Field Artillery

A Professional Bulletin for Redlegs

September-October 2002

Close Support

Fire Support in Afghanistan

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INTERVIEW

ARTICLES: Close Support

Covers: Front—Photo of the Q-36 Firefinder radar section with 3d Brigade Combat Team, 101st Airborne Division (Air Assault) in Afghanistan is by SPC Jeremiah Johnson, Combat Camera, and the photo of 101st soldiers firing a mortar during Operation Anaconda is by SGT Keith D. McGrew, 55th Signal Company. Back—Both of the two photos of three soldiers are of A Company, 4th Battalion, 31st Infantry, 10th Mountain Division in the Shah-e-Kot range taken by SPC Andres J. Rodriquez, 55th Signal Company.

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The FA and the Objective Force—

An Uncertain But Critical Future

By Major General
Michael D. Maples
Chief of Field Artillery

We are an Army at war. We are also an Army postured for significant change. Both of these conditions inevitably bring uncertainty to our view of the future.

In my last article, I stated the Field Artillery is absolutely essential today to the success of our joint forces and the Army's combined arms team and that the Field Artillery, fully integrated with joint fires and all other effects-producing systems, will be even more critical in the future. I want to reinforce that message.

As we consider the directions our nation may take in the near term to achieve our objectives in the Global War on Terrorism, we can anticipate the vital role the fires of the Field Artillery may play. The potential for employing ground forces in the war combined with the recent completion of two Congressionally mandated indirect fires studies and the Maneuver Unit of Action (UA) Operational and Organizational Concept (O&O) only reinforce that current and future forces will remain dependent on indirect fires and that the Field Artillery has a critical role to play in both.

The Need for Maneuver and Fire Synergy. In today's rapidly changing contemporary operating environment (COE), there is an unprecedented need to achieve true synergy between fires and maneuver. Fires and maneuver have an empowering relationship on the battlefield, each complementing the other in contributing to the achievement of decisive outcomes. A commander may employ his maneuver force to attain positions of tactical advantage in order to most effectively employ his fires. In other circumstances, it may be the effects of fires that will permit the effective maneuver of forces. From positions of tactical advantage, a commander can employ accurate, destructive fires against high-value targets to eliminate enemy combat capabilities.

The effectiveness of our fires will present a dilemma to our adversary. He either will have to remain in position and continue to suffer the effects or move in an attempt to reduce the vulnerability of his position. By moving, the enemy risks exposing his force to exploitation by ground maneuver and the effects of joint and land-based fires. In either event, the position of advantage gained by maneuver enables fires to be employed to achieve the destructive effects that lead to tactical decision.

Expectations of Fires. The Army requires fires that are immediately responsive and continuously available in all types of terrain and weather. While we expect to derive full effects from the fires of joint and coalition capabilities as well as the tremendous firepower afforded by Army aviation, these capabilities cannot ensure the fulltime, full-spectrum requirements of maneuver forces are met.

The Army must have an organic ability to deliver fires in a fully networked architecture: destructive fires, both point and area; protective and suppressive fires in the required quantity and duration; and special munitions, such as obscurants, illumination, and obstacles.

Before forces are joined, the increased long-range killing capability of fires will fix and destroy the enemy. By achieving greater destruction at standoff, we can ensure freedom of action and reduce the need to rely on tactical assault to achieve decisive outcomes. Long-range fires will dislocate, disintegrate or destroy the enemy, creating the opportunity for maneuver to transition to exploitation or move to other positions of advantage.

Once contact occurs, fires must be fully integrated in support of maneuver. Fires must be continuously available on demand, tailorable to mission requirements and scaleable to achieve the effects desired. Fires will continue to be employed against planned targets; however, we must significantly improve our ability to attack targets of opportunity to respond to the needs of forces at the lowest tactical level.

Fires generally will be categorized into three primary purposes: destructive, protective and suppressive, and special purpose fires. See Figure 1 for the definitions of those purposes.

