

Field Artillery

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A Joint Magazine for US Field Artillerymen

September-October 2004



**Joint
Close Air
Support**

Field Artillery

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Front Cover: During the joint close air support (JCAS) exercise Operation Joint Thunder at Fort Sill in May, Air Force Master Sergeant Bradley Prais, Standardization and Evaluation Chief, and Staff Sergeant Steven Dumont, Joint Terminal Attack Controller, look skyward at two Naval Reserve F-18s, each dropping four 1,000-pound bombs on an "enemy convoy" simultaneously with cannon and rocket artillery fires. They are from the 3d Air Support Operations Group, Fort Hood, Texas. The event culminated the 212th Field Artillery Brigade's exercise that incorporated the efforts of 13 units, nine installations and four branches of the armed services. (Photo by SPC Matthew Meadows, Fort Sill *Cannoneer*)

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Army & FA in Transition

Leadership and Soldier Tours, FA Modularity and Other Issues

Part of my job as the Chief of FA is to keep you informed and, therefore, most able to lead and implement the multiple changes ongoing in the Army and our branch. These changes are affecting every aspect of the Army and FA, including the length and types of leaders' and Soldiers' tours, the design of the FA formation and the requirement for artillery leaders to serve as maneuver leaders, among other nontraditional missions—the issues discussed in this column. In addition, part of my job is *bragging* on the FA—which is easy to do.

Leadership Tours. Our branch is fully on board with and an integral piece of the Army's overall effort to move forward quickly to grow additional maneuver brigades. We all must understand that the Army is moving out as expeditiously as possible to stand up these additional units and create the force our regional combatant commanders require while providing a more predictable deployment expectation for our volunteer force.

Our most senior leadership appreciates the stress that repetitive combat tours 12 months long have on the volunteer force. In order to move closer to six-month deployments, increase deployment predictability and provide a reasonable period between tours, our Army must grow more maneuver brigade combat teams (BCTs). And that is exactly what we are *doing*.

As I discussed in the July-August edition, our Army is in the process of reconfiguring all BCTs as unit of action (UA)

formations, and will grow the number of Active Component (AC) BCTs by 10 (potentially 15). Each BCT will have an organic cannon artillery battalion with unmanned aerial vehicles (UAVs) and other assets added, called a fires battalion. (I discussed the fires battalion in more depth in my July-August edition column online at sill-www.army.mil/famag.)

In the Army National Guard (ARNG), the number of cannon fires battalions will increase with the number of ARNG BCTs while the number of multiple-launch rocket system (MLRS) battalions will decrease slightly. Overall, the number of ARNG FA battalions will decrease with some converting to other branches or deactivating.

In the AC, the number of fires battalions will increase for an overall increase in FA battalions. This means there will be more AC cannon artillery battalions to command.

As many of you are aware, our Army at war is not changing leaders in mid-stream—in the face of the enemy. Maintaining commanders and command sergeants major (CSMs) in place while units are deployed in the fight is all about readiness, keeping Soldiers alive and winning America's War against Terrorism.

But extending serving commanders and CSMs means that some principals slated for these positions are "waiting in the wings." We are working closely with FA branch to ensure that every effort is made to work each case individually in order to maintain slate integrity, timelines and follow-on positions. I encourage each in-



involved to communicate with FA Branch.

We will work through this unusual period of challenge. At the end of the day, I believe the overall increase in AC FA cannon battalions will balance longer command tours and maintain AC battalion command opportunities at about the levels we see today.

The concept of the joint and expeditionary mindset also requires we take steps to increase unit stability and readiness by setting the leadership for the 36 months of a unit's lifecycle. During the first six months of the cycle, Soldiers and leaders are assigned to the unit and complete both individual and collective training certifications. This enables the unit to be ready for deployment in the remaining 30 months.

During this 30-month period, Soldiers and leaders should expect one six-month deployment with about 24 months between deployments. Unless the Soldier's professional development requires a permanent change of station (PCS), he will remain in his unit for its lifecycle, greatly improving family stability.

Modularity in the Artillery Formation. The Army's first artillery fires brigade for a unit of employment (UEX) will be stood up at Fort Hood, Texas, on 16 December. It will be the 4th Fires Brigade in support of the 4th Infantry Division (Mechanized), a new UEX.

Although some of the components of this first fires brigade will not be available on its 16 December effective date,



the basic command and control structure and organic MLRS battalion will form the brigade's foundation (I detailed the organization of the fires brigade in my July-August column.) Other components will be added as they become available.

What is *essential* is for the 4th Fires Brigade to establish an appropriate relationship with the 4th UEx staff as well as training and warfighting relationships with the maneuver BCTs and their organic fires battalions.

Fort Sill is working closely with the DA and Training and Doctrine Command (TRADOC) staffs and the National Guard Bureau to determine the units that will be organic to the fires brigades and those assigned to them plus the locations of the fires brigades.

The current rules of allocation authorize one fires brigade for each AC and ARNG UEx. We are coordinating the establishment and designation of the fires brigades for the remaining UExs.

Expanding Responsibilities of FA Commanders. Artillery commanders at each level remain responsible to their maneuver commanders for the training and certification of cannon and rocket Soldiers plus fire supporters and, ultimately, the delivery and execution of the maneuver unit's fires and effects. By virtue of their experiences and the personal relationships of trust and confidence established with their supported maneuver commanders, our artillery commanders uniquely "wear the roses" of delivery system commander and effects orchestrator.

Staff officers help and inform the commander. Unlike the commander, they ensure the "science" pieces of effects coordination are properly enabled by our automated systems and are prepared for execution to standard. The science of fires and effects includes geometry, fire support coordination measures (FSCMs), attack guidance matrices (AGMs), etc.

However, the FA commander creates the "art" of effects coordination and makes battlefield decisions that truly enable fires and effects to achieve the intent of his BCT or UEx commander.

Artillery battalion- and brigade-level commanders always have functioned in this dual capacity. Their training and experiences have made them better, more versatile senior Army leaders with



Photo by Al Zbarsky, Fort Lewis, Washington

Cadets receive hands-on training during Warrior Forge at Fort Lewis, Washington.

unique insights into overall maneuver operations.

As we mature our doctrine supporting modularity, we will continue to expect artillery commanders to be both delivery system commanders and fires and effects coordinators.

In addition, FA unit commanders in the war on terrorism or training at the Combat Training Centers (CTCs) repeatedly have served as commanders of maneuver headquarters in the past year-plus and executed maneuver missions with great success.

Continuing Quality of the Branch. My recent visits to Fort Lewis, Washington, and Fort Knox, Kentucky, for Warrior Forge 04 and Leader Training Course 04, respectively, gave me great optimism that this year's recruiting class from all commissioning sources is going to be *outstanding*. The teams and cadre of artillery Soldiers who showed off the FA at its best and shared their Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) experiences with the cadets were highly professional, peer-credible and enthusiastically "on-target."

Fort Sill's 214th FA Brigade, part of III Corps Artillery, combined with Redlegs from the 101st Airborne Division (Air Assault), Fort Campbell, Kentucky, and the 18th Field Artillery Brigade and 82d Airborne Division, both from Fort Bragg, North Carolina, did a truly *awesome* job of demonstrating the full range of the artillery's capabilities at Warrior Forge at Fort Lewis. At Fort Knox, the 2d Battalion, 222d Field Artillery, Utah ARNG, with support from Redlegs from the 212th FA Brigade, superbly executed fire support, cannon and MLRS lanes. Each

cadet had hands-on training, setting fuzes, transporting rounds and smelling cordite after the Paladins fired 155-mm high-explosive M107 rounds. The cadets' excitement was evident by smiles that extended from ear to ear as they exited the Paladins.

These cadets received a great exposure to the opportunities and challenges of our branch. To build additional recruitment opportunities, I ask each commander to encourage his lieutenants to share their branch experiences in communications with their commissioning schools.

More on Communications. Keeping each member of our formation informed is a priority. The new Strategic Communications (Strat Comms) Office is now operational under the able leadership of Lieutenant Colonel (Promotable) Annie Baker (mary.baker@sill.army.mil).

Our most current messages and information regarding modularity, transformation, leader development and other key issues will be posted on the officer website of FA branch at Human Resources Command (HRC) in Alexandria, Virginia. The website is <https://www.perscomonline.army.mil/opfa/fasitrep.htm>; click on "Branch Chief Notes" and then on "MG Valcourt Sends."

In September, the Fires Knowledge Network (FKN) will be online at Army Knowledge Network (AKO) and accessible by anyone with an AKO account. It will include my strategic themes and messages.

Check these sites often, and give me your feedback at redleg@sill.army.mil.

FKN is the first branch and model for other branches as a one-stop website for all fire support and Field Artillery professional knowledge. FKN will link the operational forces with the Field Artillery Center and with each other. Individuals automatically will receive messages from Fort Sill when they log onto FKN, including information targeted specifically for them by communities, such as all warrant officers, commanders and (or) command sergeants major, joint fire supporters, Cannoneers, etc. Units will be able to have their own robust websites on FKN that are customized to fit their missions.

Redleg Pride. Again, never a day

goes by that we do not witness the incredible adaptability and professionalism of our deployed artillery formations, both active and Guard. Throughout the spectrum of conflict, our artillery Soldiers and leaders demonstrate

awesome versatility and value to combatant commanders by not only delivering precise, timely and lethal fires, but also executing maneuver missions very effectively.

I am proud to be a Field Artilleryman,

and even prouder to serve in an Army at war with professional Soldiers and Marines, like you. *Create the Thunder!*



Incoming

Letters to the Editor

Full-Spectrum Indirect Fire Support: Mortars in the FA

An indirect fire support system by any other name is still an indirect fire support system. Those of us who are fire supporters and artillerymen ought to look to where we can further employ our expertise for the betterment of our Army and fighting forces. One such area, which many within our circles often dismiss, is the employment of mortars: the 60-mm, 81-mm and 120-mm mortars.

Mortars have been inherent in Infantry MTOEs [modified tables of organization and equipment] for many years. Despite the evolutional shift to precision fires, we still need the responsive area fires mortars provide.

Regardless, Infantrymen tend to focus on employing their direct fire systems. They do not prioritize mortars as highly as their primary direct fire weapon systems.

Infantry MTOEs should be modified to fill mortar sections and platoons with 13-series MOS [military occupational specialty] Soldiers. 13B Cannoneers would fill the mortar-men positions, and 13E Cannon Fire Direction Specialists would staff the mortar FDCs [fire direction centers]. Similarly, officers in mortar platoon leader positions would be 13-series.

Other specialties (Intelligence, Medical and Signal) have embedded their branch-specific Soldiers in Infantry, Armor and Field Artillery units for many years. Why should we be any different?

The crux of the issue is putting those who are best qualified in the job. First, let me say there are many high-quality Soldiers who are mortarmen. My point is that those who specialize in indirect fire support should be charged with managing, training, equipping and resourcing all the ground force's indirect fires, not just a portion of it. For years the Infantry has relied upon its DS [direct support] FA battalions to help train their mortar crews and mortar FDCs. Let's just take it a step further and incorporate Field Artillery personnel into the mortar crews.

Just as the 13F Fire Support Specialist was created almost 25 years ago to include artillery and mortar forward observers, so, too, should the remainder of the mortar equation be transformed.

The time for this change is now. Accurate and timely indirect fire support is the service we provide. We should be the full-spectrum providers of indirect (non-line of sight, or NLOS) fires, not just the keeper of cannons and rockets.

Fire Supporters are committed to supporting the close fight. And with the Army's move toward modularity and the former DS battalions' becoming fires battalions organic to the BCTs [brigade combat teams], our Infantry brethren should welcome our desire to provide our indirect fire expertise and manning in mortar positions to make the BCT



Two four-mortar batteries in Afghanistan were manned by 10th Mountain Division Redlegs who had been trained on the standard M120 120-mm mortar fielded to mechanized infantry battalions.

a more ready and capable fighting force.

Clearly this change would take some responsibility away from the Infantry, but the maneuver commander still would own his mortars. An advantage would be that the integration of mortar fires into the overall fire support plan would be greatly enhanced.

The advent of the 120-mm mortar prompts some questions. An option would be to have two eight-howitzer batteries of either 105-mm or 155-mm howitzers and one battery of 120-mm mortars in each of the BCTs' fires battalions.

It's time for Field Artillery to expand and transition into more responsibility in the new BCTs. We are the Army's all-weather, fully capable providers of fire support. Our mission does not change: we must provide accurate and timely fires to support the maneuver commander. What must change is *how* we do it.

We need to step forward and enhance fires in the close fight by taking responsibility for mortars in the BCTs. Then we need to give this initiative the horsepower to do it right.

COL Keith J. Bucklew
Commander, 138th Regiment
Former Commander, 38th Infantry Division Artillery
Indiana Army National Guard

AFATDS Improvements—We Hear You!

While reading the March-June edition of the *FA Journal*, I found two articles of particular interest. The first was “IMEF Fires in OIF” by Lieutenant Colonels Paul M. Andrus and Randol D. Rule and Major Robert J. Terselic, all USMC. The second was “4th ID: Clearing Airspace for Counterfire in Iraq” by Army Major Michael Donahue and Captain Carl F. Robinson.

These articles were of interest to me as an Assistant TRADOC [Training and Doctrine Command] Systems Manager for Field Artillery Tactical Data Systems (TSM FATDS) working on the AFATDS [advanced Field Artillery tactical data system] program. Both articles mention AFATDS and suggest specific changes to make AFATDS more effective. It may be of interest to readers to note that the authors’ suggestions already are programmed for future AFATDS and its effects management tool (EMT) software releases.

Large Numbers of No-Strike Targets. In “IMEF Fires in OIF,” the Marine officers took AFATDS to task for its inability to handle their 13,000-plus no-strike OIF targets on the AFATDS’ “Limited Protected Area List.” The cur-

rent version of EMT (2.16), which is issued with AFATDS Version 6.3.2 software, has eliminated problems associated with the extremely large Limited Protected Area List. It also can import the Limited Protected Target List from a spreadsheet file and perform automated coordination checks against the list. AFATDS 6.3.2 and EMT 2.16 are fielded or being fielded to units today. AFATDS Version Software Block 2 (SWB2), due for release in November 2006, will be able to handle the Limited Protected Target List by itself (no EMT needed).

No Restricted Operating Zones (ROZ). The “4th ID: Clearing Airspace for Counterfire in Iraq” article stated that AFATDS does not have a ROZ geometry type. This is true. The 4th ID’s use of the platoon area hazard (PAH) as a means to identify danger areas associated with their firing elements was both innovative and technically correct. The Air Force system, theater battle management-core system (TBMCS), considers a PAH a ROZ.

In the future, AFATDS Version SWB2 will support the ROZ as a new geometry type, an improvement suggested

by the 4th ID article.

Improved Web-Based Interface with TBMCS. Additionally, AFATDS SWB2 will incorporate an improved web-based interface with TBMCS. This interface will overcome many of the limitations imposed by the USMTF [US message text format] currently used to communicate with TBMCS and will allow greater visibility of air tasking order [ATO] and airspace control order [ACO] data.

These articles are examples of how creative and innovative our warfighters are and how requirements for automated systems are continually evolving. The members of TSM FATDS read all articles and feedback about AFATDS and react to fix our warfighters’ challenges as quickly as funding allows. We welcome users’ comments and recommendations.

Please visit our website at http://www.army.mil/tsm_fatds/ to get the latest information on AFATDS or give us feedback by contacting me at (580) 442-6838 (DSN 639) or pattersonnp@sill.army.mil.

MAJ Neil P. Patterson, FA
Assistant TSM FATDS
Fort Sill, OK

AFATDS Wins Top-Five Award



Lft to Rt: COL Francisco Alicea, TSM FATDS; COL(R) Steve Lutz, Raytheon; and LTC James Chapman, Program Manager for Intelligence and Effects, receive the award.

The advanced Field Artillery tactical data system (AFATDS) won an award for being one of the government’s “Top 5 Quality Software Projects” in April. The award was presented at the Systems & Software Technology Conference’s (SSTC’s) 16th annual symposium in Salt Lake City, Utah.

This symposium attracts systems and software professionals in the Department of Defense (DoD) and government-related industries and academia. AFATDS was selected as one of the top-five programs from 44 nominees. The award recognizes outstanding performance by software teams to promote best practices.

AFATDS is an Army Marine Corps program but is applicable across all services. Because Soldiers’ and Marines’ lives depend on AFATDS, rigidly high standards guide the development of its software.

JCAS and the Defense of Duffer's Wadi



By Colonel D. Matthew Neuenswander, USAF, and Lieutenant Colonel D. Wayne Andrews

This article updates E.D. Swinton's book *The Defense of Duffer's Drift* written about combat in the Boer War and printed in the US in 1905. Like its predecessor, the article outlines a series of dreams of a main character in combat—in this case, a captain in command of a Stryker company who is tasked with the defense of a key piece of terrain, Duffer's Wadi. A "wadi" is a valley, gully or riverbed that remains dry except during the rainy season.

Reminiscent of *Duffer's Drift*, the main character makes mistakes in the first dream that result in disaster for him and his unit. In his subsequent dreams, he learns from his previous mistakes until he finally is successful in accomplishing his mission. Unlike *Duffer's Drift*, this article focuses on a single mission area: the ground commander's use or misuse of fires, specifically, joint close air support (JCAS).

The lessons the captain learns in these dreams are actual lessons gleaned from Air Warrior I and II after-action reports (AARs). Air Warrior I is the USAF exercise flown in support of brigade combat team (BCT) rotations at the National Training Center (NTC), Fort Irwin, California. Air Warrior II is the USAF exercise flown in support of BCT rotations at the Joint Readiness Training Center (JRTC), Fort Polk, Louisiana.

In the article's scenario, the enemy is referred to as the "Feyadeen." The battle could have taken place last year or will take place five years from now somewhere in the Middle East or Afghanistan. The Feyadeen consists of both

regular forces with conventional weapons, such as tanks, BMPs, mortars, surface-to-air missiles and rocket-propelled grenades (RPGs), and irregular forces with non-conventional weapons, such as car/truck bombs, technical vehicles, suicide bombers and improvised explosive devices (IEDs). The Feyadeen are fanatics committed to driving all American and allied forces from their country despite the fact that their nation is in the process of building a fledgling democracy.

Prologue. The dust had just cleared from the last C-17 leaving the airfield as my company XO [executive officer], and I walked up to the tent that served as the battalion command post [CP], known as the TOC [tactical operations center]. It was the last day of October, and my company was one of two that had been airlifted to an abandoned airfield in the middle of nowhere as part of Operation Vigilant Foresight. Portions of a Ranger battalion had parachuted into this airfield that the Russians had built in the 1970s and secured it as our future SBCT [Stryker BCT] FOB [forward operating base].

The rest of my brigade would begin arriving early tomorrow morning. For now, it was up to my company and one other company in my Stryker battalion and the Rangers to hold the FOB and airfield for the night. Fortunately, we had about six hours until the sun went down to figure out what was going on.

Inside the TOC, my battalion CO [commanding officer] was looking over a map with the S3 and the Air

Force master sergeant who served as the EBALO [enlisted battalion air liaison officer]. The EBALO was in charge of the single TACP [tactical air control party] we were able to get on the C-17s today. The rest of the USAF team and equipment would arrive tomorrow with the brigade TOC. My CO looked at me and pointed to a wadi on the map 20 kilometers due west of the airfield.

"We don't expect any trouble from the Feyadeen tonight, but if they come, it most likely will be from *here*, Duffer's Wadi," he said as he pointed to the map. (See Figure 1 on Page 6.)

"Move your company to Duffer's Wadi, establish a hasty defensive position and hold until relieved." The CO also told me that only three of the unit's 155-mm M198 howitzers had arrived and ammo was very limited. He sent the other company several kilometers east to block the eastern approach to the airfield.

"The ASOC [air support operations center] said they will give us the CAS we need," the CO said, "so take your FIST [fire support team] and company mortars with you and make sure you check in with the signal officer before you leave."

Photo by Air Force SMI/Sgt
(Ret) Patrick Nugent

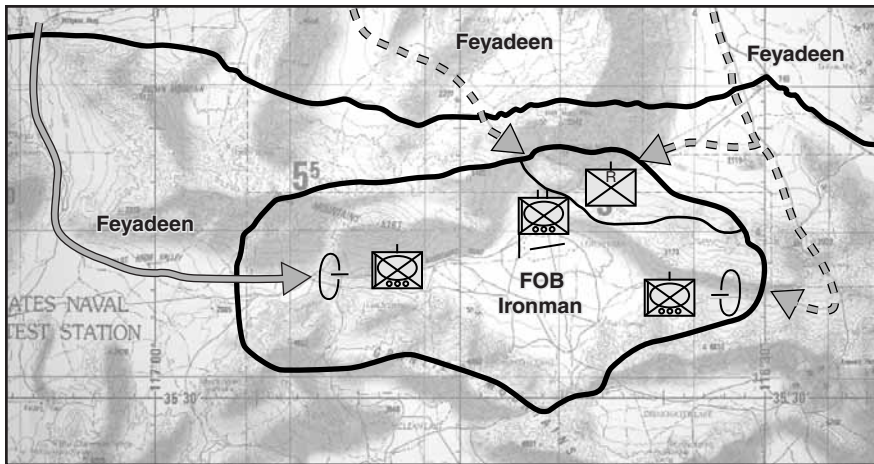


Figure 1: The General Plan for the Defense of Forward Operating Base (FOB) Ironman

“I don’t have a TACP to send with you out west; we will run any CAS you need out of the battalion TOC until tomorrow. As soon as you get out there, radio back any preplanned CAS requests. Unless you have any questions, you and your men can get going,” he finished.

My mind was jumping ahead to the myriad of things I had to do—orders to give, develop a plan for how to defend the wadi—so I told the CO, “We got it!” and left the TOC.

As I walked to the commo tent, the EBALO caught up with me and asked if I wanted to take an Air Force JTAC [joint terminal air controller] assigned to the Ranger battalion with me. The JTAC’s unit had not arrived yet. Apparently, he was a combat veteran, had lots of great gear and was willing to support my company for the next 24 to 36 hours. My unit had trained hard together for months before this mission, and I did not want to baby-sit some new guy if things got Hot. I politely declined the EBALO’s offer and went to see a man about commo.

In the commo tent, they handed me a list with our unit’s nets, frequencies and crypto for the next week. The signal lieutenant asked, “Sir, because your unit is the first one ‘out of the shoot,’ I’m going to let you decide if you want to freeze crypto for the next 48 hours so you don’t have to take two months’ worth of data.” I looked at my watch and realized it would be next month in 10 hours and that this lieutenant had just had a great idea.

I asked him if that would affect my ability to talk to the battalion TOC, and he told me, “No,” that if he froze crypto for me, he would do it for everyone in the battalion until the brigade set up its TOC tomorrow or the next day.

I walked out of the commo tent with one month’s commo data, satisfied I had simplified my hasty plan a great deal.

It took a little less than an hour to finish fueling our Strykers and start moving. I pushed the company hard to get to our position with enough light to reconnoiter the area before we set up our perimeter and vehicle positions. We traveled in a column with flank security parallel to a well used dirt road running through the center of the wadi.

The position we were to defend was the mouth of Duffer’s Wadi where it opened up to the west into a large valley. Our battle position was the narrowest part of the wadi, and the terrain closed into a three-kilometer-wide chokepoint. The ground rose gradually to the north and sharply up on the south with mountains on either side of the wadi.

My company consisted of 14 Stryker vehicles plus the one FSV [fire support vehicle] and totaled 150 personnel. We had two 120-mm mortars, nine Javelin

missile systems, seven .50 cal machine guns and seven MK-19 automatic grenade launchers mounted on the Strykers. My three platoons consisted of 12 dismounted squads, each with a SAW [squad automatic weapon].

My company FIST had a brand new second lieutenant FSO [fire support officer], a staff sergeant FSNCO [fire support NCO] and two Soldiers, while each platoon had an FO [forward observer] party with one sergeant and Soldier each. My three MGSes [mobile gun systems] had been bumped from the air manifest to make room for the three 155-mm howitzers because intel had reported the enemy did not have a large armored force. The Javelins could handle anything the Feyadeen had.

The First Dream. This was my first chance to prove myself as a company commander. I was confident that my unit had the tools, the training and the firepower to hold the wadi against a much larger force.

After a quick recon, I decided to set my company CP up on the high ground just north of the middle of the wadi and arrange my Stryker platoons in a reverse horseshoe in the valley floor. (See Figure 2.) I placed the company FIST in the center of my defenses with the mortars located on the far southern flank behind a large rock outcropping. We were approximately four kilometers back from the entrance to the wadi, and any enemy force that entered it would come under the direct fire of the entire company—plus all the indirect fire I could call in.

The radio in my Stryker crackled, and it was my CO on the line. He wanted to know if we were in position. He also relayed the message that the EBALO

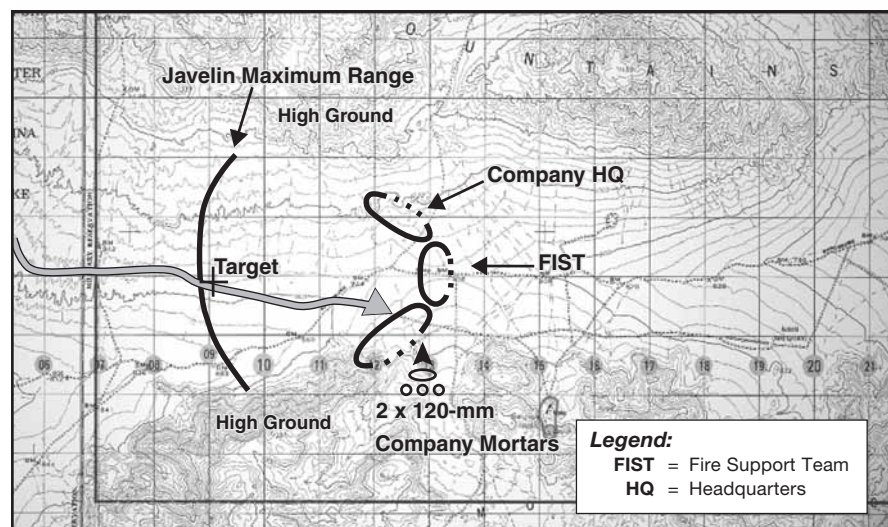


Figure 2: Company Defensive Position on Duffer’s Wadi—1st Dream

was standing by for my CAS request.

I told him we were in position and had not encountered any opposition. I said I had no CAS request at that time but would get back with him if I needed CAS. My CO informed me that our sector would begin receiving JSTARs [joint surveillance and target attack radar system] coverage around midnight and that the TOC would forward that information to us digitally as soon as it came in. He told me to provide updates every two hours throughout the night unless I became engaged and then as necessary.

I put down the radio's handset just as the sun started to set. My men were eating MREs [meals ready to eat] in their defensive positions and had an air of confidence about them.

We were in the *perfect* position. As I looked west, the entrance of the wadi sloped up hill and crested at the optimum range of both my mortars and Javelins. I told my platoon leaders to have the Javelins focus on any tanks or APCs [armored personnel carriers] that came into the fight while the .50 cal and grenade launchers were to concentrate on any light-skinned vehicles. I had my FSO prepare a fire-for-effect, "At My Command" fire mission for the chokepoint at the mouth of the wadi.

The night was clear and cool. There was a full moon—we almost did not need our NVGs [night-vision goggles] and thermal sights. I was certain we were prepared for whatever the Feyadeen could throw at us—any enemy who poked his nose over that crest was going to be in for one *helluva* surprise.

A few minutes after midnight, the CO called and advised me that JSTARs picked up a force of approximately 60 vehicles 18 kilometers northwest of our position and moving toward us. At the present rate of speed, the enemy would be at my position in approximately 40 minutes. I alerted the platoon leaders and gave them the intel and orders to go to full alert.

Eventually, a single enemy tank flanked by two pickup trucks came over the crest and stopped. I could not take the chance that this tank had picked up on one of my Strykers, so I ordered the Javelins to engage them. The first Javelin was a direct hit, and the tank went up like a roman candle, lighting the entire wadi.

