joint Test and Evaluation (JT&E) for Joint Fires Coordination Measures (JFCM) plans to experiment with kill box MTTPs. The JT&E seeks to increase limited available joint fires efficiency, maximize limited fires effectiveness and reduce the risk of fratricide through standardized kill box MTTPs.

Employing (or not) service-approved TTPs is the option of the combatant commander. But through the efforts of doctrine developers, the combatant commander now has clearly defined, simple and flexible kill box FSCM to help facilitate his air-ground operations and give him agility—attributes valued in all military operations.

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**Lieutenant Colonel Karl E. Wingenbach is the Joint Doctrine Manager for Training and Doctrine Command (TRADOC) and was the Army lead for developing kill box doctrine. In his previous assignment, he was the Operations Chief for the 1st Battlefield Coordination Detachment (Airborne) deployed to the Coalition/Joint Air Operations Center in Kuwait during Operations Enduring Freedom and Iraqi Freedom. In that job, he coordinated, executed and managed air operations in support of the land component, including kill boxes. His email address is karl.wingenbach@us.army.mil.**

*The author wishes to acknowledge Lieutenant Colonel (LTC) Charlie Guerry, Chief, Joint and Multinational Doctrine Division, Combined Arms Doctrine Directorate, Combined Arms Center, Fort Leavenworth, Kansas, for invaluable help in crafting this article. Additionally, the author acknowledges the contributions of LTC Lou Schurott, US Army, and Lt Col Rob McCreadie, USAF, at the Air, Land, Sea Application Center, Langley AFB, Virginia, who led the effort to develop joint kill box doctrine.*

### Endnotes:

1. *Joint Publication 1-02 (JP 1-02) Department of Defense Dictionary of Military and Associated Terms* (12 April 2001, as amended through 9 May 2005), 295. The definition for the kill box in FM 3-09.34 will replace the definition for kill box in JP 1-02 when *JP 3-09 Doctrine for Joint Fires* is revised.
2. *Air Force Doctrine Document 1-2 (AFDD 1-2)*, *Air Force Glossary* (24 August 2004), 31.
3. *Combined Forces Command (CFC) Publication 3-1 Joint/Combined Fires-Korea* (15 April 2003), Chapter 5.
4. *USAREUR/USAFE [US Air Force Europe] TTPs for Command and Control of Joint Fires* (24 April 2001), Chapter 4.
5. *CENTCOM Kill box Interdiction/Close Air Support (KI/CAS) CONOPS [Concept of Operations]*, 2003.
6. Airspace coordination measure (ACM) is the joint term; the Army term, in accordance with

- FM 1-02, is airspace control measure.
7. *JP 3-60, Joint Doctrine for Targeting* (17 January 2002), Appendix D "Common Reference Systems: Area and Point," D-1.
8. *FM 3-60.1 MTTP for Targeting Time-Sensitive Targets*, Appendix G, "Common Geographic Reference System," describes a standard area reference system. "CGRS is primarily an operational-level administrative measure used to coordinate geographical areas rapidly for battlespace deconfliction and synchronization.... The usefulness of a CGRS is that it enables establishment of appropriate control and coordination measures that can be mutually coordinated, deconflicted, and synchronized via a simple, common, mutually understood, and agreed upon reference system." The CGRS is a regional/theater-based system that a combatant commander can employ. On 15 December 2004, the Joint Chiefs of Staff signed a memo to the

- Chairman, Joint Chiefs of Staff, adopting the ALSA-developed "regional common geographic reference system (CGRS) as each service's training standard." On 25 March 2005, the Secretary of Defense directed the National Geospatial-Intelligence Agency (NGA) to "take the lead in developing a global reference system that meets the requirements of the combatant commanders and services." NGA, with the help of service representatives, is developing that new global system. The joint doctrine community will address this in the ongoing revision of *JP 2-03 Geospatial Intelligence (GEOINT) Support to Joint Operations*.
9. The joint working group deliberately formatted Chapter 1 of FM 3-09.34 to ensure that the language defining the kill box can migrate directly into the revision of JP 3-09.



A view of the Combined Air Operations Center (CAOC) at Al Udeid Airbase, Qatar. Currently the 19th Battlefield Coordination Detachment (BCD), located in the center, daily monitors an average of 25 named operations of relevance in Operation Iraqi Freedom and 10 in Operation Enduring Freedom.

# The 19th BCD in Counterinsurgency Operations

The 19th Battlefield Coordination Detachment (BCD) is “on point” in Central Command’s (CENTCOM’s) area of responsibility (AOR) and is integrated at the top of the joint effects hierarchy at the Combined Air Operations Center (CAOC) at Al Udeid Airbase, Qatar. Since September 2004, the 19th BCD has executed its wartime mission in support of Operations Enduring Freedom (OEF) and Iraqi Freedom (OIF). We continue a legacy of continuous air power integration in the region, dating from Operation Desert Storm nearly 15 years ago. (See Figure 1 for the 19th BCD’s mission.)

Since the conclusion of major combat operations in Iraq, Coalition Forces have faced an ever-maturing insurgency consisting of a thinking and adaptive enemy. The hallmark of the Army is its ability to reflect and adjust in mid-stride. We have undergone significant adjustments in the tactics, techniques and procedures (TTPs) associated with all

By Colonel James M. Waring, Lieutenant Colonel Carl L. Giles, AV, and Chief Warrant Officer Three John A. Robinson

facets of effects-based operations (EBO) in response to the insurgent threat. The most significant changes have been in the application of joint effects.

The BCD has evolved to meet the challenges of the Global War on Terrorism (GWOT) environment while retaining basic capabilities. The fundamental roles and functions outlined in *Field Manual 3-09.13 The Battlefield Coordination Detachment* are firmly established as our doctrinal base and remain just as relevant in counterinsurgency operations as in high-intensity conflict environs. That said, the *focus* of the BCD has changed to meet the tactical realities on the ground.

**The Shorter Air Tasking Order (ATO) Cycle.** To the benefit of ground forces, the Coalition Forces Air Component Commander (CFACC) also has adapted to the counterinsurgency environment. The joint targeting process and ATO is leaner, shorter and more flexible in its ability to support ground force requirements for air power.

The ATO planning cycle has contracted from the typical 72-hour process to a 44-hour cycle. What this means for effects coordinators at the battalion and brigade combat team (BCT) levels is an air support request (ASR) submission deadline that better supports the kind of abbreviated planning cycle often conducted at those levels in counterinsurgency operations. (See Figure 2 on Page 18 for the 44-hour joint air tasking cycle.)

To achieve the shortened ATO cycle, the CFACC has reduced the frequency of the assessment and strategy reviews by publishing the air operations direc-



tive (AOD) on a weekly vice daily basis. The AOD is his vehicle for issuing planning guidance and priorities for air power. As the supporting command, the CFACC fully integrates MultiNational Corps, Iraq/Combined Joint Task Force 76 (MNC-I/CJTF-76) commanders' priorities and desired effects into the AOD.

For ground forces, this means that the MNC-I's or CJTF-76's prioritized air support list (ASL), the roll up of ASRs for a specific ATO cycle, is the de facto CFACC prioritization for air support.

Due to reduced demand for kinetic targeting, the CFACC executes the guidance, allocation and targeting (GAT) process by exception. The current complement of airframes available throughout the AOR allows the CFACC to support the vast majority of ASRs from both theaters everyday.

**The BCD in Counterinsurgency Operations.** The BCD continues to exercise its primary mission of ensuring that the ground commander's requirements for air power articulated in the form of ASRs are met or suitable alternatives are provided, as necessary. To perform this mission, the BCD counts on fire supporters at all levels to clearly articulate their desired *effects*, not capabilities.

The term "effect" is target-centric. Effects are related to those enemy behaviors the ground commander wishes to modify through the use of fire support, regardless of type. In a broader sense, effects may be achieved using either lethal, nonlethal or a combination of the two. "Capabilities" relate to the performance standards of particular airframes. While requesting a particular airframe is frowned upon as it limits air planners in their flexibility, requesting capabilities as a complement to the articulated effects is acceptable.

Ground Commanders *should* ask for a precision-guided munition (PGM)-capable aircraft, but they should *not* ask for an F-15 when any aircraft carrying a PGM will do. It's about the effect to be achieved, not the aircraft achieving it.

*Aircrew Situational Awareness of Ground Operations.* The nature of counterinsurgency operations dictates that the BCD provide a very detailed and precise level of coordination to achieve the ground commander's desired effects. In an environment where company-level operations frequently require joint effects and often have theater-level strategic implications, pilots

and air planners need to understand the details of each operation to integrate air power.

Frankly, the 19th BCD encounters resistance from ground units to the idea that a three-star headquarters requires such a micro-view of operations. We have learned that the macro-view of the ground scheme of maneuver that is echelons-above-battalion level provides insufficient situational awareness to the CFACC and his aircrews.

Currently, the 19th BCD monitors an average of 25 named operations of relevance in OIF and 10 named operations in OEF daily. This represents the most significant operations in a list of many. The BCD is the point of entry to the CAOC for these missions and associated graphics and uses the ground liaison team (GLT) to ensure that key graphics make it into the cockpit of supporting aircrews.

Simply put, if a pilot can quickly orient on a company commander's graphic control measures, he can efficiently and effectively provide the needed effects; his enhanced situational awareness may make him a force multiplier in ways the ground commander may not have anticipated.

The message for battalion fire support officers (FSOs) is that the BCD needs your graphics for those company-level operations that are supported by air power. FSOs must think of the BCD as

an extension of their reinforcing headquarters and provide the same degree of situational awareness to the joint community via the BCD.

*Lethal and Nonlethal Effects.* The CAOC's target cell provides collateral damage estimates (CDEs) for pre-planned targets requiring kinetic strike. The CDE requirements differ between theaters, but the target cell works closely with its counterpart at CENTCOM to ensure that the right CDE calls are made in a timely fashion. This ensures commanders understand the level of risk they are assuming.

Similarly, rules of engagement (ROE) differ for both theaters. Given the fact that theater air power is provided by a coalition of nations, each of whom may have unique elements of ROE, the CAOC legal team must ensure coalition partners are not asked to deliver air power in a manner contradictory to their respective ROEs. The BCD supports the ground commander by facilitating the CDE process and helps to integrate air power in accordance with the established ROE.

A critical capability of air support to ground operations has become what has been variably described as the "show of force" or "presence" mission. These ostensibly are close air support (CAS) missions to achieve two, simultaneous nonlethal effects for the ground tactical commander. Captain Joseph Katz

**Serve as the liaison between COMARFOR (MNC-I/CJTF-76) and the CFACC to facilitate and synchronize air and ground operations in the designated AOR.**

**Key Tasks**

- Process and coordinate all pre-planned and immediate ASRs.
- Exchange operational and intelligence data between ARFOR and the CAOC:
  - Monitor/interpret current ground operations to enhance situational awareness within the CAOC.
  - Provide the ARFOR view of the enemy situation to the CFACC and staff.
  - Provide the GLTs the best available information for pilot briefings for missions in support of ground operations.
- Monitor the current ATO execution.
- Coordinate Army aviation fires into the ATO and ACO.
- Coordinate Army intra-theater airlift assets.

**Legend:**

- |                                       |  |
|---------------------------------------|--|
| ACO = Airspace Control Order          | CFACC = Coalition Forces Air Component Commander |
| AOR = Area of Responsibility          | CJTF = Combined Joint Task Force                 |
| ARFOR = Army Forces                   | COMARFOR = Commander, Army Forces                |
| ASRs = Air Support Requests           | GLTs = Ground Liaison Teams                      |
| ATO = Air Tasking Order               | MNC-I = MultiNational Corps, Iraq                |
| CAOC = Combined Air Operations Center |  |

Figure 1: 19th Battlefield Coordination Detachment (BCD) Mission

touched on this capability in his article, "Afghanistan—The Role of 'Show-of-Presence' Aircraft in the First Democratic Elections" in the January-February edition.

In brief, ground commanders in both theaters have determined that high-performance aircraft flying in visible and aggressive profiles achieve simultaneous effects. They serve as reassurance for law-abiding citizens and as a forceful deterrent to would-be evildoers.

The BCD works closely with fires and effects cell (FEC) personnel in both theaters to ensure ASRs clearly articulate the effects desired and Air Force strategists and combat planners fully appreciate the context in which these missions are to be flown.

**Information Operations (IO).** The BCD is a key integrator in the realm of IO and its related elements. According to *Field Manual 3-13 Information Operations* as well as its joint counterpart, Joint Publication 3-13 of the same name, an important supporting element of IO is physical destruction. There are several other IO-related aerial capabilities that BCD personnel routinely integrate into ground operations. The increased use of air- and ground-based electronic warfare (EW) assets in both OIF and OEF theaters provides an enhanced effect to ground commanders and adds to the complexity of joint effects integration. The BCD provides liaison through the CAOC's EW element to the EW coordinators in the MNC-I/CJTF-76 FECs to help plan and deconflict EW effects across the battlespace.

**Intelligence Support.** To defeat insurgents, ground commanders require an unprecedented level of intelligence, surveillance and reconnaissance (ISR) capabilities to provide the "long, unblinking eye" necessary to develop a multitude of elusive targets. The CFACC provides a host of assets to support the collection demand—U2, joint surveillance and target attack radar system (JSTARS), Predator, Global Hawk, P-3 aircraft and others. The CFACC's ISR division has developed innovative cross-cueing TTPs, integrated non-traditional ISR platforms and learned to squeeze the most out of existing assets in its struggle to satisfy the demand for intelligence.

The Detect phase of the Decide-Detect-Deliver-Assess targeting cycle has grown in complexity as the insurgency matures. There is a clear need for a strong coordination cell to represent the

ground commander in the CAOC's planning and execution of joint ISR operations. Remarkably, the BCD's intelligence section does not have a doctrinal role in the joint collection process. *FM 3-09.13* assigns the intel section the mission of providing air power with the ground commander's view of the enemy and targeting tasks.

Nonetheless, the 19th BCD facilitates the resourcing and execution of ISR operations to support the joint integrated prioritized collection list (JIPCL). The 19th BCD has made significant inroads into filling this void and increased the efficiency of the collection process on behalf of the ground commander.

**Airspace Management.** The BCD airspace section has a wide range of tasks in support of counterinsurgency operations. The airspace section executes the same coordination tasks in counterinsurgency operations as in high-intensity conflict. It processes an average of 750 Army airspace control measure requests (ACMRs) daily via the tactical airspace integration system (TAIS). This ensures every Army aircraft in theater is "missioned" on the ATO and provides the CFACC staff and aircrews situational awareness of known flight hazards, such as explosive ordnance disposal (EOD) points and active ground firing ranges. This is a daunting task list, especially in the mature, high-density and nonlinear battlespace of Af-

ghanistan and Iraq.

The section fulfills a key role as the Army's advocate to the CFACC, who is dual-hatted as the airspace control authority. What this means to Army airspace coordinators is that the BCD airspace section has a seat at the table where the most important decisions regarding joint airspace management are made.

The section is uniquely postured to facilitate solutions on behalf of the ground commander if armed with a solid understanding of issues and requirements. Additionally, the section uses its proximity to the CFACC's airspace and air traffic control sections to influence the baseline documents that govern airspace operating procedures: the airspace control plan (ACP), airspace control order (ACO) and special instructions (SPINS).

The section works to deconflict competing requirements and priorities for airspace usage in an extremely congested operational environment. The challenge is truly unique as the airspace architecture in both Iraq and Afghanistan are rapidly maturing from their previous wartime state to peacetime civil airspace in the near future.

The complexity of airspace management is immense. It equals the level of coordination required to clear counterbattery fires in battlespace that is occupied by Army, Marine, Air Force

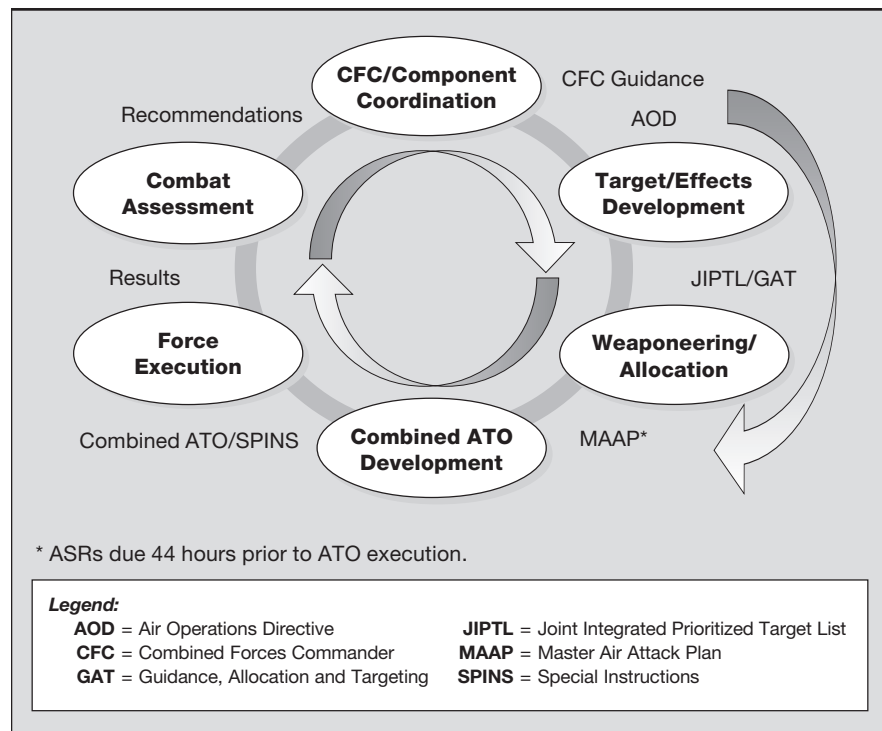


Figure 2: 44-Hour Air Tasking Cycle



and Navy forces plus Coalition partners, a plethora of unmanned aerial vehicles (UAVs), commercial airline traffic and special operations aircraft. Then add a credible ground-to-air threat and place the Hot Platoon inside what normally would be considered Class B airspace due to the high density of air traffic. At the same time, the air traffic command and control facilities are partially manned by host nation operators because they own the airspace.

**The Way Ahead.** Ironically, BCD personnel often find they are more understood by Air Force personnel than by their Army brethren. As fire supporters, we must work to overcome this visibility gap and educate our own ranks. The BCD is the key point of entrance for fire support elements (FSEs) and FECs to ensure vital aerial fire support for ground forces.

Recently, BCDs were designated O-6 commander positions, a brigade com-

mand selection list billet with concurrent efforts to code the operations sergeant major position as a command sergeant major billet. Additional efforts are underway to recode BCD positions as joint assignments.

It is essential that we, as fire supporters, educate each other and our respective senior Army leadership of the significant role the BCD plays at the operational level of joint warfare and in the modular structure of the force interface with FECs in higher tactical headquarters, operational-level headquarters and joint task forces (JTFs).