Mix of Capabilities. Our future fire support system will require a mix of capabilities, including the full range of joint fires and indirect fire systems. Missiles, rockets, cannons and mortars as well as fixed-wing aircraft and attack helicopters all offer unique capabilities and, likewise, have system-specific limitations that must be understood and considered.

For ground forces, a mix of mortar, cannon, rocket and missile systems clearly provides the greatest flexibility and mitigates the individual shortcomings of each delivery means. The strength of our future fire support system will be the ability to employ this mix of capabilities, enabled by networked command, control communications, computers, intelligence, surveillance and reconnaissance (C^4ISR).

A Continuing Need for Cannon Artillery. The Army clearly has articulated the need for a cannon as an integral component of this fires system to provide immediately responsive, continuously available fires to our maneuver units for the foreseeable future.

Cannons will continue to be required in the Objective Force to deliver both precision and non-precision fires and as the primary delivery system of a wide variety of special purpose munitions. Cannons give us the ability to deliver close supporting fires, often in close proximity to friendly forces, 24 hours a day in all terrain and under all weather conditions.

Precision cannon fires will achieve increased lethality in those instances where intelligence, surveillance and reconnaissance (ISR) assets provide precise target locations and the target type warrants engagement by a precision mu-

- **Destructive Fires** include precise or area fires to shape engagements by striking the enemy before forces are joined. Destructive fires also are employed in conjunction with direct fires after forces are joined to present the enemy with multiple lethal challenges.
- **Protective/Suppressive Fires**. *Protective Fires* may be lethal or nonlethal and are oriented on the friendly force to facilitate our ability to maneuver. Ultimately, protective fires for maneuver formations may include danger-close missions and final protective fires (FPFs). *Suppressive Fires* also protect friendly forces but are oriented on proactively attacking targets, such as enemy indirect fires or air defenses. Suppressive fires may be employed to facilitate ground maneuver and the employment of Army or joint aviation assets. Inaccurate or unconfirmed target locations may dictate the employment of suppressive fires.
- **Special Purpose Fires** add to the full-spectrum relevance of the Field Artillery. These fires may include munitions that have obscurants, multiple means of illumination, countermobility capabilities, thermobaric effects, incapacitants and munitions that will blind or disable enemy acquisition and observation systems.

Figure 1: Fires for the Objective Force. Fires are categorized as Destructive, Protective/Suppressive or Special Purpose.

nition. Cannons also will enable us to deliver non-precision fires in those circumstances when target locations are imprecise or where area effects are required.

Cannon artillery is responsive, flexible and agile and enables high-volume fires, both in quantity and duration. Cannons offer us a wide range of trajectory options to support the diversity of battlefield and terrain requirements—from direct fire to high-angle fire.

The responsiveness and effectiveness of cannon artillery will be greatly enhanced when integrated with all other forms of fires into a system of networked fires.

The high-mobility artillery rocket system (HIMARS) will provide destructive fires (shaping and offensive counterstrike fires) for the UE and long-range land-based fires for the joint force.

Networked Fires. Networked Fires will be an application within the Objective Force battle command system. As a fires system-of-systems, it will give commanders the ability to apply full-dimension effects solutions in near real-time throughout their battlespace.

• Networked Fires will link all relevant Army, joint, national and multinational sensors, Army and joint fires and effects delivery means, and the information technology systems of battle command to develop integrated strike solutions.

• Networked Fires will apply effects-based solutions to achieve the commander's objectives through the integrated application of lethal and nonlethal munitions and other effects.

• Networked Fires will change our focus from attacking specific weapon systems to a more precise application of effects against decisive points, centers of gravity and key nodes of the enemy's systems.

• By employing effects-based fires, we will be less concerned about command and support relationships and more focused on achieving desired outcomes by employing the delivery system that can most effectively deliver the desired effects.

• Networked fires will enable all echelons to have access to Army and joint effects.

This Networked Fires capability will be particularly relevant to the synchronization of fires that must be achieved in the Objective Force between the Unit of Employment (UE) and UA.