Just then, another tank and several more trucks came over the crest, and I called for both the mortars and howitzers to fire. Within seconds, the mouth of the wadi was engulfed in flames and

explosions. Three of the trucks were hit; the tank retreated.

My CO informed me that JSTARs reported the enemy force was dispersing four to five kilometers to my west. My defensive plan in the wadi was exactly what I wanted: anything coming toward me faced certain death. Now all I had to do was wait for the Feyadeen to gather their courage and attack again.

It was another hour before we saw any movement from the enemy. Unfortunately when we picked up their troops moving on foot, they were already in the hills to our north and south. We immediately began engaging these troops with mortar and machine gun fire. Those who were not hit continued to move toward our flanks. Eventually, we started taking sporadic small arms and RPG fire from the ridge to the south of the wadi.

I told my FSO to work up a fire mission against the ridgeline just as my CO came on the radio and informed me that JSTARs said several of the vehicles were beginning to mass just beyond my line-of-sight at the mouth of the wadi. I informed the CO that I would need a significant artillery barrage if they attacked, and he told me that his tubes only had enough ammo for one more fire-for-effect mission.

As I worked the fire mission up with my FSO, the southernmost Stryker took a direct hit from an RPG. The burning Stryker illuminated our entire position, and the enemy's small arms and RPG fires immediately became more accurate. The reports of killed and wounded started

coming in on the company net when two tanks and 20 vehicles came over the hill moving *fast*.

Again I yelled on the net for my platoon leaders to focus the Javelins on the tanks. Fingers of fire reached out, and within a half-minute, the tanks were dead—but not before one got off a shot and hit a Stryker on my left flank illuminated by the fire still burning from the first one.

The 155-mm fire mission started hitting the wadi floor when the trucks were about half way between

the crest and my position. We poured everything we had onto them, and within a minute, half of the vehicles were dead or on fire.

Suddenly one of the burning trucks exploded in a huge fireball. It was then that I realized that the remaining trucks had no troops in them—that each appeared to be heading for a different Stryker. They were *suicide* bombers who knew the exact positions of the other Strykers. As this was happening, the ridge to the north erupted with RPG fire, hitting another two Strykers. My command was now down four Strykers in less than five minutes.

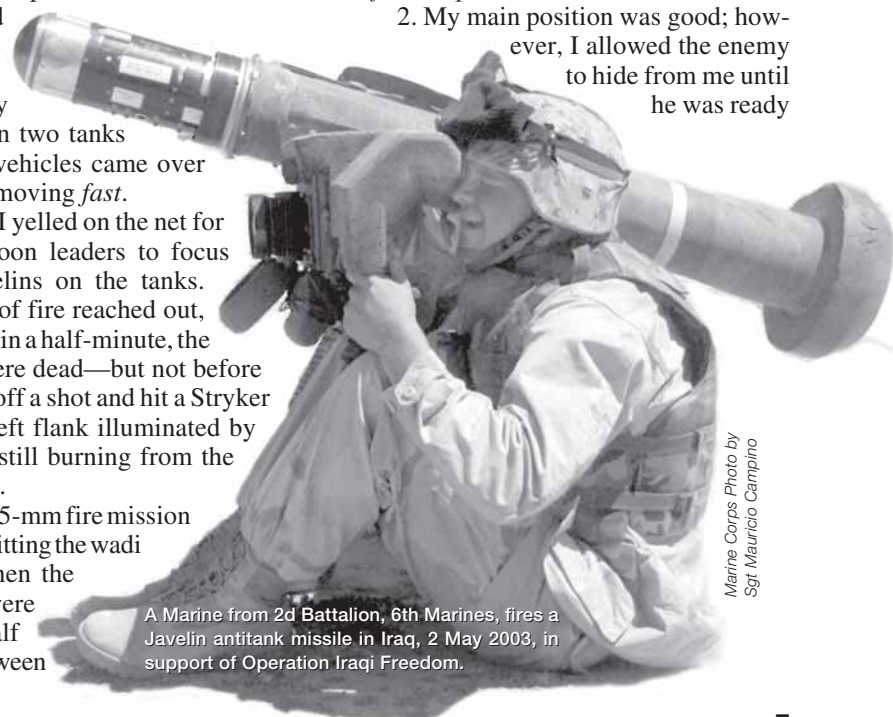
Only four of the original trucks were still moving, but I watched in horror as they weaved back and forth at full speed coming toward us. I was standing 50 meters from my command Stryker when the truck hit and my world went black.

Sometime later, I thought I heard a voice speaking a language I did not understand as vehicles drove past my position heading east. My head was throbbing, partly from the explosion of the suicide bomber and partly from the knowledge that I had failed in my mission and gotten most of my company wiped out.

I quickly pondered my situation and grasped the following lessons:

1. Twice I had been offered more fires in the form of CAS, and twice I had turned CAS down. We were defeated because we did not have enough fires to kill the enemy before they got to us. *Next time I would include CAS in my fires request.*

2. My main position was good; however, I allowed the enemy to hide from me until he was ready



A Marine from 2d Battalion, 6th Marines, fires a Javelin antitank missile in Iraq, 2 May 2003, in support of Operation Iraqi Freedom.

Marine Corps Photo by
Sgt. Mauricio Campino

to attack—we could not kill the enemy as fast as he could present targets. *I needed to move my FISTers to terrain where they could see the enemy sooner, so we could engage the enemy farther from our position.*

Second Dream. Suddenly, I was walking out of the battalion TOC with my XO en route to the commo tent. It took me a moment to realize that I was in the same place with the same orders on the same day that I had started before—had the other been a dream? This time, I was much wiser and armed with two major lessons I had learned in the first fight.

Just then, the EBALO walked up and, again, offered me a Ranger JTAC; like before, I turned him down. This time, I told the EBALO that I would put in a CAS request as soon as I saw the terrain and would expect his help in executing CAS if we needed it. He promised to stand by for the request.

We went to see the commo lieutenant. I immediately asked the lieutenant to freeze crypto to simplify commo. Again, he agreed. I walked out with one month's data looking forward to the fight ahead.

Again I pushed my guys hard to get to the wadi with as much daylight as possible left to set up our defenses. I used the same reverse horseshoe defense and kept my mortars in the same place. This time, I told my FISTers to move as high as they could into the terrain on my right flank and far enough forward to see beyond the crest at the mouth of the wadi. (See Figure 3.) I wanted them to be able to see into the open valley beyond to get artillery on the bad guys before they could see us.

I told the company FSO that the plan was to hit the enemy with CAS after the main artillery barrage and that I would

save enough artillery rounds for a last ditch defense of our position. Again, I had my FSO prepare a fire-for-effect, "At My Command" mission for the chokepoint at the mouth of the wadi. If things got Hot in the valley, I would pull him back to our right flank and then execute the fire mission.

As the FIST's Stryker moved off to the north, I got battalion on the radio to put in my CAS request. I told the EBALO I wanted CAS available from dark until 1200 tomorrow, for starters. He informed me that I could expect two F-16s equipped with LANTIRN [low-altitude navigation and targeting infrared for night] pods to be over our area starting at midnight at the same time that JSTARS came on station. The LANTIRN pod gives the pilot the ability to accurately locate targets at night. With the intel that JSTARS could provide, these fighters should provide devastating effects on the enemy.

The EBALO also told me that A-10s would be on station in flights of two starting around 0400 to cover us until the sun came up. He asked if I wanted to build any ACAs [airspace coordination areas] to deconflict the CAS from the artillery. Because my FISTers were the experts on this and they had just left, I told the master sergeant, "No, we will separate by time, sequentially using artillery and then CAS." I figured that, at this range, the 155-mm tubes' max altitude would be very high, and I did not want to mix up the jets with incoming rounds.

I still thought the defensive position and direct fire plan from the first attack was the right way to proceed, so I told my platoon leaders to have the Javelins focus on any tanks or APCs that came into the fight while the .50 cal and

grenade launchers were to concentrate on any light-skinned vehicles. But this time, I told the platoon leaders to expect suicide attacks in the form of truck bombers, and if any trucks were headed directly at us at high speed, the Javelins should take them out first.

The sun was just setting in front of us as we made the last of our preparations while my FISTers checked in on the radio. Using my binoculars, I could barely make out the FIST Stryker about three kilometers west of us on my right and 700 to 800 feet above the valley floor. They were hidden from view from the west and should have a great view of the open valley below.

I made the first of my reports to my CO and told my driver to start some coffee; it was going to be a long night. I settled down to wait and went over the first battle in my head. Were there really only two lessons to be learned? Had I adequately prepared this time? I convinced myself I had and decided to walk the defenses before it got too dark.

At midnight I called the EBALO and asked him for a JSTARS report. He told me he would get right back to me. He called 10 minutes later with the CO on the line and told me JSTARS had picked up a force of approximately 60 vehicles 18 kilometers northwest of our position moving toward me. If they did not slow down, they would be at my position in approximately 40 minutes.

I asked the CO for an initial location on the Feyadeen convoy, and he passed the convoy's coordinates to me. I contacted my platoon leaders, gave them the intel and put them on full alert.

Finally, I called my FIST and gave them the information on the enemy. I reiterated my guidance: artillery first, then CAS and told them to contact the EBALO and start coordination for the CAS mission. (I realized at this point that I did not have a radio I could hear the pilots on; the CAS mission info all would have to be radio relayed through the EBALO who was still back at the airfield. But I was confident we would be able to work any request we needed.)

Less than 30 minutes later, my FIST lieutenant informed me the enemy convoy was in sight and within range of the artillery. I told him to start engaging it with artillery and monitored his request for fires on the net. His request was by-the-book; 90 seconds later, the rounds screamed overhead. As I heard them impact beyond the rise, I asked the FIST to give me a report. They said the rounds

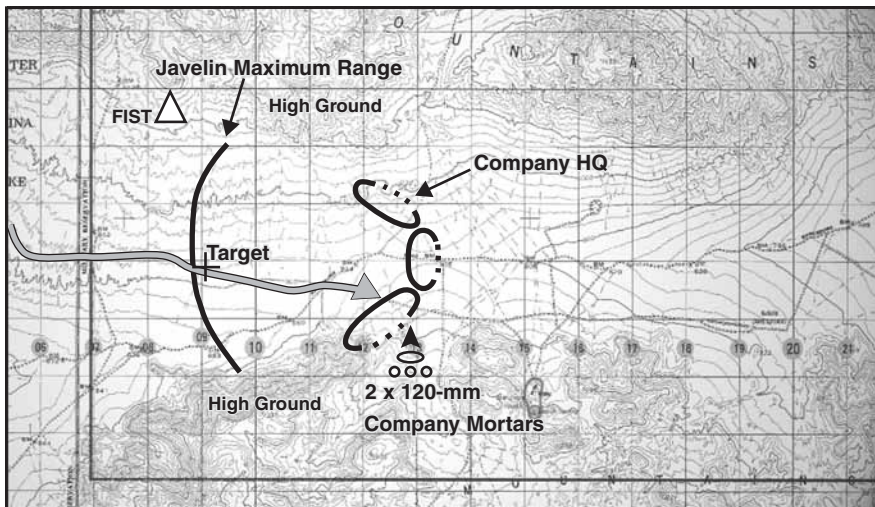


Figure 3: Company Defensive Position on Duffer's Wadi—2d Dream

impacted at the beginning of the convoy, and the enemy was scattering to the north and south of the wide valley at high speed. The lieutenant adjusted fire for two more volleys when the battalion FSO came on the net and told me we had fired all the rounds available if I wanted to save some for last-ditch final-protective-fires [FPF].

The FIST lieutenant was yelling on the radio that six vehicles were burning and one of them had blown up in high order, like an ammo carrier. In his next report, the lieutenant said the enemy was still dispersed but had resumed moving toward the mouth of the wadi at high speed. He told me he was talking to the EBALO, and the F-16 pilots had visually identified the enemy and our friendly positions.

The EBALO came over the net and said the first fighter would attack in 30 seconds. Just then, a tank came over the rise at the mouth of the valley three kilometers away. I called on the net to ensure the Javelins had acquired it when the tank exploded in a huge fireball. I thought to myself, these Air Force guys are *okay*.

Within seconds, another fireball erupted several miles to the west, but I could not tell what had been hit. I could faintly hear the jets pass overhead to the west and then another two explosions. The FIST lieutenant came back on the net and reported that about half of the trucks had stopped on each side of the mouth of the wadi and dismounted infantrymen were running into the hills. The rest of the trucks and tanks were racing toward the wadi, trying not to get hit by the CAS aircraft.

I told the lieutenant to focus the jets on the mouth of the wadi just as two more bombs blew up in the distance. My plan was working—we were really hitting the Feyadeen *hard*.

As I picked up the radio handset to report to battalion, five vehicles appeared at the mouth of the wadi driving fast and weaving back and forth. I radioed the platoons and told them to focus all fires on those trucks. Javelins and .50 calcs reached out into the night, and almost immediately, three of the vehicles were burning.

Suddenly we were blinded as two of the trucks heading our way exploded in a flash of light. It took several seconds for our NVGs to readjust, seconds in which I waited tensely to see if any of the vehicles had not been destroyed. I could hear my



Air Force Photo by SSgt Lee O. Tucker, 125th Fighter Wing

An F-16 flies a combat mission 23 July in support of Operation Iraqi Freedom.

FIST lieutenant directing mortar rounds into the wadi directly in front of us. Two more Javelins fired on my right, and I began hearing the thump of the mortars and the hammer of the .50 calcs.

There was another large explosion, this time a kilometer to our front, and a second of blackout for the NVGs. I heard one of my platoon leaders yelling orders on the net to a Javelin gunner, and a flash was followed by a large explosion barely 300 meters to our front. I shuddered to think that all five of the enemy trucks must have been suicide bombers.

We had done well; however, we now were all bathed in the bright light of five burning vehicles in the wadi—our NVGs were virtually useless. I called my FIST lieutenant and asked him where the enemy was and if he could put more CAS on them. He told me the fighters were out of bombs but could strafe with their guns. He also told me the EBALO had moved the F-16s just out of the fight because we wanted to fire an artillery barrage and needed the aircraft out of the area to fire.

I asked when there would be more fighters with more bombs on station, and the EBALO broke in to say he could get more aircraft in 20 minutes. As I hung up the mike and tried to see to the

west, I caught a flash of light on the ridge to my right and saw an RPG impact roughly where the FIST was. In a couple of minutes, sporadic RPG fire began erupting from the ridges north and south of our position. The FISTers said they were okay, but I decided to pull them back and prepare for a last ditch until the next CAS aircraft arrived.

I called my platoon leaders and asked for a Javelin inventory. We had shot half of our Javelins in the last attack, and I had no idea how many enemy vehicles were still out there. Suddenly, somewhere west of the burning hulks I saw a flash and a puff of smoke and then an earsplitting explosion 200 meters to my left ended with one of my Strykers erupting in a volcano of white fire. *A tank!*

I could not make out the tank with or without my NVGs due to the bright light of the burning trucks. Our positions were lit up. I queried my platoon leaders to see if anyone could find the tank and kill it with a Javelin. Another tank joined the first, both firing as fast as they could, and within seconds, five more of my Strykers were hit.

I grabbed the radio, “Lieutenant, fire all remaining artillery and mortars on those tanks, *now!*” I screamed. That would have to do until the CAS got here.

My own mortars thumped over and over, and I could see the explosions close to where the first tank fired. Overhead, our artillery screamed and began hitting the opening of the wadi two to three kilometers in front of us. The flames from the trucks were dying down enough that I could use my NVGs again. Two of my Javelin gunners must have figured this out at the same time, and I saw both Javelins strike a tank on the north side of the wadi. There were two more tanks moving toward us along with several trucks. The artillery and mortars hit a couple of trucks and forced the remaining vehicles to take evasive action.

I called the FIST lieutenant and asked him what we had left for fires, and when we were going to get more CAS. He told me we were out of 155-mm ammo and had about 20 rounds of mortar HE [high-explosive rounds] left. A shot from a tank on the south and another Stryker down—that was *seven*. I could not take losses like this for much longer.

“Have the fighters strafe the tanks if that is all they have left,” I ordered the FIST.

I yelled to the platoon leaders, “Why

isn't someone shooting the tanks with the Javelins?" Just then I realized the tanks had been focusing on the Strykers nearest where the Javelin shots had come from. When my platoon leaders reported we were out of Javelins, I was not surprised.

A jet passed low overhead, and its 20-mm cannon lit up the sky as the pilot fired at one of the two tanks in sight. Cannon shells exploded all over the tank, shearing off a tread and leaving it smoking but still in one piece. A shoulder-fired missile chased after the jet from the south wall of the wadi; it flared and disappeared into the night sky. The missile must have missed the jet. The remaining tank took a shot at us, missed and pulled back out of the light.

Now effectively down to 50 percent of my company and low on ammo, we were in a bind. We had destroyed a large number of the enemy, but we could not stand another attack like the last one.

As we began consolidating the wounded near the intact Strykers, small arms fire and RPGs started raining down on our position from the high ground on both sides of the wadi. We returned fire into the hills and the enemy fire slowed but did not stop. My FIST lieutenant reported the team had moved to a safe position and two new F-16s were on station. I told him I wanted to know how many of the enemy vehicles he could identify, particularly the tanks. I wished out loud that the FIST was still in a position to see beyond the rise at the mouth of the wadi. By now, the fires to our front had died down completely, but the moon was full and overhead.

The F-16 flight lead reported to the EBALO that it looked like there were approximately 20 vehicles and two or three tanks still out there and most were starting to move our way slowly. I got on the radio and directed the fighters to "Hit the tanks *now!*"

The fighters complained they were not picking up our positions on their systems and would have difficulty sorting us out if the enemy vehicles got much closer. When I asked the EBALO why, he explained the fighters have encrypted systems on board to pick up our EPLRS [enhanced position locating reporting system] receivers. The fighters use the data for their SADL [situational awareness data link] to tell where we were positioned and keep from hitting us. The jets stay current with all the other systems throughout the theater.

It dawned on me that I had frozen crypto, which gave us yesterday's crypto data while the fighters had today's data. *Ouch!*

The fighters made two passes and scored two direct hits on the tanks. When the first bombs hit, the enemy charged our position. Whether the charge was to escape the CAS or to die in a last-ditch attack I will never know.

Of the original force of 60, the Feyadeen only had 15 or 20 vehicles left. One of the trucks was hit by a fighter attack and blew up 300 meters to our front; fragments from the bomb rained on our position.

The FIST lieutenant told me the EBALO needed the ground commander's initials for any attacks closer than that last pass. We were not dug in, so I told the EBALO to limit the fighters to "cannon only" attacks to reduce risks and gave him my initials.

As I watched the fighters strafe two more trucks 200 meters in front of us, I called my CO and told him there was a good chance we were going to be overrun. The valley went bright as one of the trucks, a would-be suicide bomber, went off and illuminated our positions.

Now the enemy was just meters away. The last thing I remember before a truck bomb hit my Stryker was calling off CAS and telling the EBALO to have CAS aircraft stay with the enemy if the enemy made it past our position.

Hours later, I was awakened by someone saying my unit had

taken 80 percent casualties. Despite the A-10s showing up and chasing the enemy after the enemy past our position, one of the truck bombs had made it to our base and blown up the Ranger headquarters, causing heavy casualties.

As my mind cleared from the fog, I tried to decide why I had failed *again*. It became clear that there were several other lessons I should have learned:

3. CAS, indirect fires and my company's direct fires had significantly hurt the enemy. But to hold my position against a significantly larger force, *I needed to slow the fight down and kill more of the enemy before he got into the wadi.*

4. The turning point in this battle occurred when the tanks took out seven of my vehicles and the rest of my Javelins. While I had requested CAS this time, I had no CAS plan. Using my FIST and the EBALO, I had directed the fighters to attack the enemy column when I really needed to be more specific on what my targeting priority was: tanks. Too late in the fight, I realized the fighter jets would hit exactly what I needed them to, but I had to communicate that plan to them. I now understood that *what* I killed was as important as *where* I killed it. *I needed to build a good CAS plan and communicate it effectively.*

5. I had turned down a JTAC willing to come with me who had both the training and equipment to help me specifically target what I wanted in real time. *A CAS expert could help me build and execute a solid CAS plan.*

6. Twice before, the enemy had dismounted into the high terrain on either side of my position. The second time he had caused less damage than the first, but he had forced me to pull my FIST back. I could not afford to let the enemy dismount into the hills if I intended to hold my position. *My CAS and fires plan would have to prevent the enemy from dismounting into the hills.*

7. Finally, my "frozen crypto" was a problem with the CAS jets. *I needed to ensure my unit was on the same communications plan as the joint assets that support us.*

Third Dream. I awoke just outside the battalion TOC and was not surprised to see my XO pointing toward the commo tent. Same place, same orders, same day—but now I had learned seven lessons.

On cue, the EBALO walked up and offered me a Ranger JTAC for the



Marine Corps Photo by Lance Corporal Andreas A. Plaza

An M198 towed howitzer fires in support of Operation Iraqi Freedom, 3 April 2003.

mission. The EBALO seemed surprised when I slapped him on the back and told him I would *love* to take the JTAC with me. I told the JTAC where my vehicle was and asked if he would like to ride with me.

I then told the EBALO that I would give him a detailed CAS request with a CAS plan as soon as the JTAC and I saw the terrain we were going to defend. I also told the EBALO to meet with my FIST lieutenant and the JTAC before we left and come up with a concept of how we could synchronize all our fires.

I walked into the commo tent and walked out with two months of crypto data.

As we drove to the wadi, the JTAC and I studied the map together. I told him I needed a fire plan that allowed me to delay the enemy to slow the fight down and enable me to kill the enemy through the depth of the sector rather than try to kill him all at one time. I especially needed help destroying the enemy tanks and preventing the enemy infantrymen from dismounting into the hills on either side of us. I told the JTAC I intended to move my FIST forward (again), and put the JTAC with them so they could target as far forward of the company position as possible.

We got to the wadi with daylight left, and I used the same reverse horseshoe defense and kept my mortars in the same place. Before the FIST and JTAC took off, we had a quick meeting. I told them to focus the CAS on any tanks that the enemy might have as early as possible and hold the artillery until the enemy reached the mouth of the wadi. The JTAC told me that jets equipped with the targeting pod should be able to break the tanks out of any formation and pick them off if they were not moving too fast. I told him to work closely with the CAS fighters as they picked off the tanks.

I also sent four of the Javelin teams with the FIST lieutenant and told the teams not to let *any* tank enter the wadi. (See Figure 4.) If there were no tank targets, the Javelins second priority would be to hit the fast-moving trucks. I also told the JTAC that, as the enemy got closer, I wanted him to use CAS and prevent the Feyadeen from dismounting into the hills on our flanks.

Like before, I had the FIST lieutenant prepare a fire-for-effect, “At My Command” fire mission for the chokepoint at the mouth of the wadi; I also told the team to recon alternate positions and egress routes instead of moving them and the

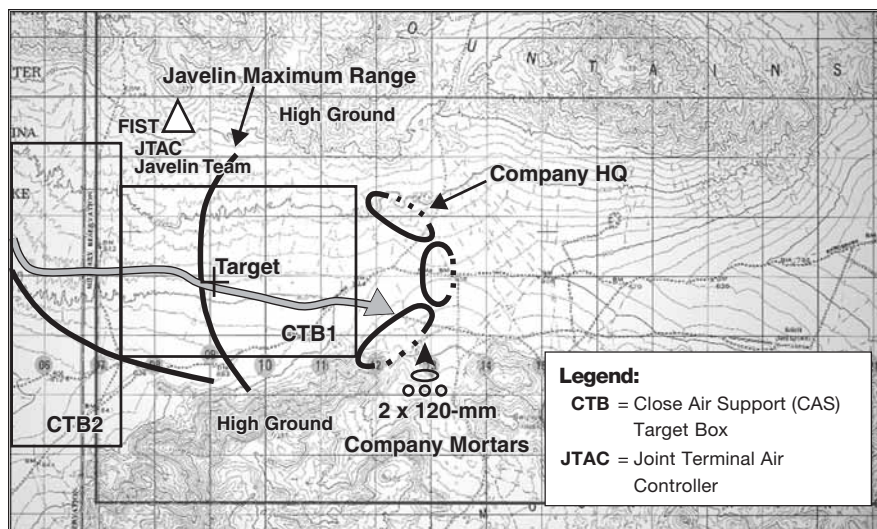


Figure 4: Company Defensive Position on Duffer's Wadi—3d Dream

Javelins back, if things got too dangerous.

The JTAC told me the maximum range of his laser designator was roughly 10 kilometers and showed me on the map where he could expect to designate targets. I told the JTAC to work with the EBALO and get us as much CAS as possible from now until noon tomorrow, for starters, and that we would update the request in the morning for the next day. He said he would report to me once the request went in and if there were any changes.

Unlike before, I told my FIST lieutenant I did not want him using artillery unless the Feyadeen entered the wadi, and then I wanted it to be in conjunction with the Javelins and CAS, if at all possible. I directed he and the JTAC to build ACAs with the EBALO and let me review them when they were done. The JTAC asked if I wanted ACAs where air and artillery could fire at the same time, and I told him that was the only kind I wanted for this engagement. I was impressed with this young Air Force NCO and how quickly he fit in with my unit, even though we had not trained together.

As my FIST, JTAC and four Javelin teams moved into the hills on our right flank, I decided to walk our positions one more time while I still had light.

Around 2200, the JTAC and FIST lieutenant reviewed their plans with me by radio. (See Figure 5 on Page 12.) If the fight got into our wadi, the maximum ordinate of the artillery would be 16,000 feet AGL [above ground level]; the fighters with targeting pods simultaneously could drop their laser-guided bombs from above this altitude without fear of being hit by friendly artillery. If they had to come lower to use their guns

or freefall bombs, we would have to shut off the artillery for the pass only.

I called my CO and briefed him that we were ready and went to my Stryker for a cup of coffee before things heated up.

By 2345, I could feel my adrenaline start pumping in anticipation of the battle I knew was ahead of us. Were we ready this time? Had I gleaned all of the lessons learned from the first two dreams? I remembered the last time I went to the NTC my brigade commander said, “The enemy always gets a ‘vote.’” Tonight, if I had my way, the Fedayeen would not make it to the polls.

The radio crackled and brought me back to the mission at hand. Right on time, I heard the EBALO announce that JSTARS picked up an enemy force of approximately 60 vehicles 18 kilometers northwest of our position and had sent two F-16s their way. This force was heading directly toward Duffer's Wadi and would reach us in 40 minutes if we did not slow it down.

I grabbed the mike and asked the JTAC if the jets saw any tanks in the enemy convoy. After a couple of minutes the EBALO came up on the net and reported that the fighters counted 15-plus tanks. Before I could call the JTAC again, he came over the net and told me he was proceeding as planned. Within minutes I heard the faraway sound of jet noises and then saw flashes followed seconds later by the rumbling of bombs going off.

I waited five minutes and called the JTAC for an update. He told me the fighters caught the convoy 15 kilometers north and were “tank plinking.” The convoy had executed a “bomb burst” maneuver to the four corners of the compass and was totally disorga-

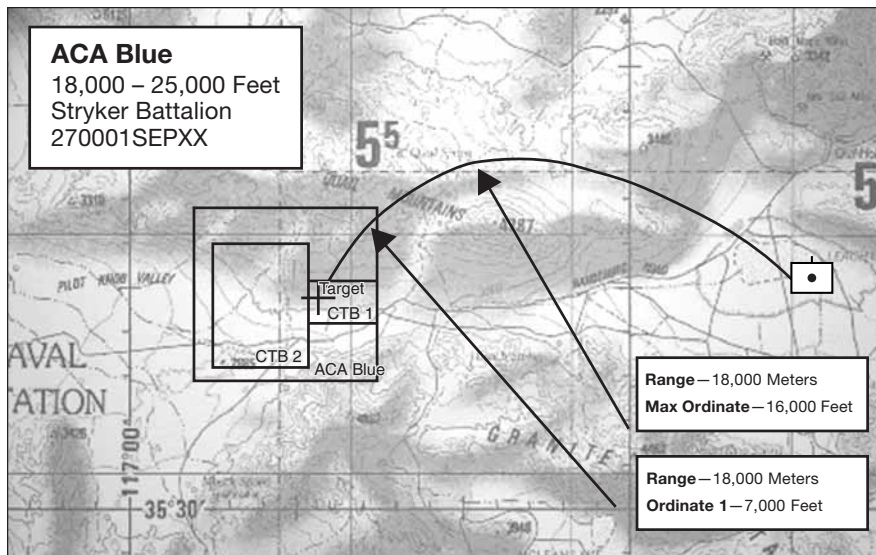


Figure 5: Airspace Coordination Area (ACA) Plan for the Defense of Duffer's Wadi—3d Dream

nized. He said he called the EBALO for another set of fighters as the two on station were in a feeding frenzy but only had enough bombs to kill eight tanks if they ran a perfect score.