**Colonel James M. Waring commands the 19th Battlefield Coordination Detachment (BCD) out of Ramstein Air Force Base, Germany. He deployed the 19th BCD to Al Udeid Air Base, Qatar in September 2004. His other commands include serving as Commander of the 1st Battalion, 7th Field Artillery (1-7 FA), 1st Infantry Division**

**(Mechanized), in Germany. His operational deployments include Operations Desert Shield and Storm and Operation Desert Thunder in the Gulf and Operation Joint Guardian II in Kosovo.**

**Lieutenant Colonel Carl L. Giles, Aviation, is the Chief of Plans for the 19th BCD in Qatar. A Senior Army Aviator, his previous assignments include serving as S3 and Executive Officer for the 1-227 Attack Helicopter Regiment (AH-64D) of the 1st Cavalry Division, located at Fort Hood, TX. He also served with the 1st Armored Division during Operation Desert Storm and as an Aviation Officer Advanced Course Small Group Instructor at Fort Rucker, Alabama.**

**Chief Warrant Officer Three John A. Robinson is the Targeting and Information Operations Officer for the 19th BCD in Qatar. He previously served as the Targeting Officer and Field Artillery Intelligence Officer (FAIO) for Combined Joint Task Force-180 (CJTF-180) in Afghanistan during Operation Enduring Freedom (OEF) and as Targeting Officer/FAIO for CJTF-Mountain, also in OEF.**

## Cav Leader's Course Open to Other Branches

Efforts to make modular brigade combat teams (BCTs) a reality have required some fundamental shifts in thinking about how to organize BCTs and configure them to fight in a full-spectrum environment. The cavalry's role has not been spared this reexamination. To ensure the officer education system (OES) at Fort Knox, Kentucky, remains current and relevant, the Armor School recently redesigned the Cavalry Leader's Course (CLC).

As the force structure changes, we also must reconfigure our assumptions about who should attend the CLC. The combined arms philosophy underpinning the logic behind creating modular BCTs demands that all officers assigned to the BCT planning staffs or the reconnaissance squadrons within the BCTs understand reconnaissance and security operations, regardless of branch.

Leaders who attend the CLC are provided in-depth knowledge of reconnaissance and security as applied to the new reconnaissance squadrons found in the heavy BCTs (HBCTs), infantry BCTs (IBCTs) and Stryker BCTs (SBCTs). The CLC accomplishes its learning objectives

through practical exercises that test and hone the students' understanding of the latest doctrine; tactics, techniques and procedures (TTPs); organizations; missions; and the capabilities and limitations of reconnaissance, surveillance and target acquisition (RSTA) and reconnaissance squadrons.

The Armor School encourages CLC enrollment for all Armor officers as well as leaders serving in Field Artillery, Infantry, Engineers, Aviation, Military Intelligence and Signal Corps assigned as planners or commanders of RSTA/cavalry organizations in the modular BCTs. These planners or commanders should consider attending the CLC to prepare for assignments to or in support of RSTA and cavalry organizations. Attendance at CLC is now open to graduates of any Officer Career Course in the grades of first lieutenant (promotable) through major.

The course is offered six times a year



Photo by Fred W. Baker III

and is three weeks long. Enrollment is available through the Army training requirements and resources system (ATRRS).

The homepage for the course is <http://www.knox.army.mil/school/16cav/octeam.asp> (access "Student Info," then "Cav Leader"). For questions about the course, call (502) 624-1324 or DSN 464-1324. You can send questions via email to Captain J. Timothy Vibbert at [tim.vibbert@knox.army.mil](mailto:tim.vibbert@knox.army.mil).

MAJ Matthew A. Dooley, AR  
Former CLC OIC/Instructor  
Fort Knox, KY

# Terrain Denial Missions in OIF III

During the second week of November 2004, in Logistical Support Area (LSA) Diamondback in Mosul, Iraq, one of the most prominent threats to the camp was daily anti-Iraqi forces (AIF) mortar and rocket fires aimed at the installation. Soldiers and civilian workers alike wore body armor and Kevlar helmets wherever they traveled.

Because of this threat, I was charged to develop a plan to incorporate counterstrikes and psychological operations (PSYOP) and conduct combined arms and coalition ground combat patrols to disrupt enemy activities—including terrain denial. These operations resulted in a decrease from one attack daily to two or three isolated attacks monthly.

I was attached to 2d Battalion, 10th Special Forces Group (2-10 SFG) (Airborne), at Forward Operating Base (FOB) 102 as a fire support officer (FSO). This was a unique arrangement worked out by 10 SFG and the 3d Brigade, 3d Infantry Division (3d ID), my original unit of assignment.

My duties included coordinating indirect fire support for all of FOB 102's operational detachments that were spread throughout northern Iraq and coordinating and conducting counterstrikes for the base defense of FOB Hornbeck, the FOB 102 living area within LSA Diamondback. Through the implementation of an aggressive campaign combining indirect fire assets and nonlethal effects, we disrupted AIF at-

By Captain Justino Lopez, Jr.

tacks on LSA Diamondback. The campaign included harassing and interdicting (H&I) fires with the collection of enemy indirect fire data using Q-36/Q-37 radars and the Special Operations Forces (SOF) unique test system: the unattended transient acoustic measurement and signatures intelligence (MASINT) system (UTAMS).

UTAMS is an acoustic mortar detection system that detects points of origin (POOs) and points of impact (POIs) by triangulating the lines of bearings (LOBs) developed by each UTAMS array. Each array consists of a tripod, four acoustic microphones, a global positioning system (GPS) antenna, a temperature sensor and an electronics unit. Once the arrays are set up, the microphone with north-seeking arrow on each array is aligned either at true north or at a known distant aiming point (DAP). Although its main use is for acquiring indirect fires, it also can pinpoint improvised explosive device (IED) explosions and small arms/rocket-propelled grenade (RPG) fires. The UTAMS has detected POOs up to 10 kilometers out.

**Pattern Analysis.** After researching enemy mortar and rocket attack data back to October 2004, it was obvious the LSA Diamondback Airfield was being targeted. In the month of October, there were 27 mortar and rocket attacks; in November, there were an

additional 27 attacks.

After conducting pattern analysis, it was apparent the AIF was firing mortars everyday between 1300 hours and 1800 hours. Firing times coincided with dining hours, so the assumption was that the AIF was trying to maximize its chances of producing mass casualties.

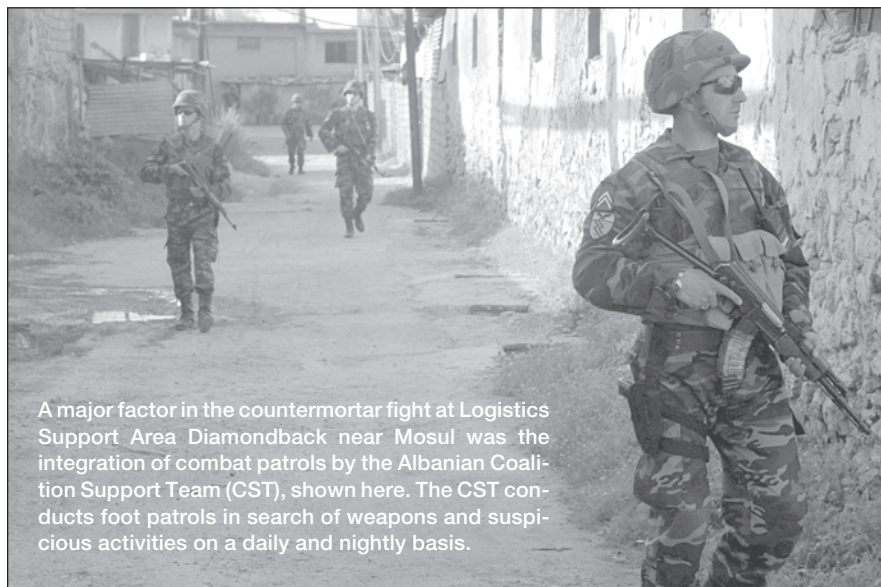
Not only were we able to establish a most likely time when they would shoot, we also were able to establish a pattern of where they would shoot from. Primarily, the AIF were shooting their mortars from the east side of the Tigris River from the farm fields north and south of Palestine, a Sunni neighborhood in Mosul. Occasionally, the AIF traveled across the Tigris River by boat and shot their mortars from an island we called "Gilligan's Island" and the western bank of the river.

**Counterstrike—Terrain Denial.** The rear area operations center (RAOC), initially a combat support battalion and later an FA battalion, was responsible for the LSA base defense. In conjunction with the RAOC, we developed courses of actions (COAs) to counter the enemy indirect fires.

As our primary COA, we requested a mortar section from Task Force 1st Battalion, 24th Infantry (TF 1-24 IN) and established a firing position for them in FOB Hornbeck. Its mission was to conduct terrain denial fires and counterstrike missions to deny the AIF terrain that could easily range the targeted LSA and to have psychological effects on the AIF who witnessed these displays of firepower.

The mortar section fired more than 380 of rounds of 81-mm and 120-mm illumination (ILLUM) and high-explosive (HE) rounds throughout their five-month tour on the FOB. When the mortar section was not available to shoot, we conducted terrain denial missions with the M198s (155-mm towed), located in FOB Courage, eight kilometers north of the target area. The howitzers shot 43 rounds of both ILLUM and HE on the same targets as the mortars.

When neither the mortars nor the M198s were available, we used MH-60 helicopters armed with 7.62-mm machine guns, 30-mm main guns and 2.75 rockets or Apache attack helicopters for terrain denial fires.



A major factor in the countermortar fight at Logistics Support Area Diamondback near Mosul was the integration of combat patrols by the Albanian Coalition Support Team (CST), shown here. The CST conducts foot patrols in search of weapons and suspicious activities on a daily and nightly basis.

Photo by SFC Jeremy D. Crisp



Terrain Denial fires were executed based on the established time pattern of enemy indirect fires. When the AIF established a pattern of firing their mortars during night hours, we conducted terrain denial missions using ILLUM rounds and the armed MH-60 helicopters to disrupt their pattern. When the AIF established a pattern of firing in the daytime hours, we conducted terrain denial fires using HE rounds and the Apache helicopters. This continued for two weeks until the AIF adjusted firing times to odd, random hours of the day. Likewise, we adjusted our mission times to correspond to the AIF's.

After six weeks, the frequency of mortar attacks declined significantly from one attack per day to one attack every three to four days. We had disrupted the AIF mortar cell but only temporarily.

We considered bringing the fight closer to the enemy to put more pressure on him. The problem was the Tigris River, an obstacle on the eastern boundary of our area of operations (AO). The east side of the river belonged to a different task force that was already spread thin and could not provide a forward observer (FO). Due to terrain limitations and the proximity of the Palestine neighborhood, we had to restrict our terrain denial missions to either Gilligan's Island or a piece of terrain west of the river.

The challenge was that many of the enemy indirect fires came from east of the river. We were able to deny the AIF enough terrain that he was unable to range the LSA with 60-mm mortars, his primary indirect fire asset.

Our assessment of only temporary disruption was correct. On 7 February 2005 a mortar attack hit the LSA, injuring four people. Four days later, the AIF resumed more accurate attacks. Based on these attacks we extended our terrain denial missions into Palestine.

The immediate response to the mortar attacks was executing a terrain denial mission on 14 February 2005 using the armed MH-60s, firing on a target on the east side of the river within observation of the mortar POO in Palestine. The commander directed the MH-60s to "rock the neighborhood and knock pictures off of the walls of the houses surrounding the POO" without causing collateral damage. MH-60s do not require an observer as they observe their own fires.

We then used the gunships to drop 3,000 PSYOP leaflets throughout the area, warning the local population that

if they continued to allow the enemy to shoot from their neighborhoods, we would counter with artillery and mortars. The leaflets also informed residents of the local tip line phone number to report AIF activities. We followed the MH-60 fires with several nights of terrain denial fires using ILLUM east of the river.

This show-of-force combined with a leaflet drop had an immediate influence on the population of Palestine. Mortar fires ceased, and the next three weeks were the quietest the LSA had experienced in a long time. Obviously the populace realized we would no longer tolerate their willingness to cooperate with AIF.

The local nationals in Palestine reported to the MultiNational Forces (MNF) patrols that they were tired of our constant firing. Several of them told the task force that owned the battlespace they would promise to do their best to prevent the AIF from shooting mortars from within their neighborhood.

They also tipped MNF troops about the location of several weapons and ammunition caches. While the majority of the neighborhood remained anti-MNF, the populace also decided that the AIF were unwelcome.

The LSA saw four incidents of indirect fires from late February to early March 2005. However, none of these attacks came from Palestine. All were 107-mm rockets placed in an improvised launching tube and set on time fuzes from south of Palestine.

In response, MNF set up observation posts (OPs) to overwatch the POO locations. Believing the AIF emplaced the rockets after curfew, we executed additional terrain denial missions late at night using a 1-5 IN mortar section.

Once again, the AIF were deterred from shooting rockets at the LSA. This was true until late April when we were hit with two additional rounds of 107-mm rockets in two attacks, injuring seven people. The rounds came from the far eastern side of Palestine. Currently, we are targeting the area by developing POO and time patterns.

**Albanian Support.** A major factor in the countermortar fight was the integration of combat patrols by the Albanian Coalition Support Team (CST) whose main task at LSA Diamondback was base defense. The Albanian CST combines US Special Forces advisors with three rotating platoons of Albanian Kommandos who have since been replaced with two rotating squads of Al-

banian Special Forces. The Albanian CST goes outside the perimeter daily to conduct combat patrols along the river and occupy OPs.

The Albanian CST was key to the countermortar fight for three reasons. First, it could respond quickly outside the perimeter and conduct crater analysis on indirect rounds that landed short of the targeted LSA. We provided them with the impact locations from the UTAMS. Once the Albanian CST received the UTAMS readings and conducted crater analysis, they provided the pertinent information to the RAOC and the conventional forces' fire support cells that rarely ventured outside the perimeter.

Second, the Albanian CST was the security force for all our OPs as we executed the calls-for-fire (CFFs) for terrain denial missions. I knew the terrain intimately by patrolling the area east of LSA Diamondback with the Albanian CST. We conducted more than 130 combat patrols and occupied more than 50 OPs through more than 90 hours of continual observation.

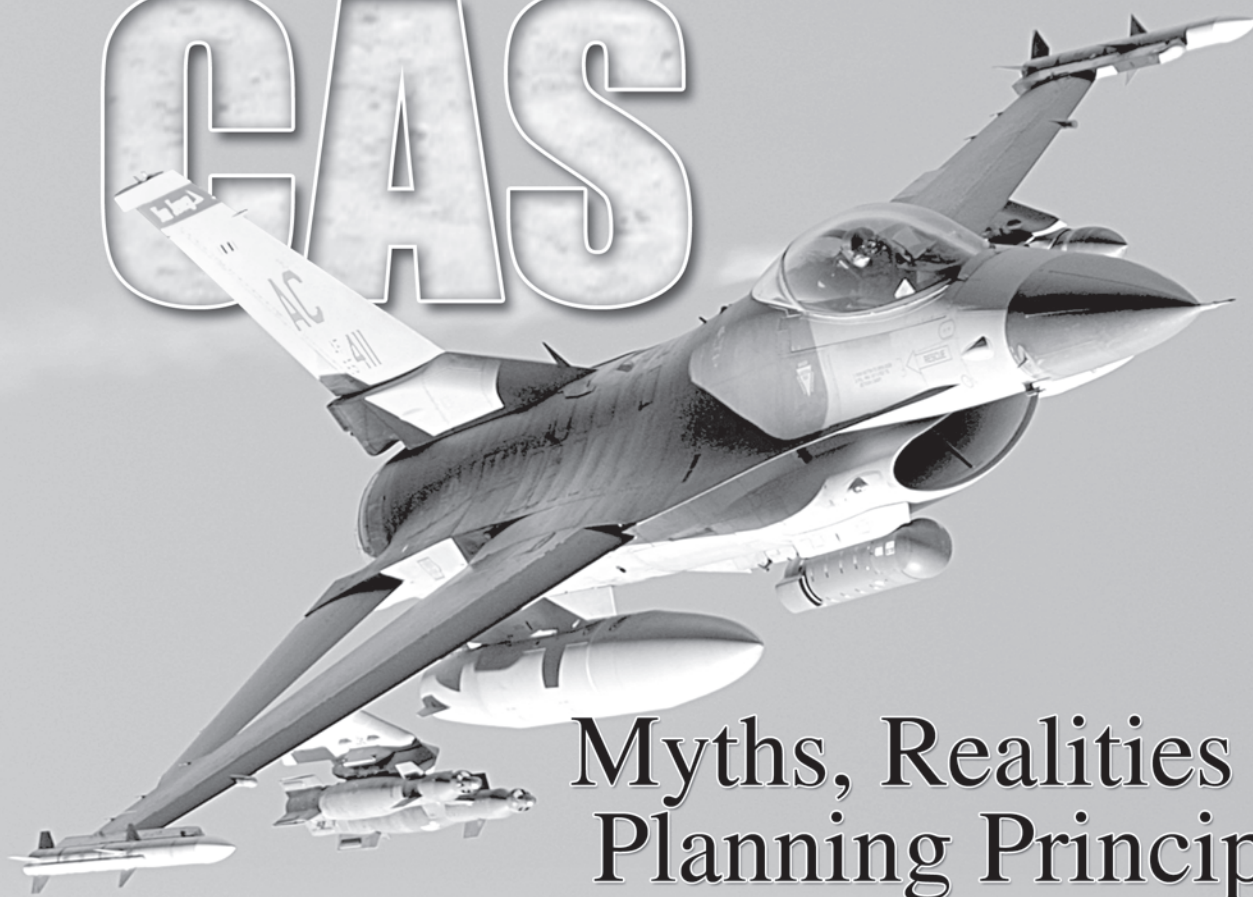
Third, the Albanian CST was available to conduct recovery operations for the Raven unmanned aerial vehicle (UAV), whenever necessary. We used the UAV to observe fires when we could not observe the target from a safe distance due to the minimum safe distance of the type of rounds being fired or the gun-target line (GTL) being online with the observer-target line (OTL).

Terrain denial fires have proven to be an excellent deterrent to enemy indirect fires in this ever-changing combat environment. While the physical effects of the fires on the "target" are minimal, the psychological effects on the real targets, the minds of the AIF mortarmen, were substantial. Firing 400 rounds of mortar/artillery rounds is a small price to pay for the life of a single Coalition Soldier. These missions reinforce the concept of using lethal fires to create nonlethal effects.

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**Captain Justino Lopez, Jr., is the Battalion Fire Support Officer for 2d Battalion, 10th Special Forces Group in Mosul for Operation Iraqi Freedom III. His previous assignments include serving as Assistant Brigade Fire Support Officer for 3d Brigade and Targeting Officer for 3d Squadron, 7th Cavalry Regiment, both in the 3d Infantry Division at Fort Stewart, Georgia, and Firing Platoon Leader with 1st Battalion, 38th FA Regiment, 2d Infantry Division in Korea.**

# GAS



US Air Force Photo by SSgt. Lee O. Tucker

## Myths, Realities and Planning Principles

Close air support (CAS) had its beginnings in the early 20th century with bombs dropped by hand. In less than a century, we have transitioned from open-air cockpits to the higher-performance aircraft of World War II through the sound barrier and now to sophisticated technologies of stealth aircraft designs and unmanned aerial vehicles (UAVs). Ground maneuver forces have evolved as well, and the Army currently is transforming into a smaller, more agile, faster and more deployable force—enabled by networked information in an increasingly complex web of battle command.