Fires and Effects for the UE. UEs in the Objective Force are division- and corps-like elements that will employ and support multiple UAs. Among the core missions evolving for the UE are shaping and isolating the battlespace and shielding the force.

While integrating and synchronizing Army forces conducting full-spectrum operations at the higher tactical and operational levels of conflict, UEs will orchestrate continuous shaping operations with extended-range precision fires, selected air-ground maneuver operations and the full range of Army and joint effects-producing capabilities. The process of shaping will set conditions for follow-on tactical engagements or battles in support of multiple subordinate UAs. One of the most critical shaping tasks will be to achieve favorable force ratios to enable tactical maneuver. The UE will isolate the battlefield by eliminating an enemy's ability to synchronize action, attacking mobile reserves or blinding the enemy by disabling his command and control capabilities.

Shielding the force includes eliminating the enemy's long-range precision fires, thus shielding the force from his effects.

To accomplish these missions, it is clear the UE will require robust long-range fires linked to precise targeting systems. This force certainly will require precision missiles and rockets carrying discriminating munitions. While the detailed design work for the UE is still in progress, access to joint and precision fires is an acknowledged requirement.

Division Artillery. Current concepts envision a division artillery structure in the division-level UE with organic target acquisition and long-range precision fires capabilities. The division artillery will employ the fires of reinforcing fires units allocated from force pools and tailor fires packages to meet the specific needs of UAs. Through Networked Fires, the division artillery will have access to available fires of the UA non-line-of-sight (NLOS) battalions.

Fires and Effects Cell (FEC). The plan for the Objective Force staff structure includes a FEC as one of five staff components that assist the UE commander in battlefield visualization and communication. The FEC will plan and coordinate the production of effects resulting from the application of both lethal and nonlethal capabilities.

Fires and Effects for the UA. In support of the tactical fight, the UA brigade will coordinate and integrate organic UA, UE and other Army, joint and multinational NLOS fires assets.

Fires and Effects Cell. The UA brigade also will have a FEC. It will (1.) Advise the commander on the capabilities of friendly and enemy fires and effects assets; (2.) Develop targeting priorities and attack criteria to meet the commander's guidance and intent; and (3.) Develop the brigade scheme of supporting NLOS fires to support the maneuver plan, meet the commander's intent and accomplish the mission.

- Provide precise or area long-range destructive fires.
- Provide close support tactical fires fully integrated with maneuver to isolate or fix enemy forces, protect friendly forces with suppression or obscuration, deny mobility, counter indirect fires and protect maneuver formations.
- Conduct artillery raids.
- Employ Networked Fires to access external capabilities, including direct access to joint fires, and "missiles-in-a-box."
- Perform target acquisition with an organic radar and small-unit unmanned aerial vehicle (SUAV).
- Provide special purpose fires to include obscurants, illumination, countermobility and a range of nonlethal effects.

Figure 2: NLOS Battalion Tasks

The FEC will exploit networked sensors, delivery systems and effects to provide the commander the broadest possible range of options and capabilities. It will accomplish this by applying the commander's objectives for NLOS fires as parameters in a networked system-of-systems and by dynamically establishing sensor-to-shooter linkages based on changing conditions of the battle.

The FEC rapidly will plan, coordinate, synchronize and manage the delivery of organic and supporting NLOS fires and nonlethal effects throughout the UA battlespace.

The NLOS Battalion. Within the UA will be an NLOS battalion equipped with organic acquisition means, future combat system (FCS) NLOS cannons and attack missile capabilities. The NLOS battalion will coordinate and provide full-spectrum Army and joint fires and effects to enable the UA to conduct decisive operations. The primary tasks the NLOS battalion must accomplish include those outlined in Figure 2.

We are in the process of experimentation, analysis and design to further develop UA fires and effects capabilities and the detailed organization of the NLOS battalion. Figure 3 lists several characteristics we expect to include in the UA fires and effects design.