The EBALO said we could expect a two-ship of fighters about every 45 minutes and two more were inbound. After a few moments of thought, I asked the JTAC how many bombs and how much time on station the fighters had left. He came back with three bombs and 30 minutes. I told him to call the fighters off and have them hold while we talked.

I pulled out my map, found a grid line 10 kilometers north of us and told the JTAC to have the fighters hold and only re-attack if a tank or organized column passed the grid within the next 20 minutes. After 20 minutes, the fighters were cleared to re-attack the remnants of the convoy, focusing on the tanks. The JTAC understood I was trying to slow the battle down and attrit the enemy at range.

I hacked my watch and called my platoon leaders and let them know what was going on just a few kilometers north. After 20 minutes, I checked the JTAC who said the fighters reported the enemy was regrouping. I told him to send the fighters back in and check the status of the next two-ship of fighters. Soon after, I saw more flashes and, eventually, heard three more explosions. The JTAC told me the fighters had scored six tank kills with another probable and were passing the coordinates to the next flight.

For the next hour, we continued to put two more two-ships of CAS on the convoy. When the bombs went off, the

vehicles in the convoy would scatter, zigzag or drive in circles. Still, the fighters were killing their fair share.

The enemy had started shooting back with shoulder-fired missiles. The JTAC reported the fighters had to climb to stay out of range of the missiles and were having trouble distinguishing tanks from APCs and trucks based on all the thermal energy near the convoy caused by the burning hulks. We were just getting used to seeing a flash followed by a dull thump when a huge flash and a much larger explosion occurred. The JTAC told me that the fighters thought they hit a truck or APC filled with explosives. My guess was they hit a truck bomb.

I called my platoon leaders again and told them to expect suicide bombers and stick with the plan if the enemy ever came south. When I asked the JTAC for BDA [battle damage assessment], he told me the fighters had killed at least 18, maybe 20, of the vehicles and that the convoy was still disorganized but beginning to move south. It appeared that the enemy was tired of getting beaten up in the open and was racing toward the high ground north and south of the mouth of the wadi.

A few minutes later, the JTAC told me the last two fighters were almost out of bombs, and it would be 20 minutes before more were on station. I did not want to let up on the enemy, but I also did not want to give away the positions of my Javelin teams just yet.

The enemy now was becoming visible to the FIST, so I asked the JTAC if he could use his laser to mark targets the fighters could kill with their cannons. He

said he would try. The EBALO called and said the fighters had a 10,000-foot deck unless troops were in contact. I told him I needed the deck cancelled to use their guns to either kill or stop the trucks before they hit the high ground or we *were going to be* troops in contact. He called the ASOC, which got permission to cancel the deck from its higher headquarters, the AOC, in a couple of minutes.

Five or six times I watched the sky erupt as flames came off the nose of an F-16; I heard the sound of a sheet ripping followed by a high growl. Although the aircraft only hit two of the movers, the convoy reversed back to the north. On one pass, a missile streaked up at the sky but the aircraft flared and turned away unharmed.

The F-16s were out of gas, and two more were ten minutes away. After this next flight of F-16s, we were going to get two two-ships of A-10s.

It was almost 0300, and we still had not seen any Feyadeen. But based on my previous experience, I did not want to get too comfortable. If the enemy rushed us, it would be time for the FIST to go into action. By my best count, the enemy still had between 30 and 40 enemy vehicles left, and they were now less than four kilometers from the mouth of the wadi. If any of the enemy got through the fighters, I would make our next move with the Javelins on the north ridge.

I conveyed this plan to the FIST lieutenant and platoon leaders and told the JTAC to have the next set of fighters focus their attacks on any tanks within five kilometers of the wadi. The fighters acknowledged and confirmed their systems were showing our positions.

The lieutenant yelled for us to get ready for a group of about eight vehicles rushing us at high speed. I held off on the artillery and let the Javelin gunners with the FIST have the first shot. I told the platoons in the wadi to hold fire unless a threat got within 500 meters. Just then four trucks and an APC crested the wadi entrance followed by what might have been a tank. I never got a good look at it because four fingers of fire shot off of the ridge and blanked my NVGs. The four explosions were almost simultaneous and half of the vehicles blew up. A 500-pound bomb hit next, and the whole wadi lit up like day.

As the FIST Javelins reloaded, two vehicles came through the burning hulks toward us. I cleared my platoons to fire

and three Javelins hit the two trucks. Even though they were 800 to 900 meters in front of us, the shock waves off of these trucks were incredible. They had to have been truck bombs loaded with thousands of pounds of explosives.

West of the wadi's mouth I saw a flash and then heard an explosion in the vicinity of my FIST. The lieutenant's excited voice came over the radio, and he told me a tank was shooting at him from just outside of the Javelin's range. The tank was stopped and shooting inaccurately but would home in on any future Javelin shots.

The JTAC immediately lased the tank for the F-16s to take out. The JTAC told me there were three more tanks coming fast, and he did not know if the fighters could get all three before they got to us. He also said the remaining 25 to 30 vehicles were behind them and speeding up.

I told everyone to focus the fighters and Javelins on the tanks and told the FIST lieutenant to call in the artillery and mortars when the vehicles entered the wadi. I had to get fires on the enemy and keep the enemy infantry from dismounting and shooting back.

The valley was still lit up from burning vehicles, and our positions in the center of the wadi were visible.

The fighters got another tank before two entered the wadi. The FIST gunners killed one, and two missiles missed the other. The enemy tankers were shooting their main gun and machine guns on the move at a Stryker on my right.

The JTAC yelled that one of the F-16s had the tank locked, but the pilot's system showed us inside the bomb frag area and asked if I wanted to give my initials for this close of an attack. Thankfully, I never had to answer. A Javelin came from 200 meters to the left of me and scored a direct hit on the tank. The

tank's main gun missed the Stryker it was aiming at, but a Stryker was damaged by the machine gun and caused my first casualties.

I could hear our artillery screaming overhead at the same time my own mortars started thumping. The lieutenant had timed it perfectly; 20 vehicles came into view and disappeared in smoke and flashes caused by 155-mm rounds, 500-pound bombs and mortars rounds. A few of the Javelin gunners could still make out targets and were shooting.

Two trucks made it through on the left flank and every .50 cal on the southern Stryker platoon poured lead on them. The trucks came to a stop, started burning and then both went up in huge fireballs. More truck bombs!

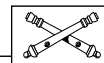
The FIST lieutenant said the enemy was pulling back, and asked if he could Check Fire the 155s and mortars. I gave him permission and told the JTAC to keep the fighters on the enemy. Sadly, the JTAC informed me the fighters were out of bombs but that it looked like we were going to get a breather from the enemy assault.

The FIST lieutenant told me we had fired all the artillery and mortars we could if we wanted to save ammo for a last ditch defense. The lieutenant said there were only 10 to 15 vehicles left. I was asking the JTAC if the F-16s could harass the remaining vehicles with their cannon when he told me that a two-ship of A-10s just checked in. The A-10s set up an orbit over the remaining vehicles and, within 10 minutes, the Warthogs destroyed the remaining enemy vehicles.

It was 0430 when the EBALO called and said that JSTARS no longer had any movers on its radar to my west. The sun was just starting to lighten the eastern sky. Our losses were three wounded, two on the wadi floor and one of the FISTers on the ridge. One of the Strykers would have to be towed back to the airfield for repair. I called my CO and reported in; he told me to expect relief in six hours. The C-17s with the rest of the BCT already were landing at the airfield. I posted guards and told the rest to grab a few hours of sleep.

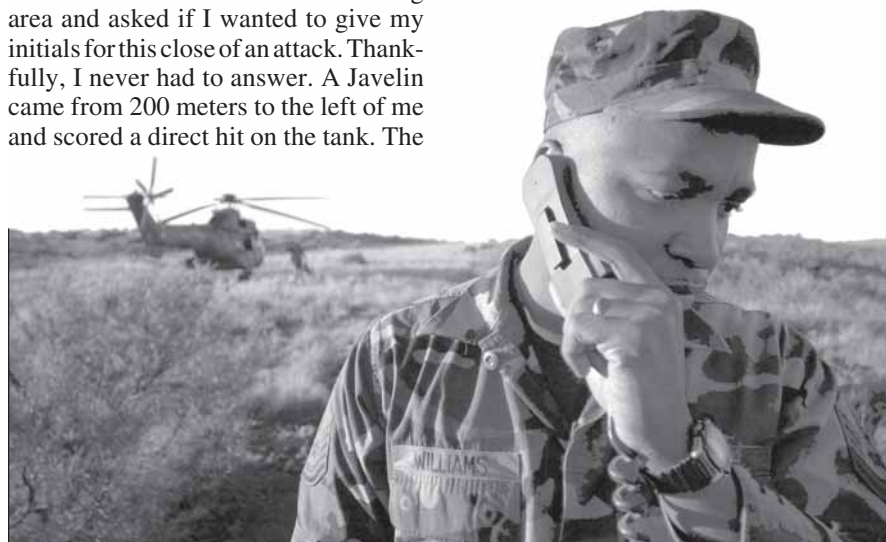
No sooner had I laid down than I felt a hand on my shoulder shaking me awake. My first sergeant was telling me we had two hours to load on the C-17s and deploy forward for Operation Vigilant Foresight.

Had this *all* been a dream? Only time would tell.



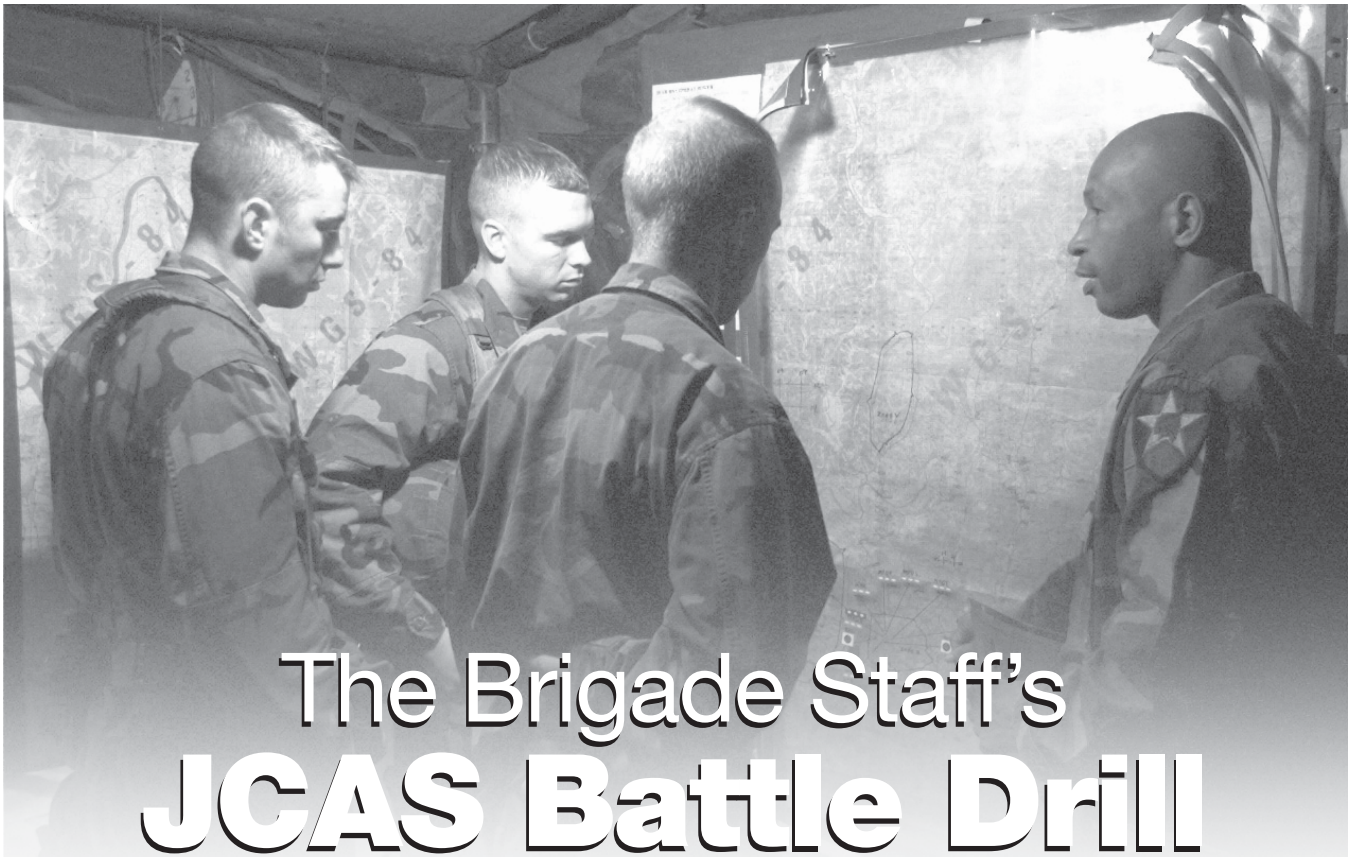
Colonel D. Matthew Neuenswander (El Cid), USAF, until recently, was the Commander of the Air-Ground Operations School (AGOS) at Nellis AFB, Nevada. In that capacity, he was responsible for the Joint Firepower Course, the USAF's primary close air support (CAS) training as well as executing more than 20 Joint Air Warrior I and II exercises in conjunction with the National Training Center (NTC), Fort Irwin, California, and the Joint Readiness Training Center, Fort Polk, Louisiana. Currently, he is Chief of Counterland Doctrine in the Air Force Doctrine Center at Maxwell AFB, Alabama. He has flown both the F-16 and A-10 during Operation Anaconda; he commanded the A-10 detachments in Afghanistan and was the first Group Commander at Baghrum Air Base.

Lieutenant Colonel D. Wayne Andrews is the Senior Instructor on the Army Joint Support Team at Nellis AFB. He has served as an S3 and Battalion Executive Officer for the 2d Battalion, 5th Field Artillery (2-5 FA), 212th Field Artillery Brigade, and a Small Group Instructor for the FA Officer Advanced Course at the FA School, both at Fort Sill, Oklahoma. He also was a Field Artillery Battalion Observer/Controller and Chief of the Leader Training Program at the NTC. He commanded C Battery, 1-4 FA, 2d Infantry Division, in Korea and, in the 1st Cavalry Division, Fort Hood, Texas, he commanded B/26th FA (Target Acquisition Battery) and then served as a Fire Support Officer for 1-5 Cav.



Air Force Photo by MSgt Cesar Rodriguez

MSgt Shawn Williams, enlisted terminal attack controller (ETAC), establishes communications with a B-1 bomber during the Global Reach joint exercise with the South African Air Force at the Lothala Range, Northern Province, Army Battle School, Germany.



The Brigade Staff's JCAS Battle Drill

By Major James A. Frick

Joint close air support (JCAS) is a combat multiplier for the brigade, which, along with some of the ground force's indirect fires, is one of the few lethal shaping means that can range beyond six kilometers of the forward line of own troops (FLOT). Therefore, the entire brigade staff should take ownership of employing JCAS on the battlefield and integrate all brigade assets with JCAS assets to ensure the success of this very capable means.

However, the trend for the past several years at the National Training Center (NTC), Fort Irwin, California, is brigade staffs are poorly trained in the execution of CAS. This is one reason the NTC has focused on the crawl-walk-run training model for CAS, now called joint effects training (JET). (See the article "CAS Training at the NTC" by Lieutenant Colonel Mark L. Waters and myself in the March-June 2004 edition.)

The Problem. No doubt our terminal air controllers are trained in talking fixed-wing aircraft onto a target, which many of our manuals discuss in detail. Where units fail to employ CAS effectively is at the brigade and task force staff levels. In those staffs, battlefield operat-

ing system (BOS) representatives lack the know-how and battle drills for executing their responsibilities during CAS.

Our fire support manuals do not provide a complete doctrinal how-to of CAS integration for a battle staff. *FM 3-09.4 Tactics, Techniques and Procedures (TTPs) for Fire Support for Brigade Operations* is more focused on terminology with some coordination considerations for employing CAS. *FM 3-09.30 TTPs for Observed Fire and Fire Support at Battalion Task Force and Below* has more on executing CAS but from an observer-to-pilot perspective.

The newly signed *Joint Publication 3-09.3 Joint TTPs for Close Air Support* (3 September 2003) provides the most detailed discussion about CAS planning, preparation and execution. It lays out critical execution information on airspace management, the synchronization of CAS and indirect fires, release authority, tactical risk assessment and target engagement. But even that excellent manual does not outline the brigade/task force staff requirements by BOS to execute CAS.

Our weapon systems normally have crew drills in which each member has a specified task or set of tasks for sending

munitions down range. Many brigade battle staffs don't have a battle drill for CAS or one they have rehearsed. Normally, the air liaison officer (ALO) and fire support officer (FSO) are the only staff members focused on the request and distribution of aircraft during the fight. This leads to the unit's having the asset available but not focusing it properly.

CAS is often sent deep to perform a reconnaissance role, which may be an inefficient use of the platform—depending on the type of aircraft and the attitude and speed at which it is flying and whether or not the enemy is moving. When sent deep to recon, CAS can be committed into airspace not cleared of indirect fires and without a notification/situational awareness provided to friendly air defense artillery (ADA) systems.

Staff Battle Drill. Executing CAS should involve the entire staff. There must be constant cross-talk among the fire support element (FSE), tactical air control party (TACP) and S2 shop as well as among the staff, brigade commander and his fire support coordinator (FSCOORD).

Once on station, CAS is flexible. If there is a confliction in airspace and

indirect ground fires are the priority, the staff must be prepared to shift CAS vertically or laterally until the airspace is clear. If CAS is on-station and there is no brigade target identified, the staff should consider distributing CAS down to the task force with the main effort. If the staff identifies a brigade target but has no CAS, it must send an immediate request through Air Force channels.

The staff must be searching constantly for threats that would limit the use of CAS and recommend supporting solutions, such as suppression of enemy air defenses (SEAD) with indirect fires or jamming enemy command and control nets.

Bottom line: these processes all come down to the staff's executing a CAS battle drill.

The S2 brings to the staff's attention a high-priority target identified by division and brigade collection assets. Led by the executive officer (XO), the staff determines the need for directing CAS on to the target and recommends this action to the brigade commander.

The FSO follows up with his recommendation to the FSCOORD. The FSO coordinates with the FA battalion for SEAD and marking rounds. The S3 air, ALO and FSO work together to deconflict airspace with all current users. The military intelligence commanding officer (MICO) works with the staff to determine where and when he needs to be jamming command and control nodes (the brigade does not have assets to jam ADA radars; however, its assets can jam the frequencies that enemy ADA units are talking on). This, in turn, may disrupt the enemy's ability to give early warning to shoulder-fired systems.

The air defense officer (ADO) notifies subordinate air defense systems of the friendly aircraft and adjusts weapons control statuses. If the Sentinel is available, the ADO also can provide the staff information from the radar's tracking of the aircraft.

Finally, the ALO conducts the initial check-in of the aircraft, its hand-off to a qualified controller, weapons release and terminal control recommendations. During this process, the FSE must ensure it uses both digital and voice communications to turn on and off airspace coordination areas (ACAs) with division and subordinate units. This fa-



Two F-15 Eagles from the 71st Fighter Squadron "Ironmen," Langley Air Force Base, Virginia, fly in formation.

Air Force Photo by MSgt Michael Ammons

during the battle drill is critical and should include a level of discipline that ensures the battle captain announces and logs critical events, such as CAS on station or off station times, the opening and closing of airspace, and shifts in focus or priority. Additionally, the primary staff or a knowledgeable representative must be available at the battle map to remain apprised of the current situation.

This requires the battle staff primaries to use their assistants to perform the legwork.

Facilitates clearance of fires as well as provides the ALO indirect fire system grids which, in turn, are forwarded to the aircraft.

Another aspect of the staff's facilitation of a functional battle drill is the BOS positioning within the tactical operations center (TOC) and the battle staff interactions. First, the FSO and ALO must be next to one another, and, in turn, positioned around the battle map where they can easily converse with the S2 and XO. They must be positioned so they have a full understanding of the S2's interpretation of the enemy's course of action (COA), a comprehension of the friendly COA and the ability to formulate recommendations for CAS use. The XO must be fully apprised of all discussions with staff members briefing him on actions, reactions and recommendations.

A break down in the CAS battle drill occurs when staff information and actions become "stove piped." For example, the FSO receives a report from an observer and formulates a plan for CAS with the ALO without providing the information to the S2 for analysis and the XO and commander for a decision. Likewise, if the S2 or MICO do not provide timely information to the rest of the staff for consideration, the staff is unable to allocate resources properly to the right location and at the right time.

As for the ADO, if he is left out of the loop, the potential exists for air defense teams' not being forewarned of friendly air and having the wrong weapons control status in place, which could result in their engaging friendly aircraft.

The XO's detaching himself from the drill and failing to serve as the "Chief of Staff" of the process further encourages such inefficiencies.

The importance of shared information

In the case of the fire support cell, the assistant FSO or targeting officer verify that information is passed up to division and down to the artillery battalion and task force FSEs and that the advanced FA tactical data system (AFATDS) and analogue maps are updated. They are the guys circulating throughout the TOC, talking to the other BOS representatives to share and gather information. It is they, not the brigade FSO, who facilitate the information flow from the fire support cell to the TOC battle map.

As for the TACP, the Air Force NCOs perform check-ins and talk to the pilots, so long as they are positioned to readily pass information to the ALO.

Another necessity to the staff's employing CAS effectively is the availability and use of tools during the battle drill process. The battle staff must have a map visible to them with the Army airspace command and control (A²C²) overlay as well as a visual method of identifying open airspace. This can be accomplished through a number of techniques, such as keeping the A²C² overlay on the staff battle map or having a fire support map in view with this same overlay. Additionally, colored transparent stick-ons that can be placed over a formal ACA name and altitude or just a dotted line drawn in for informal ACAs adds to the staff's situational awareness. The FSE also should have artillery and mortars plotted on the map with a "whiz wheel" and maximum ordnance charts available to deconflict indirect fires with CAS.

The ALO should have at least the Air Force 3-3 manuals (individualized TTPs for each type of aircraft) on-hand for aircraft the ALO is not familiar with. With digital units, the use of the Army battle command system (ABCS) also

Time	Who	Action
H-30	ALO	Confirm aircraft inbound (announce to the staff):
		Verify the number and type of aircraft and munitions carried.
		Contact the JTAC.
H-28	Tgt Team	Conduct CAS targeting meeting:
	S2	Verify the size, activity, equipment and location of enemy formations in 25 minutes.
	MI CO	Provide the current status, location and capability of IEW assets.
	ADO	Provide the current ADA posture and enemy air threat; notify the air defense community of inbound friendly aircraft.
	ALO	Recommend the best target type to engage based on the aircraft/munitions; brief who is controlling the aircraft and from what location.
	FSO	Recommend the formation/location to attack based on the EFSTs/scheme of fires.
	XO	Decide on the CAS target(s) and recommend it to the BCT commander; assess the tactical risks and decide upon the type of control based on the ALO's recommendations.
H-25	ALO/FSO	Establish A ² C ² : Decide/develop ACAs to support the ingress and egress of aircraft.
	S2/MI CO	Update the enemy ADA threat:
		Confirm the enemy ADA template.
		Locate the enemy ADA hits and brief intelligence reports that can affect airspace.
H-20	Tgt Officer/FSO	Develop the SEAD plan based on the updated enemy ADA threat analysis.
H-15	FSO	Send the SEAD plan for lethal fires to the DS/R battalions (to include marking rounds).
	MI CO	Allocate MI assets to attack nonlethal targets.
	ALO/JTAC	Inbrief the aircraft or the FAC(A); pass control of the aircraft to the JTAC.
H-10	Battle Staff	Update CAS by briefing:
	S2	Enemy formation/location.
	ALO	Aircraft status.
	FSO	A ² C ² and SEAD plan.
	MI CO	Nonlethal target attack confirmation.
H-5	ALO/JTAC	Issue the 9-line briefing to the aircraft and establish the target TOT.
	FSO	Initiate the ingress SEAD plan "At My Command" with the DS and (or) R battalion FDC.
	FSO	Activate ACAs through the division FSE.
H-2	FSO	Activate ACAs on the brigade fires net (follow up digitally).
H-Hour	ADO	Change the ADA weapons control status.
	FSO/MI CO	Initiate the ingress SEAD plan.
	ALO	Ingress aircraft in accordance with the SEAD plan's timing.
Off Station	FSO	Initiate the egress SEAD plan "At My Command" with the DS and (or) R battalion FDC.
Time-5		
Off Station	FSO	Initiate the egress SEAD plan.
Time	ALO/ETAC	Egress aircraft IAW the SEAD plan's timing.
Off Station	ALO	Confirm the aircraft are clear of the brigade's airspace; collect BDA and pilots' reports.
Time+2	FSO	Cancel ACAs on the brigade fires net and through the division FSE (follow up digitally).
	MI CO	Stop IEW jamming.
	ADO	Return ADA weapons control status.
Off Station	ALO	Report CAS BDA to the battle staff.
Time+5	S2	Collect and analyze the BDA and pilots' reports.
	XO	Assess the mission's effectiveness and determine the next course of action.

Legend:

A ² C ² = Army Airspace Command and Control	CAS = Close Air Support	IEW = Intelligence and Electronic Warfare
ACAs = Airspace Coordination Areas	DS = Direct Support	JTAC = Joint Terminal Air Controller
ADA = Air Defense Artillery	EFSTs = Essential Fire Support Tasks	MI CO = Military Intelligence Commander
ADO = Air Defense Officer	ETAC = Enlisted Terminal Air Controller	R = Reinforcing
ALO = Air Liaison Officer	FAC(A) = Forward Air Controller (Airborne)	SEAD = Suppression of Enemy Air Defenses
BCT = Brigade Combat Team	FDC = Fire Direction Center	Tgt = Targeting
BDA = Battle Damage Assessment	FSE = Fire Support Element	TOT = Time-on-Target
	FSO = Fire Support Officer	XO = Executive Officer

enhances the staff's ability to clear CAS and deconflict airspace.

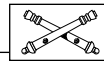
The figure on Page 16 provides an example of a CAS battle drill based upon a 30-minute timeline. This drill was developed and further refined by 3d Brigade Combat Team (BCT), 3d Infantry Division (Mechanized), as part of the BCT's JET conducted in January 2004 at the NTC. The drill also has been used by the 2d Unit of Action (UA), 3d Infantry Division, during its March NTC rotation.

This timeline may vary, based on the proficiency of the unit firing the SEAD or marking rounds as well as the time the staff needs to conduct the process. Re-attacks of a target will not start at 30 minutes but will be based upon the "When Ready" time of the different assets.

The amount of time needed for each event or order may vary between units'

battle drills, but the information discussed and staff actions in the figure always must be included. Finally, the unit's entire battle staff must rehearse the battle drill, both as a planned process according to the battle drill timeline and as a continuous process with multiple re-attacks.

It is up to the chief of staff to sit his team down to develop and rehearse the battle drill that works best for them. It is through an effective staff interaction with each BOS representative coming prepared with the right tools and information and applying their individual knowledge and capabilities that units can begin to break the trend of employing CAS ineffectively.