The Army's modular force emphasizes new efficiencies in command and control (C<sup>2</sup>) and the seamless integration of joint fires as essential enablers. In consonance with this strategy, the Army is divesting itself of some of its organic indirect fires assets (along with tanks, Bradleys, aviation platforms and other assets) and leveraging the capabilities of other services' joint fires. CAS constitutes one of the most significant of these capabilities.

**By Colonel Julius E. Clark III, AV**

Understanding how to employ CAS is essential, and understanding how to request it is imperative.

**CAS—what is it?** Definitions are important. It is critical, then, to understand CAS as expressed in joint doctrine. "CAS is air action by fixed- and rotary-wing aircraft against hostile targets that are in close proximity to friendly forces and which requires detailed integration of each air mission with the fire and movement of those forces" (*Joint Publication 3-09.3 Joint Tactics, Techniques and Procedures [TTP] for Close Air Support*, Chapter I). "Close proximity" is a relative, situational term that is unrelated to a specific distance. The requirement for "detailed integration [because of proximity] with the fire or movement of those forces" is the determining factor. As further noted in joint doctrine, Army aviation does not conduct CAS, but it may use joint TTP to conduct close combat attacks (CCAs) as an integrated Army aerial maneuver element.

*Preplanned CAS Requests.* A preplanned request is nothing more than one that is submitted early enough to be included on the joint air tasking order (ATO). This is often 72 hours in advance but may be less than that based on established procedures. Most of the written TTP state that preplanned requests are submitted on a DD Form 1972 Joint Tactical Air Strike Request, but there are automated alternatives.

Fire supporters can use the advanced FA tactical data system (AFATDS) to submit requests for both preplanned and immediate air support requests (ASRs) for CAS. AFATDS uses the D670 US message text format (USMTF) and automatically populates the appropriate data fields for transmission to other Army and joint C<sup>2</sup> systems.

The advantages in doing so are digital transmission from the AFATDS workstation up the fire support chain to the joint air operations center (JAOC) and to its associated battlefield coordination detachment (BCD); automated response regarding whether the request was approved, disapproved or is still in



coordination; digital transmission of a mission number when approved; and the capability to receive the ATO with other mission data.

**Immediate CAS Requests.** Immediate ASRs are those submitted outside of the ATO planning cycle. Immediate requests for CAS are not responsive solutions for failures to plan.

A useful enhancement to an immediate CAS request is to extract the supporting unit information from the ATO (an air wing if resourced by the Air Force) and contact the Army ground liaison officer (GLO) in the wing operations center. The GLO communicates the latest ground maneuver situation to the wing's aircrews before they execute the mission and participates in aircrew debriefings after the missions are completed. Direct contact can promote aircrews' situational awareness and is particularly valuable in volatile, dynamic circumstances and when critical information becomes available close to the time for mission execution.

As with preplanned requests, most written TTP neglect the automated C<sup>2</sup> systems available to submit immediate ASRs. While immediate requests are often submitted via the Air Force air request net (AFARN) used by the air liaison officer (ALO) and tactical air control parties (TACPs), AFATDS also can transmit these requests with the advantages previously noted plus an additional one. Immediate requests are approved at each fire support echelon in the hierarchical chain, and these requests receive final approval via the commander (usually through the effects coordinator or ECOORD) at the lowest level where resources can be made available for the mission. AFATDS accomplishes this quickly, but it takes *practice*.

There are broad misunderstandings about CAS request procedures. This article highlights some of these misunderstandings and advances some planning principles—more *how* to think than *what* to think.

**CAS Request Myths and Realities.** Unless a Soldier has been through the Joint ATO Processes Course (formerly known as the Joint Aerospace Command and Control Course) at Hurlburt Field, Florida, or the Joint Firepower Course at Nellis Air Force Base, Nevada, it is rare for him to have the insight to plan and develop CAS requests with

the flexibility the system is designed to provide.

Most often, it's what we *think* we know that leads to trouble. So it is with CAS. The following are some familiar myths and their corresponding realities.

1. **Myth:** The ATO is inflexible. The process is so regimented that it does not meet maneuver commanders' needs for responsive CAS.

**Reality:** The ATO is a flexible document with opportunities for refinement within the typical 72-hour cycle.

2. **Myth:** If you want CAS, you need a 10-digit grid and a target description 72 hours in advance.

**Reality:** An ASR for CAS can be submitted even if all that is known 72 hours in advance is that CAS will be required in a future operation (with an idea of the timeframe).

3. **Myth:** There is always plenty of CAS—we never had a problem in Operation Iraqi Freedom (OIF).

**Reality:** CAS requirements compete

with other priorities for air power. Our recent experiences in Afghanistan and Iraq have been against adversaries with no significant air power and with somewhat vulnerable air defenses.

Other potential adversaries may require substantial apportionment of air power assets against other theater missions, particularly at the onset of conflict. Recent experiences with CAS availability should, in fact, be considered the exception vice the rule.

4. **Myth:** "Push CAS" (near continuous on-call CAS missions) is the best approach to the request process. The ALO makes sure that CAS is available when we need it. He is the expert, so let him figure it out.

**Reality:** Push CAS is not the cure for all ills and carries disadvantages of its own. Push CAS is based upon a level of relatively unconstrained CAS assets.

Even in circumstances of abundant CAS availability, commanders and fire supporters must be closely involved in CAS planning. Timing, weapons loads and aircrew situational awareness are important details for CAS missions and are much more important for CAS in an urban environment.

The ALO is a vital asset in the process, providing expertise on capabilities, limitations and effective TTP for employment. However, the ground commander is responsible for the timing and effects of joint fires—including CAS.

5. **Myth:** The 72-hour timeline causes maneuver commanders to default to "immediate CAS"—ask for it when it is needed. That's why they call it "immediate."

**Reality:** There is no such thing as "immediate" CAS. There are only immediate ASRs for CAS. Immediate requests resource truly unanticipated requirements, not failures to plan.

Immediate requests are typically filled either with aircraft on on-call missions or by diverting aircraft from other scheduled missions. In both cases, the aircraft may have been intended to support other ground maneuver missions. The aircrews will have planned for different missions, have ordnance tailored for other requirements and have developed situational awareness for other circumstances—all of which increase the risk of fratricide and the time required to respond and decrease the probability of achieving the effects



Air Force Captain Danny Stout, an air liaison officer deployed with the Army's 2d Battalion, 505th Parachute Infantry Regiment of the 82d Airborne Division, guides an A-10 Thunderbolt II onto his location in the mountains of Afghanistan. Stout, a B-52 Stratofortress pilot serving a two-year tour with the Army, was part of the initial air assault into the hostile area where he immediately set up his radio and began talking with the fighter aircraft.

US Air Force Photo by 2 Lt. Rebecca Garland

needed.

6. *Myth*: The fire support coordination line (FSCL) is an impediment to the rapid employment of CAS. Missions conducted short of the FSCL are CAS missions, requiring terminal attack control by a joint terminal attack controller (JTAC).

*Reality*: The FSCL is not a CAS demarcation line; this is an explicit point in JP 3-09.3 (Chapter III). CAS is not tied to a location on the battlefield and may occur well beyond the FSCL.

Similarly, missions short of the FSCL are not necessarily CAS. There is nothing that precludes air interdiction missions short of the FSCL, requiring only that maneuver commanders control these operations. Air interdiction missions do not require terminal attack control.

**Understanding CAS C<sup>2</sup> Architecture.** The C<sup>2</sup> architecture supporting CAS request procedures is a broad, fairly complex web of C<sup>2</sup> nodes and associated functions that extend from the battalion level up to the theater's joint force commander. It includes all four services, designated theater-level functional joint force commands and the US Special Operations Command as described in the Air Land Sea Application Center's publication *TAGS: Multi-service TTP for the Theater Air-Ground System* (designated Army FM 3-52.2). TAGS is the joint C<sup>2</sup> architecture with service coordination links that facilitates the integration, synchronization, planning and execution of joint air-ground operations.

While the details of this "system of systems" are beyond the scope of this article, everyone in the business of joint fires and effects should have a working knowledge of the dynamics outlined in the publication. Especially important are the Air Force system, the theater air control system (TACS), and the Army system, the Army air-ground system (AAGS), that together constitute the C<sup>2</sup> nodes, linkages and liaisons necessary for the Army to conduct joint air-ground operations in general and CAS specifically.

Even when the Army employs Marine or Navy CAS assets, TACS/AAGS applies. The tasks of integrating and executing fire support planning via terminal attack control of CAS aircraft require this Army-Air Force partnership.

**Principles for CAS Planning.** The TTP in JP 3-09.3 nearly suffices to shape planners' thinking. Even so, there are some unwritten organizing prin-

ciples that apply to preplanned and immediate requests.

The principles presented here are to be used in conjunction with the joint doctrine in JP 3-09.3 and with the multi-service TTP in TAGS. They complement the two publications by relating familiar planning processes with ASRs. This is more about how to think than what to do.

When distilled to the most fundamental elements, all relate to time management.

*Time matters.* In developing requests, focus on the time period for the requirement over other considerations. The ATO seeks to organize people and things in space, time and purpose to apply air power capabilities. In truth, it is more of a plan than an order. The ATO is constrained more by time periods for execution than locations for CAS (using assets that can shift locations at more than 400 knots per hour).

CAS execution has a long list of associated tasks that must be synchronized with the mission: aircraft maintenance, aerial refueling plans, ordnance configuration and loading, defensive counterair planning, electronic warfare (EW) planning, updated imagery requirements, weather assessments and others that need some lead time.

*Resource ambiguous future requirements with on-call missions.* A preplanned or an immediate ASR can be used to request an on-call CAS mission that is updated later with previously unavailable mission details. The update simply references the mission number. The time period, probable target type and probable location are sufficient to initiate a request.

*Integrate CAS planning into the military decision-making process (MDMP) timelines.* In the MDMP, "receipt of mission" is not too early to submit an ASR. Just as a commander may issue initial guidance, start reconnaissance operations and begin logistics preparation when he receives the mission, he also can submit an ASR for CAS when the requirement is relatively certain and the time period is fairly well defined. He must be sure to use the ALO's insights.

*Higher headquarters can ease the process.* Higher headquarters can submit a preplanned ASR for an on-call mission to support subordinate forces' future operations. In most cases, the higher headquarters will have better insights into future missions. Fire supporters at

higher headquarters should take the initiative to submit ASRs early to ensure CAS assets are available.

**Other CAS Considerations.** The brigade combat teams (BCTs) of the modular force are assuming additional C<sup>2</sup> functions previously found at the division or corps levels. The BCT's joint fires and effects cell (JFEC) must integrate fire support planning with the air defense and airspace management (ADAM) cell and with the brigade aviation element (BAE).

CAS cannot be considered as an operation isolated from others in the battlespace. Surface-to-surface fires, UAV operations, civilian air operations, air and missile defense missions, Army aviation operations and CAS all may occur simultaneously. Integrating the ATO, the airspace control order (ACO), fire support coordinating measures (FSCM), airspace control measures (ACM), air defense planning, the civil aviation structure, clearance of fires, the ground common operating picture (COP) and the air COP all can come into play. We must understand the joint processes involved, the C<sup>2</sup> systems tools used for synchronization and the practical TTP to be applied.

This article has examined some details of CAS requests and underscored that the broader fires and effects realm is about how to think. All Soldiers should seek professional military education in joint air-ground operations as a step toward bolstering both competence and confidence in thinking through their complexities.

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# IO FOR JOE

## Applying Strategic IO at the Tactical Level

By Lieutenant Colonel Joseph F. Paschall, USMC

LCpl Williams J. Smith, a fire direction control Marine, hands out information operation pamphlets to children during a civil affairs mission to Abu Tiban, Iraq.

(USMC Photo by GySgt Kevin W. Williams, 31st Marine Expeditionary Unit)

Information operations (IO) is a much maligned term that is applied to everything and nothing at the same time. At the strategic level, the joint services continue to wrestle with exact definitions and core capabilities of IO and, too often, recommend changes.

Concurrently and in the absence of clear guidance from “echelons above reality,” troops in Iraq and Afghanistan apply their own understanding of IO at the tactical level. The challenge is to glean from the strategic level aspects of IO that can be readily applied at the tactical level and train and equip Soldiers and Marines to use these concepts daily to guide their actions.

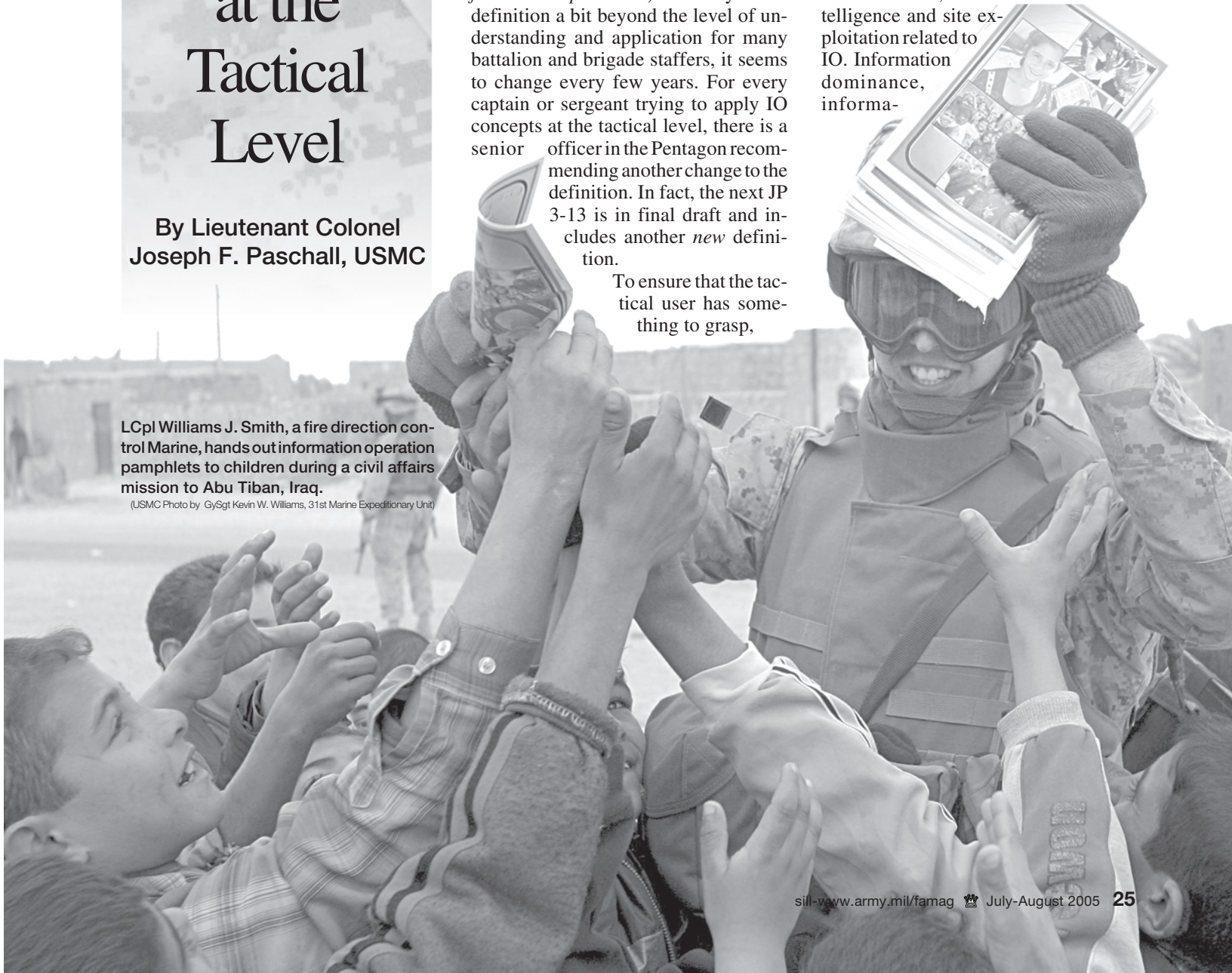
**IO Defined—Joint Confusion.** “IO involves actions taken to affect adversary information and information systems while defending one’s own information and information systems” (*Joint Publication 3-13 Joint Doctrine for Information Operations*). Not only is this definition a bit beyond the level of understanding and application for many battalion and brigade staffers, it seems to change every few years. For every captain or sergeant trying to apply IO concepts at the tactical level, there is a senior officer in the Pentagon recommending another change to the definition. In fact, the next JP 3-13 is in final draft and includes another *new* definition.

To ensure that the tactical user has something to grasp,

paraphrasing the definition as “influencing the way someone thinks” stays within the spirit of the definition no matter how much it changes. It also enables Soldiers and Marines to move forward at the tactical level without having to take a step back each time the definition changes.

Aside from the changing definitions of IO, the delineation of what elements comprise IO sows more confusion at the tactical level. (See the figure on Page 26.) Doctrinal IO core elements (as of April 2005) are psychological operations (PSYOP), military deception (MILDEC), operational security (OPSEC), electronic warfare (EW) and computer network operations (CNO) with the related activities of civil affairs (CA) and public affairs (PA), all intertwined by the need for accurate and timely intelligence support.

Joint publications also consider physical destruction, counterintelligence and site exploitation related to IO. Information dominance, informa-



tion fires, information assurance and any other term that can be prefaced with “information” add to the confusion by providing new ways of describing the problem instead of offering tangible solutions.

Meanwhile, the Air Force also has created its own terminology, which includes delineation of elements into groups of network operations and influence operations.

This grouping and regrouping of such disparate and seemingly unrelated items might lead one to believe that *everything* is IO—the corollary of which becomes *nothing* is IO. To assist the tactical planner currently engaged in actually influencing people (vice doctrine), we must get past this tendency to endlessly group, regroup, redefine and rename everything relating to IO and emerge with something that describes the exact application of IO elements for tactical units.