In conjunction with the Armor Center at Fort Knox, Kentucky, and the Infantry Center at Fort Benning, Georgia, we are working to further develop the doctrine and tactics the UA will employ. We are engaged with the Combined Arms Center at Fort Leavenworth, Kansas, as well to contribute to the evolving conceptual work on the UE.

At each echelon of command, the Army clearly has established a solid foundation that recognizes the importance of fires. Our task now is to ensure ongoing developmental work accounts for the full range of fire support tasks at every level.

Today and Tomorrow. We are an Army at war today, and in that war, our nation may require the fires of her Field Artillery to help accomplish national objectives. Should the Field Artillery formations of our operating forces be called upon to deliver fires in support of the Global War on Terrorism, the readiness needs of our Field Artillery commanders will have "Priority of Fires" from the Field Artillery Center and School here at Fort Sill.

The Field Artillery School has placed great emphasis on identifying and resolving those issues most critical to the commanders and command sergeants major of our Field Artillery formations. The FA School has been working on the input received from them at the Senior Field Artillery Leader's Conference last April with a clear priority to solve those issues that may have an operational impact in the near term. We are aggressively attempting to resolve the issues we face in manning, training and equipping the force and will continue to do so.

We are also an Army engaged in transforming for tomorrow. I am confident the developmental work for the Objective Force lays a solid foundation that underscores the critical importance of fires and effects. Enabled by the tremendous advances that we expect to achieve in C^{4}ISR, the success of the future force depends on our ability to achieve a true synergy between maneuver and fires. The Field Artillery is a full partner in achieving that success.

- Provide reliable, timely, accurate and effective fires and effects that are continuously available with high sustained rates-of-fire and rates-of-kill in all weather and terrain conditions.
- Support sensor-to-shooter teaming relationships with strike aviation platforms, unmanned sensors and the reconnaissance troops and maneuver companies of combined arms battalions.
- Be capable of rapid teaming, expeditious task reorganization and mission tailoring.
- Be capable of maneuver by platoons or in teams in all terrain or weather.
- Be able to mass fires without having to collocate weapons systems, providing mutual support and massed effects from dispersed locations.
- Provide increased overmatching lethality with quicker response times, increased accuracies of target location and weapon delivery systems, higher sustained rates-of-fire, the ability to rapidly deliver discrete or volume fires and superior munitions effects.
- Be able to rapidly integrate joint, multinational and other Army reinforcing fires means and effects.

Figure 3: Some Characteristics of the Developing NLOS Battalion

Major General Michael D. Maples became the Chief of Field Artillery and Commanding General of Fort Sill, Oklahoma, in August 2001. In his previous assignment, he was the Director of Operations, Readiness and Mobilization in the Office of the Deputy Chief of Staff for Operations and Plans (G3) at the Pentagon. In Germany, he was the Assistant Division Commander (Support) in the 1st Armored Division and Senior Tactical Commander of the Baumholder Military Community. He also served in Germany as the Deputy Chief of Staff for Operations in the Allied Command Europe Rapid Reaction Corps and for the Kosovo Force (KFOR), planning and executing the entry of NATO forces into Kosovo; G3 of V Corps; and Deputy Chief of Staff for Operations in US Army Europe (Forward) in Taszar, Hungary, supporting US forces in the Balkans during Operation Joint Endeavor. He commanded the 41st Field Artillery Brigade, V Corps, Germany, and the 6th Battalion, 27th Field Artillery, 75th Field Artillery Brigade, III Corps at Fort Sill, Oklahoma, and in the Persian Gulf during Operations Desert Shield and Desert Storm. He also commanded B Battery, 6th Battalion, 37th Field Artillery in the 2d Infantry Division in Korea. He holds an MA in Organizational Behavior from Pacific Lutheran University, Tacoma, Washington.