Major James A. Frick, until recently, was Bronco 27, the Brigade Fire Support Trainer, at the National Training Center (NTC), Fort Irwin, California. Also at the NTC, he had served as Lizard 27, the 52D Assistant Fire Support Coordinator (AFSCoord)/Brigade Live Fire Support Trainer, and Dragon 47, the Light Infantry Live Fire Support Trainer. Currently, he is a student at the Air Command and Staff College, Montgomery, Alabama. He commanded A Battery, 1st Battalion, 9th Field Artillery (A/1-9 FA) in the 3d Infantry Division (Mechanized) and was the Fire Support Officer for the division's cavalry squadron and the Division Artillery's Fire Control Officer, all at Fort Stewart, Georgia. Previously, he was the Battalion Fire Direction Officer (FDO), Battalion Adjutant (S1), and a Platoon Leader in B/1-17 FA, 75th FA Brigade, Fort Sill, Oklahoma, and Battery FDO, Platoon Leader and Assistant Battalion S4 in 4-82 FA, 2d Armored Division, Fort Polk, Louisiana.

New Fort Sill Counterstrike Task Force Needs You

In response to the wide range of indirect and unconventional threats to US forces serving in the Global War on Terrorism (GWOT), the Field Artillery School, Fort Sill, Oklahoma, is establishing the CounterStrike Task Force (CSTF) in coordination with the Army G3 and Headquarters, Training and Doctrine Command (TRADOC). The task force's mission initially is to lead, direct and coordinate Army/joint staff and major command (MACOM) efforts focused on mitigating the indirect fire threat to joint/Coalition Forces abroad. It also will serve as a

conduit for government, industry and academic efforts to counter the asymmetrical indirect fire challenges our forces face in GWOT and be proactive in anticipating future challenges. The task force will assess, develop and coordinate doctrine and tactics, techniques and procedures (TTPs) and leverage existing capabilities while accelerating the development of hardware and software solutions to current and evolving indirect fire threats.

And to do all that, we need to tap into the experience and innovative military expertise of a variety of Army and joint organizations and individuals—including out *Field Artillery* readers.

The CSTF will work directly with the Commander of the Effects Coordination Cell (ECC) of the Multi-National Corps I (MNC-I) in Iraq, which was stood up from III Corps Artillery and is



Soldiers from 1-319 FAR, 82d Airborne Division, locate an enemy rocket launcher near a point of origin determined by the Q-36 radar.

commanded by the III Corps Artillery Commander. The ECC is the organization in the Central Command (CENTCOM) theater of operations that has the lead for counterstrike in GWOT. The CSTF will facilitate the ECC's resolution of enemy indirect fire challenges in theater by coordinating with stateside military, industry and academia assets and devising solutions.

The CSTF seeks to enhance and provide a streamlined linkage between the "sensors" that detect the threat and a full spectrum of "responders" that counter the threat. It will help leverage existing and emerging technologies to provide greater capabilities for both sensors and responders. These sensors and responders span the Army, Navy, Air Force and Marine Corps and include a suite of national assets.

The task force will coordinate the ac-

tivities of all sensors and responders that support forces in the field and rapidly provide commanders the reach-back tools they need to protect the force. One such tool under development is the CSTF Web Portal, a secure location to collect and rapidly analyze GWOT lessons learned from the field and suggestions for countering the enemy's indirect fire strikes. This will allow experts to develop counterstrike solutions to current and emerging threats—hardware, software or TTPs—in collaboration with servicemen and leaders in the field.

The cooperation between all branches and services is absolutely vital to the task force's success in accelerating time-critical solutions to protect servicemen's lives and frustrate the enemy's attempts to defeat the Coalition Forces in GWOT.

The initial CounterStrike website is <http://sill-www.army.mil/counterstrike>.

For more information on the CSTF or to submit ideas and information, please visit the website or contact me at michael.borg@sill.army.mil.

The task force's charter is not limited to resolving counterfire challenges. As the threat changes, the focus of the CSTF will change as well.

LTC Michael D. Borg, FA
CounterStrike Task Force
Joint and Combined Integration
Directorate (JACI)
Fort Sill, OK



Supporting Arms Synchronization of Fires: Altitude Separation of FA and Fixed-Wing CAS

By Captain John S. Gilbert
USMC

Joint fire support manuals provide guidance for altitude separation of FA and fixed-wing aircraft yet fail to present detailed instructions to fire supporters in calculating the “stay aboves” and “stay belows.” This article shows the calculations that allow fixed-wing aircraft to fly closer to the artillery trajectory rather than having to use maximum ordinate (MAXORD) during the ordnance delivery portion of the flight profile.

Suppression of Enemy Air Defenses (SEAD). The SEAD mission may be used when friendly aircraft can’t complete their mission without critically exposing themselves to a ground threat, such as air defense artillery (ADA). (Throughout this article, *any* ground threat to friendly aircraft will be referred to as “ADA.”) Indirect fires suppress the ADA via SEAD missions and mark the target (threat to ground forces) for the aircraft to attack. If ADA is suppressed, it’s less likely to acquire and engage the aircraft.

There are two types of SEAD missions: standard, and non-standard.

There are two types of standard SEAD missions: continuous and interrupted. The continuous timeline has rounds impacting at -1, -:30, 0, +:30 and +1 minutes. The mark is at -:30 for white phosphorous (WP)/red phosphorous (RP) or -:45 for illumination on the deck (IOD). The interrupted timeline has rounds impacting at -1 and -:30. The mark is at -:30 for WP/RP or -:45 for IOD.

The non-standard timeline can include

any coordinated and deconflicted supporting arms, as long as they are tailored to support the ground scheme of maneuver, suppress the ADA and mark the attack target.

Marks can be provided by indirect fire, direct fire or by laser. Laser marks (i.e., infrared pointers) and direct fire should be initiated 30 seconds before the close air support (CAS) time-on-target (TOT) and continued until 30 seconds after the CAS TOT. This provides Dash-2 (second aircraft of the two-ship section) the same redundant marks to orient onto if Dash-1 does not release its ordnance (Dash-2 usually orients off Dash-1’s effects).

Types of Separation. Aircraft and SEAD fires may be separated by distance or time. This is commonly subdivided into lateral, time and altitude separation or any combination of these.

Lateral separation is effective for synchronizing indirect fire and aviation attacks against two adjacent targets. A specific distance separates the suppression fires from the targets aircraft are attacking. The minimum separation distance between suppression targets and aviation attack targets varies and should be based on the caliber of indirect fire fired at the suppression target. Based on the fixed-wing aircraft’s ordnance, the pilot determines how far to stay above the fragmentation pattern.

Each unit must develop a minimum lateral separation for friendly units used in conjunction with indirect fires. A recommended minimum is 1,000 meters

for artillery (155-mm) and 400 meters for mortars (81-mm). Units are not recommended to pass underneath active mortar gun-target lines (GTLs).

Establishing a temporary, informal airspace coordination area (ACA) is one method of maintaining lateral separation. For example, such an ACA could be, “Stay east of the Euphrates River.”

If fixed-wing aircraft are attacking a target below 2,000 feet above ground level (AGL) in conjunction with artillery or mortars, the same lateral separation restrictions should apply. This is based on the vertical portion of the fragmentation pattern of indirect fires (155-mm) plus a 1,000-foot safety buffer.

Time separation may be required when aircraft can’t be routed away from indirect fire trajectories or suppressed targets or must use extremely low ingress and egress flight profiles. This technique requires SEAD fires to be coordinated with the routing of aircraft so that although aircraft and SEAD fires occupy the same space, they don’t do so at the same time.

Time separation should be used with mortar fires suppressing a fixed-wing aircraft target. It allows suppression before and after the CAS attack while not forcing the aircraft to stay above the mortar trajectory.

Mortar trajectories can be as high as 10,000 feet AGL. At this altitude, fixed-wing aircraft may have difficulties acquiring the mark or target and the forward air controller (FAC) may have difficulty acquiring the aircraft.

The SEAD interrupted mission is a good use of time separation while synchronizing mortars and fixed-wing aircraft against the same target. If suppression is desired after the aircraft attack, a separation of two minutes from the CAS TOT allows Dash-2 to clear the area before mortars fire again. This is based on the mortars' average time-of-flight (TOF) and an additional 15-second safety factor in case Dash-2 is late or mortars fire early.

A separation of one minute and 30 seconds from the CAS TOT is recommended for artillery (based on a smaller average TOF). Using time separation for artillery is not recommended and will not be necessary when using altitude separation.

Altitude separation is effective when aircraft can safely remain above or below indirect-fire trajectories and above their effects. This technique supports low-altitude or high-altitude CAS attacks and is the least restrictive to both indirect fire agencies and fixed-wing aviation. It allows indirect fires to continuously suppress the target the aircraft is attacking.

Establishing a temporary and informal ACA is one method of maintaining altitude separation. For example an ACA might be, "Stay above 7,600 feet MSL [mean sea level]" or "Stay below 4,900 feet AGL and above 2,000 feet AGL."

Attack Geometry. This refers to three general geometric possibilities in combining fixed-wing aviation and indirect fires: attacking and suppressing the same target, attacking long and suppressing short, and attacking short and suppressing long.

When attacking and suppressing the same target, there is no lateral separation of the aircraft and fires. Therefore, another separation plan must be used (see Figure 1).

The recommended technique for artillery is to suppress and mark the target while using altitude separation (i.e., stay above 2,000 feet AGL). The altitude separation should not be excessive in terms of the pilot's ability to acquire the target visually or the FAC's ability to acquire the aircraft. This allows a large caliber weapon to continuously suppress the ADA during the fixed-wing attack.

The recommended technique for mortars is to suppress and mark the target while using time separation for the suppression. Due to the mortar's high trajectory, it is not recommended to continuously suppress a target while at-

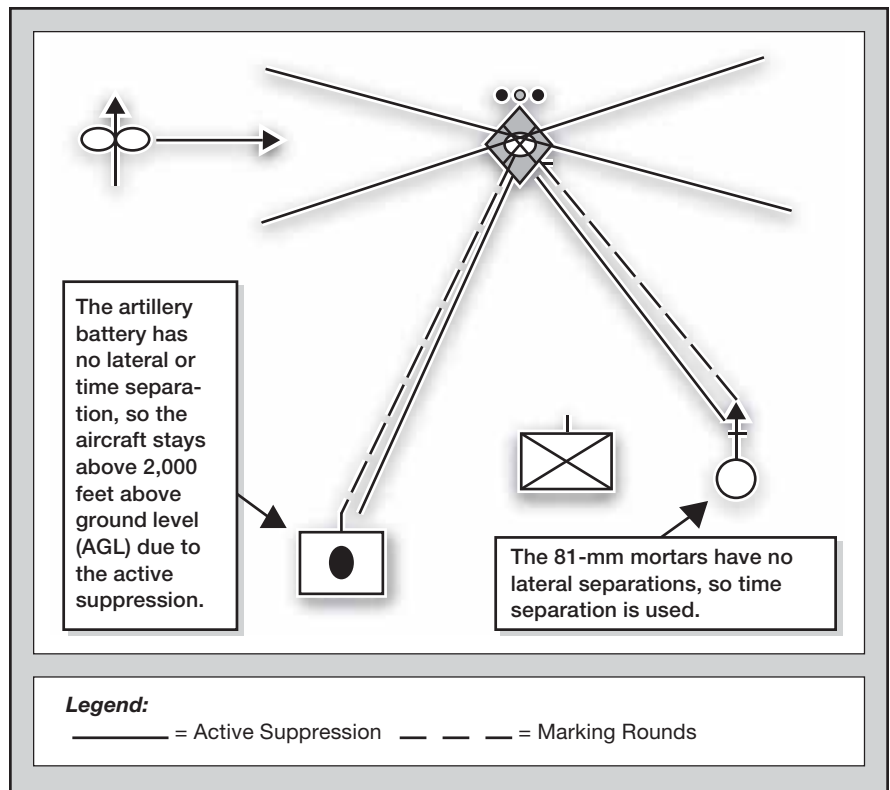


Figure 1: Attacking and Suppressing the Same Target by Using Altitude Separation

tacking it with fixed-wing aviation. This would require the aircraft to stay above the mortar trajectory. Instead, use time separation (i.e., the SEAD interrupted mission).

If using direct fire as a redundant mark, the aircraft should stay above its potential ricochets and effects. Recommendations for altitude separation using direct fire is 5,000 feet AGL for tank main gun and 25-mm gun fires, 4,000 feet AGL for .50-caliber machine guns and 3,000 feet AGL for 7.62-mm or 5.56-mm fires.

When attacking long and suppressing short, the ADA threat is separated from the attack target and is closer to the firing agencies. Therefore, use several separation plans (see Figure 2).

The recommended technique for artillery when suppressing short is to continuously suppress the ADA target and mark the attack target. Lateral separation is used for the ADA target (it should be more than 1,000 meters from the attack target). Time separation for the marking round on the attack target should be used. The aircraft's route should not cross the active suppression GTL.

The preferred technique for mortars is to suppress and mark the attack target if artillery or a better agency is available to suppress the ADA. Because of the mortar's high trajectory, don't continu-

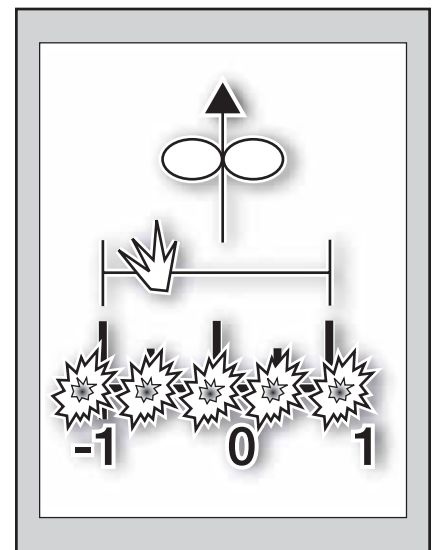


Figure 2: Attacking Long and Suppressing Short—Suppression of Enemy Air Defenses (SEAD) with a Continuous Timeline. Under these conditions, use several separation plans and provide continuous SEAD from -1 minute to +1 minute, marking the close air support (CAS) target with white phosphorous at -30 seconds. The CAS time-on-target (TOT) is at 0.

ously suppress a target while attacking it with fixed-wing aviation. Instead, use time separation.

When attacking short and suppressing long, the ADA is separate from the attack target and at a greater distance to

the firing agencies. Therefore, use several separation plans (see Figure 3).

The preferred technique for artillery is to suppress the ADA target continuously and mark the attack target. There is no lateral separation from the ADA target because the aircraft is crossing the active suppression GTL. There is no

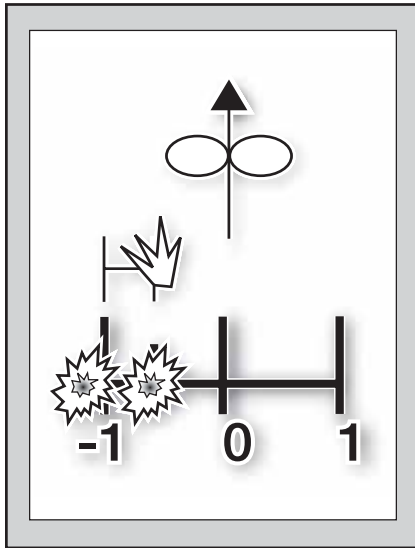


Figure 3: Attacking Short and Suppressing Long—SEAD with an Interrupted Timeline. Under these conditions, also use several separation plans and provide interrupted SEAD with suppression from -1 minute to -30 seconds and the white phosphorous marking at -30. The CAS TOT is at 0.

time separation on the attack target because of continuous suppression GTL on the ADA threat. Therefore, use altitude separation.

The preferred technique for mortars is to suppress and mark the attack target. Because of the mortar's high trajectory, don't continuously suppress a target while attacking it with fixed-wing aviation. Instead, use time separation.

Fixed-Wing Aircraft Attack Profiles. The enemy threat, weather conditions, type of ordnance, type of suppression, FAC's ability to acquire the aircraft and the pilot's ability to acquire the target all factor into which flight profile the aircraft will fly. The attack profile affects the attack geometry and thus the type of separation needed.

The pilot should have a final attack "cone" of between 15 and 30 degrees wide. The cone should be separated radially from an active GTL and measured in degrees and have the attack target as the common center. During ingress, the pilot should be given egress instructions not to cross active GTLs, and the cone should be separated radially from the GTL by 30-degrees to keep the aircraft from inadvertently crossing the GTL while maneuvering for a fire solution. The aircraft has a higher risk of crossing the active GTL with fewer degrees of separation. At the

same time, the higher the degree of separation, the more restrictive it is for the pilot.

The final attack cone may cross the active GTL on the descending branch, straddle the summit or cross the ascending branch only. If the final attack cone straddles the summit, use the maximum ordinate of the trajectory for altitude separation (+/- a safety factor). Based on the tactical positioning of artillery units in relation to the forward line of troops (FLOT), 99 percent of the altitude separation means will have the final attack cone crossing the descending branch. At this point, this article addresses this scenario only.

Calculating Altitude Separation. Before making the decision to use altitude separation, plot everything in the battlespace. This reveals the attack geometry and, thus, the separation needed for fixed-wing aircraft and artillery.

When providing altitude separation, be as precise as possible while plotting, measuring and calculating. Precise calculations guarantee the safety of the aircrew. The following steps show how to calculate altitude separation for a specific tactical scenario.

1. Gather the materials you need: artillery trajectory charts (in this case, Charge 6 White Bag: "CHG 6WB, M107 HE"), a measuring ruler (Graphic Training Aid 06-05-001, called the "pizza cutter"), map pens, a Twentynine Palms East map, a round protractor, a calculator and an altitude deconfliction cheat sheet.

2. Plot a mechanized company at grid NU702064 (see Figure 4). Plot an artillery battery at grid NU724035. Plot an enemy mechanized company at grid NU702091; this is the attack target. Plot enemy ADA at grid NU657114; this is the suppression target.

3. Draw a line from the battery to the suppression target. This line is the active suppression GTL the aircraft will cross. Measure this range.

The range to target is 10,300 meters. The mission will be fired using Charge 6 White Bag.

Extract the suppression target altitude from the map. The target altitude is 880 meters. Convert that into feet by multiplying by 880 x 3.3. The target altitude is 2,900 feet.

4. Ask the FAC for the final attack cone and plot it on the attack target. Draw out both sides of the cone because it helps you visualize the potential ingress and egress routes in relation to

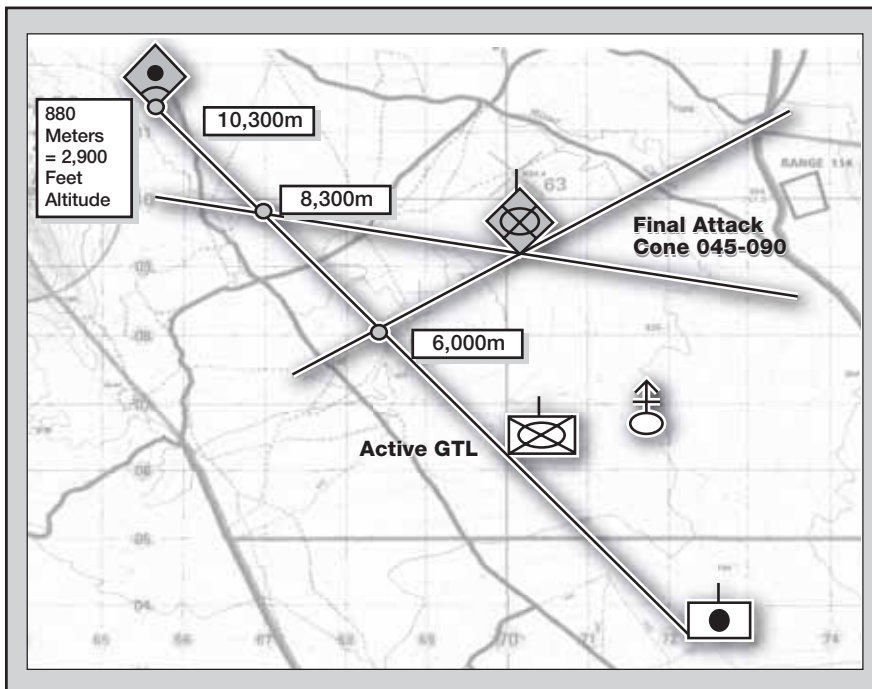


Figure 4: Calculate Altitude Separation on a Map. The enemy mechanized company at grid NU702091 is the attack target. The enemy air defense artillery (ADA) at grid NU657114 is the suppression target. The line from the friendly FA battery to the suppression target is the active suppression gun target line (GTL) the aircraft will cross.

geography, friendly and enemy units and the active GTL. If there are specific egress instructions, then draw them on the map.

For this scenario, the final attack cone is 045 to 090 degrees magnetic. When drawing the final attack cone, remember you must convert degrees magnetic to degrees grid—the grid to magnetic (GM) angle at Twentynine Palms is –240 mils.

To “declinate” the protractor, draw a permanent line on the protractor from 6160 mils to 2960 mils. This allows the protractor to orient on the map in degrees magnetic. Place two elastic “bow-ties” on the protractor and mark off the final attack cone.

Place the center of the protractor over the attack target and place pen marks on the map that represent both sides of the final attack cone. Draw the final attack cone by connecting the pen marks; ensure the cone intersects the GTL.

5. Measure the range from the battery to the point(s) of intersection between the final attack cone and the GTL. The ranges are 6,000 meters and 8,300 meters.

6. Locate the trajectory chart for Charge 6 White Bag and place a mark at range 10,300 meters along the 0 meter line. (See Figure 5.) If there is no trajectory that intersects this range, construct a trajectory by visually interpolating the distance between the next highest or lowest trajectory on the chart. Place pen marks along the 0 meter line at ranges 6,000 meters and 8,300 meters. Draw a straight-line perpendicular to the base of trajectory up toward the trajectory for 10,300 meters. Between where these lines intersect is where the aircraft will cross the GTL.

7. From these two intersections, draw a straight line from them to the left side of the trajectory chart until the line is perpendicular to the origin. Read (visually interpolate as necessary) the ordinate of each line. Extract the chart ordinates for these intersections. The ordinates are 1,400 meters for the higher line and 1,000 meters for the lower line.

8. Use the altitude deconfliction sheet to quickly calculate the chart ordinate times 3.3 +/- 1,000 meters for both stay aboves and stay belows (see Figure 6).

For *stay aboves*, multiply the higher chart ordinate times 3.3 and add a safety buffer; 1,000 feet is recommended. (This safety buffer assumes several risks in this calculation and will be discussed later.) As necessary, you express the

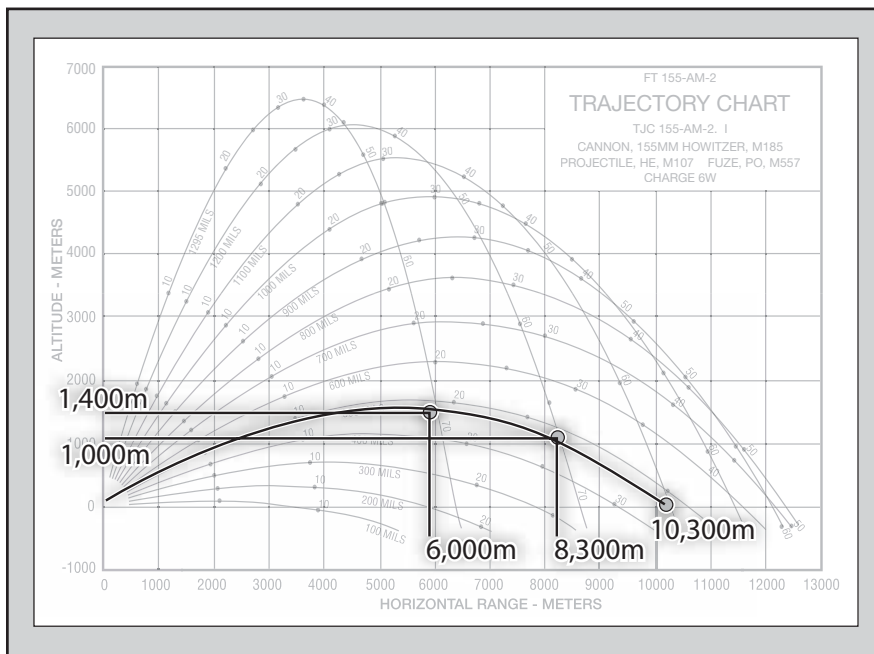


Figure 5: Determine the Chart Ordinates (Trajectory Chart, Charge 6, White Bag). The higher line ordinate is 1,400 meters, and the lower line is 1,000 meters. Between where these two lines intersect is where the aircraft will cross the GTL.

1. Range to Target: 10,300 Meters
2. Charge: 6 White Bag
3. Target Altitude: 880 Meters (Meters x 3.3 = Feet): 2,900 Feet
4. FAC: 045 to 090 Degrees Magnetic
5. Range to Intersection of the FAC: 6,000/8,300 Meters
6. Chart Ordinates: 1,400/1,000 Meters

Chart Ordinate	Stay Above	Stay Below
<300	2000	N/A
400	2400	N/A
500	2700	N/A
600	3000	N/A
700	3400	N/A
800	3700	N/A
900	4000	N/A
1000	4300	2300
1100	4700	2600
1200	5000	2900
1300	5300	3200
1400	5700	3600
1500	6000	3900
1600	6300	4200
1700	6700	4600

Figure 6: Altitude Deconfliction “Cheat Sheet.” For the stay-above altitude, multiply the higher chart ordinate times 3.3 and add 1,000 feet as a safety buffer (1,400 x 3.3 + 1,000 = 4620 feet expressed up to the next 100 feet on the cheat sheet to 5,700 feet). Then add the 5,700 feet to the target’s altitude (2,900 feet) and you have the stay above altitude of 8,600 feet at mean sea level (MSL). For the stay-below altitude, multiply the lower chart ordinate times 3.3 and subtract 1,000 feet (1,000 x 3.3 - 1,000 = 2,300 feet). Then add the 2,300 feet to the target’s altitude (2,900 feet) for the stay below altitude of 5,200 feet MSL.

stay-above number up to the next highest 100 feet listed on the altitude deconfliction cheat sheet. In this case, the results are 4620 expressed up to 4,700 feet + 1,000 feet = 5,700 feet. Add the target altitude: 5,700 feet + 2,900 feet = 8,600 feet at MSL, the final

stay-above altitude.

For *stay belows*, multiply the lower chart ordinate times 3.3 and subtract the safety buffer of 1,000 feet. As necessary, you express the number down to the next lowest 100 feet on the cheat sheet. In this case, the results are 3,300

feet - 1,000 feet = 2,300 feet (expressing the number down unnecessary). Add the target altitude: 2,300 feet + 2,900 feet = a final stay-below calculation of 5,200 feet MSL.

9. Another fire supporter should verify the calculation. If the verifier calculates the stay above at a higher number, use it (it is safer). If the verifier calculates the stay below at a lower number, use it (it is safer). Ensure the FAC passes the stay-above and stay-below altitudes to the pilots.

Risks in Using a Rigid Trajectory. Using this method of altitude separation assumes three things. First, it assumes a rigid and parabolic artillery trajectory instead of a non-rigid and unpredictable trajectory. This allows a simple calculation using trajectory charts. Second, it assumes no inherent (systemic) errors that cause dispersion and that all conditions are standard. Third, it assumes the vertical interval (VI) between the firing unit and the suppression target is zero.

These assumptions make for easy calculations, but they introduce a difference between the actual trajectory fired and the trajectory we use for the calculation (assumed trajectory). We can diminish the risks of this difference by factoring in a safety buffer. One thousand feet above and below the assumed trajectory is recommended as this safety buffer. The safety buffer of 1,000 meters is based on several factors. First, it is common sense to add a safety buffer. It is not an arbitrary number, such as 4,862.9 meters or 3.009 meters.