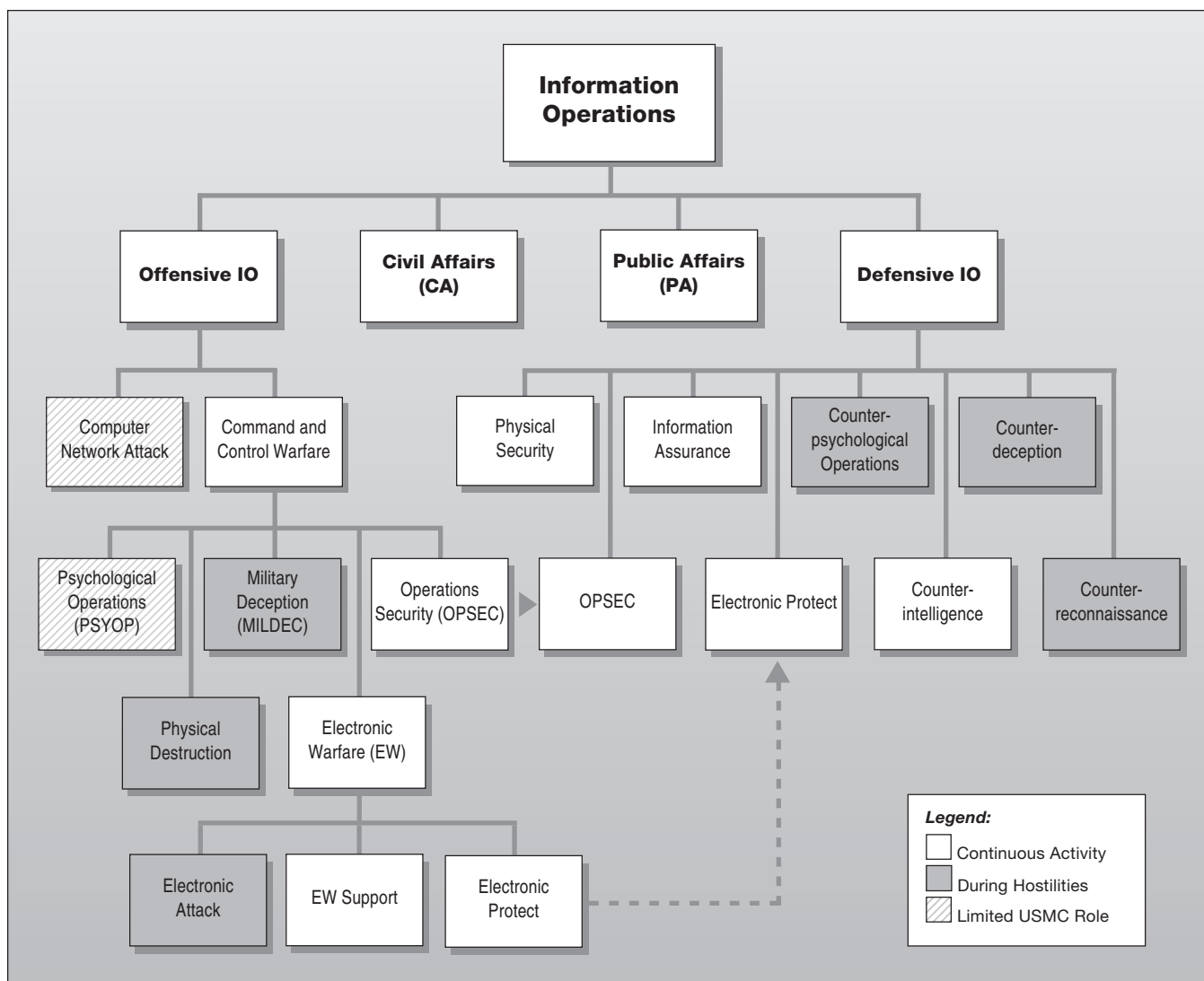
**Tactical IO—Joint Disparities.** Because these elements of IO have different levels of importance for different services, first we should depart from the *joint IO* vision to define IO at the user level on the ground. Considering that the Navy and Air Force usually conduct operations from 12 nautical miles off the coast or 30,000 feet above ground, they have cultivated significant strengths in the techno-centric functions of EW and CNO, yet have a near inability to influence anyone face-to-face. For this reason, they historically have taken IO to mean synchronization of their EW and CNO assets. The result is when Navy and Air Force IO planners join a joint task force (JTF) IO cell, they often forget that there are more human-centric ways to conduct IO.

Similarly, the best applications for IO within tactical units of the Army and Marine Corps are those involving face-to-face contact with the local populace.

Army IO planners likely are from intelligence or PSYOP backgrounds, and the Army is heavy in PSYOP and CA forces. Therefore, Army planners probably fall back on face-to-face methods of influencing a population.

Although the Marine Corps has so few IO planners that they are not often found in a JTF, a Marine will have some understanding of the Navy techno-centric mentality because of the need to operate and launch from sea-based platforms. But he will tend to depend on the synchronization of PSYOP, CA and PA to define his concept of IO.

**Tactical IO Applications.** Although the primary elements of IO applied on the ground may be PSYOP, CA and PA, all elements of IO have some application in ground engagements. CNO and EW are commonly used to isolate an objective area for brief periods of time to better facilitate ground maneuver and, therefore, warrant at least cursory fa-



Information Operations (IO) at the Tactical Level



miliarization by the staff.

Although CNO and EW commonly go unnoticed by company and even battalion commanders, these types of non-kinetic effects are coordinated by a higher headquarters staff in support of ground operations. The tactical commander may not need to know *how* to use a plan for CNO and EW effects, but he must know that they are available to him and can help isolate his objective for the short term.

A more commonly visible application of EW at the tactical level (outside of signals collection related to intelligence) is EW for force protection. In both Afghanistan and Iraq, remotely controlled improvised explosive devices (RCIEDs) have become one of the primary threats to Coalition Forces. Counter-RCIED black boxes emplaced in coalition vehicles can be used to pre-detonate RCIEDs and protect the force. Although this clearly is not an IO-related application of EW, IO planners need to be familiar with this application.

OPSEC is applied across the spectrum of conflict and across the spectrum of war. However, at the lowest tactical levels, its applications are narrow. At this level, the most pressing concerns for OPSEC are day-to-day protection of information regarding critical vulnerabilities of the force. Therefore, all units must ensure that Soldiers adhere to communications plans, patrols vary their routes and troops take other physical measures to avoid offering the adversary an easy target.

In addition to these age-old methods of obscuring friendly activities from an adversary, we now have to worry about tipping our hand through emails to friends and relatives back home. Because every Soldier and Marine may have a digital camera and everyone wants to send pictures and notes back daily, we must ensure that troops know exactly what they can and cannot talk about and (or) restrict internet access for certain periods of time when missions are ongoing.

PSYOP is another IO-related term that is misunderstood. In fact, many Navy officers hold that a carrier battle group is conducting PSYOP when it nears a foreign shore in a show-of-force.

Without delving into a parochial dis-



A Marine officer from the 4th Civil Affairs Group shows press members around the Jolan Park Humanitarian Assistance Site in Fallujah.

USMC Photo by GySgt Robert Blankenship, IMEF G-3 Combat Camera

cussion of what constitutes PSYOP and what is simply a psychological activity, the tactical user should consider PSYOP simply as marketing. At this level, we do not intend to engage in any PSYOP other than portraying the truth (our version) to local residents. PSYOP as marketing is portraying us to our adversaries in the most positive light.

Strategic and operational PSYOP actions have impact at the tactical level, so it behooves everyone to be familiar with PSYOP capabilities to conduct broadcasts and drop leaflets as well as pass information via hand-held radios. Tactical units may find some of these leaflets and radios in their areas of operations (AOs).

Tactical units generally only will work directly with the PSYOP activities of handbill and poster distribution and face-to-face loudspeaker broadcasts. At the battalion or brigade levels, the commander will probably consider these capabilities his IO.

Although leaflets are created primarily for aerial delivery, they also can be hand-delivered. Therefore, some battalions/brigades may be tasked to hand out leaflets during routine patrols or other operations. Handing out leaflets adds a human dimension that enables our forces to gain feedback on the locals' reactions to the leaflets—one of the biggest challenges. Troops should be pre-briefed to be prepared to judge whether the handbills were received positively or negatively.

Many tactical commanders confuse CA with civil-military operations (CMO). In CA, a school-trained, military occupational specialty (MOS)-holding CA professional conducts long-term assessments, determines civil goals

and then coordinates the accomplishment of those goals.

However, in the absence of a CA detachment, there is much that a tactical commander can do for himself by way of CMO. Anyone who can liaison with locals to determine a need and unite that need with a capability of the unit to meet the need can perform CMO.

In Iraq during the early combat stage of Operation Iraqi Freedom (OIF) I, my unit could barely purify enough water to satisfy its own needs and certainly had no extra chow to offer. However, we found other ways to meet some

basic needs without compromising our own needs.

A local village with no playground for the kids and a damaged schoolhouse became the perfect site for a platoon-level CMO project. We brought in our bulldozers to level a playing field, used PVC pipe and camouflage netting to make goals and bought a soccer ball in town for five dollars. Total cost was five dollars and six hours of sweat-equity for 30 Marines.

Through our embedded media, we had pictures of Iraqis playing soccer with Marines on CNN by that evening. At the same time, another platoon of Marines was cleaning up the village schoolhouse.

These are perfect examples of "IO on the cheap" whereby a tactical unit can make a difference and build rapport with the locals while also realizing some strategic impact if media can be involved. It doesn't take much more than a platoon commander with a little creativity to undertake this type of CMO project.

Other examples of IO on the cheap are the CMO projects that can be undertaken through the use of unit medical/dental civic action programs (MEDCAP/DENCAP) and veterinarian civic action programs (VETCAP). Units may find that in some areas, the locals don't know who is running in the upcoming election but clearly know their livelihood is tied to whether or not their livestock is healthy. In rural areas, units can make significant progress with locals when they help them get back on their feet economically.

These relationships may later develop into good intelligence collection opportunities. Obviously, not every unit has an organic medical/dental/veterinary capability beyond a medic. However, if

the platoon commander is thinking along these lines and finds a significant need in his AO, he can request MEDCAP, DENCAP or VETCAP support from his higher headquarters. Doctors, dentists and veterinarians want to get outside the wire too, so sometimes this can be mutually beneficial for all parties involved.

PA is invaluable to the IO effort at both the tactical and strategic levels. In fact, PA is often responsible for merging the two levels by giving strategic impact to tactical actions and tactical impact to strategic issues.

PA also brings the first major friction point, which is the relationship between PA and PSYOP. Doctrinally, PA *informs* the US public concerning military activities while PSYOP *targets* foreign sources for our message.

These lines are blurred at the tactical level where PA embedded media are often from foreign outlets, and PA media events involve foreign press. However, at the tactical level, the difference in the two should not be so extreme because both PA and PSYOP are *marketing* the US military to the media.

One of the innate challenges of IO planners at any level is to convince PA and PSYOP personnel to work together and to force them do so when friction occurs. However, both PA and PSYOP planners should be able to agree that, at the battalion and brigade levels, both are marketing the same product—the truth. Both entities stand to gain by sharing the media through which they have access (TV/radio, handbills, leaflets and loudspeakers).

One vignette that encapsulates how IO can be effective at the tactical level is related to my last unit deployment in OIF I. In April 2003, the unit recently had moved from An Nasiriyah to the Qalat Sukar area of central Iraq and had not yet established total control of the area. Before any of our intelligence or reconnaissance personnel went into Qalat Sukar, we sent in a tactical PSYOP team (TPT) to desensitize the village to our presence.

The TPT incorporated an interpreter from CA who had lived in the area 10 years before but had immigrated to the US. The team also incorporated intelligence personnel to take digital images of potential targets for follow-on missions.

With the help of the interpreter, the team identified a Ba'ath Special Police headquarters and a Ba'ath Party head-

quarters and pictures were taken for mission planning. Because both targets were in populated areas where collateral damage could be severe, the commander opted to have a small company raid force led to the objective by the TPT. No enemy fire was taken at the objective, and a couple of rooms full of small arms and ordnance were confiscated.

While the ordnance was being seized, a riot appeared to be brewing in the street where the locals had been cordoned off by security forces. The “riot” was actually a throng of well wishers who recognized the interpreter and reunited him with his family. (Chanting and screaming Arabs often look the same to most Americans whether they are happy or angry.)

The media's interest immediately shifted from coverage of the ordnance seizure to the human interest of the combat family reunion. The day ended with the unit being welcomed by throngs of enthusiasts who cried and thanked us for bringing their local hero home with the victorious Coalition. Because all of this was captured by the media, it received coverage on several stations worldwide that evening.

Although the military impact was simply the seizure of a large arms cache, the political impact was much more significant on many levels. Locally, we had gained major inroads with the town by way of the interpreter's reunion; strategically the then-weak international Coalition was shown a “happy face” for its intervention in Iraq.

You could say that we had craftily scripted all of this, but that's not how it usually works. What separates a good IO planner from a bad one is the ability to recognize when something falls into his lap and capitalize on it.

There are many opportunities at the tactical level to capitalize on good works. IO can be the facilitator by ensuring that MEDCAPs or DENCAPs occur in the village where the unit wants impact by making sure the commander knows when to expect media presence and what “hot button” topics should be either pushed or avoided. IO also can help the commander make the most of his kinetic effects on the battlefield by offering information on which targets will have the desired political/economic impact when attacked and which targets to avoid attacking.

**The IO Planner.** As the IO planner seeks to synchronize these disparate

activities, there are certain friction points that will make his work more difficult than necessary. Personnel from the PSYOP, EW, PA and CA fields have trained for their professions for years and often resent the imposition of an IO planner who has been trained in a two-week “shake-‘n-bake” course—the implication is that these planners are professionals, whereas, the IO planner is an amateur.

Specifically, PA is hesitant to engage with PSYOP, PSYOP doesn't like working with CA and CA doesn't like working with counterintelligence (CI). All these present leadership challenges, but there are significant gains for the unit if they can coordinate and synchronize their activities.

The IO planner is usually the senior planner at any level and is tasked with integrating these functions. Yet none of them technically work for him, and they may often choose to remind him of that. Personalities will come into play, but a savvy IO planner should be proficient at persuading people to work together without alienating them.

Once the IO planner has mastered the ability to glean useful applications from the academic rhetoric of joint IO publications, has become savvy enough to persuade all elements to play nicely together, and has honed his creativity skills enough to consistently capitalize on any opportunity that comes his way, he still is not out of the range of “Murphy.” Despite the IO planner's best efforts to control events at all levels, whether or not the IO plan is effective ultimately is determined by the least educated, least culturally aware and lowest-paid player on the field: GI Joe.

**The IO Impact of Joe.** Joe is and always has been the best weapon and worst liability of the IO effort. He has the face-to-face access on a daily basis that more senior personnel do not have, and it is his actions, not the IO planner's, that determine the local attitude toward Coalition Forces.

CNN loves to watch Joe because he shoots from the hip and speaks from the heart. Joe will make or break the mission, and his mistakes can fuel the insurgency. Because all Joe's actions can now be broadcast in real-time via international media, his every action or inaction has immediate strategic impact.

Joe can be a liability, but he also can be our greatest asset if he is given a little more support and a lot more information. Joe doesn't have much worldly



experience, but he *is* a quick study. He is more adaptable than his superiors and more flexible in his approach to dealing with others.

To train Joe and give him some guidance at the lowest possible level, battalion/brigade S3s can coordinate language and cultural training for him before deployment, and PA can ensure that Joe has a rules of engagement (ROE) card in his hip pocket in case he runs into something he is unprepared for. The S2 or PA can give him a daily dose of the hot button issues from international media reporting, so he knows what locals might hit him with when he is out in town. (Will they throw rocks today because Abu Ghraib just broke the news? Is there a cleric on trial somewhere?)

Joe also should have some help at battalion/brigade in the form of PSYOP, PA, CA and Combat Camera assets that he can seek out for guidance. Situation allowing, ideally each battalion S3 shop would have an IO-trained officer to help guide Joe and capitalize on daily opportunities falling into the battalion's lap.

Joe is the dissemination point for US policy, and he can handle more than we give him credit for.

IO can be very complicated and confusing if we allow it. Part of the biggest obstacle in the implementation of IO is that for every young battalion IO officer trying to come up with an IO plan in Iraq, there are 10 senior officers talking about IO in the Pentagon. It is much easier to continue the circular academic debate about IO, strategic communications, public diplomacy, etc., than to actually consider how an infantry battalion can employ IO concepts.

We have to get past the endless debate of terminology and "death by PowerPoint" that IO has become and get down to giving Joe something he can use. We have opportunities in Iraq and Afghanistan everyday that we can capitalize on if we can instill a basic understanding of the tactical applicability of IO in our battalion/brigade staffs. It needn't be complicated or technical to succeed. We simply need a few good IO planners who can train Joe, think outside the box

and recognize opportunities when they arise.

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## 1st Cav Div Arty Inactivates

On 30 June, the 1st Cavalry Division Artillery (Div Arty) inactivated in ceremonies at Cooper Field on Fort Hood, Texas. The Div Arty has been part of the first Cavalry Division for the past 65 years. The inactivation is part of the division's becoming modular.

The division recently returned from Operation Iraqi Freedom II, serving as Task Force Baghdad. While in Iraq, the Div Arty Headquarters served as the division's 5th Brigade Combat Team (BCT) and several FA battalions served as motorized task forces.

During his inactivation speech, the Commanding General of the 1st Cavalry Division, Major General Pete Chiarelli, praised the performance of the Div Arty in Iraq. "If you were to read each of [the Div Arty] Soldier's records, you would not see infantryman written on them....But on the streets of Baghdad, you couldn't tell the difference. These were professional Soldiers with missions to accomplish, and they performed absolutely magnificently."

Also during the 30 June ceremony, the 1st Battalion, 7th Cavalry (1-7 Cav) and 1-21 FA had changes of commands. Both battalions were part of the 5th BCT, among other units.