Major General Franklin L. Hagenbeck,
Commanding General, 10th Mountain Division (Light), Fort Drum, New York,
and Commanding General, Coalition Joint Task Force Mountain in Afghanistan

AFGHANISTAN

Fire Support for Operation Anaconda

By Robert H. McElroy, Fort Sill Public Affairs Specialist,
with Patrecia Slayden Hollis, Editor

Major General Hagenbeck was the commander of ground forces in Afghanistan for the 17-day combat Operation Anaconda (February-March), part of Operation Enduring Freedom. The purpose of Operation Anaconda was to dig pockets of al Qaeda forces out of intricate caves in the rugged terrain of the Shah-e-Kot Valley in Afghanistan.

Basically, US forces consisted of some 40 Special Forces soldiers; about 1,200 infantrymen with 60-mm, 81-mm and 120-mm mortars from the 10th Mountain and 101st Divisions; 24 Army cargo, utility and attack helicopters; and Air Force, Marine and Navy aviation assets. In addition to Afghanistan, coalition nations contributing forces were Canada, England, Germany, Australia, Norway and New Zealand. (This interview was conducted 4 June.)

Q To set the stage for your discussion of fire support in Operation Anaconda, what were the cultural and environmental conditions and enemy like in Afghanistan [see the map on Page 8]?

A In terms of the terrain, one analogy I use is that if you flip a dinner plate over and then add the Hindu Kush Mountains down through the middle, it is akin to what Afghanistan looks like. The altitude of our headquarters at Bagram Airfield is about a mile high.

The Shah-e-Kot Valley floor where we fought had an altitude ranging from 7,000 to 8,000 feet. The valley was ringed by the rugged Turgal Gar Mountains that have an altitude of 11,000 feet in some places.

We called the eastern part of the valley the "Eastern Ridge" and the western part had a terrain feature we called "The Whale." It was very complex terrain, difficult and steep.

The Eastern Ridge had more than 100 caves dug in throughout the ridgeline. The enemy went from what appeared to be small fighting positions to the complex caves; the largest cave we found was about 30 meters deep in an inverted "V" and then went right and left another 30 meters each. That cave was filled with weapons and ammunition caches.

Afghanistan has very few roads or even good trails. To get around in Afghanistan, you need to be part mountain goat.

When the Northern Alliance fought in the first couple of months of the war, substantial numbers of the enemy surrendered. Later, during Operation Anaconda, the al Qaeda soldiers who were left were combat veterans, the hardcore who wanted to fight. Except for a handful of Afghanis, the foreign al Qaeda were virtually all we found in those caves.

The al Qaeda declared a Jihad—a holy war—calling on the villagers to kill all Americans in the first three days and into the fourth day of the operation. Anaconda was finally the set-piece battle they had been waiting for.

They thought the battle was going to be a "mirror image" of their fight with the Soviets. The Shah-e-Kot Valley is the area in which the Afghanis had fought and won decisively against the Soviets on two occasions. The al Qaeda came to the valley eager to fight and kill Americans.

This was good because we didn't have to chase so many down after the operation. Once we realized they were coming at us, it was easier to determine specific targets and maneuver our forces.

The al Qaeda came out of the cave complexes to fight American infantrymen and then ducked back in when they heard "fast movers" overhead [fixed-wing attack aircraft]. We found mortar base plates that were cemented in, allowing the al Qaeda to move tubes easily in and out of the caves. They already had registered their mortars on the key pieces of terrain and other features throughout the valley.

The weather was harsh. Just before Operation Anaconda, it was snowing and sleeting with some light snow at Bagram. Down at the lower elevations, it was raining so hard I had to delay D-Day for two days.

The temperatures during the first three days of the operation ranged from a high of 60 degrees Fahrenheit to a low of zero with a wind chill the first night of minus 20. So the temperature, in effect, dropped 80 degrees in 24 hours.

The rough terrain and weather had an impact on our targeting. It was very difficult for our overhead ISR [intelli-

gence, surveillance and reconnaissance] platforms to identify the cave complexes. So it took "boots on the ground" to find the caves. The shadows, alone, precluded our discovering a cave until our soldiers were almost on top of it.