Second, adding 1,000 meters is easy, even when under combat stress, without a calculator, etc. Last, the 1,000-meter safety buffer (plus or minus) has a historical basis. It has been used through decades of combined-arms exercises (CAX) without incident.

Using exactly 1,000 meters is irrelevant as long as you consider the risks involved. The smaller the safety buffer, the less safe the calculation is. The larger the safety buffer, the safer the calculation is, but it also is more restrictive.

The calculation becomes less safe under several conditions.

- The farther the assumed trajectory is away from the actual trajectory, the less

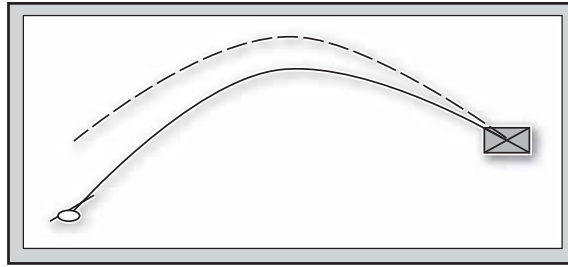


Figure 7: Assumed Trajectory is Above the Actual Trajectory. If the assumed trajectory (the one used for calculations, shown here as a dotted line) is above the actual trajectory (solid line), then the vertical intersect (VI) is positive (actual target to plotted target > 0) and the target is above battery. This calculation is safer for stay-above altitudes but less safe for stay-below altitudes. (The difference between the two trajectories is emphasized for clarity and may not reflect actual conditions.)

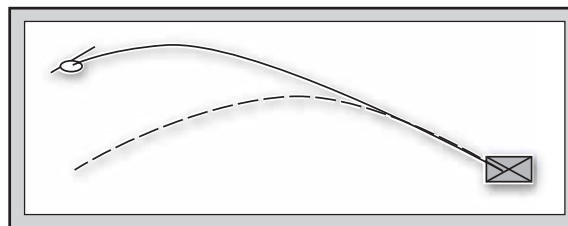


Figure 8: Assumed Trajectory is Below the Actual Trajectory. In this case, the VI is negative (actual target to plotted target < 0) and the target is below battery. This calculation is safer for stay-below altitudes but less safe for stay-above altitudes. (The difference between the two trajectories is emphasized for clarity and may not reflect actual conditions.)

safe the calculation is. (The converse is true: if the assumed trajectory equals the actual trajectory, the calculation is 100 percent safe.)

- There are two possible examples of the differences between the trajectories: the assumed trajectory is generally above the actual trajectory (see Figure 7) or the assumed trajectory is generally below the actual trajectory (see Figure 8).

- The closer the final attack cone comes to the summit where it crosses the GTL, the less safe it is. This is due to the larger difference in the assumed trajectory and the actual trajectory near the summit. At the level point, the trajectories are closer together.

- The farther the VI is from zero, the more the actual trajectory becomes less like the assumed trajectory and, therefore, less safe.

The successful synchronization of supporting arms fires puts the enemy in a dilemma. If he defends against one, he makes himself vulnerable to another.

This altitude separation technique increases the fire supporter's tools available to destroy the enemy using the suppressive effects of large caliber indirect fires and the large ordnance of

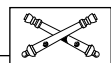
fixed-wing aviation while minimizing risks to the aircrew.

A more in-depth explanation of this technique and other TTPs for synchronizing indirect fires and aviation is available from the author at johnsgilbert97@yahoo.com.

The joint community has several broad tactics, techniques and procedures (TTPs) for separating aircraft and indirect fires, but the TTPs fall short of providing specific scenarios and calculations to fire supporters. The TTPs in this article should be adopted by the Army, Navy, Marine Corps and Air Force and move the services toward developing more JCAS TTPs.

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Operation Joint Thunder

JCAS Training at Fort Sill

Fort Sill, Oklahoma, the Army's Center for the Integration of Joint Effects, is a premier joint training post. It has the advantages of troop units and the Army-Marine schoolhouse eager to train joint close air support (JCAS); Air Force and Navy squadrons in close proximity; open airspace and large impact areas that facilitate range safety requirements; and the joint fires and effects training system (JFETS). In May, the 212th Field Artillery Brigade, III Corps Artillery, Fort Sill, leveraged those advantages to lead a weeklong JCAS exercise at Fort Sill.

Operation Joint Thunder marked the beginning of a new era of joint fires and effects training at Fort Sill. After a nine-year hiatus, joint aircraft, once again, provided CAS while cannon and rocket systems simultaneously massed against targets on Fort Sill's West Range. The live-fire exercise was the capstone event following eight months of planning, coordination and rehearsals. It included 13 units from nine military installations and four branches of the armed services.

During the live fire, strike aircraft dropped more than 88,000 pounds of ordnance, 155-mm artillery fired more than 400 rounds, and a multiple-launch rocket systems (MLRS) unit fired more than 60 rockets.

Joint Participants. The strike aircraft came from the Naval Strike Squadron VFN 201 out of Fort Worth, Texas, while the Air Force's 3d Air Support Operations Center provided forward air controllers (FACs). With JCAS at Fort Sill, Navy aircraft were able to drop live ordnance with a 30-minute round-trip flight vice the six-hour round trip flights they had been accustomed to.

Scout-Observers from the 2d Battalion, 14th Marines (Reserves), Oklahoma City, participated as well as elements of the 212th Field Artillery Brigade and the 18th Field Artillery Brigade, Fort Bragg, North Carolina.

These joint assets massed effects in support of a maneuver force attacking a contemporary operational environment (COE) enemy in high-intensity conflict. The amount of ordnance and the

total number of Soldiers, Sailors, Airmen and Marines taking part in the exercise made it the largest at Fort Sill in recent memory.

Training Goals. The exercise accomplished four major training goals.

1. It massed cannon, rocket and CAS fires simultaneously with high and low CAS engagement and proactive and reactive suppression of enemy air defenses (SEAD) supported by timely and accurate counterfires.

2. The exercise conducted onward movement and integration operations and live fire with a light artillery unit conducting airborne assault operations integrated with heavy FA brigade operations. In the first airborne operation on Fort Sill in more than 10 years, C Battery, 1st Battalion, 321st Field Artillery Regiment (Airborne) (C/1-321st FAR), 18th Field Artillery Brigade, initiated Operation Joint Thunder. The battery dropped two M198 howitzers followed by artillery paratroopers onto Snow Ridge Drop Zone (DZ) and fired 12 missions from the DZ, among other missions during the exercise. The *Proud*



C/1-321 FA fires a mission from Snow Ridge DZ, Fort Sill, during Operation Joint Thunder.

Americans, 6-32 FA, 212th FA Brigade, provided rocket fires, focusing on both planned and reactive SEAD and counterfire.

3. Operation Joint Thunder digitally integrated all command, control, communications, computers, intelligence, surveillance and reconnaissance (C⁴ISR) and fire support systems. This included conducting digital and voice sensor-to-shooter missions.

In addition to the "boots on the ground" training, Operation Joint Thunder integrated simulations from Fort Sill's Battle Lab using the SimC⁴I Interchange Module for Plans, Logistics and Exercises called "SIMPLE." SIMPLE integrated all simulations, collected exercise data and drove an interactive tactical scenario.

4. A final goal was to provide an operational scenario and system to test selected new fire support systems, primarily target acquisition (TA) systems. This enabled Soldiers using the latest TA assets to verify target location and accuracy against known data, providing immediate feedback on the systems' capabilities.

Also, C/1-321 FA accomplished the first tactical firing of the modular artillery charge (MAC) at Fort Sill. This new propellant reduces the unit's logistical requirements by as much as 40 percent as compared to the standard tube artillery propellants.

During the exercise, Major General Kenneth J. Quinian, Commandant of the Joint Forces Staff College at Norfolk, Virginia, was an observer. He said, "I think the joint community is learning what a national treasure Fort Sill is as a training location where you have airspace, range facilities and tactical units... When people find out about the advantages for all our nation's services to train jointly, they'll make this an event that occurs more often."

Without a doubt, Operation Joint Thunder demonstrated Fort Sill is a Joint Fires and Effects Training Center.

MAJ John R. Watson, Brigade S3
212th FA Brigade, Fort Sill, OK

On 12 April 2003, 2d Battalion, 5th Field Artillery (2-5 FA), the *Rock Hard Battalion*, deployed as part of the 3d Armored Cavalry Regiment (ACR) in support of Operation Iraqi Freedom (OIF). As part of the 212th Field Artillery Brigade at Fort Sill, Oklahoma, 2-5 FA (Paladin) has a habitual relationship with the 3d ACR based at Fort Carson, Colorado. Before deploying to Iraq, 2-5 FA participated in many rotations at the National Training Center (NTC), Fort Irwin, California, and OIF train-up exercises with the regiment.

The battalion was trained and ready to perform its traditional artillery role of providing close supporting fires for the 3d ACR. Little did 2-5 FA know that throughout the deployment, the unit would make significant contributions in roles that were anything but "traditional."

Upon arriving in theatre, 2-5 FA quickly postured itself to perform as the regiment's direct support (DS) artillery battalion but ultimately assumed responsibilities as another ground maneuver unit. In addition to providing close fires in support of maneuver operations, 2-5 FA conducted patrols, raids and other tasks normally associated with infantry and armor units. This was the beginning of the non-standard role for 2-5 FA and its baptism as a ground maneuver force.

On 1 May 2003, the President declared an end to major combat operations in Iraq, and units began preparing for the transition to stability and support operations (SOSO). As units transitioned, they adjusted their priori-

2-5 FA

A Ground Maneuver Force for the 3d ACR in OIF

By Lieutenant Colonel David C. Hill and Major Shaun E. Tooke

ties toward maintaining a secure, safe and stable environment for the Iraqi populace.

2-5 FA priorities shifted to include providing security and re-establishing national operations in Iraq, serving as a maneuver force, conducting humanitarian assistance (HA) operations, training Iraqi Civil Defense Corps (ICDC)

forces and conducting captured enemy ammunition (CEA) operations, all while continuing to conduct traditional artillery firing tasks. As the battalion moved into Iraq, the Soldiers of 2-5 FA found themselves contributing to each of these key priorities in several locations in Iraq. (See the map.)

Providing Security and Re-Establishing Iraqi. There were key priorities commonly addressed: security, re-establishing education programs, getting food to the Iraqi people and restoring the flow of oil to provide oil revenues back to the Iraqi people.

As a ground maneuver unit, the Soldiers of the *Rock Hard Battalion* were responsible for an area of operations (AO) that exceeded 6,500 square kilometers. Within this AO were several high-priority sites that required forces to secure them, oversee site repairs and, eventually, return the sites to Iraqi control. This included the Al Anbar University in Ar Ramadi, three World Food Program (WFP) sites, an oil pump station and one of the largest ammunition supply points (ASP) in the region.

Al Anbar University. The battalion established its headquarters and base of operations just south of Ar Ramadi near Al Anbar University more than 100 kilometers west of Baghdad. In addition, a large portion of the force operated within the university compound, so 2-5 FA secured this site and removed the Baath Party presence in the school's hierarchy.



2-5 FA Soldiers train Iraqi Civil Defense Corps (ICDC) students.

The battalion organized a free and open election of new department heads and a university president and then established liaison with outside agencies to assess repairs needed at the university and contract with both Army and Iraqi engineers to rebuild the university. These initiatives facilitated the return of more than 4,500 students to Al Anbar University by the fall of 2003, enabling them to complete the semester interrupted by the war.

Over time, 2-5 FA continued to foster a relationship with school officials, enabling the university to become one of the first sites to train Iraqi Facility Protection Security (FPS) personnel in the Al Anbar region. Here, the battalion trained more than 350 Iraqis on basic security tasks and turned over security operations at the university to the FPS as well as other sites secured by Coalition Forces when 2-5 FA left the area.

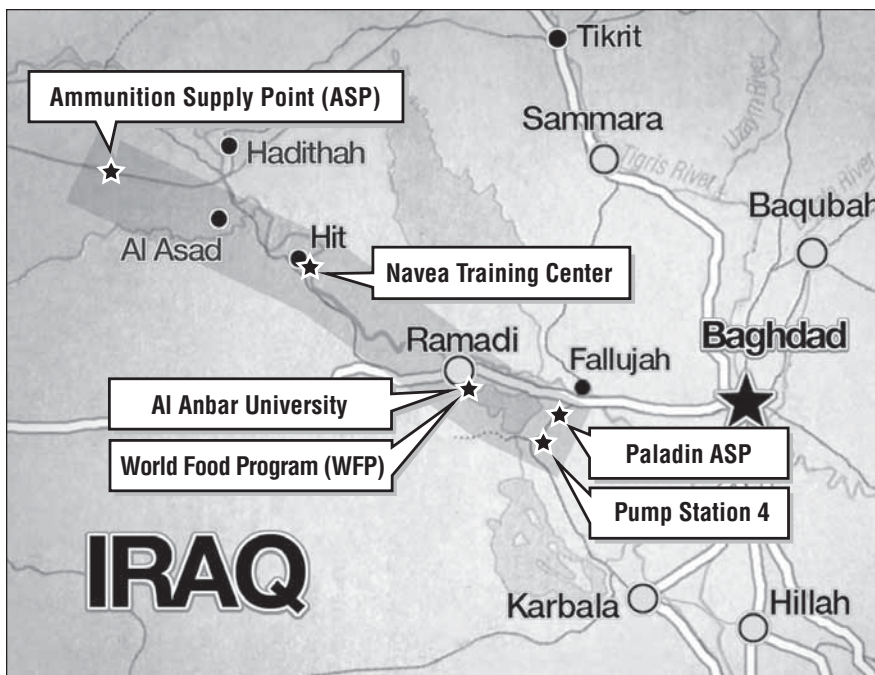
WFP Compounds. The second and probably most important site secured by 2-5 FA was a group of three compounds used by the WFP. Operated in conjunction with the United Nations, the WFP distributed food to the Iraqi people throughout the Al Anbar Province.

WFP received truckloads of various foods, such as grain, rice and vegetable oil. WFP then packaged the items for delivery to satellite sites across the Al Anbar region from which they were distributed to the Iraqi people.

In addition to securing the WFP sites, the battalion screened WFP employees to prevent Baath Party control and corruption and monitored the flow and distribution of food. The unit provided security along the routes the distribution trucks took to ensure destabilizing forces did not misdirect them or their cargoes were not pilfered. 2-5 FA batteries used the secure WFP compounds as bases of operation to patrol the surrounding areas and maintain a secure, safe and stable environment.

Oil Pump. Another high-priority site was an oil pump, referred to as Pump Station #4, which pumped oil throughout Iraq and on to Turkey. During the initial reconnoiter of the AO, Soldiers arrived at Pump Station #4 to find its buildings heavily looted, oil spewing into the air and the pump's electrical components damaged beyond repair.

Some of the battalion's innovative mechanics repaired the pump enough to prevent further oil spills and established a gravity feed that allowed the oil to flow to designated locations through-



2d Battalion, 5th Field Artillery (2-5 FA) Area of Operations—6,500 Square Kilometers

out Iraq. The battalion used two reinforced howitzer sections to secure Pump Station #4 and prevent further looting and damage. The sections had to operate in very austere conditions in the desert with, on occasion, up to 150-degrees of heat.

ASP. Down the road from Pump Station #4, the battalion secured one of the largest ASPs in the region. Commonly referred to as *Rock ASP*, it measured 16 square kilometers and was just south of Al Fallujah. The ASP had more than 50 bunkers and another 100-plus bermed up areas that contained small arms, artillery and mortar shells, mines and air-to-air as well as surface-to-air missiles.

The ASP also served as a base of operations for the southern portion of 2-5 FA's AO, providing a mutual support re-transmission sites located on the banks of Habbaniyah Lake and Pump Station #4. From this base, elements of 2-5 FA conducted combat patrols, provided security along major lines of communication (LOCs) and performed various HA missions.

Serving as a Maneuver Force. The 3d ACR assigned 2-5 FA an AO in which it had to defeat destabilizing forces in order to maintain a stable, secure and safe environment for the Iraqi people. In addition to security missions, the *Rock Hard Battalion* conducted combat patrols, manned traffic control points (TCPs) and conducted raids to defeat those militant forces seeking to destabilize the towns and cities

within 2-5 FA's AO.

Combat patrols usually were for securing the LOCs or base camp and for reconnoitering the area, using both mounted and dismounted techniques. With the battalion spread across such a large area, each subordinate unit had to deter anti-Coalition activities; enforce policies, such as those affecting the possession and use of weapons; and prevent black marketing of petroleum and illegal weapons in their respective AOs.

The TCPs were random checkpoints established along road networks to conduct vehicle searches, enforce the curfew and ensure the Iraqi populace was not only familiar with new policies established in their neighborhoods, but also in compliance with them.

2-5 FA also conducted many raids and cordon-and-search operations to capture key destabilizing forces or Fedayeen personnel. One particular raid was on a large apartment complex with more than 150 families, a complex repeatedly identified as housing members of the Fedayeen. Based on the size of the target and the risks involved in entering such a large urban complex to detain individuals, the battalion received additional support in the form of infantry, aviation, psychological operations (PSYOPS) and counterintelligence (CI) personnel plus interpreters.

During a two-month period, 2-5 FA used multiple sources throughout the 3d ACR to confirm key targets and planned the mission. With artillery providing

inner and outer cordon security, aviation providing overwatch and an infantry company assaulting the complex, 2-5 FA executed the plan, detaining more than 60 personnel. The detainees included seven of the ten targeted individuals and Target Number One, who was suspected of being a major Fedayeen operative.

Conducting HA Operations. One inherent task was for the battalion to identify areas in which the Iraqis needed assistance in rebuilding and refurbishing their key infrastructure. While operating in the Ar Ramadi area, 2-5 FA conducted initial site assessments for many schools, mosques, water treatment facilities, irrigation canals and medical facilities. Soldiers on patrol often talked with Iraqis about the conditions in their villages or towns, followed up by battery commanders' discussing these issues with tribal elders and sheiks.

After these initial meetings, the battalion civil military operations officer (S5) coordinated with higher headquarters civil affairs to conduct follow-up assessments and estimate the amount needed to fund the HA projects. More importantly, 2-5 FA had the freedom to contract the work using local personnel from the respective towns or villages, which helped stimulate the economy and allowed the Iraqis to contribute toward rebuilding their homes towns—a major factor in winning local support for Coalition operations.

When 1st Brigade, 1st Infantry Division (Mechanized) out of Fort Riley, Kansas, arrived, 2-5 FA conducted a battle handover of the AO, including to

another proud 5th FA Regiment battalion, 1-5 FA.

2-5 FA then departed for Al Asad Airbase about 100 kilometers west of Ar Ramadi. There the battalion executed two vital missions in support of the 3d ACR. The first was to establish and run an ICDC training site, and the second was to consolidate and destroy CEA.

Training the ICDC. Using training models developed by the 101st Air Assault and 4th Infantry Divisions, 2-5 FA developed Al Anbar Province's first ICDC Academy near the small town of Hit between Al Asad and Ar Ramadi. The training site would become known as the Navea Training Center, named after the battalion's first casualty, Specialist Rafeal Navea.

The site was once a training facility for the Iraqi Army but was heavily looted and lay in ruin. The battalion received a team of engineers to tear down buildings and clear debris and hired Iraqi contractors to refurbish a few salvageable buildings for use as classrooms and living areas. The Iraqis also built a dining facility for the ICDC trainees. The battalion master gunner supervised this effort. In as few as three weeks, the site was cleared of debris and buildings were rebuilt and refurbished by Iraqi contractors, and instructors prepared to train new recruits.

During the next four months, 2-5 FA trained more than 3,500 Iraqis on basic skills, laying the groundwork for US maneuver units to begin collective training and incorporate the ICDC into daily operations. Not long after the ICDC companies and battalions were estab-

lished, the 3d ACR and the 82d Airborne Division employed them in support of small skirmishes and carefully planned offensive operations.

Conducting CEA Operations. As the battalion continued to train ICDC recruits, 2-5 FA began an extensive CEA operation at an ASP secured by another artillery unit, the 3d Howitzer Battery from 3-3 ACR. This site was approximately 50 kilometers northwest of Al Asad and measured four by 13 kilometers. The ASP had more than 180 bunkers and bermed-up areas filled with small arms, mines, artillery and mortar shells and various other munitions.

The battalion spent four months destroying bunkers and transferring ammunition into a consolidated ammunition holding area where civilian explosive ordnance disposal (EOD) experts assessed the types and quantities of munitions for future destruction. This was truly a combined effort with civilian EOD, ammunition specialists from the regimental support squadron, artillery Soldiers and, on any given day, as many as 200 Iraqi workers assessing, moving and preparing ammunition for destruction.

By the time the battalion prepared to conduct a battle handover of the ASP with the Marines in March 2004, these personnel had facilitated the destruction of just fewer than 11,000 short tons of ammunition.

Conducting Artillery Operations. Although major combat operations had ended, artillerymen still had to do what they do best: send steel down range in a timely and accurate manner.

While performing its various assigned tasks, the battalion maintained a "hot" platoon to provide continuous artillery support to the 3d ACR and the battalion's own operations. Based on mission, enemy, terrain, troops and time available plus civilians on the battlefield (METT-TC) and allowing for maintenance and rest, the hot platoon operated with as many as three and as few as one section ready to fire. The hot platoon provided close fires in the form of on-call illumination and suppression missions, pre-planned schedules of harassment and interdiction (H&I) fires and countermortar fires.

To support countermortar fires, the 3d ACR attached a Q-37 Firefinder radar to the battalion. However in the urban environment of Navea Training Center, the battalion had minimal success detecting mortars with the Q-37. After using mortar ballistic tapes with the Q-37



2-5 FA Soldiers supervise and help Iraqis with the consolidation and destruction of ammunition at an ammunition supply point (ASP) 50 kilometers from Al Asad.

unsuccessfully, the regiment acquired a Q-36 to support the countermortar missions.

Before Navea became an ICDC training site, 3d ACR units had used it as a forward operating base (FOB). Here, they experienced 107-mm rocket attacks about every other night. At the beginning of 2-5 FA's ICDC training mission, the battalion also experienced frequent rocket and mortar attacks.

With the Q-36 linked into the hot platoon, the battalion targeting officer conducted more accurate pattern analyses. Timely reactive countermortar fires combined with fire plans used in conjunction with analyses and active patrolling reduced the number of confirmed indirect attacks from 25 in November 2003 to a total of 21 during the next three months combined. As the unit prepared to redeploy, 2-5 FA had shot more than 1,000 rounds in support of the 3d ACR and battalion operations.

Lessons Learned. The battalion learned many lessons throughout its deployment to Iraq. One very important one was that the *Soldiers and junior leaders in today's Army are every bit as ready, if not more so, than their predecessors.* They exhibited courage, commitment, discipline and flexibility that ensured they accomplished every assigned task.

Regardless of the type of operation, the unit's mindset must remain "combat" operations. Every movement from base camp was a tactical combat operation, and every Soldier, regardless of military occupational specialty (MOS), was prepared to operate as an infantryman.

For example, in addition to keeping the battalion functional in terms of combat service and support, food service specialists and mechanics were equally successful in combat patrols, conducting TCPs and participating in raids.

Discipline cannot be overemphasized. The Iraqis could distinguish between those units that were disciplined and ready for a fight and those others that were not. The Iraqis have a saying that there is a difference between a unit's being ready for a fight as opposed to looking for a fight. Discipline included knowing when to show restraint.

The operating environment created special force protection challenges. While conducting a variety of missions over such a large area, the battalion's management of key weapon systems, personnel and vehicles was crucial to setting the conditions for Soldiers' suc-



2-5 FA Soldiers train ICDC students on basic soldiering tasks at Navea Training Center.

cess. In some cases, once the unit emplaced crew-served weapons on static site security, there were not enough crew-served weapons to simultaneously conduct the many patrols and movements between base camps. Units had to manage the number of patrols to ensure each included the required force protection packages, or on a case-by-case basis, commanders assumed risks without violating force protection policies.

The M-240 machinegun in many infantry units would be a welcomed addition to artillery battalions. The M-240 provides flexibility for ground or vehicular mounting and reduces collateral damage and risk of fratricide when employed in support of convoy security and in and around the mud style buildings of Iraq—as compared to the .50 caliber machinegun.

All Soldiers must know how to operate all unit weapons. Due to ammunition constraints, not all Soldiers qualify on crew-served weapons or squad automatic weapons (SAWs) at their home stations. Therefore, resource limitations initially allowed only normally assigned gunners or assistant gunners to man their respective weapons systems in Iraq.

By developing training procedures and ranges during deployments, units can ensure every Soldier is familiar with the basic operations of the various weapons and can employ them with confidence in response to an enemy attack.

The FA battalion needs more high-mobility multipurpose wheeled vehicles (HMMWVs) in its table of organization and equipment (TOE) with more of them up-armored in a SOSO environment.

For years the artillery has tried to get more HMMWVs. According to the current TOE, critical personnel throughout the battalion are not authorized a HMMWV. Among them are the command sergeant major (CSM), first sergeants (1SGs) and platoon leaders. At

the expense of other sections, battalions often redistribute HMMWVs within the organization to accommodate key personnel. With the variety of tasks these leaders must conduct in a potentially volatile environment spread over a large AO, these leaders need HMMWVs without stripping other sections authorized HMMWVs.

After receiving five additional HMMWVs and, eventually, four up-armored HMMWVs, the unit installed pedestal mounts in light skinned HMMWVs and used these additional resources to formulate a gun-truck platoon controlled at the battalion level.

Up-armored HMMWVs were in short supply and managed closely. When a landmine destroyed the first up-armored HMMWV, it didn't take long to realize that certain wheeled vehicles became combat pacing items with the same maintenance priorities given a howitzer.

With the lack of up-armored vehicles, units lined the floors of light skinned vehicles with sandbags. On more than one occasion, this saved a Soldier's life. In addition when the battalion finally received the new style flak vests, Soldiers used the old flak vests to line the doors and troop seats of vehicles.

While operating as both a maneuver and artillery unit in SOSO, 2-5 FA needed a larger staff with diverse skills. For example, the S2, who normally provided an artillerized intelligence preparation of the battlefield (IPB), now conducted a more traditional IPB and demographic study of the many villages and towns in the AO. This was valuable in understanding the tribal makeup and various key leaders in each area.

The battalion was not used to operating in an urban environment, which is part of the terrain analysis and requires identifying unrestricted, restricted and severely restricted terrain. The S2 categorized the streets of every urban area

in the AO for trafficability by each type of vehicle in the battalion. This identified the vehicles we could use in planning an operation, based on the nature of the operation's terrain.

The battalion also relied on the targeting officer to be the unit's chief interrogator for processing enemy prisoners of war (EPWs).

Most battalions are not authorized or manned with a civil military operations officer (S5). In dealing with the many HA missions, the battalion quickly assigned the chemical officer the additional task of S5. This was crucial to coordinating with outside agencies to support the various rebuilding contracts, maintaining visibility on all contractual work and allowing the Iraqi leaders to become familiar with a single point of contact they could rely on and trust.

Staff agencies taking advantage of subject matter experts as combat multipliers became a key part of battalion operations. The battalion had several Soldiers and leaders performing in a general support role who also were subject matter experts in the areas of psychological operations (PSYOPS), civil affairs and counterintelligence (CI). The staff quickly incorporated them into all operations and learned techniques and procedures to perform some of their tasks. These combat multipliers played a major role in the battalion's ability to maintain crowd control, conduct follow-up assessments for humanitarian relief, understand the demographics within the AO and identify pro- versus anti-Coalition neighborhoods and personnel.

Each FOB needs an interpreter. Whether performing HA or combat patrols, unit efforts easily are improved with interpreters and hurt by a lack of interpreters. The battalion received a trained Army linguist from the 3d ACR and, eventually, two civilian-contracted linguists from the US.

Additionally, 2-5 FA relied on interpreters it had identified, screened and hired. The battalion sought out willing members of the local populace with communications skills to fit unit needs.

In an ideal situation, each FOB should have an interpreter to help with patrols, TCPs and HA. Short of that, Soldiers with a rudimentary understanding of the language's key phrases and the culture also were combat multipliers.