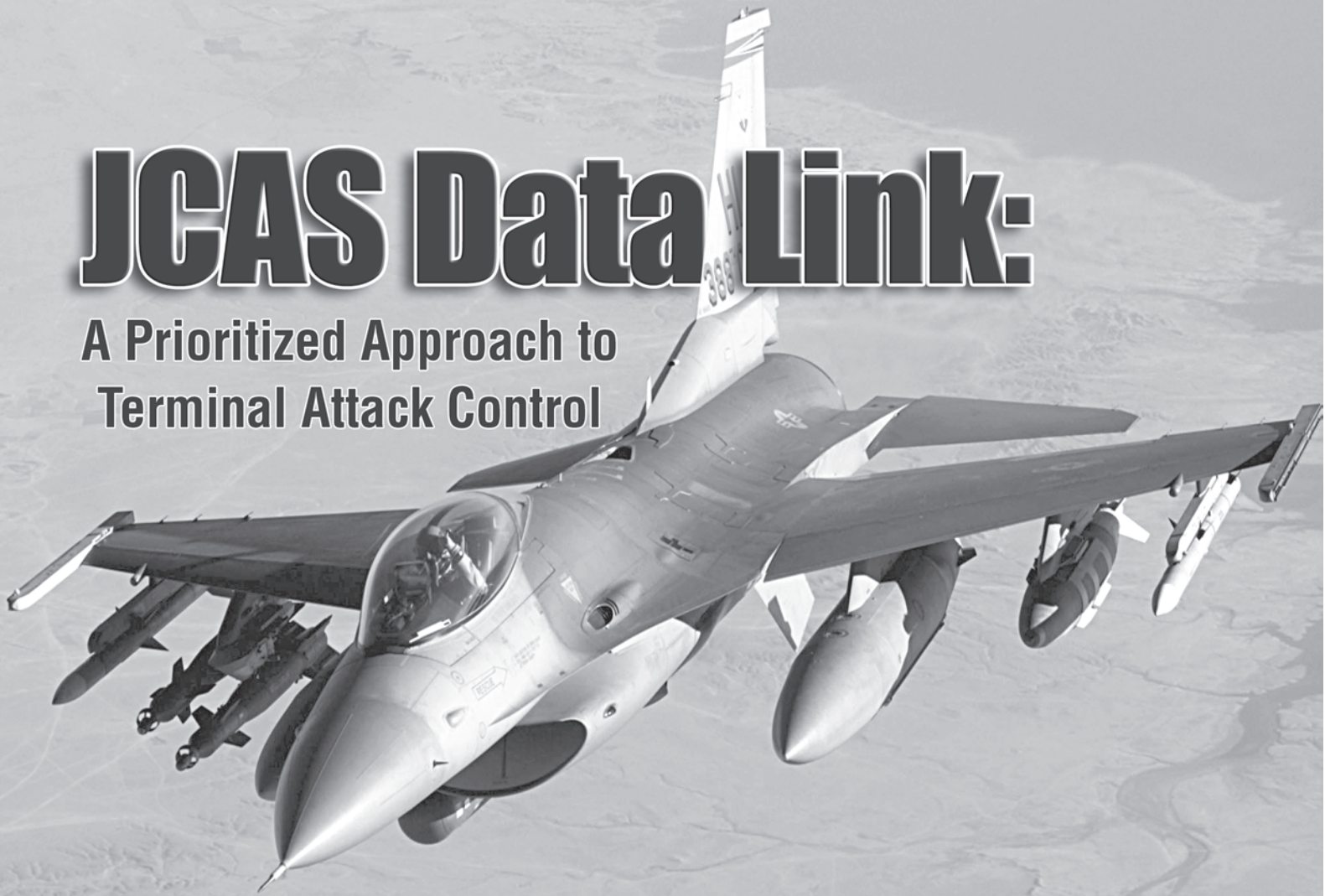


The last commander and command sergeant major of the 1st Cavalry Division Artillery (*First Team, Red Team*), Colonel Stephen R. Lanza (on left) and CSM Gerald J. Schindler (right), case the Div Arty's colors during the 30 June inactivation ceremony at Fort Hood, Texas.

Photo by Fred W. Baker III

# JCAS Data Link:

## A Prioritized Approach to Terminal Attack Control



**T**his article focuses specifically on defining two data link capabilities key to enhancing the speed and lethality of joint close air support (JCAS) terminal control. This “bang for the buck” approach is intended to prioritize data link implementations that are attainable in the near-term and provide the most enhanced combat capability to the warfighter.

Although data links have the potential to enhance many aspects of JCAS from integration and coordination through battle damage assessment, the discussion in this article is limited to data link applications to close capability gaps in the execution of Type 1 terminal attack control. Complete Joint Combat Identification Evaluation Team (JCIET) and JCAS Joint Test and Evaluation (JT&E) reports are available on the Joint Fires Integration and Interoperability Team (JFIIT), Eglin Air Force Base, Florida, website <https://jfiit.eglin.af.mil>.

Current threats and precision-guided munition (PGM) technology have dramatically altered JCAS. Extended

By Perry H. Davis

launch ranges, higher altitude and all-weather/day-night employment push command and control (C<sup>2</sup>) decisions and airborne target acquisition well beyond the visual arena. These changes make the already challenging terminal attack control process more difficult.

The commonly held perception that aircrews can positively identify friend from foe before weapons release has been proven false in JFIIT assessments. Additionally, even the best trained joint terminal attack controller (JTAC) can't accurately predict a weapon's impact point in this environment. Failure to correct these basic deficiencies in visually based terminal attack control equates to continually treating the symptoms while failing to cure the disease.

JFIIT experiments explored the potential of data links to overcome these deficiencies. Initial efforts to leverage the data links' potential to improve JCAS must focus first on passing digital target location to the attacking aircraft's weapons system and, second, on displaying

the aircraft's aim point to the JTAC. These two enhancements will dramatically improve the speed and combat effectiveness of air-delivered fires and, simultaneously, minimize the potential for fratricide and undesirable collateral damage.

**JCAS Terminal Attack Control Capability Gaps.** While medium-altitude and standoff tactics help aircrews cope with today's threat, they aggravate the challenges in target acquisition and terminal attack control. JFIIT historical data confirms the impact of these visual limitations. During both All Services Combat Identification Evaluation Team (ASCIET) 2000 and JCIET 2002, aircrews were able to positively identify the target in less than one percent of attempts to employ ordnance. Likewise, under ideal conditions, terminal controllers were able to visually determine the medium altitude weapons aim points in only 45 percent of the CAS attacks in the JCAS JT&E Mini-Test 1 (February 1999) and in 67 percent of the CAS attacks in the Mini-Test 2 (June 2002). To frame JFIIT observations in the



proper context, we first must understand the root cause of visually based terminal control deficiencies.

*Gap No. 1: Aircrews cannot reliably identify the intended target.* On the modern battlefield, an A-10 Thunderbolt 30-mm high-angle strafe attack probably provides the best opportunity for a fixed-wing attack pilot to visually identify a tactical target. The aircraft has a typical roll-in and engagement decision range occurring at approximately 9,600 feet. To put this in the perspective of what the pilot sees at this range, a T-72 tank appears smaller than the word "TRUST" viewed on a quarter held at arm's length.

At best, this target may be recognizable as a vehicle and possibly armored, but the characteristics that determine friend from foe cannot be reliably distinguished visually, even at this short tactical range. At a 6,000-foot firing range, the T-72 is barely wider than the two milliradian aiming index of the A-10 sight (2.56 mils).

Standoff weapon deliveries produce similar identification problems, even with the aid of aircraft sensors. A typical weapon's release slant range for a medium-altitude PGM attack is 26,000 feet. Using an onboard targeting pod with 20-power magnification, a T-72 on a cockpit display would be approximately the size of George Washington's head, using the same arm's length quarter comparison. Although this equates to a larger apparent target size, the gains in magnification are offset by a loss in detail due to the display's resolution and environmental factors of the increased range.

*Gap No. 2: The JTAC cannot reliably determine the attacker's aim point.* Increased release ranges also create a problem with visual acuity for the JTAC. His estimation of the weapon's impact point is based on his visual assessment of the aircraft's altitude, dive angle, airspeed, attack azimuth and anticipated release point and the weapon's ballistic profile.

While it may be possible for a controller to predict an aim point for a 30-mm strafe attack, this task is impossible for a Maverick launched from a three and one half- to six-nautical mile (NM) slant range or a global positioning system-(GPS)-guided munition dropped from a bomber flying 20,000 feet above the target. Assessing a "dot in the sky" dropping a "nonballistic" PGM with an unpredictable flight path, even in per-

fect meteorological conditions, forces the JTAC into an untenable "best guess" situation.

**Effects on the JCAS Terminal Attack Control Process.** These two capability gaps not only jeopardize the effective application of CAS, but also contribute to lengthy delays in delivering the necessary air power. Typically, target coordinates provide the initial cue for the aircrew to begin target acquisition. A talk-on process describing target area geographical features and target orientation/layout follows to help the aircrew during the search.

This talk-on process can be time-consuming and is prone to errors due to differences in perspective. For example, an aircrew may find a likely looking hot spot appearing near the target coordinates from the airborne perspective, which is beyond the ground controller's field of view or knowledge. Additionally, commonly found geographical features, such as multiple T- intersections, can cause aircrew and controllers to believe they are referring to the same target when, in fact, they are not.

Terminology frequently contributes to this confusion. When an aircrew reports it has acquired or identified the target it typically is indicating it has simply acquired a "blob" whose recognizable attributes and position generally match the description provided by the controller.

The JTAC then makes a "Cleared hot" call, believing the pilot has accurately identified the intended target. With clearance, the pilot releases ordnance on this blob, confident the controller has confirmed he is engaging the desired target. This scenario results in a high potential for ineffective missions, undesirable collateral damage or fratricide.

**The Near-Term Solution—Tactical Data Links (TDLs).** Digitally sharing continuously updated targeting information via fielded TDLs can mitigate the problems inherent in visually based terminal attack control. During JFIIT evaluations, participants have been encouraged to experiment and explore the practical application of TDLs in a robust data link architecture. Although data links support a broad range of C<sup>2</sup> messages, two specific TDL capabilities can leverage existing technology to overcome the two fundamental Type 1 terminal attack control deficiencies.

*TDL Priority No. 1: Transmit target location (coordinates/elevation) directly to the aircraft's avionics and*

*displays.* An accurate target location integrated with the aircraft avionics is an aircrew's most useful cue to initiate its search for the target. While not directly addressing the deficiencies associated with visual terminal control, this data link significantly reduces cockpit workload and minimizes the multitude of potential format and data entry errors associated with the manual coordinate processing. In properly configured aircraft, the accurate target coordinates provide the aircrew a digital target mark in the form of a cross-hair position on a weapons video screen and designation cue in the heads-up display (HUD).

*TDL Priority No. 2: Digitally share the attack aircraft's current sensor or weapons system aim point with the JTAC and C<sup>2</sup> systems.* While a data link dramatically improves the speed and surety of communicating a target location, this capability alone does not ensure an aircrew can acquire and designate the correct target. A complementing and critical data link to close the loop is referred to as sensor point of interest (SPI).

SPI is a generic term describing the ability to share the attack aircraft's current sensor or weapons system aim point with the JTAC via a data link. In a standoff weapons delivery, receipt of the SPI allows the JTAC to determine the aircrew's intended aim point and confidently declare "Cleared hot" or "Abort," as necessary.

**TDL Use in JCAS Live Experiments.** The TDL capability was successfully employed during JCIET 2002. In this experiment, a Marine Corps air officer had a TDL laptop terminal, joint surveillance and target attack radar system (JSTARS) workstation, unmanned aerial vehicle (UAV) video feed and appropriate radio frequency (RF) communications. In coordination with the Blue Force maneuver units, the air officer used JSTARS and UAV cues to detect possible enemy locations.

With an SPI-capable UAV, he identified an enemy tank (a T-72, in this case), extracted a rough coordinates and digitally transmitted a "9-line" brief to a TDL-equipped aircraft. The pilot cued his sensor to the steer point automatically generated from the data linked coordinates, refined his sensors to a suspected target hot spot and made an "SPI on" call.

The air officer then confirmed the SPI from the fighter and the UAV were on the same target. After a final check of the UAV video to confirm the target as

a hostile T-72, the air officer made the "Cleared hot" call with high confidence, knowing that the hot spot seen by the aircrew was, indeed, the intended target.

The aircrew's post-mission comment, "This is too easy," highlights the dramatic improvement in speed and accuracy these two TDL capabilities bring to the JCAS terminal attack control process.

Other TTP possibilities quickly evolved as participants experimented with data links. An air officer performed a talk-on, steering the aircraft's SPI location: "Viper 51, you're looking too far south; bump your sensor 300 meters north up the dirt road...that's good, right there." This transmission was followed shortly by, "Viper 51 is contact."

A JTAC also used the UAV SPI as a digital mark on a moving vehicle. Because target coordinates were rapidly changing, he directed the attack aircrew to "hook" (capture) the UAV SPI in lieu of giving target coordinates. The aircrews easily used the UAV SPI as a pointer to acquire the moving target.

In another TTP development, attack flight leads and wingmen employed SPI to rapidly sort and coordinate multiple aim-points to maximize their weapons effects on the first pass.

In a separate evaluation (JCAS JT&E Mini-Test 2), terminal controllers using stable SPI accurately confirmed aircraft aim points in 97 percent of all

attacks without visually observing the attacking aircraft or target.

**Defining Priorities.** TDL applications for JCAS are receiving more attention as the number and type of TDL-capable aircraft increase. The services' program managers for platforms and systems struggle to reconcile priorities, based on differing perspectives and their investments in legacy systems. But it is imperative that joint TDL implementation efforts start with the digital transmission of target location and SPI-sharing capabilities.

Any data link implementation, even within a single system, presents many technological challenges. Add the complexities of assuring interoperability across many weapons systems developed by several vendors at the request of multiple services, and the challenge increases exponentially.

By prioritizing implementation of achievable capabilities to data link the target's location and aircraft's aim point, the services can realize immediate gains in supporting the maneuver force commander. Existing gateways, translator forwarders and operational TDLs can serve as the backbone of a much-needed interoperable capability. Challenges in JCAS transformation span the initial air request process, integration and coordination through actual attack and post-strike assessment.

The underlying goal always has been to put the right weapon on the right

target at the right time to achieve the desired effects for the ground commander. In today's warfighting environment, TDLs can provide a near-term solution by enabling digital transmissions of target location and aircraft SPI to significantly increase combat effectiveness accompanied by a dramatic decrease in the potential for fratricide. Aggressive joint development, acquisition and implementation of these crucial TDL priorities will provide the tools to enable more effective terminal attack control.

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## ARDEC Puts Current FA TFTs Online

In response to the many Field Artillery, Infantry and Armor communities' requests to have tabular firing tables (TFTs) online, the Army's Armaments Research, Development and Engineering Center's (ARDEC's) Firing Tables and Ballistics Division (FTaB), Aberdeen Proving Ground, Maryland, announces the availability of artillery and mortar tabular firing tables (TFTs) online. The TFTs are on the Army Knowledge Online (AKO) FTaB organizational site Knowledge Collaboration Center (KCC). Also, the Fires Knowledge Network (FKN) on AKO and Product Manager Mortar website have links to these electronic TFTs.

The KCC currently is organized by branch with plans to organize KCC by artillery and infantry (mortars) and add armor and infantry small arms in the near future. Each branch is further refined by weapons system and projectile, making it easy for Soldiers to find the most current, official TFTs quickly.

Access to the KCC is controlled using the AKO security tool set and querying the individual requesting the subscription to the KCC to determine if mission needs warrant access to the TFTs. Once access is granted, the individual can access the TFTs from around the globe 24 hours a day for the remainder of the calendar year. At the end of the calendar year, the subscription is terminated and a request for a new subscription is re-

quired for further access.

When new or updated TFTs become available, announcements will be posted via the AKO system and the respective branch magazine publications. Further, the KCC is set up so subscribers are automatically notified when the TFTs are updated.

The TFTs can be found on AKO by clicking the site map under "Army Organizations" and then the "Organizational Sites" tab. Soldiers must then expand the major command, or "MACOM," directory as shown: MACOMS\AMCRDEC\ARDEC\VAETC\FCST\FTaB.

Andrew E. Graber  
FTaB, ARDEC  
Aberdeen Proving Ground, MD





US Air Force Photo by MSgt James M. Bowman

SGT Elijah Caddy from A Battery, 2d Battalion, 319th Airborne Field Artillery Regiment, adjusts the sights of an M119A1 105-mm lightweight towed howitzer during training at Baghdad International Airport. 2-319 AFAR was the 1st Armored Division's general support unit for counterstrike in Operation Iraqi Freedom.

# 1st AD's Revised Counterstrike Drill for Baghdad International Airport

As the 3d Infantry Division (3d ID) supported attacks throughout Iraq in March 2002, it set the standard for what a heavy division artillery (Div Arty) can bring to the fight. It was successful in all its endeavors and proved its lethality as it helped seize the objective at Baghdad International Airport.

The 1st Armored (1st AD) began a relief-in-place (RIP) with the 3d ID and the 1st Div Arty began transforming from a wartime headquarters to a reconstruction headquarters. The RIP briefing dominated the first few days of the 1st AD's existence in Iraq. Perhaps the most surprising information not addressed in the RIP briefing was the many indirect fire mortar systems that

**By Sergeant First Class  
Robert M. Castillo**

were spread in and around the airport left by retreating Iraqi soldiers.

The mission of securing the airport was assigned to the 1st AD. As the division transformed, we began to see an increase in mortar attacks around the airport. As a result, the commander directed us to redefine the counterstrike battle drill to meet the threat in our new environment.

This article addresses how the 1st Div Arty redefined its battle drill to combat the threat using all assets and means available.

**Revision Process for the Counterstrike Battle Drill.** The basic Div Arty

counterstrike drill involves the radar, target processing section (TPS), Div Arty fire control element (FCE) and shooter. All elements were included as we refined our battle drill. However, we changed the tasks within the drill to meet the threat.

The defense of Baghdad International Airport was the primary focus for the Div Arty headquarters; there were some 18,000 Soldiers and several civilian contractors from a host of different units and companies who fell under the umbrella of our protection. Within that realm is the security of the perimeter in the form of checkpoints. Initially the focus for the Div Arty was to understand the physical layout of the airport

(to address security concerns) and the infrastructure for the many civilian contractors trying to enter the airport.

The challenge was to address the mortar attacks and decide the correct response to those attacks. We initially looked at tasking our direct support (DS) artillery battalions each for one platoon of Paladins, but they were already task organized to the maneuver brigades. For the most part, the DS battalions had their hands full with security and command and control (C<sup>2</sup>) of the patrols they were conducting everyday in their respective areas of operations (AOs).

2d Battalion, 319th Field Artillery (2-319 FA) from the 82d Airborne Division was tasked to become our general support (GS) asset directly responsible for answering all counterstrike missions in the Div Arty zone. The introduction of the light battery (105-mm) to the 1st Armored Div Arty gave us an asset for the urban environment, an asset able to deter mortar attacks.

The use of the advanced Field Artillery tactical data system (AFATDS), fire orders, live-fire rehearsals and handheld terminal units (HTUs) with battery computer system (BCS) software and the introduction of cross-training between the Div Arty and its newly assigned light battery highlight that, sometimes, we don't train as we may have to fight.

The Div Arty's fire control Soldiers (13D Field Artillery Tactical Data Systems Specialists) began to perform duties that were essentially battalion fire direction tasks, which we had changed to fit the current mission. Understanding battalion-type fire orders became the primary focus for these Soldiers as well as understanding what their brother 13Ds were experiencing on the gun line.

The 1st Armored Div Arty Soldiers also provided battery fire direction Soldiers training on AFATDS and began to establish the criteria for AFATDS to show the counterstrike picture throughout the division and corps sector.

In turn, the light battery Soldiers offered a glimpse of the training needed to conduct fire missions in their battery fire direction center (FDC) to all the Div Arty FCE Soldiers. The ability to understand each other's jobs allowed both parties to expand their technical and tactical skills.

Concurrently, another problem we faced was the Air Force's clearing of airspace. Baghdad Tower was respon-

sible for clearing local airspace, while Baghdad Radio had the authority to clear a particular altitude. Yet another agency cleared the airspace above Baghdad Radio's altitude. Coordinating with several external agencies to clear airspace for one mission was a task that most artillerymen had never done.

Australian airmen quickly established the parameters for clearance and manned the tower. Their efforts combined with the Div Arty fire control officer's (FCO's) established clear guidance to shoot live counterstrike missions quickly.