The Afghanis are a fiercely independent and autonomous people. There's a lot of tension among the tribes—the only time they seemed to coalesce is to fight a foreign invader, such as the Soviets.

The Afghanis are worn out after 23 years of war and happy to let us kill the al Qaeda. But we can't let the al Qaeda put out a misinformation campaign that we are "invaders." The "clock is ticking." They are going to want us out of there.

Q *If you had, had 10th Mountain Division M119 105-mm howitzers in Afghanistan, would you have used them in Operation Anaconda?*

A In retrospect, we didn't consider bringing in 105s because I knew we could accomplish the mission without them. With the limited number of assets we brought into Afghanistan, it was clear we could capitalize on our mortars as well as on the Army, Air Force, Marine and Navy aviation assets.

Around the first of February, we got the warning order that something might evolve, and so we started doing the legwork—but the impending operation was far from solidified. I had established my TAC [tactical command post] forward. I went ahead and jumped my TAC and main [command post] up to Bagram and joined them on the 17th—11 days before D-Day.

That's when I got my first briefing on courses of action. We laid out the troops and other assets available, and I knew we could accomplish the mission. The fact that I did not have 105s never became contentious.

So the question, "Would I have used 105s?" is hypothetical. But I will tell you that the trade-off I would have had to make the first day would have precluded me from using 105s. In that terrain, my choice would have been to either airlift in soldiers with their mortars or 105s.

So the next question is, "Why did I use Chinooks [CH-47 cargo helicopters] to bring the troops in rather than Blackhawks [UH-60 utility helicopters], which I also had available?" It was because of the altitude…the constraints on the lift capability of helicopters at that altitude.

In addition, on Day One, we still did not know exactly what anti-aircraft defensive systems the al Qaeda had. We suspected they had Manpacks. We knew they had RPGs [rocket-propelled grenade launchers]. To sling a 105 underneath a CH-47 and try to set it down in very rugged terrain, to include slinging in the ammo after it, would have been very difficult and dangerous.

Then the question becomes, "Well, why couldn't you have 'offset' the 105s—have brought them into another position, not necessarily the top of a mountain, but a position from which they could shoot across the valley—The Whale was one of those places?" My answer is that we were in the "wild, wild west." I would have had to take combat assets to provide security for the battery. I would have had to dedicate Apaches or other "birds" and probably infantry troops to secure that battery until I knew exactly what we were up against.

So there would have been trade-offs which, again, I didn't face because we didn't have 105s in country.

Let me make something clear: I *always* want organic fire support systems—*always*. And at that point, I had mortars. If I'd had 105s, because of the terrain and the lack of road systems, I would not have brought them in on the first day.

The British have some 105s in Afghanistan now, and we have slung load those howitzers all over the country. But they didn't come in during Operation Anaconda. In fact, they have not participated in combat and have had limited opportunities to shoot on the Pakistani border.

Q *How effective were your mortars in Operation Anaconda?*

A They performed *superbly*. Generally, within two rounds, the mortars were ready to fire for effect.

All mortar missions were observed missions—we had Field Artillery FIST [fire support team] personnel at the platoon, company and battalion levels. They were professionals—quick, responsive and calm while processing fire missions.

In the 10th Mountain's 1st Battalion, 87th Infantry [1-87 IN], the battalion's companies kept the 60-mm mortars for immediate engagements while the battalion kept the 81-mm mortars and two 120-mm mortars, the latter to provide flexibility to move them around for reinforcing fires. The rest of the 120-mm

mortars were in "general support," providing full coverage north and south.

Q *What's the most challenging part of combat operations in Afghanistan?*

A Unquestionably, the harsh environmental conditions—they had an impact on the flying piece. Picture a Chinook sling-loading assets at night in limited illumination with the dirt and dust flying all around. I think the Afghanis invented darkness. Sometimes there was no ambient light. Our NVGs [night-vision goggles] don't work well without a little ambient light.