The hot platoon conducted clearance-of-fires and countermortar rehearsals in conjunction with adjacent units to



A Soldier from A/2-5 FA pulls security at an ICDC training site during the Iraqi trainees' prayer time.

ensure all headquarters understood the requirements and expectations for operating in and around the Navea Training Center. As a maneuver unit, 2-5 planned, cleared and executed fires within its AO; however, the Navea Training Center was a smaller area within an adjacent unit's AO.

To improve the timeliness of fires against mortar attacks at the center, the battalion used a kill-box technique and a restricted operating zone (ROZ). The kill boxes were used as a method of pre-clearing fires while allowing adjacent units to operate in the same area. The ROZ was designed in a similar fashion to require aircraft to coordinate before entering that particular airspace. As units planned operations, boxes were closed or opened accordingly to facilitate clearing fires rapidly.

A successful technique for radar management was reorienting at night. Early on, it seemed every mortar or rocket attack came from a direction not covered by the radar's azimuth of search. Sheep herders and children often roamed in the vicinity of the hot platoon, so we established one azimuth of search during the day, covering previous mortar firing points and, after dark, changed the azimuth of search. The first time the battalion employed this technique resulted in a target acquisition and an immediate artillery response.

The battalion employed both mounted and dismounted patrols in coordination with adjacent units to patrol specific areas, which greatly reduced the indirect threat. On many occasions, enemy mortar personnel set up firing points to work by wire or timer. Many of the techniques were very rudimentary and resulted in inaccurate fires that were harassing at best. The patrols helped counter this enemy technique.

The battalion employed every means of communication available through-

out the deployment. In addition to the traditional communication methods, units relied on Iridium and Thuraya satellite phones purchased through supply channels and managed by the S4 and signal officer.

Before deploying, the battalion fielded the mobile tracking system (MTS) in its ammunition platoon. This was extremely valuable in battle-tracking units traveling outside the normal voice ranges but required a palletized load system (PLS) to travel with that convoy.

2-5 FA lacked blue force trackers found in the digitized division, rapid deployment forces of the 18th Airborne Corps and other III Corps units, making common situational awareness and communications among units difficult. Fielding compatible systems or having them as part of pre-positioned stocks would enhance communications among units, such as corps artillery battalions or National Guard and reserve units that don't deploy with that equipment.

For the most part, when treated with dignity and respect, the Iraqi people were willing to share the burdens and hardships with American Soldiers—often took on the dangerous jobs—and were in awe of American Soldiers helping them rebuild their nation. From day to day, it was easy to see that the Iraqis were not much different than Americans. Like Americans, there are always those who can't be pleased. But on many occasions, the Iraqis prevented Soldiers from doing something dangerous or placed themselves in harm's way to accomplish securing and rebuilding their nation.

The latter was especially true during CEA operations. Iraqis would identify unexploded ordnance (UXO) while working in ammunition bunkers, determined if it was safe or not and warned American Soldiers not to touch unsafe munitions.

For those Iraqis who doubted the American Soldiers' competence, courage and caring, it only took the actions of a few 2-5 FA Soldiers who risked their lives to save Iraqis from a burning munitions bunker to convince Iraqis otherwise. Staff Sergeant Timothy E. Haungs, an Ammunition Section Chief, is one of those 2-5 FA heroes who rescued Iraqis from a burning ammo bunker and progressed Iraqi-American relations in that rural area forward a decade. His "Soldier's Story" is on this page.

With the success of artillery in OIF,

it's easy to see that as forces deploy to Iraq and Afghanistan, our Army's leaders will continue to call on the *King of Battle* to perform its standard artillery role as well as execute maneuver and SOSO missions. The hope is this article will provide insights for those artillery units who follow, helping them to prepare for the next deployment.

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Major Shaun E. Tooke is the Executive Officer for 2-5 FA. He joined the battalion on 9 June 2003 in Iraq where he originally served as the Battalion Operations Officer during OIF. With the 1st Infantry Division (Mechanized), he was the S4 and a Battery Commander in 1-6 FA and Assistant Fire Support Coordinator (AFSCOORD) for 1-7 FA, both assignments in Bosnia-Herzegovina, and Task Force FSO for 3d Brigade in Germany.

A-Soldier's-Story

SSG Tim Haungs, Ammo Section Chief
2-5 FA (Paladin), 212th Field Artillery Brigade in OIF

Staff Sergeant (SSG) Timothy E. Haungs, 36, from Jefferson City, Tennessee, is a Military Occupational Specialty (MOS) 13B Cannoneer Ammunition Section Chief in the 2d Battalion, 5th Field Artillery (2-5 FA), 212th Field Artillery Brigade, III Corps Artillery, Fort Sill, Oklahoma. He was deployed to Iraq from April 2003 to March 2004 for Operation Iraqi Freedom (OIF). While supervising the removal of captured enemy ammunition (CEA) from an enemy bunker, a round exploded, injuring several of his Iraqi workers and threatening to detonate the entire bunker. At the risk of his life, he and others raced into the burning ammo bunker and rescued the Iraqis. 2-5 FA considers him a Soldier Hero of OIF. This is his story.

I was supervising about 25 Iraqis working in the enemy ammo bunker that day. The bunker was large enough to park two tractor-trailers inside and loaded with, probably, eight-year-old 122-mm powder shells. The Iraqis were loading the rounds into a tractor-trailer backed up to the entrance of the bunker.

I was outside the bunker when suddenly I saw a bright flash of light followed by a loud bang and smoke coming out of the bunker. Some Iraqis came running wildly out of the bunker screaming. They knew what could happen because we had exploded a 122-mm round during their safety training.

About that time, I heard screaming coming from inside. Immediately, I looked around to account for all my Soldiers. Then I grabbed the Medic, Private Akai Johnson, to help me, and we ran inside the bunker.

I didn't know until later that there was a fire inside the bunker. If that bunker had gone up, it would have

left a pretty big hole in the ground.

There was chaos inside with screams and some black smoke swirling around. Iraqis were still inside, hunkered down in the corners of the bunker.

We got three Iraqis out—two were injured—and began administering first aid. We had a medical support team with ambulance at the site in case of accidents.

A third injured Iraqi was standing near the truck screaming. We grabbed him, calmed him down and walked him out of the bunker. Not until I got outside could I tell the extent of his injuries. His face looked like hamburger meat.

We laid him on a stretcher, cut his clothes off, finding powder burns all over his body, and started an IV to try to keep him from going into shock. I had to keep the other Iraqis back and calm while the Medic worked on him and got him loaded into the ambulance. Later, I found out he had been blinded. The injuries of the other two Iraqis were minor.

Then the Iraqi foreman started yelling



that an Iraqi was still in the bunker. I ran back into the bunker with Corporal Ryan Waters, an Ammo Handler, and Captain Tim Godwin, Assistant S3, to find the Iraqi. That's when we found the pieces of a wooden ammo crate burning from the explosion. There was loose powder everywhere that could ignite and blow the bunker. I quickly grabbed the wood and took it outside to put out the fire. As it turned out, there weren't any more Iraqis in the bunker.

The Iraqis really appreciated our rescuing their co-workers. The translator told us the Iraqis said they then understood we knew what we were doing and that we would take action when we had to.

Why'd I run into ammo bunker that just had, had an explosion? You just *do* it. The Army trains you to take care of your Soldiers. I was responsible for those Iraqi workers; I was their supervisor.

MTS An Untold Commo Success Story in OIF

By Captain Jeffrey J. Hilt and
Sergeant First Class Ronald L. Jones

“Contact right! Contact *right!* AK-47 and RPG [rocket-propelled grenade] fire from behind the berm on the right!” came screaming across the battery net.

This southbound convoy transporting hundreds of tons of captured enemy ammunition (CEA) was being attacked with RPGs, small arms fire and improvised explosive devices (IEDs), destroying one trailer and damaging another.

The insurgents fled when engaged by a fusillade of small arms fire from the escort vehicles and gun trucks; however, an unexploded 122-mm IED lay next to the road near a burning trailer with its load of ammunition “cooking off,” blocking the route. No casualties were sustained during this attack.

“Call Sheriff and notify battalion, ASAP!” were the instructions given to the convoy commander’s driver. Using the military’s version of “dial 9-1-1” on FM, call sign “Sheriff” (monitored by the Military Police responsible for route security), the driver attempted to contact the police and get explosive ordnance disposal (EOD) personnel to the scene. But because the convoy was in the middle of the desert in the Sunni Triangle some 100 kilometers south of Baghdad, the driver could not reach Sheriff, who was out of FM communications range. The only other unit within FM range was a sister battery heading north along the same route that also had no communications with higher.

The driver then attempted to call Sheriff on the Thuraya cell phone, but the phone could not find a signal because that area of the desert had no coverage. How was the convoy going to get EOD on the scene to neutralize the IED and engineer elements there to clear the route?

Luckily, this convoy had the movement tracking system (MTS). MTS, a system designed to maintain visibility of resupply over long distances, allows



A medical evacuation helicopter lands to evacuate an Iraqi national injured in vehicle accident. The flight was called in using MTS.

the vehicle in which it is installed to track and communicate with other MTS vehicles, sending real-time, two-way communications via satellites. It can communicate over a broad range of satellite systems while using National Imagery and Mapping Agency (NIMA) digital maps. MTS encrypts the address information and the message data from both sender and receiver.

Using MTS plain text messaging, the convoy sent a nine-line unexploded ordnance (UXO) report and situation report (SITREP) to the battalion headquarters, which in turn transmitted it to Sheriff using both digital non-secure voice telephone (DNVT) and FM. The local quick reaction force (QRF) and EOD were dispatched and arrived at the scene in time for the convoy to move to a safe laager area for the night, removing 29 contracted civilian trucks loaded with CEA out of harms’ way.

Unfortunately, attacks such as the one we just described happen repeatedly throughout the Central Command (CENTCOM) area of operations (AOR) since the Coalition Forces entered Iraq.

Our battalion mandated convoys carry redundant means of communications: FM radios with battery and battalion command, Sheriff and medical evacuation (MEDEVAC) frequencies loaded at all times; Iridium satellite phones;

Thuraya cell phones; and tactical satellite (TACSAT) phones. But MTS was the most dependable means of communications we had. It never failed us in 12 months of combat.

Originally, the system was installed in our heavy expanded-mobility tactical trucks (HEMTTs) to track ammunition resupply and movement during high-intensity conflict. However, due to considerations of the mission, enemy, terrain, troops and time available and civilians on the battlefield (METT-TC), we could not always employ HEMTTs in our assigned missions. With that limitation, battalion directed we remove a number of the MTS and install them into our high-mobility multipurpose wheeled vehicle (HMMWV) gun trucks to maintain crucial command and control (C²) of our convoys.

Multiple Uses for MTS. In the majority of cases, MTS was our convoy’s primary and, sometimes, our only way to contact Sheriff and our battalion headquarters. We used it to communicate with higher for C² of our convoy and to call the QRF, MEDEVACs for Soldiers and Iraqi civilians, the engineers to clear roads and for the locations of safe laager areas when our convoys were delayed.

While escorting and hauling hundreds of tons of CEA and other explosives, our battalion was able to pass on the latest intelligence and instructions to convoys hundreds of kilometers away, thereby allowing the convoys to bypass or avoid routes blocked by IED attacks.

In one case, a convoy of 30 trucks avoided a four-hour traffic jam caused by multiple unexploded IEDs on the highway through downtown Baghdad because of a timely MTS message. The convoy was hauling 1,000-kilogram bombs from Taji and bypassed the situation via an alternate route around Baghdad.

MTS helped convoys receive maintenance and recovery assets or troubleshooting advice to recover and (or) re-

pair broken-down vehicles. This system also allowed us to notify higher of what Class IX and petroleum, oil and lubricant (POL) products the convoy would require upon its return, thereby, reducing the amount of time it took to bring the convoy up to fully mission capable (FMC) status and back into operation.

MTS Equipment. MTS has two types of systems. One is for vehicles, called mobile stations, and one is for C² located in the administration and logistic operations center (ALOC) and battalion headquarters, called control stations. Both use Window's-based programs with pop-up screens that allow the operator to simultaneously send and receive messages while viewing his position.

The mobile station is a small unit with a hardened case, which encloses the screen and small keyboard, allowing for easy use without impeding the operator's movement inside the vehicle. The control station is nothing more than a ruggedized laptop computer with the MTS software on it. Both types have precision lightweight global positioning system receivers (PLGRs) connected for satellite tracking.

The antennae for both are mounted on magnetic bases, enabling them to be attached to vehicles without damaging the vehicles. The magnetic base ensures the antenna doesn't fall off, no matter how rough the terrain is.

Each vehicle is assigned an individual identification number, based on its antenna's manufacturer's number. If the antenna is exchanged, then the vehicle the new antenna is mounted on has a new identification number.

Units are then broken down into group numbers, also assigned by the manufacturer. Control stations can move individual vehicles from group to group and can delete and add vehicles to a group or delete and add complete groups, as required. Only control stations, however, can communicate with MTS mobile stations in different groups; mobile stations can only communicate with other mobile stations in the same group.

For C² purposes, the control station in charge of a group can promote a mobile station in that group to a control station. Once the mobile station is promoted to control station, it, too, has the same capabilities as its promoting control station.

However, the mobile control station being promoted to control station must



SSG Gary Crawley, 1-12 FA, operates an MTS mobile station mounted in his vehicle in Iraq.

be well trained because, with its new capabilities, it could wreak havoc in untrained hands. For example, if a group is inadvertently deleted, it takes a while to reestablish it along with a letter from the battalion commander explaining how and why this occurred.

MTS Challenges and Solutions. Initially, we ran into a number of issues installing these systems into the HMMWVs, mainly concerning the wiring system and power boxes. Our battalion mechanics were up to the challenge and adapted the system to fit into our gun trucks while not altering or damaging the original configuration.

Mechanics also fabricated mounts for the MTS computer processing units (CPUs) on HMMWVs. This facilitated the gun-truck commander's ability to use the MTS without impairing his situational awareness. The installation of these systems into our gun trucks was an unmitigated success, and it multiplied our combat effectiveness exponentially.

We faced many problems with the PLGR ports burning out in both HEMTTs and gun

trucks, thereby, rendering the system not mission capable (NMC). The solution was to use battery power for the PLGRs. Batteries were a scarce resource in theater, so we had to monitor each battery life closely.

The incredible heat also took its toll on the PLGRs. With outside temperatures averaging in the mid-130s and temperatures inside the vehicles in the mid-140s, most systems malfunctioned or quit working entirely. To keep them cool, we tried to keep the vehicles in the shade and turn a fan directly onto the MTS. But shade and fans were very scarce commodities in Iraq last summer.

Due to the criticality of the MTS and the frequency of problems we were having with the PLGRs during the summer months, civilian contractors in theater executed a workaround to bypass the PLGR. They could not allow us to conduct the workaround because if an operator entered the administrator password incorrectly three times, MTS locked down and had to be sent back to the manufacturer or civilian contractors to be unlocked.

Bypassing the PLGR allowed us to have two-way communications and use the maps on the system but did not allow us to be tracked via satellite. Our solution was to send position updates to our higher headquarters periodically as the mission dictated.

The key to maintaining operational MTS is keeping them not only cool, but clean—easier said than done in a desert environment. During convoys, we used air hoses from the HEMTTs to keep the mobile stations dust free. Our unit also invested in many air compressors be-



SGT Jeremy Bennett, 1-12 FA, operates an MTS control station in the battery administrative and logistics center in Iraq.

fore deploying that were “worth their weight in gold” in keeping our systems as dust-free as possible. The only time the dust goes away in Iraq is when it turns to mud.

Based on weather conditions (dust storms, etc.), we blew the MTS free of dust once a day, at a minimum. As the temperatures soared and dust increased, we continually blew the systems free throughout the day.

The inhospitable conditions in the summer months caused multiple component failures. To maintain MTS communications, we had to swap parts from other systems to keep as many systems FMC as possible.

We ran into accountability issues for these MTS components, mainly with the PLGRs, antennae and CPUs. When the civilian contractors diagnosed one of these components as being non-repairable on site, we would sign for a replacement. That MTS was on loan until the original item either returned from being repaired or was replaced entirely from the continental US (CONUS). We annotated the swaps as they occurred but still had to conduct constant inventories to ensure accountability. Repaired items usually took four to six months to return to us in theater.

More importantly, the MTS vehicle identification number changed if the antenna was replaced. The control station it was assigned to had to delete the old number and add the new antenna number to track and communicate with the vehicle.

Another issue was the placement of the antenna for communications with the satellite. For stationary use, the system communicates best when the antenna faced south and had an unimpeded line-of-sight to the satellite. For mobile stations, terrain, such as ridges and urban areas, blocked the signal, causing the vehicles to move until they got communications. OE254 antenna “farms” and Air Force radars also caused massive interference. Correct MTS antenna placement was, at times, a matter of mere centimeters.

One problem with the MTS system is the limited number of characters that the plain text message allows (85, including spaces between words). Our workaround was to break the message down into multiple transmissions (i.e., a nine-line MEDEVAC request took nine transmissions) or use a standardized system of acronyms and abbreviations that we developed in our standing



An MTS installed in a HEMTT.

operating procedure (SOP). An example is “IED ATK VIC CP15A, 3 EN KIA,” which means, “IED attack in the vicinity of Check Point 15A, three enemy killed in action.”

Another limitation that we faced in theater was the number of system options available to us. The mobile system can report its position to the satellite every 30 seconds, but due to the fact that the MTS program is in its initial stages, the military is using rented satellites that cannot handle this amount of traffic. Therefore, the only option we had was for the mobile systems to report their position every five minutes.

We could change this reporting to up to every 30 seconds, but the MTS would default back to five minutes; you never knew when it changed back unless you timed the movement of the mobile station icon. This might not sound like a big deal, but in Iraq, seconds often meant the difference between life and death.

Currently MTS users have one of two options to send a message to multiple MTS stations. The operator either can send one message to each individual station multiple times, causing a delay in the transmission of messages, or send one message to the entire group, even if it doesn't apply to all stations. It would have been helpful for us to be able to send a message to the multiple individual MTS users of our choosing at the same time.

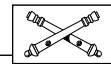
Another issue was that we had no idea who was in what group without physically going to a unit with MTS and asking them. This was particularly important if we had to notify QRF or MEDEVAC for an immediate reaction. We established a list of QRFs MTS group and identification numbers from different base camps and outposts, but this took an inordinate amount of time and effort. And our list was inaccurate when any user changed its antenna.

We would like MTS to have a version of “9-1-1” to contact ORF/MEDEVAC immediately in case of emergencies and an index of MTS units that is readily accessible.

Training on the MTS is critical, and combat is not the time to learn this system. We recommend MTS operations be incorporated into the mission-essential task list (METL) of multiple-launch rocket system (MLRS) ammunition crews with certification under the watchful eye of the battalion Master Gunner. MTS is not a difficult system to learn but, like other skills, its operational skills are perishable without constant practice and keeping up-to-date on system modifications.

MTS is a key element in the Army's efforts to improve its visibility of logistics that we took and used to our advantage. The Field Artillery community should incorporate enabling technologies, such as those found in the MTS, for seamless operations across the entire tactical and strategic spectrum.

MTS allowed us to be aggressive, yet flexible, in daily operations in all theaters of operations, especially fighting the insurgency in Iraq. The nation's most precious commodity, the lives of its sons and daughters, depends on the flexibility of systems such as MTS.



Captain Jeffrey J. Hilt commands C Battery, 1st Battalion, 12th Field Artillery (C/1-12 FA) (Multiple-Launch Rocket System) in the 17th Field Artillery Brigade, III Corps Artillery, Fort Sill, Oklahoma. As commander, he was deployed to Operation Iraqi Freedom (OIF) from April 2003 to April 2004, frequently conveying tons of captured enemy ammunition (CEA) and other explosives. In a previous assignment, he was a Company Fire Support Officer in 2-3 FA, 1st Armored Division, and was deployed in Operation Joint Guard to Bosnia for seven months in 1997.

Sergeant Fire Class Ronald L. Jones is the Master Gunner for 1-12 FA at Fort Sill. Also in the battalion, he was the Support Platoon Sergeant and deployed to OIF in that capacity for 12 months, returning in April. He was the NCO-In-Charge of many CEA convoys while in Iraq. His other assignments include three tours in Germany and three at Fort Sill. From September 1990 until April 1991, he served as the Ammunition Section Sergeant for 1-27 FA, 41st Field Artillery Brigade, V Corps, in the Gulf during Operation Desert Storm.

101st FIST Platoon in SOSO: Lessons Learned from CMO

By First Lieutenant
Robert M. Chamberlain

The usefulness of a fire support team (FIST) platoon does not disappear at the conclusion of high-intensity conflict. While the forward observers (FOs) no longer routinely are placing timely, accurate fires on the battlefield, the FIST has several attractive attributes for the maneuver commander in stability and support operations (SOSO). It has a high concentration of officers and NCOs, familiarity with tactics and communications, a fire support chain that extends to the highest levels of the organization, a habitual relationship with the maneuver element and the intelligence and flexibility that typifies Military Occupational Specialty (MOS) 13F Fire Support Specialists.

In 3d Battalion, 327th Infantry (3-327 IN), *Battle Force*, of the 101st Airborne Division (Air Assault), the FISTers were dedicated to the battalion's civil-military operations (CMO) at the end of major combat operations in Operation Iraqi Freedom (OIF). The FISTers of the 5th Platoon, Headquarters and Service Battery, 2-320FA undertook CMO in Mosul from May 2003 to February 2004.

CMO is likely to be a common mission for FISTers in SOSO; thus, the phases of developing CMO and the lessons learned in this article are important information for FISTers deploying to Iraq, Afghanistan or other areas of the world.

CMO presents several challenges for a FIST platoon. Untrained personnel must learn critical tasks rapidly. The platoon must develop staff procedures to integrate a variety of new mission types. FISTers must balance on-going combat operations with community-building missions. CMO must include an active security plan to address residual enemy forces while keeping the organization's aggressive posture from undermining relations with the local community. In short, CMO is hard work.

CMO occurred in essentially four phases: area assessment, key leader recruitment, project creation and project integration. Each phase set the conditions for the next, and each provided unique challenges in command, staffing, planning and implementation.

Phase I: Area Assessment. As our battalion entered Mosul, it rapidly transitioned to SOSO, which includes CMO. To "get our bearings," we began assessing local institutions that could become focal points for US aid and policy directives. Initially, we focused on schools, hospitals and mosques. Due to severe fuel shortages, US forces also assumed responsibility for the distribution of propane and kerosene.

We undertook several initiatives to assess the area.

- We established a standing operating procedure (SOP) that outlined the various organizations' anticipated informa-

tion requirements and the resources that will be dedicated to each. For example, will the infantry companies check religious institutions in their area of operations (AOs) or will the chaplain check all of them? This is not only more efficient, but also eliminates repeated visits to the same institution to ask the same questions, making US forces seem disorganized and ineffectual in the eyes of the local population.

Additionally, the assessment process can become a never-ending process of reassessment for more and more detail. If the command knows what information is necessary for effective decision-making in subsequent phases, as outlined in an SOP, it can avoid this trap and shift its main CMO effort at an appropriate time.

- We interacted with the local population but did not revisit institutions unless we had news the institutions needed. Once again, if one week a school asks for pens and paper and a unit drops by the next week without any supplies, the school will not appreciate the neighborliness; it will be irritated the unit came empty-handed.

- We integrated information operations (IO) into the Assessment Phase in the form of "talking points" disseminated to all leaders who have formal interactions with local institutions. Initially, these talking points addressed US efforts in areas likely to be of great

Photo by SGT Kyran V. Adams, 55th Signal Company (Combat Camera), Fort Meade, MD

concern to the Iraqis (food, water, electricity and fuels) and increased local perception that the unit is addressing community problems in a decisive and coherent manner.

Phase II: Key Leader Recruitment. As is generally the case in CMO, there was significant overlap between Phases I and II. Phase II began in late May and continued through July. Having done our initial assessments of community institutions, we began meeting with local leaders to gain their support of the US effort. In Iraq, we met with secular community leaders (called Mukhtar), local religious leaders, academic leaders from the university and city leaders from the newly selected Mosul City Council.

We invited these leaders to a series of forums known internally as Operation Soul Train. Additionally, company FISTs made a concerted effort to recruit Mukhtars in their AORs.

- We took into account the local culture. In Iraq, the Mukhtars are a combination of public services hotline, notary public, phone book, postmaster and gossip columnist. However, they were not included in the battalion's initial assessments.

Once we "discovered" Mukhtars, we



Soldiers of C Company, 3-327 IN, prepare to conduct a raid and cordon search in a suspected Fedayeen rebel's home in Mosul, 29 July 2003.

Photo by SPC Kieran Moore, 982d Signal Company (COMCAM)

had an additional intelligence source that had broad knowledge of the community, a source of local legitimacy for searches of suspects' houses and a convenient neighborhood liaison. At the same time, we also learned that community leaders may have links to the old regime and, therefore, should be approached with caution.

It is likely that every society will have an idiosyncratic institution that may be of some value to occupying forces. It is up to battalion and company-level leaders to make contact with these individuals and use them to achieve their CMO mission.

- We recruited key leaders on a one-on-one basis. While some local leaders are suspect, others can be extremely valuable allies. A relationship built over time can be translated into concrete

can yield significant results.

- We avoided repeated mass meetings if initial results are unpromising. There is a distinct possibility that these meetings will become forums for airing grievances that yield neither goodwill nor progress. Even acknowledged enemies of the US will show up for a good meal and a chance to try make the US leadership look bad.

Additionally, preparing facilities for a mass meeting, distributing invitations and tasking battalion leaders for the evening are resource-intensive activities. Attempt a mass meeting, but unless some identifiable benefit is apparent early on, beware of being trapped into a recurring high-effort, low-yield activity.

Phase III: Project Creation. In June, the 101st Division made funds available at the brigade level for projects designed to improve the quality of life in the local communities. The 502d Infantry Brigade, to which 3-327 IN was attached, then allowed the battalions to submit projects to the brigade for funding. The battalion created some projects of its own, but it also tasked its companies to produce projects for their sectors.

We considered several things when initiating a project.

- We focused on high-payoff projects, regardless of cost. The ideal project for local communities would make their lives significantly better and cost next to nothing (e.g., digging a culvert that drains a local swamp). However, these projects are few and far between.

Thus, the battalion was pulled in two directions: a low-cost "quick fix" that treats the "symptoms" but not the "disease" (e.g., sending trucks to eliminate



A local Mukhtar discusses local issues during a weekly meeting on 14 July 2003.

Photo by SSG William Armstrong, 56th Signal Company (COMCAM)

a local cesspool) or high-cost systemic fixes (e.g., rebuilding the neighborhood sewage network). In our experience, a two-pronged approach is best. Initially, we used the quick fix to alleviate some of the worst problems that had built up over months. Next, rather than continue the quick fixes indefinitely, we followed up with a systemic fix that prevented the problem from reoccurring. This alleviated both current suffering and avoided future problems.

- We established an asset under battalion control to create and monitor projects. Company commanders inevitably sought to distinguish themselves from their peers, and the easiest measure to compete in CMO is the number and cost of projects. Unfortunately, this may result in the proliferation of easy to manage quick fixes at the expense of the development of the more time-consuming systemic fixes.

A battalion asset that did the actual contracting avoided this issue and encouraged company commanders to focus on the security and well being of their sectors, regardless of the projects that resulted from their assessments.

- When possible, we allowed the local government to award and administer contracts. This was an excellent way to build institutions, reduce the battalion's work load and find contractors to do the work. We found the best way was to establish a contract for a project with the relevant government agency and allow the agency to take care of the project's implementation.

The implied tasks are that either the battalion or some higher headquarters checks the accounting of the funds and spot-checks the work being done.

Phase IV: Project Integration. In September, the brigade began transitioning away from the use of US-controlled funds to let contracts. The brigade began receiving smaller payouts to distribute to the battalions.