Essentially, the airspace over the airport was divided into sections. Smaller sections allowed the air controllers to focus on the vicinity where the mortar was located. Upon request, the air controllers could clear airspace immediately in the smaller area, a distance of up to five nautical miles and an altitude of up to 10,500 feet. In addition, a set of fire orders was established between the air controllers and the Div Arty to better understand what area needed clearance and if the mission was a training or counterstrike mission.

Establishing standard fire orders between the two parties was, perhaps, the Div Arty FCO's most important contribution to the process. This simple act eliminated confusion for all parties involved in the counterstrike drill, especially in the tactical operations center (TOC) and air tower.

The introduction of a judge advocate general (JAG) officer to the TOC empowered the Div Arty commander to make sound and thoughtful decisions about the use of the artillery. The JAG officer also used satellite imagery and computer software, such as the AFATDS' effects management tool (EMT) as well as the automated deep operations coordination system (ADOCS) to help his assessment for the commander.

**Battle Drill Revised.** The revised counterstrike drill for the TOC included the following.

1. Target acquisition (TA) is sent from the radar section to the TPS collocated in the Div Arty TOC.

2. TPS conducts Level 1 analysis: determines the range of the hostile weapon from point of origin (POO) to point of impact (POI); matches the target description with known enemy mortar ranges; matches the target location with suspected enemy sites; and confirms the impact.

3. TPS then sends the fire mission to

the Div Arty FCE. Upon receipt, simultaneous operations occur in the TOC. The mission is sent to the firing battery FDC and a voice fire order is sent with special instructions for fire-for-effect (FFE)/ "Do not load" (DNL)/ three rounds of high-explosive (HE).

*Clearing The Mission.* The FCE AFATDS is linked to an EMT which is displayed on the large screen showing the fire mission and a running clock of the time it is taking to fire the mission. The Air Force Tower is called to clear airspace as the impact location is verified, using sight and (or) sound. The JAG officer and the S2 then clear the mission using the rules of engagement (ROE).

4. Upon clearance of the mission, the battery FDC is ordered to cancel DNL, and the mission is fired. Mission processing time and clearance of the mission takes less than two minutes.

5. Two teams are sent to the POO and POI after the firing mission. At the POO, battle damage assessment (BDA) is reported to the TOC as well as any physical evidence of the firing position, such as mortar parts, shells or powder increments that could determine the type of system used in the attack. At the POI, a crater analysis is conducted to determine the type of munitions fired, estimated azimuth from the firing position and impact grid to verify the accuracy of the sensor.

The Div Arty and 2-319 FA shot more than 600 rounds in support of Operation Iraqi Freedom (OIF) during the first six months of the 1st Armored Division's deployment. The Div Arty and 2-319 FA demonstrated their adaptability in using non-standard means to shoot counterstrike in Baghdad.

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# A Soldier's Story

## SGT Brett Granrose

Squad Leader in TF 1-6 FA, 1st ID, in OIF II

*Sergeant (SGT) Brett S. Granrose, a 13B Cannoneer from Stillwater, Oklahoma, was a Rifleman and Team Leader, filling in as Squad Leader and, once, Acting Platoon Sergeant, in 3d Platoon, B Battery [The Three-Bravo Renegades], Task Force 1st Battalion, 6th Field Artillery (TF 1-6 FA), 1st Infantry Division (1st ID) from February 2004 until February 2005 in Operation Iraqi Freedom (OIF) II. TF 1-6 FA served as a motorized infantry TF in Baqubah, one of the most hostile areas of operations in the 1st ID's sector. SGT Granrose had previous combat experience, having served in Iraq for seven months with the 101st Airborne Division (Air Assault) in 2003. Currently, he is the Chief of the 2d Section in 1-6 FA. For his actions under fire on 15 November 2004 in Baqubah, he received the Bronze Star with V Device; he received a second Bronze Star for service. This is his story.*

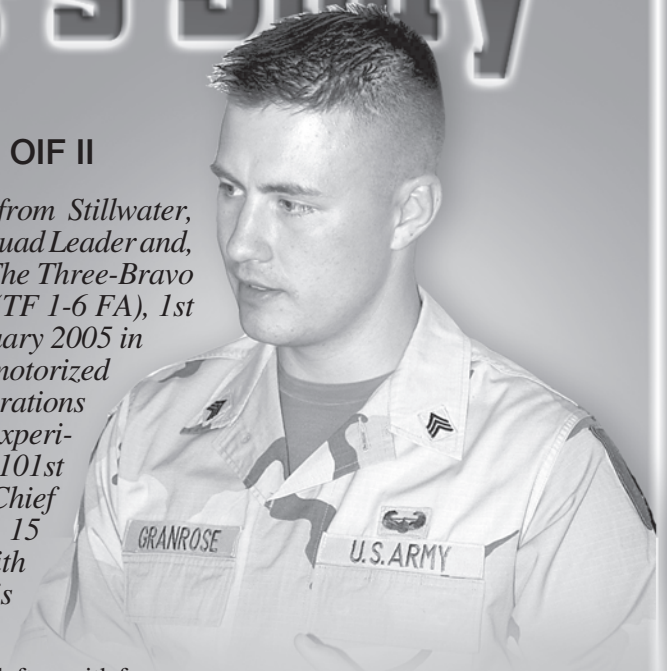


Photo by SGT W. Wayne Marlow, 1st ID PAO

I don't have enough fingers and toes to count the times we've been hit with IEDs [improvised explosive devices], or nearly hit with IEDs, while patrolling in Baqubah, and I don't have enough fingers to count the times we've been ambushed or attacked by RPGs [rocket-propelled grenades]. We've been shot at by every weapon in the insurgents' inventory. Our FOB [Forward Operating Base] Gabe in southeastern Baqubah was constantly under attack.

On 15 November, we started the day with a tactical sweep of supply routes for IEDs and got into a firefight in an alleyway in Mufrik, a hostile suburb of Baqubah. After receiving RPG and small arms fire, we blew up the insurgents' weapons and ammunition cache in a car that also had four of the attacking insurgents inside.

At the end of the fight, we patched up a wounded insurgent left behind in the alleyway, and our QRF [quick-reaction force] evacuated him to the nearest medical facility at Camp Warhorse. We follow the Geneva Conventions.

Next we got a call from the Iraqi Army that a group of insurgents was massing in Old Baqubah on the other side of town. The order came down for Three-Bravo to move to contact with the insurgents. One of our vehicles had had RPG damage to a tire in the last firefight, so we dropped it off at a coalition police station on the way for the American

forces there to fix. That left us with four vehicles.

We happened to have the battery commander with us who said to take a different route than the primary avenue we figured the insurgents were massing on. We did and came up right behind them. We rolled up at the back end of their ambush.

Then the firefight began. At the time, we thought there were about 20 insurgents; later we found out it was a company-sized element. We had 19 personnel.

RPGs started bouncing off the ground and exploding as we pushed forward. The insurgents were firing small arms at us from all directions. We got onto a road that runs parallel to the ambush road they were using. Basically, it was a bunch of alleyways.

The lead three vehicles pushed to the primary road the insurgents had set up for the ambush and started laying down fire. I was in the rear vehicle that pulled up to the last alleyway before the ambush road. That alleyway had the enemies' weapons and ammo cache vehicles parked in it about 50 meters away with numerous insurgents running around.

I laid down fire while the rest of my crew jumped out of the vehicle. Our 50 cal [machine gun] on top of the vehicle was malfunctioning, so my gunner used his M16 to help suppress the enemy running back and forth across the alley-

way.

They knew they were in deep trouble because their cache of weapons and ammunition for the ambush was right in front of my vehicle.

All of a sudden my HMMWV [high-mobility multipurpose wheeled vehicle] was hit by an RPG, and the gunner and I were knocked to the ground. My vehicle was a big cloud of smoke. We started taking more RPGs. I grabbed the AT4 and shot it down the alleyway, killing several insurgents. That pretty much put a spark in the insurgents to get out of there—to lay down fire to cover their buddies running away.

The whole thing took about 30 minutes, but it seemed like forever. At the end, Three-Bravo had killed 28 and wounded an estimated 80 insurgents.

I was proud of my guys—I only had three wounded and only one had to be evacuated. Honestly, our platoon was a bunch of *good* fighters.

Later on, through one of our interpreters, we heard the insurgents thought they had run into US Special Forces in Old Baqubah. They put a \$1,000 bounty on every Three-Bravo Soldier's head—we were *high-value* targets! They never got a one of us.

I know every branch is doing its part over in Iraq, but it seems like the artillery is called upon to be the "universal MOS" [military occupational specialty]. We're versatile and accomplish what we're sent out to do.

# JFIIT—Joint Fires Integration & Interoperability Team

Combining the Joint Close Air Support (JCAS) Test Team and the Joint Combat Identification Evaluation Team (JCIET), JFIIT was formed 24 February at Eglin AFB, Florida. It is a joint subordinate command reporting to the Joint Forces Command (JFCOM) at Norfolk, Virginia.

JFIIT investigates, assesses and improves the integration, interoperability and operational effectiveness of joint fires and combat identification. JFIIT's purpose, structure and mission focus on creating success for the warfighter. It works to improve joint fires integration across service and joint doctrine, organization, training, materiel, leadership, personnel and facilities (DOTMLPF).

As new and maturing technologies emerge on diverse battlefields, the dominant task has become the need for a joint team to coordinate, integrate and train joint forces for maximum joint fires interoperability. This includes developing and fielding joint tactics, techniques and procedures (JTTPs) and joint equipment. JFIIT helps the warfighter assess and isolate problems, identify solutions and, together, deliver them. JFIIT also enhances training in varied exercises and collects data supporting its analyses and assessments—ultimately to fuel improvements on the battlefield. See Figure 1 for the specific joint task areas JFIIT focuses on.

**JFIIT Organization.** JFIIT is organized to deliver products to the combatant commands (COCOMs) and services through an innovative and collaborative approach. It is based on the J1 through J6 model with the J3 directorate chartered as the operational production lead.

The J3 coordinates projects that are managed and fielded by project leads using expertise from throughout the organization. Projects and taskers come from many sources, including the COCOMs, services, warfighters or higher headquarters.

The J3 is the tasking authority in JFIIT. With coordination from the division chiefs, he assigns a project lead to study, assess and improve multi-level combat effectiveness. The J3 division coordi-

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- Joint Targeting
- Joint Interdiction
- Joint Close Air Support (JCAS)
- Naval Surface Fire Support (NSFS)
- Surface-to-Surface Fire Support
- Joint Suppression of Enemy Air Defenses (J-SEAD)
- Non-Kinetic Means/Nonlethal Effects
- Command and Control (C<sup>2</sup>)
- Intelligence, Surveillance and Reconnaissance (ISR)
- Joint Theater Air and Missile Defense (JTAMD)
- Offensive Counter Air (OCA)
- Combat Identification (CID)

Figure 1: Joint Tasks of the Joint Fires Integration and Interoperability Team (JFIIT), Eglin AFB, Florida

nates with and supports higher headquarters and the relevant service battlelabs, doctrine commands, weapons and tactics schools and joint staff working groups.

The Advanced Concepts and Strategic Development Directorate (J5) staff develops advanced concepts in joint fires, maintains strategic plans and recommends changes to these plans as requirements and opportunities arise. The J5 staff determines key organizations in the Department of Defense (DoD) and collaborates with them to identify shortfalls and implement improvements in operational-level joint fires tasks.

The instrumentation backbone of JFIIT is the responsibility of the Technical Solutions Directorate (J6). The J6 plans, develops and executes instrumentation for collecting and debriefing data, voice

and electronic assessments.

**JFIIT Projects.** Selected JFIIT projects stem from three primary sources: Joint Training (JFCOM J7), Joint Battle Management Command and Control (JBMC<sup>2</sup>) (JFCOM J8) and warfighter concerns and issues input through the services and COCOMs. Three examples of JFIIT projects include the DoD Joint National Training Capability (JNTC) Implementation Plan, Training Transformation Implementation Plan and JCAS Joint Mission Thread.

**JNTC Capability.** The JNTC aligns selected service training programs to best perform both service and joint training tasks during scheduled training operations, significantly improving joint training opportunities. For example, the Air Force's Air Combat Command (ACC), Langley, AFB, Virginia, Air Warrior exercises and the Army's National Training Center (NTC), Fort Irwin, California, rotations are aligned to provide optimal JCAS integration and joint fires for maneuver brigades. This provides aircrews and ground commanders' realistic joint fires training.

The DoD Training Transformation Implementation Plan (9 June 2004, Paragraph 3.4.1.10) tasks the JFCOM Joint Force Trainer Capabilities Group to be the lead for joint force training implemented through the JNTC. As part of that effort, JFCOM tasked JFIIT to develop and deliver a comprehensive JNTC analysis capability. JFIIT designs and implements joint fires data collection plans for the JNTC exercises. For example, JFIIT will test one data collection plan that incorporates NTC observer/controllers during the JNTC-designated rotation in September.

**Services' Joint Transformation.** Chartered to support joint and service training transformation and capture valuable lessons learned, JFIIT pursues curricula enhancements to service schools, such as the Field Artillery School at Fort Sill, Oklahoma, and the Air Force Air-Ground Operations School (AGOS) at Nellis AFB, Nevada. JFIIT also facilitates integrating key issues and lessons with Fort Sill's Joint and Com-



bined Integration Directorate (JACI) and the Army's Combat Training Centers (CTCs).

JFIIT's charter is to work joint fires lessons learned with all the services' relevant schoolhouses and training centers. Having been established only seven months ago, JFIIT is still developing some service relationships.

*JCAS Mission Assessment.* JFIIT spearheaded the creation of JCAS Joint Mission Thread (JMT) Assessment Campaign Plan to improve the efficiency and timeliness of digital information exchange between joint terminal attack controllers (JTACs) and CAS platforms. This plan identifies COCOMs, services and agencies and their subordinate activities and organizations that produce and implement materiel and other DOTMLPF solutions for JCAS. JFIIT conducts JBMC<sup>2</sup> testing in concert with training assessments, such as the September 4th Infantry Division JNTC rotation at the NTC.

**Direct Support for Warfighters.** JFIIT directly supports warfighters who require urgent resolution of issues. Recently, JFIIT conducted the Laser Range Finder (LRF) Reference Point Method/Quick-Look Operational Study (RPM/QLOS) at the NTC. The RPM compensates for changes in the earth's magnetic field, LRF azimuth error and external magnetic interference. This new precision technique is employed today by warfighters in Iraq and Afghanistan.

- Army Battlefield Coordination Detachments (BCDs) and the USAF Falconer Air and Space Operations Centers
- Fires Knowledge Network (FKN)
- Joint Information Operations (IO)
- Effects-Based Operations (EBO)
- Simulated Type I Close Air Support (CAS) Controls in the Joint Fires and Effects Trainer System (JFETS)
- Joint Fires Observer (JFO) Concept
- JFO Training Capability at Fort Sill
- Restricted Military Airspace Initiative (Fort Sill)
- Fort Sill as the Army Center of Excellence for Joint Fires and Effects
- Joint Fires Center of Excellence Concept of Operations (Fort Sill as the Executive Secretariat)
- Service and Joint Fires Center of Excellence Integration

Figure 2: Issues JFIIT is working with Fort Sill, Oklahoma



TSgt Elmer Villapando takes a Laser Range Finder (LRF) shot on a target during JFIIT conducted testing of the Reference Point Method (RPM) Quick-Look Operational Study (QLOS) at Fort Irwin, California, February 2005. This method is being used by troops in Afghanistan and Iraq.

Observations during recent tests and in interviews with current JTACs indicated that the way Soldiers were employing the LRF on their vehicles or with their personal equipment might be affecting the LRF's azimuth accuracy when using the RPM. So JFIIT analyzed the effects the vehicles and personal equipment have on the LRF's azimuth accuracy and evaluated the test participants' ability to use the RPM technique.

The analysis was conducted at the NTC and was based on more than 3,850 LRF shots using surveyed four-by-eight foot targets at a nominal observer-to-target distance of 1,000 meters. As a result of JFIIT's analysis, JFCOM sent a safety message to operators in the deployed theater, providing safety warnings and highlighting the findings. The turn-around time from the Soldiers' in theater identifying the problem with the LRF equipment and RPM technique to implementation of the safety warning (the solution) was *less than 90 days*.

**The Way Ahead.** JFIIT is working to create a joint perspective, foster inventive and adaptive leadership, and ensure responsible stewardship of joint fires issues. JFIIT was organized to provide overlapping and continuous root-cause joint fires analyses and solutions to the services, the warfighter and the joint training centers.

As the Joint Force's Executive Secretariat for Joint Fires and Effects, Fort Sill is a primary customer of JFIIT. During the 2005 Fires and Effects Sym-

posium at Fort Sill, several issues were identified as opportunities for synergy between the FA School, JACI and JFIIT. (See Figure 2.)

As is true with all JFIIT's projects, JFIIT will help tackle these issues to provide the leadership, vision and wherewithal to transform the joint fires community from integrated to interdependent operations.

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**Lieutenant Colonel (Retired) Mark L. Jenner, USAF,** is an Operations Analyst and Exercise Planner in the J3 of JFIIT. He is a Command Pilot with more than 2,600 hours flying the T-38 Talon, A-10 Thunderbolt and F-117A Nighthawk.

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# A Primer on Indirect Fire Crater Analysis in Iraq and Afghanistan

**T**he war in Iraq has produced a well versed and adaptable enemy, capable of modifying his tactics, techniques and procedures (TTPs) to best offset the advantages of training and technology that US forces maintain. By deviating from the norm in both his tactics and the standard employment of his weapons, he has leveraged his own “technology.” The enemy will continue to change as we change to meet his threat.

Enemy cannons in Iraq and Afghanistan have become non-players in an insurgency environment. Mortars and rockets have come to the forefront. They are easy to maneuver and have a small signature and fire-and-forget capability.

**By Captain Edward J. Coleman and Sergeant First Class Rico R. Bussey**

Crater analysis examines the craters produced by the enemy indirect fire system and provides important pieces of the intelligence puzzle that help template an adversary’s fire support. The analysis often can determine the azimuth (direction) of fire, the type of weapon system firing and other information.

The insurgents and terrorists are employing unique techniques for indirect mortar or rocket fire on Coalition Forces: firing munitions laid against berms or other improvised devices, from the

backs of trucks or at low angles—the latter projectiles often skipping along the ground, creating a series of furrows. While mortars and rockets fired at low-angles violate the basic premise of their normal delivery, the enemy has had to modify his TTPs to survive.

Crater analysis of enemy mortars and rockets is an important facet of our counterstrike capabilities in Iraq and Afghanistan. By analyzing craters, units can confirm the presence of enemy mortars or rockets and determine a direction to them and their caliber. They may be able to confirm the suspected location of hostile weapons obtained by other means, leading to the weapon’s being captured or destroyed, and (or)



add data to pattern analyses of enemy indirect fire activities. Crater analysis also helps detect new types of enemy weapons, new calibers or new ammunition manufacturing methods. This information even is used to update national databases, which, in turn, support the Coalition Forces in theater.