Our helicopters had to fly in brownout conditions with rocks and rugged terrain beneath them—very few flat places to land on. When the illumination was low, I was hesitant to fly helicopters at night. I saw some *great* piloting in this operation.

Q *How important is it to have ground-based indirect fires capabilities for the close fight?*

A Indispensable, absolutely *indispensable*. But let me start by making a bigger point. After Operation Anaconda, I was asked why I didn't have a bombing campaign in the Shah-e-Kot.

The answer is, again, because of the rugged terrain, the cave complexes and the limited target sets—air campaigns are most effective against "fixed" targets.

Early on, there were few, if any, fixed targets we could identify as being high-value. We templated a couple. We did have an air strike about 20 minutes before the first air assault into the valley.

We knew the enemy's "center of gravity" was inside the caves where his soldiers and logistics were. But we did not know how much C^2 [command and control] he had inside that valley.

I did not want to attack the dozens and dozens of cave complexes arbitrarily without having some sense of what was in them. As it turned out, many were empty while some had people, some had munitions and some had documents in them. So, without knowing what was in those caves, we did not want to have air strikes on them until we could assess them.

The al Qaeda soldiers would hear fixed-wing aircraft overhead and quickly duck into the caves, protected from most airdropped munitions. So to get them, we had to put a JDAM [joint direct attack munition] inside the cave. But you only have so many of those precision munitions.

Because of the altitude, Chinooks [CH-47 cargo helicopters] were used to bring the troops and equipment in rather than Blackhawks [UH-60 utility helicopters].

To keep the enemy from ducking back into their caves, we used mortars and machineguns to kill them outright, when we could, or suppress them. We got a number of kills with close air support [CAS], but they were primarily because our mortars and machineguns kept the al Qaeda from getting up and running back into the caves.

Q *What did you use for CAS and how effective was it?*

A The most effective close air support asset we had was the Apache [AH-64 attack helicopter], *hands down*.

The Apaches were extraordinary—they were lethal and survivable. We had six in the fight with two left flying at the end of the first day. They were so full of holes—hit all over, one took an RPG in the nose—I don't know how they flew.

But the maintenance guys from the 101st fixed every one. They got those helicopters back up and flying. The detainees later said the Apaches were the most feared weapons on the battlefield—the helicopters were on top of them before they knew what was happening. The Apaches came as close to "one shot, one kill" as you can get.

Our next most effective CAS assets were the A-10s in the daytime and AC-130s at night. They were great.

We also had F-16s and F/A-18s [fighter aircraft] and B-52s [bomber aircraft] providing CAS. For the most part, they carried JDAMs and some dumb bombs.

Our fixed-wing pilots faced some procedural and maneuvering challenges. They had a very small view of the target

Afghanistan has very few roads or even good trails. To get around in Afghanistan, you need to be part mountain goat.

areas from their cockpits—about the size of a postage stamp. (The Navy and Marine Corps fighter pilots routinely flew as low to the ground as they could to achieve the effects, even when it was below what was deemed minimum safe distance. They were *terrific*.)

The Air Force had to work through airspace management—aircraft were stacked up to the ceiling and could only be flown in, in a few numbers.

And then the angle of attack in the complex terrain made it even more difficult for the pilots. Certainly they had some close support successes. But the bulk of their successes were against fixed targets, such as when our ground troops identified a cave we wanted taken out.

Later on the first day and into the second day, when I declared two of the villages in the Shah-e-Kot Valley as targets [Marzak and Barbakul], the aircraft leveled them—we had taken hostile fire from the villages and flown Predators [unmanned aerial vehicles] over them to confirm their activities.

The aircrafts' precision munitions were most effective against those fixed targets. We used precision munitions on known enemy intersections of infiltration and then exfiltration.

But for the first three or four days, we faced "fleeting" targets. By the time the AWACS [airborne warning and control system aircraft] handed a target off, the Air Force said it took 26 minutes to calculate the DMFI [desired mean point of impact], which is required to ensure the precision munition hits the target. Then the aircraft had to get into the airspace management "cue." It took anywhere from 26 minutes to hours (on occasion) for the precision munitions to hit the targets.