At the same time, the Mosul government agencies received their operating and capital budgets from the central Iraqi agencies. Thus, it became imperative that the battalion develop a way to ensure that local communities received the services they needed from their gov-



A Soldier from A Company, 3-327 IN, conducts a cordon and search looking for weapons in Mosul (18 June 2003).

Photo by SFC Kieran Moore, 982d Signal Company (COMCAM)

ernment. This necessitated the creation of Task Force 95 (TF 95).

In TF 95, the battalion's FISTers re-consolidated into a single FIST platoon of subject matter experts (SMEs) who became proficient in working with the broad range of agencies that dealt in providing public services. Instead of helping formulate and supervise projects at the company level, the companies submitted their needs to the battalion staff, which then prioritized the requirements for the FISTers to work with the agencies to implement them.

To facilitate this process, we undertook several initiatives.

- We developed an IO plan that enabled untrained Soldiers to understand how to build a network with external agencies. The Soldiers and NCOs of the US Army are without parallel. However, it's foolish for leaders to assume they naturally will understand the tasks inherent in becoming CMO SMEs.

SMEs need an easy format to fill in the points of contact (POCs) for all the agencies they discover, so the POCs can link up with the known agencies early on and monitor their progress with a tracker they can update daily. This enables Soldiers to achieve success.

- We used liaison meetings as an opportunity to ensure the community development vision was embedded in each agency's capital budget. If unit funds are limited, creative leaders must go elsewhere in search of funds. One way is to be an advocate on behalf of local residents in meetings with their government agencies.

These meetings also may yield some unpleasant truths about where the AO stands in the priority for funding and repairs. However, being able to explain

to local residents that there is a plan and that they will get services eventually will go a long way toward winning their trust.

- We disseminated contact information to local citizens to facilitate the eventual transition of US forces out of the AO. Nobody wanted us to be an occupying force in perpetuity, but before the US can leave, it must ensure the local community can succeed on its own.

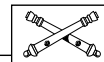
To create a sense of self-sufficiency, Soldiers began referring residents who cited problems directly to the relevant government agencies and the city council members. This acquainted

them with democracy and forced the officials to "own the problem," rather than push it onto the US Soldiers. The intended result was for the Coalition to leave behind a community that registered its own complaints, allocated its own resources and solved its own problems.

CMO is an inherently difficult task as it requires Soldiers to operate beyond the scope of their training and experience. The difficulty is compounded if the Soldiers are forced to learn their jobs "on the fly."

However, with an effective SOP in place and a well-articulated long-term CMO vision, the initiative and intelligence of the American Soldier can overcome these difficulties and he will accomplish his CMO mission.

While it is difficult to train for CMO, it is not difficult for leaders at all levels to build a plan in anticipation of CMO. The lessons learned by our FISTers should help leaders across the Army with "boots on the ground" to transition smoothly from high-intensity conflict to SOSO.



First Lieutenant Robert M. Chamberlain was a Company Fire Support Officer in 2d Battalion, 320th Field Artillery (2-320 FA), 101st Airborne Division (Air Assault), and deployed in Operation Iraqi Freedom from May 2003 until February 2004. During that time, his Fire Support Team (FIST) undertook civil military operations for its supported battalion, 3-327 IN. Returning stateside, he became the Assistant S4 for 2-320 FA before attending Oxford University in Oxford, England, starting in October, as a Rhodes Scholar. He received his commission from the University of Kansas ROTC in 2002.

FA NCOs—Lead, Follow or Get *the-Hell* Out of the Way!

By Command Sergeant Major
Tommy A. Williams

“Lead, Follow or Get the-Hell out of the Way!”—Okay, you’ve heard that before. But I can’t think of another time in my 28 years of Army service that it applies more than it does today. The Active Army (AC) and Army National Guard (ARNG) always have looked for ways to transform into a more lethal and effective fighting force and have constantly changed during the past 229 years; however, at no time in our history have we been asked to change as many things that affect Soldiers and families as quickly as we are today and while executing a war.

We are in the process of rapidly redesigning and restructuring our Field Artillery formations across the Army to be lighter, more expeditionary and more modular to face contemporary operational environment (COE) threats. That affects how you operate in those units.

We are changing the way you are trained and developed in the NCO Education System (NCOES), both in terms of length, contents and numbers of courses.

The Army is changing the way and length of time you will serve tours in one unit or at one installation, also affecting your career development. This stabilization of Soldiers and leaders for longer tours for more in-depth experience is changing the opportunities you will have to serve in leadership positions. (For more information on stabilization and its affects on you, read the article “FA Branch: Manning a Force in Transition” by Lieutenant Colonels Dennis J. Jarosz and Raymond L. Bingham in the July-August edition.)

If you are uncomfortable with change, then you can hardly stand yourself now. If you are comfortable with change, then you are flexible, have positive energy and are open to ideas that will meet the challenges of rapid change—see those challenges as opportunities to improve the Army and the Field Artil-



A drill sergeant at the Field Artillery Training Center, Fort Sill, leads basic combat trainees on a tactical move.

lery. Although there will be some “growing pains,” Artillerymen should be excited about, not scared of, where these changes and transformation will take us.

New FA Units. Most of you have served in brigade combat teams (BCTs) at one time or another in the past few years. The BCTs, recently reconfigured as units of action (UAs) in the 3d Infantry and 101st Airborne Divisions, are the new fighting formations in our Army. Other AC divisions will follow suit. When all is done, the number of BCTs configured as UAs in the Army, both AC and ARNG, will be more than the number of BCTs in the Army today.

To fully man and equip these new FA units in the BCTs, called fires battalions (cannons), we are reorganizing Field Artillery units—reorganizing AC FA units rapidly with ARNG FA units reorganizing over time. Although there will be more ARNG BCTs and each will have a fires battalion, overall the number of ARNG FA units will decrease with a decrease in ARNG multiple-launch rocket system battalions and some converting to other branches, such as Military Police.

When it is all done, the target is for the remaining ARNG FA units to have the

same equipment and weapons as their AC sister units—be fully modernized and combat ready at C-1 status. So for the first time, the AC and ARNG FA truly will be “A branch of *one*.”

All BCTs will be capable of deploying either independently or as part of larger formations. To achieve that level of modularity, fires battalions (those cannon battalions in the division artilleries, or Div Artys) are becoming organic to the BCTs and belong to the BCT commanders—that is a “done deal.”

To accomplish our mission, we, the Field Artillery Senior NCO Corps, must ensure we train and certify all FA crews, sections and individuals at all levels of delivering FA fires and fire support as part of the fires battalion and BCT. And to do this, you won’t have the Div Arty command sergeant major (CSM) to provide the standardization and evaluation guidance that you’ve become accustomed to.

Battalion CSMs assume that role within fires battalions. You have an opportunity for greater impact on your Soldiers, but you also have greater responsibility to be technically and tactically competent to train, develop and protect them.

In the future, a unit, known as the fires brigade, will serve in a unit of employment (UEX), which will be roughly the size of a division, with BCTs subordinate to it. Some of the fires brigades will not reside with their affiliated UEXs; all fires brigades will be tailorable and modular, able to be weighted by weapons systems and assigned to whatever UEX needs them. The fires brigades can add FA battalions, based on their missions.

The first fires brigade to stand up will be the one in support of the 4th Infantry Division at Fort Hood, Texas, on 16 December.

New Missions, New Training. Historically, as the first-line leaders of Red-

legs, NCOs have ensured cannons, rockets and missiles engage and destroy our enemy at great distances and in close combat, helping to set the conditions for fires and maneuver to defeat the enemy decisively. You still have that mission; but you also must be prepared to execute more nonstandard and joint fires missions than in any time in US history.

Artillerymen are executing nonstandard missions in Afghanistan, Iraq, Kosovo, Bosnia and other places around the world. Redlegs are being called on to patrol, secure checkpoints, control riots, secure convoys, search houses, arrest fugitives, serve as town stewards and many other nontraditional tasks. At the same time you are executing these new tasks, many of you are required to maintain a capability to respond quickly to counterfire threats as well as protect the force in other ways. In fact, for Redlegs, our "standard" mission requirements now encompass many more of what we used to consider "nonstandard."

These are all changes we have adjusted to in the past two years. Most of you have lived with these realities on a daily basis. As the Command Sergeant Major of the Field Artillery, I fully understand we must better prepare you, our enlisted Artillerymen, to handle these missions.

The NCOs of the Field Artillery have a window of opportunity to influence change. I and the Chief of Field Artillery are prepared to support the FA NCO Corps to ensure its quality remains and capabilities expand. Here are some initiatives at Fort Sill to support you and other FA NCOs worldwide.

● *Improvements in the NCO Academy (NCOA).* One of the first things the new Chief of Field Artillery did was to instruct the NCOA to become completely automated by FY06. That will allow every student to have a computer at his workstation and all classrooms to be linked into a central network.

The networking of systems, in turn, will allow the NCOA programs of instructions (POIs) to integrate students into collective training with the FA Officer Basic Course (OBC) and Captain's Career Course (CCC). Tying training together at multiple levels ensures you not only know how to operate the individual systems, but also how they work with other systems and their effects on today's battlefield.

● *Joint Fires Training.* In the COE, you must know joint fires. Fort Sill's

mission is to train all fire supporters to understand how to integrate and execute joint fires. To do that, you first must understand the joint battlefield and the impact of lethal and nonlethal fires and effects in a given battlespace.

At Fort Sill, we are developing a Joint Fires and Effects Trainer System (JFETS) that will incorporate both live and virtual joint fires training. (See the article "Joint Fires and Effects Integration Center: Fort Sill Initiatives for the Joint Force" by Colonel John L. Haithcock, Jr., in the July-August edition.)

JFETS is a major investment in cutting-edge technology to train and certify joint fire supporters. This training will ensure you remain combat-focused and continue as the best trained and most flexible NCOs in our Army.

● *Improvements in Other FA Training.* We are rewriting POIs for every FA military occupational specialty (MOS) from advanced individual training (AIT) to the advanced NCO course (ANCOC). The new POIs will incorporate instruction on MOS operations in a COE as well as lessons learned in Operation Enduring Freedom (OEF) in Afghanistan and Operation Iraqi Freedom (OIF).

● *NCO Education System (NCOES) Revisions.* The Army will change NCOES dramatically during the next three years. For example, as of this October, the FA ANCOC will no longer teach common core tasks. By October 2006, ANCOC will merge with the basic NCO course (BNCOC) to become one level of training.

The current four-tiered NCOES will become a three-tiered system. The new levels will be the Warrior Leader Course (Primary) (E-4/E-5), Intermediate Leader Course (E-6/E-7) and Advanced Leader Course (E-8). Among other things, the changes will eliminate redundant training of tasks at the different levels yet teach all the required subjects.

The three-tiered structure will allow you to attend courses within the training window of opportunity of your unit's 36-month management lifecycle. (This lifecycle is explained in more detail in the article "FA Branch: Manning a Force in Transition" in the July-August edition.)

Lead the Change. Change is inevitable. I have discussed only a few changes and improvements to meet the challenges of those changes. More of both are coming.

You have choices. One is you can

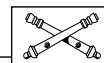
stand around and wring your hands and decide you are set in your ways or just let the changes pass you by while you are busy wringing. But the best choice for you, the FA and the Army is for you to *lead* the change.

You *lead* change by becoming informed about how each of these changes affects your Soldiers, your families and yourself; by ensuring your training and expertise prepares you for the changes in your units; by shepherding your Soldiers and units as they go through these changes; and by ensuring you provide feedback on these changes to the senior NCO leadership—which is your opportunity to influence changes ahead.

At the DA staff and at Fort Sill, we do our best to take into consideration the impact of major decisions regarding FA training, organizations, doctrine, personnel and leaders. But I need your feedback to improve and fine tune our support for you. Email me with your feedback at redleg@sill.army.mil; mark the "Subject" line "NCO Feedback."

Today, your opportunities to excel as an NCO or be promoted to our most senior grades have never been better. We are adding new fires battalions to the total force and growing the number of 13F Fire Supporters in our formations over the next couple of years. These are good news stories—the Field Artillery is alive and well.

You, FA NCOs, must be catalysts for change—take advantage of the opportunities that change brings and lead your Soldiers and units into the future. Thank you for what you do for our country and our Army. Thank you for what you do everyday for our Field Artillery.



Command Sergeant Major (CSM) Tommy A. Williams has been the CSM of the Field Artillery, Fort Sill, Oklahoma, since 20 January. During his 28 years of service, he was CSM of the 25th Infantry Division (Light) Artillery, Schofield Barracks, Hawaii; CSM of the 3d Battalion, 7th Field Artillery (3-7 FA), also in the 25th Division; and CSM of 3-29 FA at Fort Carson, Colorado, part of the 4th Infantry Division (Mechanized). He served as the First Sergeant for A Battery, 1-8 FA, 25th Division, and C Battery, 4-29 FA, 1st Armored Division in Germany. Also in the 1st Armored Division, he was the Division Artillery Operations Sergeant and Nuclear Weapons NCO-in-Charge (NCOIC). CSM Williams has held every position from Gunner through CSM.

The “Vision Thing” for Lieutenants

By Major S. Mark McMillion

Ever since I was a cadet at the US Military Academy at West Point, I have heard about the “vision thing.” I learned that a great leader has a vision and is able to communicate that vision to his troops. The reverent tones and mystical references made it all seem very mysterious to me. Time and again, I was told how crucial it is that a leader have “vision.”

But as a cadet and, later, as a lieutenant, I concluded that I must not be destined for greatness because I just didn’t “get it.” I remember taking over my platoon and not having a clue what my platoon was going to be doing (except, of course, lobbing 100-pound projectiles many miles downrange to render death and destruction on the godless enemies of our country), much less my role in the platoon. So how could I have a platoon vision?

As a brand new firing battery platoon leader, I just didn’t *know* very much about platoon operations. My half-day as the advance party man during FA Officer Basic Course at Fort Sill, Oklahoma, just didn’t spark that celestial dream of how I would one day mold my firing platoon into a fearsome, death-dealing bastion of indirect firepower.

Fortunately, I had an absolutely superb platoon sergeant, then-Sergeant First

Class George Harvey, who taught me much of what I needed to know.

Fourteen months later, I had a pretty good idea of what my platoon could accomplish and, more importantly, where it could go, in terms of capabilities and performance. My platoon sergeant had gotten me to stick my nose into *FM 6-50 Tactics Techniques and Procedures (TTP) for the Cannon Battery* (now FM 3-09.70) and read up on the TTPs of the cannon battalion. I learned what a mission-essential task list (METL) was and what it had to do with me. I spent a great deal of time tapping into my platoon sergeant’s experience base and interacting with my Soldiers.

But by then, I was finished with my gun line time and went off to the battalion S2 shop where I couldn’t even *spell* AR 190-11, the regulation governing the physical security of arms, ammunition and explosives.

Eighteen months later, I took command of a battery at Fort Sill. I had been in command for a couple of months and knew things weren’t quite humming the way they should have been when the battalion commander called me in and told me what I already knew. His assessment was that my battery was drifting due to my failure to communicate my

vision for the unit to the Soldiers.

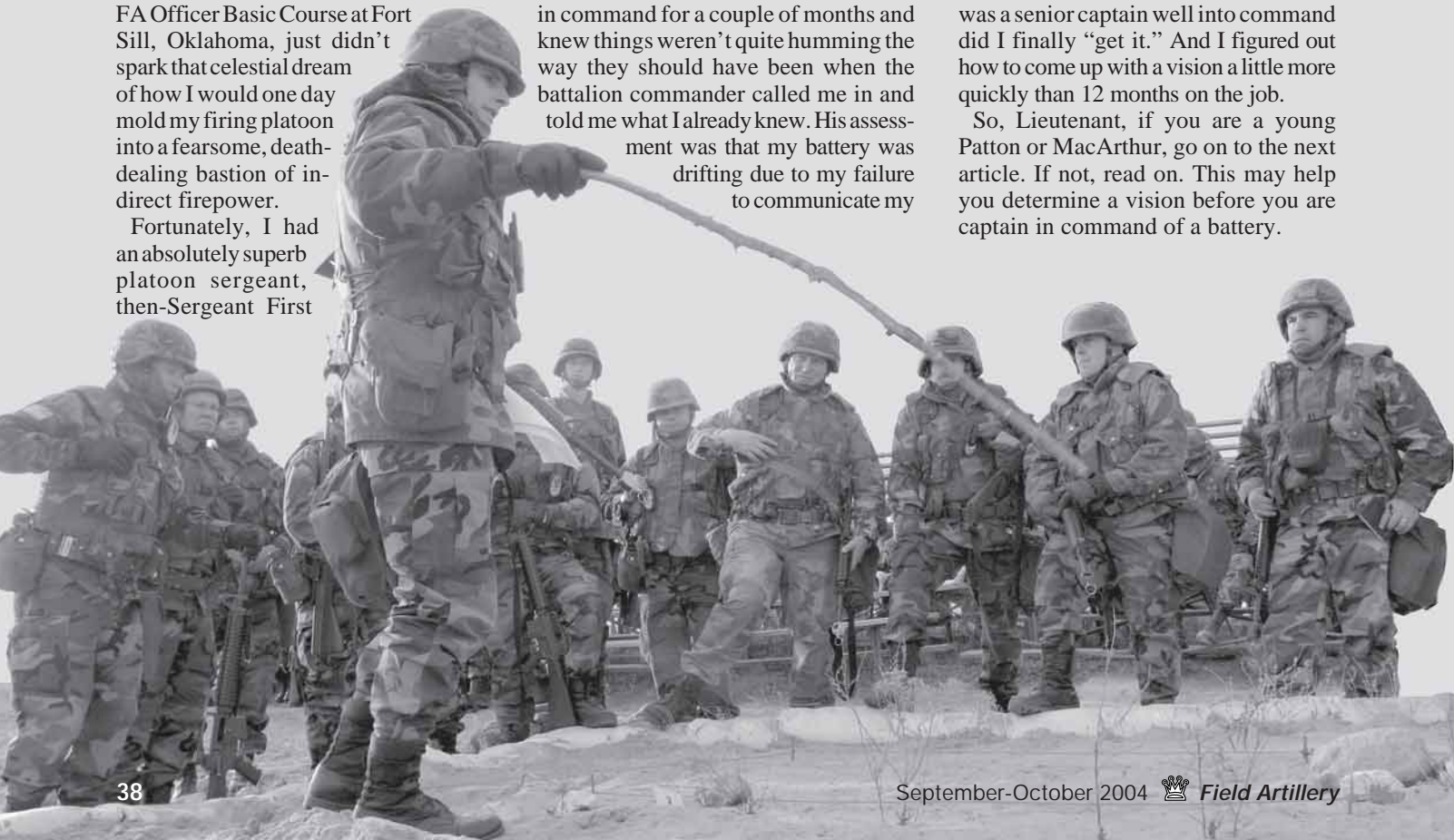
“Crap!” I thought, “*that damn vision thing again.*” I told the boss I was struggling with that whole vision concept, and he said, “You know, your vision is where you want your battery to go.” Oh, no *kidding.*

We talked for a few more minutes (to no avail), and I went off and made a PowerPoint briefing to help me tell my Soldiers what I thought I wanted. I held a battery meeting and gave them my pitch, and everything just took off as if by magic, right? *Wrong.*

It was only after I had been in command about a year that I was able to articulate clearly what I wanted. After I dug into the program of instruction (it was a basic training battery), delved into my battery METL, figured out how we measured our performance as trainers and spent some time with my NCOs, I was able to see the possibilities that lay before my battery.

I had puzzled over this vision thing for many, many moons, and only after I was a senior captain well into command did I finally “get it.” And I figured out how to come up with a vision a little more quickly than 12 months on the job.

So, Lieutenant, if you are a young Patton or MacArthur, go on to the next article. If not, read on. This may help you determine a vision before you are captain in command of a battery.



Defining Vision. Let's start with a definition of "vision." Warren Bennis, the author of several books on leadership and widely considered to be a really smart guy on the subject, describes it this way: "a vision articulates a view of a *realistic, credible, attractive* future for the organization, a condition that is better in some important ways than what now exists [emphasis added]" (*Leaders: The Strategies for Taking Charge*, Harper & Row, New York, 1985, Page 89.)

Wow! Sounds impressive, but what does it mean? First of all, you must realize we're talking about the future. This is something out in front of where you are today in terms of both time and performance. Vision is more than a goal. Goals should be more specific. A vision is broader and more general. It usually is measured in terms of several goals across different areas.

Making Your Vision "Realistic." That means achievable. This is subjective. The problem with realistic is that it varies from leader to leader.

Just as a leader must be careful when setting goals for his unit, a realistic vision can be tricky. If you set the bar too low, there is no pride in achieving the vision and you need a new vision.

Additionally, low-bar vision can undermine the Soldiers' confidence in the leadership—they actually may feel insulted. For example if part of your vision is to improve the physical fitness of your platoon with the goal of each Soldier's achieving a score of 200 on the physical fitness test (PT), your Soldiers' reaction very well could be, "The Lieutenant wants me to score 200 on the PT? Ooooooh, I'm scared."

Set the bar too high and Soldiers will become discouraged and view it as unachievable—"The Lieutenant wants a 295 average? It's time he gets a urinalysis test."

You must know what you are asking of your unit when you set goals or determine your vision for your Soldiers' future performance. To do that, you must know what tasks the Army needs them to perform under what conditions and to what level of standard, how your Soldiers are performing now and how much more they are capable of with effort. Figure 1 outlines a five-step process for doing your homework before determining your vision.

1. Study Doctrine. The first place to begin is with doctrine and the professional knowledge base. This means you dig into field manuals (FMs), mission

1	Study doctrine.
2	Review the mission and mission-essential task list (METL).
3	Research unit performance.
4	Talk to top NCOs (platoon sergeants and first sergeants).
5	Visit with Soldiers.

Figure 1: Research Steps to Forming a Vision

training plans (MTPs), *Field Artillery Journal (FAJ)* articles and Center for Army Lessons Learned (CALL) publications. FMs and MTPs will tell you the by-the-book way. Consider this the ground-truth, the foundation for everything else. *FAJ* and *CALL* articles give the latest scoop on how people are adapting doctrine and devising TTPs to meet their current needs and situations.

2. Review your battalion's mission and METL. Your mission will tell you your one-over-the-world job, something like, "To deploy worldwide and provide close supporting fires, counterfires and shaping fires in support of the 2d Brigade Combat Team's operations." Your vision statement may closely parallel this mission statement, only written at your level. Most of the time they do—but not always.

Another good place to look is your chain-of-command and their vision statements. None in my chain were helpful, but those in your chain might be very helpful. I did have a brigade commander who had a superb vision.

The example in Figure 2 was adapted from Colonel Michael W. McKeeman's vision statement as the commander of the Field Artillery Training Center at Fort Sill. Although this vision is for the brigade level, the point is that instead of conveying specific mission performance, it conveys a manner, an attitude of performance, if you will, as an option.

3. Research your unit's performance. Examine the battery and battalion's performance on the last field exercise,

to include any formal and informal after-action report (AAR) comments. Look at command inspection (CI) program results and the current statistical picture (PT averages; marksmanship scores; measures of expertise, such as performance levels on the gunner's test; etc.) as well as any other type of unit measure you can find. This information will help you understand all the tasks your unit performs and its proficiency at them. These results should point out some of the unit's strengths and weaknesses.

For example, if in looking over the results from the last round of gunners' tests you see that your platoon had the least number qualify as expert and that in section evaluations, your gun sections came in, in the bottom one-third, then you can see there is room for improvement. And if in examining the fire direction center (FDC) competition you discover your FDC come in dead last, there is definitely room for improvement. You can incorporate these upgrades in your vision to read something like, "to be the most technically proficient platoon in the battalion." The platoon's progress easily can be assessed through regular competitions in the battalion.

4. Talk to your NCOs, your platoon sergeant and first sergeant. Doing Steps 1 through 3 will help you understand what your platoon sergeant will tell you. This discussion should cover the unit's strengths and weaknesses—what it can do and what it should be able to do, but can't—and where the NCOs see the unit going (improving, getting worse or standing still).

I also recommend you talk with the section chiefs separately to get more candid feedback.

5. Talk to your Soldiers and get a feel for their levels of confidence, competence and morale. This does two things for you. First, it allows your Soldiers to get to see you up close, get to know you.

Spirit is pride—pride in what we do as Soldiers for our country, in how we wear our uniform and in how we conduct ourselves on and off duty.
Discipline is maintaining Army values and doing our duty without regard to the consequences or level of supervision.
Teamwork is valuing each Soldier and his abilities, working together to accomplish each mission and putting more effort toward the unit's success than our own personal success.
Time-on-Target is when devastating artillery fires are massed at precisely the right spot at precisely the right time to determine the outcome of the battle.

Figure 2: Spirit, Discipline and Teamwork Equal Time-on-Target (SDT=TOT)

Second, it lets you get to know your Soldiers individually.

Ask your Soldiers questions and then *listen* to their answers. Ask about their families; but most importantly at this stage, ask them how the unit is doing. How long have they been in the unit? How was the last field problem? “Are ‘we squared away’?” Which platoon is the best in the battery, in the battalion? (You should hear, “*This* one is.” If not, you might want to incorporate that into your vision.)

Creating Credibility. Bennis’ definition of a vision as “credible” means there must be some basis for the vision. This is closely linked with the “realistic” aspect of the vision.

What’s more, credibility stems from the leader himself. The leader must see that the leader is basing his vision on more than just a “gut feel” or worse yet, a “swag.” If you walk in on Day 1 and begin sharing your vision, you are going to lack credibility.

It may be possible for you to do all or most of the five research steps to ensure your vision is “realistic” before you assume the leadership position. But *generally* speaking, your Soldiers will wonder how the heck you know what you’re talking about only 24 hours into the job.

I recommend you wait at least two weeks before sharing your vision, and you can take up to 30 days. However, at the end of that first month, you should be able to articulate the destination you are leading your Soldiers to and how you are going to get them there. (Obviously, there are exceptions to this, such as taking over in *combat*.)

Credibility also comes from your personal performance. Study up *before* you get there, so you get a running start. Admit when you don’t know something. No one expects you to know everything right away. It demonstrates honesty (and courage) to admit what you don’t know and inspires confidence when you do speak because the assumption will be that you know what you are talking about (because you admit when you *don’t*).

PT is one of the foremost places to gain credibility. You should be at the 270 level or above. You may not be the fastest troop in the platoon or able to do the most push-ups, but you should be near the top.

Another obvious place to enhance your personal credibility is with your appearance. A good haircut and a well-

kept uniform worn correctly go far. Lieutenant, figure the beret out ASAP.

Making Your Vision Attractive. Bennis’ “attractive” means your vision is of a place or condition to which people want to go. This is usually in terms of eliteness, effectiveness, capabilities, excellence or another dimension along those lines.

No one truly aspires to mediocrity. Soldiers (and people in general) want to be in a better unit/organization. They want to be able to brag that their platoon is the best platoon in the battery/battalion/division artillery/Army.

Your vision will enable your Soldiers to see what they will look like in the future. It has a basis in the here-and-now, but it is a destination, a state of being that is demonstrably better than where they are now.

Bennis wrote, “When individuals feel that they can make a difference and they can improve the society in which they are living through their participation in an organization, then it is much more likely that they will bring vigor and enthusiasm to their tasks and that the results of their work will be mutually reinforcing” (*Strategies for Taking Charge*, Page 91).

This is a bit of basic psychology that leaders need to know and tap into. What does it have to do with vision? It shows the impact of giving Soldiers *purpose*. Purpose will help you craft an attractive vision that your troops will want to be part of.

Communicating Your Vision. Now that you’ve created your vision, you need to share it with your Soldiers. Do it in three steps. First, explain it to your NCOs—your platoon sergeant, gunnery sergeant, section chiefs—and then your battery commander (BC).

I recommend you bounce it off your platoon sergeant one-on-one first and get his feedback. He makes an excellent sounding board for *all* your ideas, but this one is especially important.

Then take your vision to your BC. Running anything you want to put out to your platoon as guidance by the BC is always a good idea. The last thing you want is to have to retract your vision when the BC does not agree with it.