Field Artillerymen, as the Army's fire supporters, must be the subject matter experts on conducting crater analysis and reporting the information obtained through channels. They must be able to train all other Soldiers and Marines and, as necessary, Air Force security forces in these critical TTPs in any theater of operations.

Units may organize a crater analysis team to conduct and analyze the information gathered about crater explosives. For example in Iraq, some units have established crater analysis teams at the brigade combat team (BCT) level and some at the division/unit of employment (UEX) level. In some areas, an explosive ordnance detachment (EOD) or quick-reaction force (QRF) may do the analysis.

This article is a primer for the first-line user in theater to help him detect and defeat the enemy indirect fire threat in Iraq and Afghanistan. Its discussion is limited to crater analyses for both high- and low-angle mortars and rockets (vice cannon artillery, air-delivered bomb and tank craters) because they are the indirect fire threats in Operations Iraqi Freedom and Enduring Freedom (OIF and OEF) today.

When the indirect fire attack begins, the Soldier immediately sends the size, activity, location, unit, time and equipment (type of weapon firing, if known), or SALUTE, as his initial report to his higher headquarters. When the firing ceases and the area has been cleared, he conducts a crater analysis. Figure 1 summarizes the three steps of the crater analysis and reporting process.

**Equipment to Conduct Crater Analysis.** Most of the equipment required is available in the Army inventory. One Soldier can conduct crater analysis at each impact area, but for speed and other practical considerations, a crew of two or three is recommended.

Soldiers use a compass (lensatic/M2); nonmetallic stakes (use wood or plastic stakes to avoid detonating an unexploded munition); 550 cord, string or communications wire to obtain the direction from the crater to the weapon that fired the projectile; metric measur-

- 1 Locate the crater and determine the type of indirect fire weapon that created the crater.
- 2 Select the best analysis method and conduct the analysis, determining the azimuth of fire, the projectile's caliber and the distance to the weapon (if possible).
- 3 Submit a crater analysis report to the maneuver unit S2 and fires and effects cell (FEC) targeting section, and send fragmentation and projectile remnants to the maneuver unit S2 for further analysis.

Figure 1: The Steps in Crater Analysis and Reporting

ing tape to determine the size and depth of the crater and size of fragments; a digital camera, if available, to photograph the crater and fragments; gloves; and a paper or other bag or cardboard box to collect fragments.

The Soldier may need engineer tape to cordon off the crater(s) if the impact hits near a populated area. An impact attracts souvenir hunters.

The Soldier also will need a map, commercial off-the-shelf global positioning system (GPS) or precision lightweight GPS receiver (PLGR), if available. Ideally, he will be able to locate

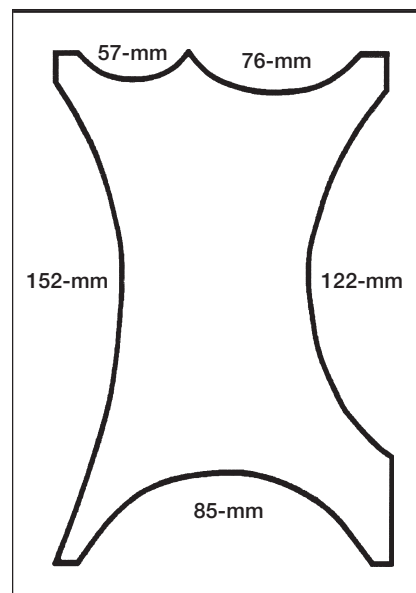


Figure 2: Sample Curvature Template. The curved cutouts of the millimeters of the hostile weapons on the template must reflect the indirect fires assets in the specific theater.

the crater to 10-digit grid accuracy.

Soldiers also may use a curvature template to measure the curvature of a projectile fragment, determining its caliber. The sample template shown in Figure 2 can be constructed of heavy cardboard, acetate, wood or other appropriate materials.

Weapon	Caliber (mm)	Max Range In Theater (km)	Extended Range In Theater (km)	Rate of Fire (rd/min)
Mortar	60	2.7	N/A	20 - 30 (15-20) <sup>1</sup>
Mortar	81	5.65	N/A	20-25 (10-15) <sup>1</sup>
Mortar	82	3.04	4.9 <sup>2</sup>	20-25 (10-15) <sup>1</sup>
Mortar	100	4.75	N/A	10-15
Mortar	120	5.7	9.4 <sup>3</sup>	5-7
Mortar	160	8.04	N/A	4-5
Rocket	57	6.8	N/A	1 per 0.5 sec <sup>4</sup>
Rocket	68	6.2	N/A	1 per 0.5 sec <sup>4</sup>
Rocket	80	9.1	N/A	1 per 0.5 sec <sup>4</sup>
Rocket	81	8.3	N/A	1 per 0.5 sec <sup>4</sup>
Rocket	107	8.5	10	1 per 0.5 sec <sup>4</sup>
Rocket	122	20.4	36	1 per 0.5 sec <sup>4</sup>
Rocket	127	30	37+	1 per 0.5 sec <sup>4</sup>

1. Rate of fire listed initially is not for aimed fire and not sustainable for more than a few minutes, depending on the mortar. The second rate is for aimed fire.  
2. Long-Range Mortar  
3. Rocket-Assisted Projectile (RAP)  
4. Most often, the enemy uses a firing control box that fires subsequent rockets in order. If fired manually, these rockets each have a rate of fire of 2-3 seconds apart.

Figure 3: Threat Mortar and Rocket Characteristics. This is a list of indirect fire weapons fired at Coalition Forces after major combat operations (MCO) in OIF, as of June 2005. Note that the maximum range can be increased significantly by tail winds, high propellant temperature and low atmospheric pressure. (Source: National Ground Intelligence Center, Charlottesville, Virginia)

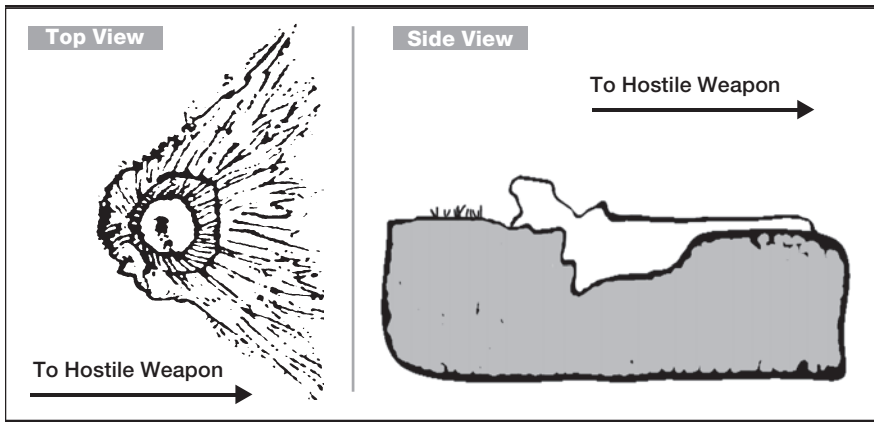


Figure 4: Example of a Crater Created by a High-Angle Projectile

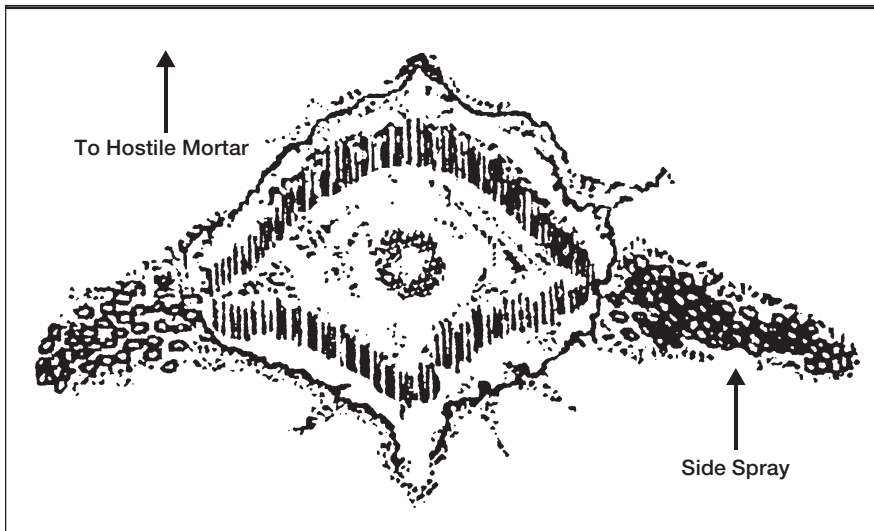


Figure 5: Low-Angle Mortar Crater

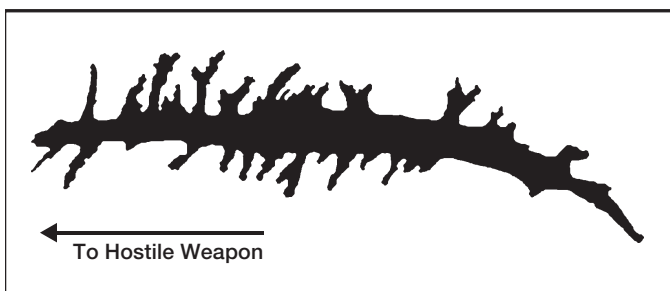


Figure 6: Low-Angle Rocket Crater

The model in Figure 2 on Page 39 is only an example of a curvature template. Each Soldier must construct a template based on the enemy indirect fire weapons found in his area of responsibility (AOR) using captured enemy ammunition shell remnants.

Units can create new curvature templates as they capture new enemy ammunition or find new projectile remnants in craters. Once created, these templates should be pushed to higher, lower and adjacent units so the information is captured and incorporated

**weapon.** The Soldier determines the location of the crater accurately enough to plot it on charts, maps or aerial photographs. He can do that using hasty survey (including with the GPS or PLGR) or map spotting. If the Soldier can analyze two or three craters, his data will be more accurate. He may even be able to triangulate the hostile weapon's position at the intersection of the firing azimuths of two or more craters.

The Soldier then determines what kind of indirect fire weapon caused the cra-

into unit TTPs. This historical data must not be lost during unit transitions of authority, only to be relearned by the new unit.

**1. Locate the crater and determine the type of indirect fire**



Low-Angle Crater Mortar

ter. He must know that to determine the crater analysis method to use. Figure 3 on Page 39 lists the enemy indirect fire weapons attacking friendly forces in Iraq and Afghanistan with their calibers, ranges and other information.

The Soldier can determine the type of weapon fired, the direction from which it fired and the projectile's angle of fall (high or low) from the pattern produced on the ground by the detonating projectile. He must keep in mind that due to irregularities of terrain and soil conditions, the "typical" crater pattern is the exception, not the rule. For example, sand, soft earth, concrete or asphalt will create deviations in the pattern.

Also, care must be exercised as craters caused by rocket-propelled grenades (RPGs) can be confused with craters caused by mortars. The type of projectile that caused the crater may be the Soldier's best guess and will be confirmed upon further analysis of fragments with markings or remnants of the actual projectile or fuze that he collects.

The most useful fragments include the tail fin or tail boom section and fuze well fragments. If possible, the Soldier can take digital photos of these components with an object of known size in the field of view to help identify unusual or new munitions. He then collects the fragments found at the crater sites, using gloves or tools to pick them up and treat them like evidence.

*High-Angle Mortar and Rocket Craters.* Regardless of the fact that the insurgents sometimes fire mortars at low angles, mortar rounds were designed to be fired at high angles.

The difference between a crater caused by a high-angle mortar round and a high-angle rocket, generally, is the size and depth of the hole (most often the rocket crater will be larger and more random in shape).

The Soldier may hear the distinctive "thumping" sound the mortar makes when fired from relatively shorter ranges



(as opposed to a rocket) to help identify and locate the weapon that fired. The Soldier may be able to determine the “flash-to-bang”—see the flash (showing him the direction to the hostile weapon) and then hear the bang of the firing weapon. By counting the seconds between the flash and bang, the Soldier can estimate the distance to the weapon. Sound travels at approximately 350 meters per second, so multiplying the number of seconds between the flash and bang by 350 will give the approximate distance to the hostile weapon in meters.

Field Artillerymen in 3d Infantry Division units in Iraq report receiving enemy rocket fires with sonic booms. A sonic boom immediately precedes the sound of a rocket’s impact (if a dud) or detonation. This can be confusing because Soldiers can interpret the two sounds (boom and impact/detonation) as two incoming rockets vice one.

Tail fins, fuze well and base fragments retaining curvature found at the crater can help determine if the projectile is a rocket or mortar and its type. See Figure 4 for an example of a high-angle crater.

In a typical mortar crater (high-angle), the turf at the forward edge (the direction away from the hostile mortar) is undercut. The rear edge of the crater is shorn of vegetation and streaked by splinter grooves that radiate from the point of detonation. When fresh, the crater is covered with loose earth, which must be carefully removed to disclose the firm, burnt inner crater.

The ends of the splinter grooves on the rearward side generally form a straight line. This line is perpendicular to the line of flight if the crater is on level ground or on a slope with the contours perpendicular to the plane of fire.

A fuze tunnel is caused by the fuze burying itself in the bottom of the inner



Although a 127-mm rocket impacted on concrete in Baghdad, (16 March 2005) the effects still are a good example of a high-angle rocket crater.

crater in front of the point of detonation.

Frequently mortar projectiles or rockets will not detonate on impact. In those cases, they make deep holes or bury themselves. Analyzing such holes may determine the direction and number of fins, depending on the soil type.

*Low-Angle Mortar and Rocket Craters.* In Iraq and Afghanistan, the enemy is using nonstandard and, in many cases, improvised firing techniques, as discussed earlier. He directly lays the projectile or uses Charge “0” (propellant in the igniter) by removing all external charge increments to give the projectile a minimum time in the air.

The detonation of a low-angle mortar round causes an inner crater (much as the traditional low-angle cannon crater, but on a smaller scale). See Figure 5 for an illustration of a low-angle mortar

crater. The burst and momentum of the shell carry the effects forward and to the sides (side sprays), forming an arrow that points to the rear (toward the weapon

#### High-Angle Mortar and Rocket Craters

- Fuze Furrow and Center-of-Crater Method
- Side Spray Method

#### Low-Angle Mortar Craters

- Ricochet Method
- Mine Action Method

#### Low-Angle Rocket Craters

- Main Axis Method
- Splinter Groove Method
- Fuze Tunnel Method

Figure 7: Methods of Crater Analysis for Enemy Mortars and Rockets in Iraq and Afghanistan

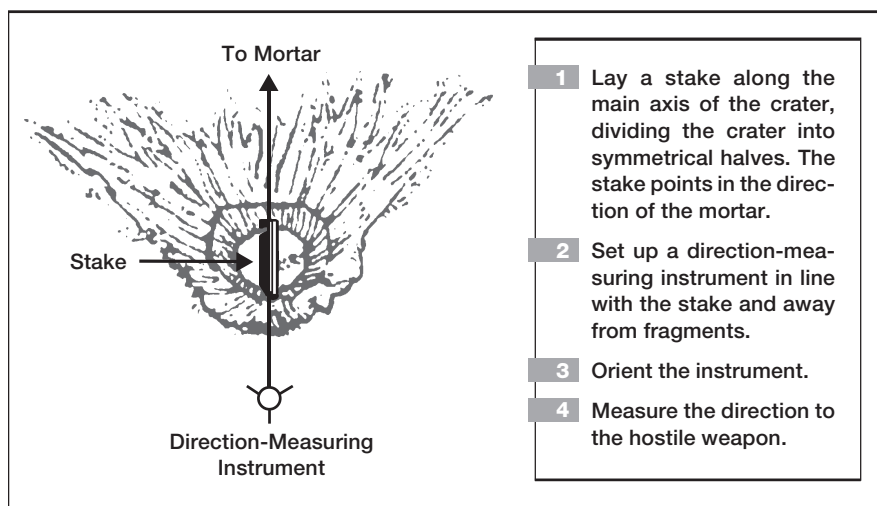


Figure 8: Main Axis Method of High-Angle Mortar and High-Angle Rocket Crater Analysis

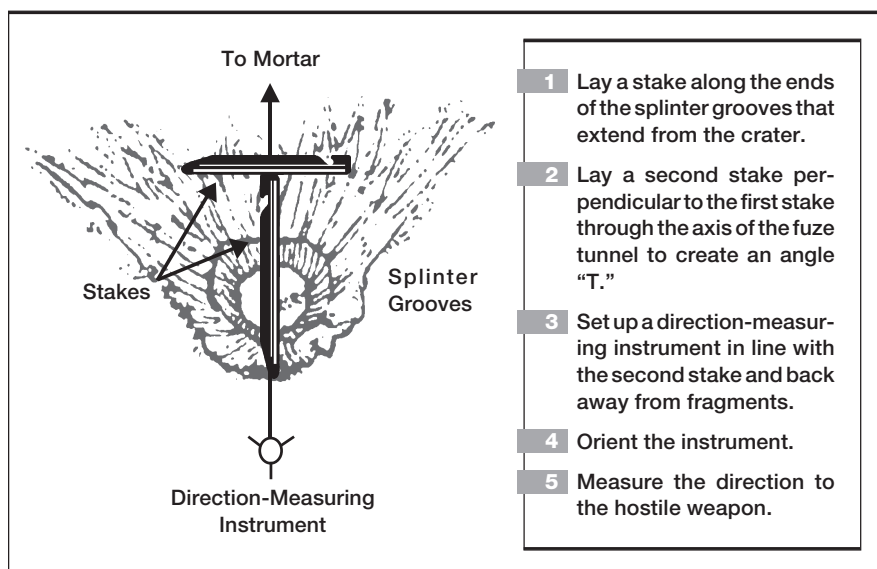


Figure 9: Splinter Groove Method of High-Angle Mortar and High-Angle Rocket Crater Analysis

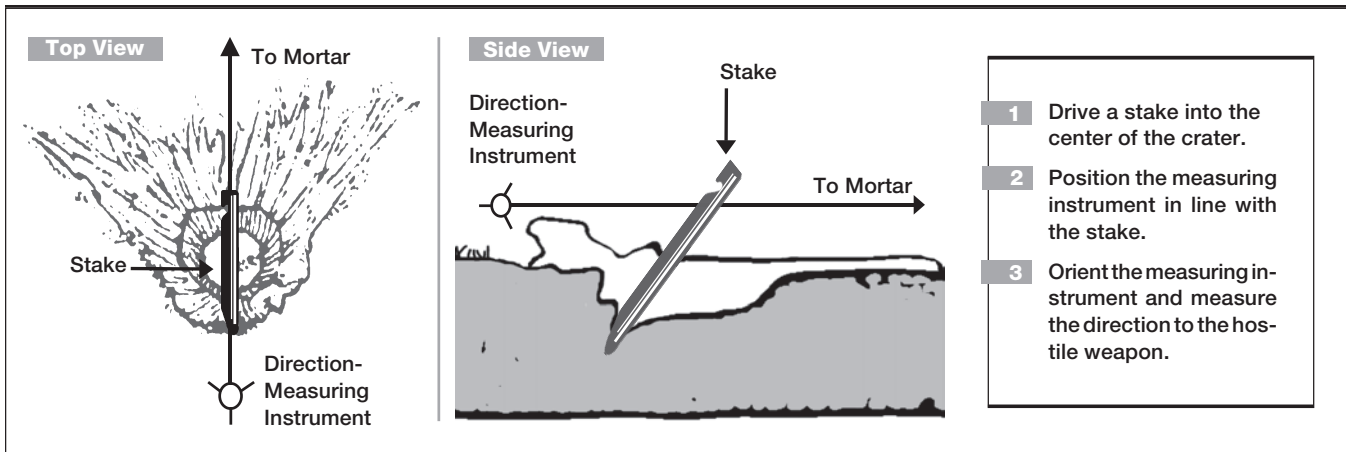


Figure 10: Fuze Tunnel Method of High-Angle Mortar and High-Angle Rocket Crater Analysis

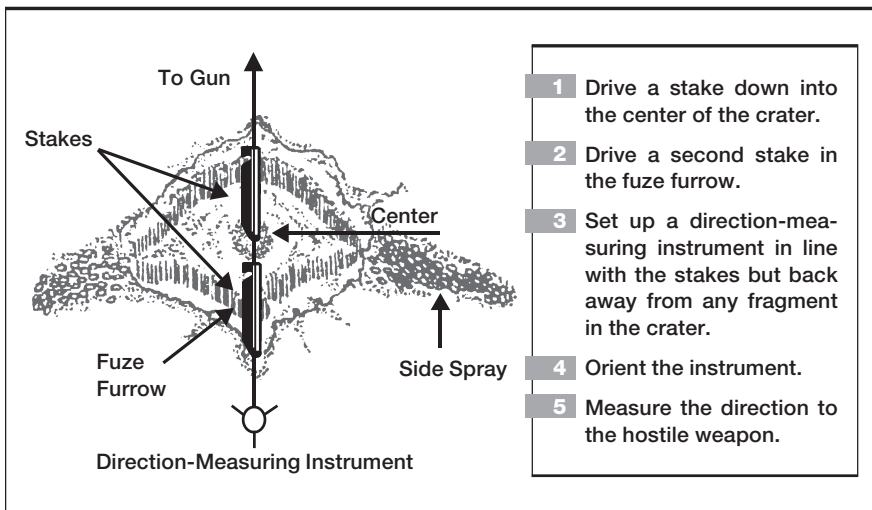


Figure 11: Steps in the Fuze Furrow and Center-of-Crater Method for Low-Angle Mortar Crater Analysis

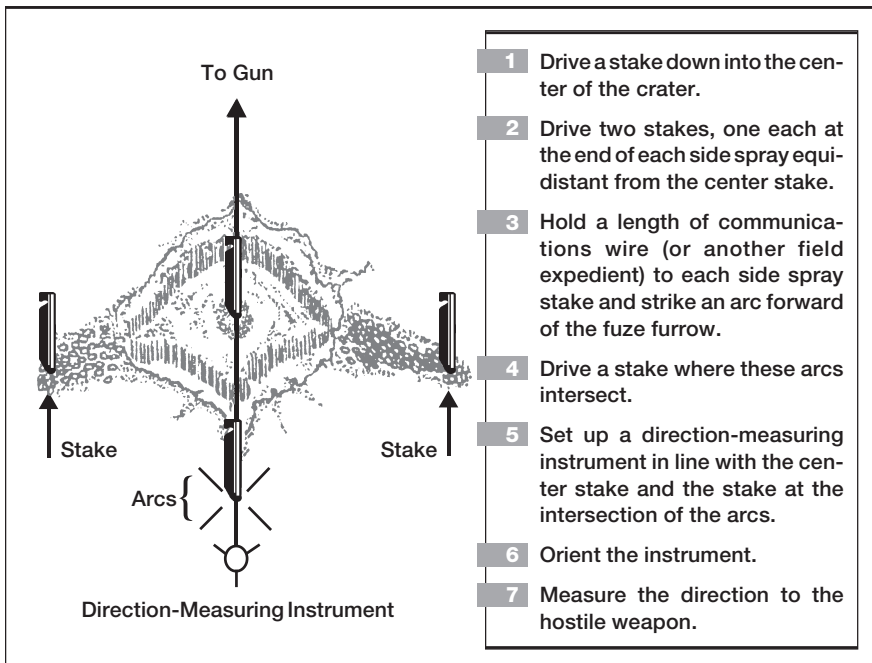


Figure 12: Side Spray Method of Low-Angle Mortar Crater Analysis

that fired the round). The fuze continues along the line of flight, creating a fuze furrow.

The impact of a rocket fired at low angle may result in its bouncing or ricocheting along the surface of the earth (many times, rockets fail to detonate or are duds). Each of these rockets enter the ground in a line following the trajectory and continues in a straight line for a few feet, causing a groove or ricochet furrow. The rocket normally deflects upward and, at the same time, changes direction, usually to the right as the result of its spin (rotation). In some cases there are a series of furrows as the rocket skips across the surface of the ground. The Soldier must determine the true azimuth from the first furrow. See Figure 6 on Page 40 for an illustration of a furrow from a low-angle rocket crater.

The Soldier must examine the area to determine that the rocket was not deflected before or while making the furrow or his crater analysis will determine the wrong azimuth.

**2. Select the best crater analysis method and conduct the analysis, determining the azimuth of fire and the projectile's caliber.** The Soldier chooses the appropriate crater analysis method for his crater. See Figure 7 on Page 41 for a list of the types of mortars or rockets fired and their corresponding crater analysis methods.

*High-Angle Mortar and Rocket Crater Analysis.* For craters created by high-angle projectiles, main axis crater analysis (Figure 8 on Page 41) is the most common method used. Two other less commonly used methods are the splinter groove (Figure 9 on Page 41) and fuze tunnel (Figure 10) methods.

*Low-Angle Mortar Crater Analysis*



*Methods.* There are two methods for this kind of crater: fuze furrow/center-of-crater and side spray. Using a combination of the two and averaging the results is the most accurate means of determining the azimuth of the hostile weapon fired, time permitting. See Figure 11 for the steps in the fuze furrow and center-of-crater analysis method.

The side spray crater analysis method bisects the angle formed by the lines of the side spray (Figure 12). This method is a continuation of the fuze furrow and center-of-crater method.

*Low-Angle Rocket Crater Analysis.* There are two methods of analyzing this kind of crater: ricochet furrow and mine action. The two methods use the same steps as illustrated in Figure 13. Directions obtained from ricochet craters are considered the most reliable.

In the mine action method, a Soldier must dig deeper to uncover the fuze furrow. Mine action occurs when a rocket bursts beneath the ground. Occasionally, such a burst will leave a furrow that can be analyzed in the same manner as the ricochet furrow. A mine action crater that does not have a furrow cannot be used to determine the direction to the weapon.

*Caliber Determination.* The Soldier determines the projectile's caliber using his curvature template to measure several projectile remnants. The size of the crater (width and depth) is some indication of caliber. Sometimes experts can identify the caliber from a digital photo or the actual fragments based on unique gas check bands, tail boom features, fin arrangement or the nozzle section of the rocket.

As time permits, the Soldier gathers and tags the remnants and fragments to send to the analysis team to provide additional information about the hostile weapon system. These can include the body or remnants of the projectile or



A 1st Infantry Division Soldier digs out a furrow of a 107-mm rocket that did not detonate (Operation Iraqi Freedom II).

fuze and fragments with bits of paint, stenciling, stampings, openings, thread counts, adapters, etc. Such recovered items can help identify the munition and provide other important information for the trained analyst. The fact that the fragments are made of aluminum, copper, brass, plastics, iron or steel also

helps the analyst.

**3. Submit the crater analysis report and projectile remnants/fragments to the appropriate organizations.** A fill-in-the-blank form for information known at the time of the indirect fire attack or gathered during the crater analysis is shown in Figure 14. If a

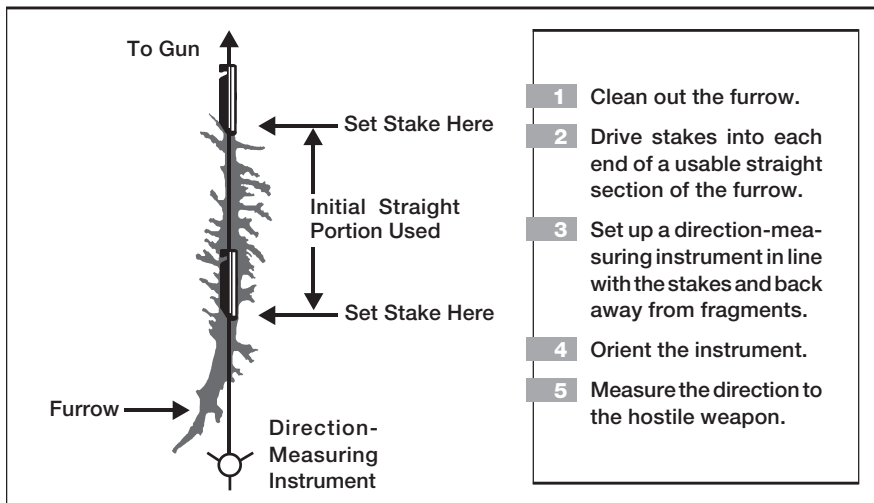


Figure 13: Steps in the Ricochet Furrow and Mine Action Methods of Low-Angle Rocket Crater Analysis. The difference between the two methods is that in the Mine Action Method, the Soldier has to dig down to find the furrow.

<b>Shelling/Crater Analysis Report</b>	
(Use to Report Cannons, Rockets, Mortars and Aviation Bombing)	Date-Time Group: _____
1. Name, Rank, Organization: _____	
2. Observer Unit Identification Number: _____ <small>(If forward observer, include team number.)</small>	
3. Crater Location/Elevation: _____ <small>(annotate map spot or PLGR)</small>	
4. Number of Craters: _____	
5. Size of Craters—Width/Depth: _____	
6. Direction to Enemy Weapon: _____	
7. Source Used to Determine Direction: <b>Crater Pattern / Weapon's Flash / Smoke / Sound</b> <small>(Circle One)</small>	
8. Estimated Distance to Enemy Weapon: _____ <small>(flash-to-bang—350 m/sec)</small>	
9. Target Acquisition Source Type: <b>Observer With Laser / Without Laser</b> <small>(Circle One)</small>	
10. Calibers and Types of Projectiles: _____ <small>(From duds or shell remnants—when doubtful, collect, tag and transmit fragments with this report.)</small>	
11. Slope of Fall: _____ <small>(high or low angle)</small>	
12. Remarks (anything unique): _____ _____ _____	
<small>(Information required for AFATDS Version 6.3.4, September 2005)</small>	

Figure 14: Sample Shelling and Crater Analysis Report Form

crater is more than six hours old, the data from that crater is considered unusable—due to various factors, such as wind/other weather and activities at that location.

Once the report is complete, it is important to get the information to the correct organization. Where possible, this includes sending digital photos of key components so they can be ana-

lyzed and forwarded quickly to higher level intelligence agencies. Figure 15 is a diagram for distributing the information when the analysis is complete.

Regardless of how little information is in a report, leaders must not hesitate to forward it. Fragmentary or incomplete information (even by radio or telephone) is often valuable in supplementing or confirming existing information.

The radio or telephone report may be followed by a written report. A small and seemingly inconsequential piece of information could be the missing piece of the intelligence puzzle when grouped with other reports.

All usable projectile remnants or fragments obtained from the crater should be tagged or labeled and sent to the maneuver battalion S2. At a minimum, the tag should include the following information: location of the crater, direction of the hostile weapon, type of weapon fired (if known) and the date/time group of the indirect fire attack.

This article is not all-inclusive. The enemy threat and systems in Iraq and Afghanistan vary from one unit's AOR to another—as do the methods units employ to defeat their threats. However, this primer can help a unit develop TTPs to deal with its enemy threat and train Soldiers and others in crater analysis. The success of an operation could depend upon the accuracy and completeness of a crater analysis.

The Field Artillery School, Fort Sill, Oklahoma, is writing a more comprehensive handbook to help leaders and Soldiers maintain their crater analysis and reporting skills. The handbook will provide a quick reference and be a job aid for conducting a crater analysis. It is projected to be published in July and distributed on the Fires Knowledge Network (FKN) on Army Knowledge Online (AKO).

The proponent for the handbook is the Fire Support Instructor Section, B Battery, 1st Battalion, 30th Field Artillery (B/1-30 FA), that can be contacted through the 13F Fire Support Specialist link on the FKN or by calling commercial (580) 442-4289 or DSN 639-5114.

Crater analysis is not just Field Artillerymen's business. It's the business of every Soldier, Marine, Airman and land-based Sailor in theater to know crater analysis TTPs and protect the force.

#### Crater Analysis References:

- *Field Manual (FM) 6-50 Tactics, Techniques, and Procedures (TPP) for the Field Artillery Cannon Battery* [Marine Corps Warfighting Publication, or MCWP, 3-1.6.23], Appendix J, "Crater Analysis and Reporting" (December 1996)

- *FM 3-09.12 TTP for Field Artillery Target Acquisition* [MCRP 3-16.1A], Appendix B, "Crater Analysis and Reporting" (June 2002)

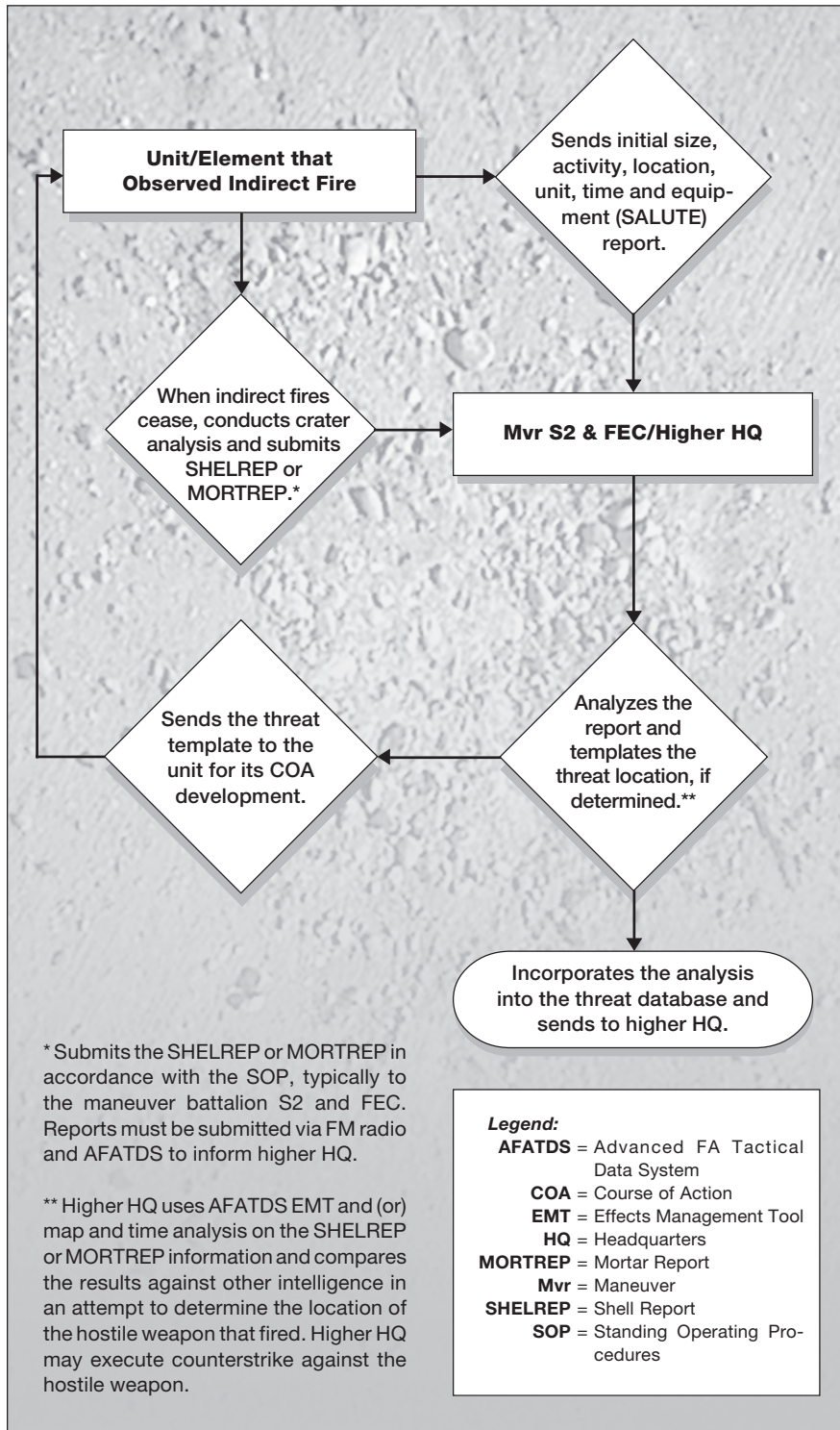


Figure 15: Crater Analysis and Data Distribution



- *FM 7-90 TTP for the Tactical Employment of Mortars*, Appendix D, “Crater Analysis” (October 1992)

- B/1-30 FA Crater Analysis Handbook on Fires Knowledge Network.

- The Navy’s explosive ordnance detachment (EOD) document “Iraqi Ordnance Identification Guide” is at <https://naveodtechdiv.navsea.navy.mil/iraqoig/>.

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He also was the Senior Multiple-Launch Rocket System (MLRS) Instructor in the Field Artillery School. Before taking command of B/1-30 FA, he deployed to Kuwait as the Intelligence Officer for 2-18 FA attached to the 41st FA Brigade, V Corps, in support of Operation Iraqi Freedom (OIF). He also commanded Headquarters Battery of 6-32 FA, 212th FA Brigade, III Corps Artillery, Fort Sill.

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FA. During OIF, he was a Company Team Sergeant and, later, a Battalion Fire Support Sergeant for 3-327 IN as part of 2-320 FA, 101st Airborne Division (Air Assault). Upon his return to Fort Campbell, Kentucky, with the 101st Division, he became the Brigade Fire Support Sergeant for the 159th Aviation Brigade.

*The authors wish to thank the instructors and leaders of the Field Artillery School, Fort Sill, Oklahoma; the National Ground Intelligence Center in Charlottesville, Virginia; and experts on crater analysis from several units either currently deployed in Iraq or recently redeployed for their contributions to this article.*



This 107-mm rocket did not detonate (OIF II, 1st Infantry Division Sector).



The picture on the top shows part of a 107-mm rocket fired into asphalt in Baghdad on 10 April 2005. On the bottom, a 107-mm rocket shell remnant lies in a dirt crater in Baghdad after an attack on 11 April 2005



This is a mortar crater on a street in Iraq during Operation Iraqi Freedom II.



A 122-mm rocket was fired at high angle and detonated on a street in Baghdad, as shown here, on 6 March 2005.