Then take it to the rest of the NCOs. This can take a variety of forms, such as a speech or a PowerPoint presentation. You should pick a medium you are comfortable with, so you can focus energy on your message, not on struggling with your means of delivery.

Speaking of energy, you need to show some during your deliveries, both to the NCOs and to Soldiers. Your vision is something you should be passionate about. You don’t necessarily need to be screaming and yelling, but you definitely need to put out positive vibrations.

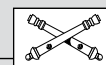
Next, you share your vision with all your Soldiers. This can be done in formation, in a classroom, in the motorpool, in the field or somewhere else. You should pick the location deliberately to help emphasize your message. For instance, if maintenance is problem area and a significant part of your vision, the motorpool might be a great place to deliver your message.

The third step is to share your vision *continually*. Everyday look for opportunities to reinforce your vision: what it is, how the platoon is moving toward it and the progress the platoon already has made. Encourage your subordinate leaders to do the same. This should be one of the points you make when you meet with your NCOs initially—that you need them to buy into the vision and help make it happen.

A vision unites, inspires, motivates and points the way. It helps the leader take his unit to a better state of being, a higher level of performance. It allows Soldiers to see where they are going and how they are going to get there.

FM 22-100 Army Leadership leaves the discussion of vision to the strategic level of leadership. But as a Lieutenant, if you elect to read Chapter 7 of that manual, you will see much of what I have covered in this article.

I submit that vision is for lieutenants, not just generals.



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The Digital Battery "TOC"

By Captain Ryan A. Howell and Craig B. Abler

At 0300, the radio crackled to life. The battalion assistant S3 came over the net and announced a pending warning order (WARNO). Rather than calling in battery commanders (BCs), sending runners to the batteries or taking the time to read the data over the net, the battalion commander switched on the radio and executed a digital file transfer of the order. Each BC then opened, reviewed, edited and printed multiple copies of the order for his battery leadership.

The BC then called in key leaders and issued the WARNO. Only 20 minutes had passed, and the platoons' leaders all had the critical information they needed to begin troop-leading procedures.

This scenario is reality and the result of Force XXI technology: the single-channel ground and airborne radio system (SINGARS) file transfer. Thanks to an application of existing research and products, any unit can acquire and implement SINGARS file transfer.

The 1st Battalion, 10th Field Artillery (1-10 FA), located at Fort Benning, Georgia, as part of the 3d Infantry Division (Mechanized), completed its rotation at the National Training Center (NTC), Fort Irwin, California, in 2004 and came away with some valuable lessons learned. 1-10 FA's tactical operations center (TOC) employed a means to transmit documents via SINGARS. During the rotation, on the average, 1-10 FA BCs were able to hand out full printed WARNOs to their leaders within 20 minutes of receiving the battalion's digital traffic.

The equipment needed for this exchange provides multiple capabilities to BCs. Computer files of any type can pass through SINGARS connected to a laptop. The laptop can be mounted in the BC's high-mobility multipurpose wheeled vehicle (HMMWV), creating the digitized battery "TOC." Command-

ers throughout the battalion can receive and transmit files at will. Battery commanders can produce orders, employ digitized battery systems and provide the tools normally associated with a TOC.

Equipment for File Transfers. SINGARS transmits documents via the RS-232 data feature of the 1523E Advanced System Improvement Program (ASIP) model. RS-232 is a data protocol commonly used by terminal emulation programs, such as Hyper Terminal, to communicate over a computer's serial port. The RS-232 data feature of the ASIP allows a user to connect two computers via radio and communicate back and forth using Hyper Terminal (which is included with the Windows family of operating systems) or other such terminal emulation programs. Hyper Terminal allows for simple text messaging from end to end or for file transfer.

Each end of the transmission link can setup for file transfer by simply connecting a cable from the serial port of a computer to the AUD/DATA jack of the ASIP radio. Figure 1 shows a laptop computer mated to an ASIP SINGARS through a modified data cable. Unfortunately, a cable equipped with the proper connectors and the correct wiring pin-out currently is not available in the



Figure 1: The digital cable links a single-channel ground and airborne radio system (SINGARS) to a laptop computer through the computer's serial port.

Army supply inventory; therefore, the cable must be fabricated.

Chief Warrant Officer Two Kenton Groombridge of the 442d Signal Battalion, Fort Gordon, Georgia, has provided a document with national stock numbers (NSNs) and step-by-step instructions for modifying the cables to transfer the documents as well as setup and directions for RS-232 file transfers. CW2 Groombridge's instructions are available at www.team-signal.net.

Advantages. Such transfers offer many advantages for the TOC and BCs.

- Digitizing information flow allows the battalion to minimize the use of couriers or the frequency of the battery leaderships' trips to the TOC and reduces lengthy radio transmissions to distribute vital data from higher headquarters to subordinates rapidly. There is a significant time savings in information dissemination, and the digitization reduces the chances of errors.

- The reduction of travel gives BCs more time to plan and execute their missions (e.g., fewer late-night, low-visibility drives to and from the TOC).

- By reducing the need to dispatch couriers (generally gunnery sergeants for a firing battery), there are fewer operational tempo (OPTEMPO) miles, reducing Soldiers' exposure to the environment and the enemy, thereby, helping to protect the force. The battalion observed that this single digital document technique netted substantial gains in force protection for the battalion during the rotation.

With the fewer OPTEMPO miles, there also is less vehicle fatigue.

- File transfers reduce the number of critical documents distributed in hardcopy to batteries, decreasing the wear and tear on the battalion's field photocopier. This produces a secondary savings in terms of printing and

copier costs.

- Message traffic passed in this manner offers other enhancements to battery resource management. By using either an advanced FA tactical data system's (AFATDS') printer or a standard office printer, a BC quickly can edit and print a detailed WARNO for the battery. This use of laptop computers and printer/scanner/copier devices abolishes the need for hand-written orders and carbon copies.

Using these technical assets, BCs can manufacture multiple issues of full battery orders, complete with synchronization matrices and support plans. This contributes to improvements in mission comprehension and execution at the platoon and section levels while saving preparation and dissemination time.

- Laptop computers at the battery level empower commanders with tools previously only afforded to battalion staffs, such as Falconview and Mr. SID Viewer. With these programs, BCs, platoon leaders and gunnery sergeants can do detailed map recons of routes and position areas without requesting additional support or resources from battalion.

During the rotation, this proved to be a highly successful means of preparing for movement through constricted terrain. Commanders exported data from these two programs and incorporated the data into their WARNOs and operations orders (OPORDs).

Disadvantages. Transferring files digitally via the ASIP SINGGARS does have some disadvantages.

- The fastest data rate that can be used for file transfers is 9600 baud. At such speeds, document transfer times are on the order of minutes, not seconds. Most terminal emulation programs, including Hyper Terminal, were written for point-to-point communications, and thus, files cannot be transmitted to more than one receiving station at a time. During transfer, the ASIP radio must be keyed continuously; a separate net is required to ensure that no traffic collisions occur during file transfer.

- The longer the required transfer time, the more likely a file is to become corrupted. Large files (about one megabyte or larger) tend to transfer poorly and must be broken into smaller segments, if possible. Range restrictions depend on the data rate used, but a good planning range is 20 kilometers when using OE-254 antennae and power amps at each end.

- This valuable equipment comes at a

PDA	\$350.00
Modified Data Cable: NSN 5995-01-454-3543	\$73.09
or NSN 5810-01-348-4675	\$43.55
Printer/Scanner/Copier	\$150.00
Inverter	\$70.00
Additional Mounting Hardware ..	\$100.00

Figure 2: Cost of 1-10 FA's digital equipment used at the National Training Center (minus the laptop computer). This equipment cost more than \$700.



Figure 3: This is a personal digital assistant (PDA) showing a Microsoft Excel spreadsheet for use as an ammunition tracker.

price, too. A typical equipment list required for a battery to maximize its digital file transfer include a SINGARS-to-PC data cable, a printer/scanner/copier, an AC inverter and a thumbnail drive. Data cables and inverters can be purchased through the Army supply system, but the remaining items cost more than \$500 and have to be purchased locally. Figure 2 lists the equipment used during 1-10 FA's NTC rotation, their descriptions and the costs associated with each item.

Personal Digital Assistant (PDA) for Ammo Tracking. 1-10 FA batteries also employed PDAs to facilitate ammunition tracking. The spreadsheet function within the PDA proved to be an extremely useful battle-tracking tool. The PDA's compactness and simplicity allows a commander to track the battery's ammunition and make updates easily and quickly.

Figure 3 shows a PDA running a Microsoft's Excel spreadsheet configured for tracking a battery's ammunition status. The PDA's portability provides commanders a current, accurate count without their having to tap battery resources constantly for information.

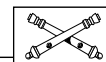
Commanders used different software on their PDAs, resulting in a lack of uniformity from battery to battery. De-

spite the differences, the success of tracking ammunition remained without the hassle and complications associated with other manual tracking systems. If commanders are to continue using PDAs for tracking ammunition, thought should be given to standardizing software and tracking procedures.

Cost of Digital Equipment. For this NTC rotation, some commanders used personal funds to acquire a few of these items (PDAs) to augment the modification tables of organization and equipment (MTOE) shortcomings.

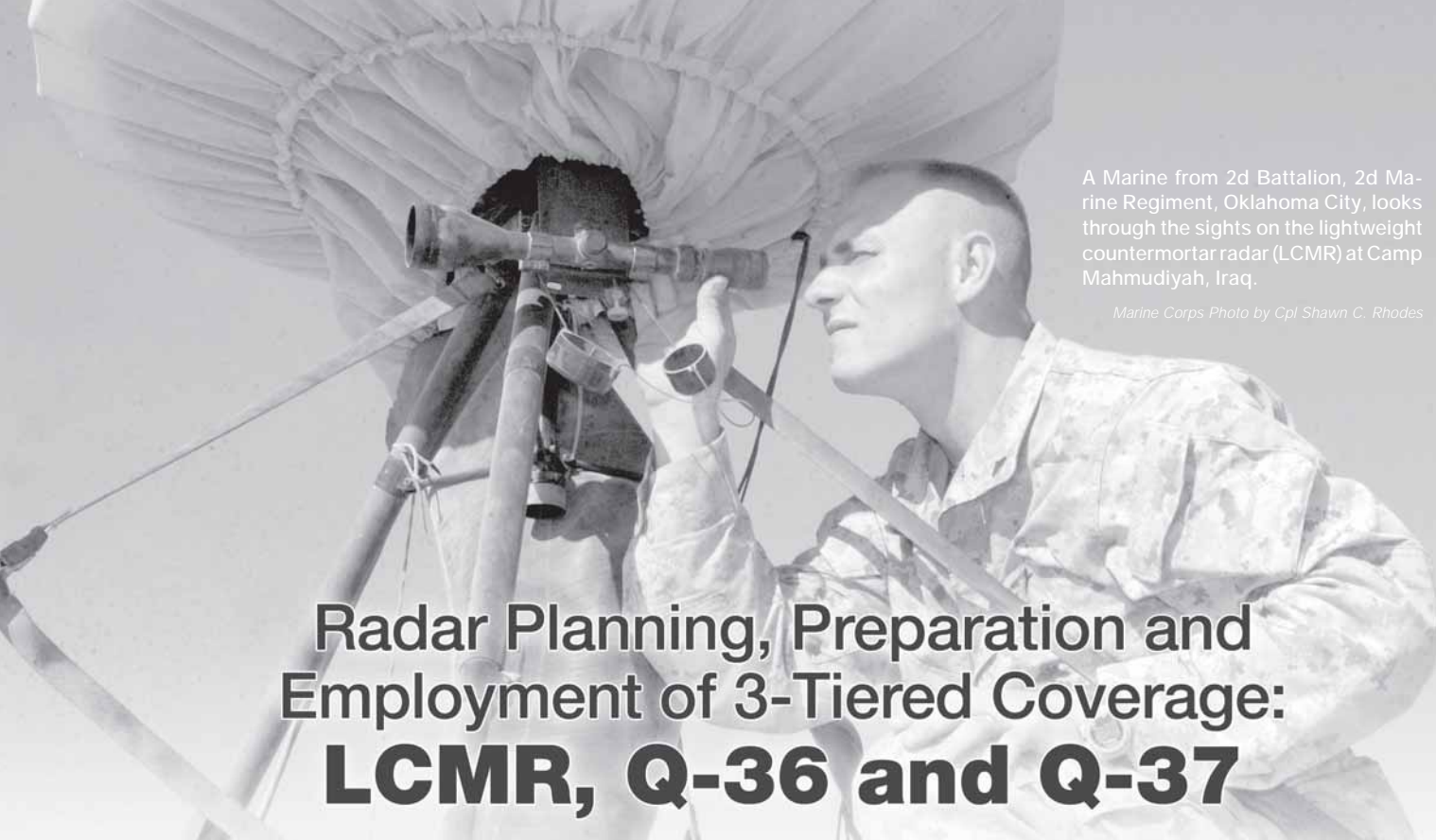
The costs, however, dwindle in comparison to the capabilities and potential that these systems offer. Cables, printers, PDAs and other digital devices should be more accessible for units. The MTOE and the Army's supply system should include these items in view of their significant contributions to the battalion's mission.

These new digital tools provide a more effective means to execute command and control. The hardware is simple to install and relatively inexpensive and results in equipment that is easy to use. The added benefits to resource management plus the improvements in force protection and mission performance more than warrant the addition of the SINGGARS ASIP's associated equipment and PDAs to the battalion's MTOE.



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Until recently, Craig B. Abler was a Captain in the Signal Corps assigned to 1-10 FA at Fort Benning. Currently, he is a civilian Fellow in the Massachusetts Institute of Technology (MIT) Leaders for Manufacturing Program. He previously served in the 101st Airborne Division (Air Assault), Fort Campbell, Kentucky, where he was the Assistant Operations Officer for the 501st Signal Battalion and Battalion Signal Officer for 2-327 IN. He holds a MS in Electrical Engineering from MIT.



A Marine from 2d Battalion, 2d Marine Regiment, Oklahoma City, looks through the sights on the lightweight counter-mortar radar (LCMR) at Camp Mahmudiyah, Iraq.

Marine Corps Photo by Cpl Shawn C. Rhodes

Radar Planning, Preparation and Employment of 3-Tiered Coverage: LCMR, Q-36 and Q-37

Rarely does a day go by without news of US casualties in Iraq or Afghanistan. Anti-coalition forces employ asymmetrical strategies, such as using improvised explosive devices (IEDs), to frustrate our efforts to bring stability to these areas and are representative of the contemporary operational environment (COE). While these attacks are tactical, they are aimed at achieving strategic effects.

This new enemy perceives the United States as a global power with a huge advantage in technology and warfighting capability but also with very exploitable vulnerabilities. (See Figure 1.)

At the same time, the target acquisition (TA) mission remains unchanged: to sense enemy fire, warn the force and respond to suppress or destroy the fire. The best way to accomplish this mission is to plan and prepare properly and employ a three-tiered approach to radar coverage that also encompasses complementary systems. Emerging technologies promise improvements in the future.

Radar Planning. Tracking incoming rounds in complex terrain or an urban environment is extremely difficult due to the way the radar operates. Therefore, site selections of forward operating bases (FOBs) and radars must be planned carefully.

High “clutter” environments cause significant problems for the radar. The term “radar clutter” refers to any ob-

By Chief Warrant Officer Three Daniel W. Caldwell

- | |
|--|
| <ul style="list-style-type: none">• Unwilling to accept heavy losses.• Sensitive to public opinion and lack of commitment.• Prefer standoff combat.• Conduct predictable operations.• Depend on high technology. |
|--|

Figure 1: Some Enemy Perceptions of US Vulnerabilities

jects that cause unwanted reflections of a radar’s electromagnetic energy to be returned to the radar receiver. These unwanted returns compete with valid returns of interest and cause the radar receiver and displays to become more cluttered and difficult to decipher.

Sources of clutter include land surfaces, vegetation, buildings, complex terrain, aircraft (particularly rotary wing) and particulate matter kicked up by wind or aircraft. In some cases, alternative sites may be limited, but if the sensor site planning process considers avoiding all possible sources of clutter, it can yield huge benefits.

The radar site analyses also can serve as input for risk assessment, patrol areas and patrolling activities, force protection plans, radar positioning and search sectors.

Radar Preparation. After securing

the optimum site for radar emplacement, the radar section limits the enemy’s ability to determine the radar’s search sector and time of operation. A fully supported radar deception plan is a low-cost, low-tech solution that pays big dividends.

The enemy understands that the radar acquires in the direction it is pointing. He also is aware that our patterns of activity and generator noise indicate when the radar is active. He seeks sanctuary by firing when the generator is off and attempting to fire from outside the perceived search sector. Random patterns of activity and decoy radar systems easily can disrupt the enemy’s ability to determine a radar’s collection orientation or even if a radar is operational.

Aggressively patrolling helps to shape enemy operations. Patrolling can limit access to areas that are difficult for the radar to search electronically and minimize the impact of not having a 360-degree search capability.

Three-Tiered Employment. Protecting the force is contingent upon the ability to sense incoming rounds and provide timely warning. Judicious employment of today’s fielded TA systems augmented by complementary systems can accomplish the mission. Based on the threat and environmental challenges, there is no “one size fits all” solution to TA.

A tiered approach to radar coverage

provides a holistic means to protect personnel and assets from mortar, rocket and cannon artillery attacks while maximizing detections of enemy fire for engagement.

First Tier: Short-Range Lightweight Countermortar Radar (LCMR). Short-range mortars firing from all angles can be a challenge for the Q-36 radars to track and calculate a firing solution for. The Q-37 has a minimum range of 3,000 meters, and neither the Q-36 nor Q-37 has a 360-degree capability. The LCMR solves these problems.

The LCMR was developed to meet the requirements of Special Operations Forces (SOF). Transportation constraints dictated the system be much smaller and lighter than the Army's existing counterfire radars. Currently, LCMRs have been fielded to selected Army and Marine units in the Central Command (CENTCOM) theater of operations.

The LCMR fielded prototype electronically searches 360 degrees, detects and tracks mortar fire beyond the ranges of most mortar weapons and locates a firing weapon with accuracy sufficient to service that target with combat air support or counterfire. The radar weighs approximately 120 pounds and disassembles for transport. It requires only 300 watts of prime power that can be provided by generator, vehicle or commercial power. It also can operate for a few hours from a battery pack.

The radar electronics, excluding control and display, are self-contained inside the antenna. The only external connection is to a power source.

The radar reports target locations to a personal digital assistant (PDA) that communicates with the radar wirelessly, so the radar operator need not remain with the radar. The PDA also provides radar control and receives and displays the system's status and fault messages.

The LCMR has an effective range out to approximately 7,000 meters and was specifically designed to detect, track and locate targets fitting a mortar's radar cross section, trajectory and velocity. Although the LCMR may detect small rockets fired indirectly, it will disregard most such fires.

Second Tier: Mid-Range Q-36 Version 8. Optimized to locate shorter-range, high-angle and lower velocity weapons, such as mortars and shorter range artillery, the Q-36 provides the second tier of radar coverage. It also can locate longer range cannons and

rockets within its maximum range. For mortars and artillery, the Q-36's higher probability of detection extends to approximately 14,500 meters for artillery and 18,000 meters for mortars. Rockets can be detected with reasonable probability out to 24,000 meters.

The Q-36 can search up to 6,400 miles (not simultaneously) by using the extended azimuth search function. With this function, the computer automatically traverses the antenna from two to four positions and performs target location.

Fort Sill's Fire Support Software Engineering Center (FSSEC), part of the Communications and Electronic Command (CECOM), is working on software to improve the Q-36's performance. Software Version 7.01 is undergoing live-fire testing. It will enhance the radar's probability of location (P_L) against mortars, provide Software Block 1 digital interoperability, provide a visual array of target locations and impacts, and enable a modern notebook computer vice the aging lightweight computer unit (LCU). In addition, FSSEC is preparing a software build to improve performance in a high-clutter environment as well as increase P_L against certain types of rockets.

Version 7.01 is expected to complete testing by early December. It will be released to the field on a compact disc to be loaded into the system in FY05.

The Program Manager for Firefinder also has secured a variety of enemy munitions and improvised launch platforms and will fire them to collect observation data. FSSEC will add the data to the radar's future operating software to enhance its performance.

The Third Tier: Long-Range Q-37. The Q-37 was designed to classify and locate faster moving, low-angle projectiles from cannon and rocket launcher firing locations. To maximize this capability, the Q-37 filters out all other radar tracks.

During the Balkan conflicts in Bosnia and Kosovo, the greater threat came from high-angle, slow-moving mortars. A software solution was developed to allow the Q-37 to replicate the capabilities of the Q-36 countermortar radar. The mortar ballistic software allows the Q-37 to replicate the Q-36 range of 18 kilometers for mortar fires with a .65 percent of range circular error probable (CEP)—a 65-meter error at a range of 10 kilometers.

The software enables the Q-37 to con-

tinue acquiring artillery and rockets. The primary risk is that the software eliminates part of the filtering process and will result in a higher clutter of radar images in a high-intensity conflict. Crew training negates this risk.

The Q-37 Firefinder's greater range, increased accuracy and ability to track mortar rounds provide the third tier of the required radar coverage.

Complementary Systems. These following complementary systems currently can't provide targeting data with a target location error (TLE) small enough to engage a target with indirect fires. However, they can help focus radar assets (and lethal and nonlethal strike assets) and mitigate the lack of 360-degree coverage beyond the LCMR's range.

- The hostile artillery locating system (HALO) is the world's first fourth-generation acoustic weapons locating system. It has been in service with the British Army since 2002 after rigorous trials and tests.

The HALO can detect gun breaks from artillery guns, mortars and tanks, providing point-of-origin and impact predictions. It is a passive, covert system with no emissions. HALO provides 360-degree coverage and can monitor an area of more than 2,000 square kilometers.

The system has demonstrated it can operate in the extremes of terrain and climate. The British Army successfully used HALO in the urban areas and mountainous terrain of Bosnia and Kosovo and in the deserts of Iraq.

HALO uses a distributed array of up to 12 sensor posts to detect pressure waves generated when artillery weapons fire or shells explode. Each sensor post listens throughout 360 degrees and computes location data on enemy artillery firing at rates of up to eight rounds per second, identifying each individual gun position. Data collected is forwarded to the HALO command post (HCP), processed and presented to the operator.

With a typical sensor dispersion pattern, three or more HALO sensors will intercept the pressure wave, and the triangulation determines the firing gun's position to a high degree of accuracy. As a complementary system with a 360-degree capability, HALO can vector other Firefinder assets, helping to compensate for the Firefinder radar's limitation of a 1,600-mile search sector.

- The unattended tactical acoustic

measuring and signature intelligence system (UTAMS) was designed and built by the Army Research Laboratory (ARL), Adelphi, Maryland, under the sponsorship of the Intelligence and Security Command (INSCOM), Fort Belvoir, Virginia. UTAMS can detect mortar and rocket launches and impacts. It is comprised of three to five acoustic arrays, each with four microphones, a processor, radio link and power source. Interface is via laptop.

- The Purple Hawk was designed and built in Israel and fielded in the Israeli Defense Force. As a mast-mounted electrical optics system, it is highly rated as a countermortar tool.

The Purple Hawk also has demonstrated its capabilities in perimeter surveillance. It is remotely operated via microwave or fiber optics and soon will have a laser designator.

Emerging Technologies. Technologies are emerging that provide increased range and accuracy to help close the capabilities gap in today's radar coverage of the battlefield.

- The Phoenix battlefield sensor system (PBS²) will be an S-band phased array radar system with computer-controlled signal processing to detect, verify and track targets and classify enemy and friendly mortar and cannon projectiles, rockets and missiles. The phased-array antenna will allow Phoenix to detect and locate weapons firing from four to 300 kilometers away. The first unit fielded with Phoenix is projected for FY09.

Phoenix will operate in three modes: normal, fast scan and extended-range. Normal mode will allow the radar to detect hostile mortar, artillery and rock-

ets while simultaneously supporting friendly operations. Fast scan will be similar to normal but allow the radar to acquire and track more than 50 in-flight projectiles simultaneously. The extended-range mode will support theater missile defense (TMD) by determining launch points and impact predict points and stating vectors for missile acquisitions, which will allow Phoenix to augment air defense assets.

In the future force, Phoenix will be the primary means to detect and locate enemy indirect fire weapons throughout the spectrum of conflict at the unit of employment (UE) level. It will range the tiered system's "white spaces" not covered by other TA radars.

- The multi-mission radar (MMR) will be a highly mobile, 360-degree radar easily configurable to perform four missions: air defense surveillance (ADS), counterfire target acquisition (CTA), fire control (FC) and air traffic control (ATC). The FC and CTA missions are of primary concern for fire supporters. Using the MMR for the FC mission, it will be able to track friendly rounds fired against enemy targets to provide "did-hit" grid data immediately for registration and early predictive battlefield damage assessment (BDA).

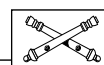
Several MMR systems will be able to be deployed on the battlefield to perform a variety of missions, either individually or simultaneously. See Figure 2 for FC and CTA MMR capabilities.

The MMR will replace the Q-36 Firefinder radar but provide greater range and accuracy with 360-degree coverage. It will provide the new brigade combat teams (BCTs) configured as unit of action (UA) formations the

information they need to exploit their battlespace. The fielding window for the MMR to multiple branches is 2012 to 2015.

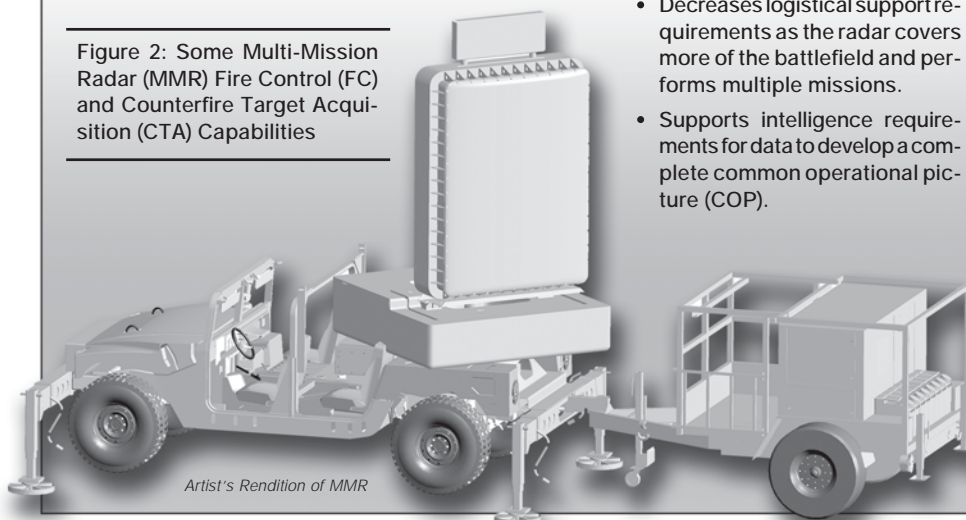
Protecting the force against a COE enemy who has a seemingly endless supply of mortar rounds is truly a Gordian knot. In the CENTCOM area of operations, each FOB has a different fight; a tiered approach tailors the radar coverage to the force's specific needs and operating constraints.

The tiered approach, coupled with complementary systems, will focus our collection efforts and techniques and render the enemy more vulnerable to detection and counterfire, deterring future attacks.



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Figure 2: Some Multi-Mission Radar (MMR) Fire Control (FC) and Counterfire Target Acquisition (CTA) Capabilities



- Decreases logistical support requirements as the radar covers more of the battlefield and performs multiple missions.
- Supports intelligence requirements for data to develop a complete common operational picture (COP).
- Provides accurate point-of-origin and impact-point prediction (IPP) information for early warning of and counterfire on enemy artillery-delivered high-precision munitions (ADHPM), such as those fired by cannons and rockets and mortars.
- Alerts the force to incoming theater ballistic missiles.
- Provides data for destroying incoming unmanned aerial vehicles (UAVs), Cruise missiles, air-to-surface missiles, limited very short-range ballistic missiles and limited hostile fixed- and rotary-wing aircraft.