That's okay if you're not being shot at or the targets aren't fleeting—such as the SUVs [support utility vehicles] the al Qaeda used for resupply. When the SUVs stopped to unload and if they stayed in one place long enough, the fixed-wing aircraft would slam them.

We really worked to find ways to kill fleeting targets the first three or so days. Honestly, we weren't that successful.

The al Qaeda moved small groups around the battlefield—each had three to five men with rifles on their backs, maybe blankets. During the daylight, we watched them on the Predator. At night, when these groups heard a Predator or AC-130 coming, they pulled a blanket over themselves to disappear from the night-vision screen. They used low-tech to beat high-tech.

The groups floated onto the battlefield with individual soldiers separated by 10 to 15 meters. They moved out like a squad or fire team. The al Qaeda did not present large target sets.

Then the enemy soldiers stopped at a way station with a huge underground complex to resupply. That complex had a very steep angle of attack, incredibly difficult for our pilots to hit. Later, when we were able to bomb that complex, it burned and exploded for 11 hours.

All mortar missions were observed missions—Field Artillery FIST personnel were at the platoon, company and battalion levels. They were professionals—quick, responsive and calm. *(Photo by MAJ Bruce E. Stanley, XO, 1-87 IN)*

Q *What mix of munitions would you like to see in future battles?*

A The mix of munitions is a function of METT-T [mission, enemy, terrain, troops and time available]. Ideally you want precision, but it really boils down to wanting responsive, effective fires.

I'll underscore that point by saying this—a ground force commander does not care about the number of sorties being flown or the number and types of bombs being dropped and their tonnage. Those statistics mean nothing to ground forces in combat. All that matters is whether or not the munitions are time-on-target and provide the right effects.

Q *During Operation Anaconda, what was your organization to conduct targeting and coordinate and deconflict fires and effects?*

A We had the ASOC [air support operations center] with Air Force personnel, primarily out of Saudi Arabia, and my "FSE" [fire support element] headed by my DFSCOORD [deputy fire support coordinator]. The DSFCOORD was my "go to" guy. He kept us on schedule and set up our battle rhythm with targeting—the entire process was doctrinally correct. I think that paid off.

We were designated CJTF [Coalition Joint Task Force] Mountain. It consisted of everything in Afghanistan: elements of the 10th Mountain and 101st Airborne Divisions; the JSOTF [Joint Special Operations Task Force], which was mainly the 5th Special Forces Group, Black Special Ops (this group reported to the CINCENT [Commander-in-Chief of Central Command]) and Task Force K-Bar/Coalition.

At the height of the battle, we had 200 fire support coordinating measures [FSCM] at one time. We opened and closed them routinely. The bulk of the FSCM were NFAs [no-fire areas] and RFAs [restrictive-fire areas]. In addition to tracking our infantrymen and small Special Forces teams on the battle-

field, we had to track personnel from "other agencies"—and you can interpret that any way you want to.

Battle tracking was a huge challenge; it was tedious, but productive. The good news is that during Operation Anaconda, we didn't have a single fratricide.

Q *What capabilities or procedures would you like to see on future battlefields?*

A Ground commanders always will need and want all-weather, organic, indirect firepower (artillery) that can provide timely, accurate (precision) and effective fires, regardless of the environmental conditions. We had good weather during Operation Anaconda and could fly our helicopters and aircraft to provide fire support. We were very lucky.

A couple of times when the ceilings dropped, we had limited air coverage. But by that time, it was several days into the fight and we had hurt the enemy badly enough. The ground force needs a highly lethal, all-weather indirect fire capability organic to the force.

We need long-haul communications. If we're going to fight on a noncontiguous battlefield spread out over a large area as we did in Afghanistan, then long-haul coms is critical—the Shah-e-Kot Valley was about 120 kilometers of mountainous terrain away from my headquarters.

We had to depend on TACSAT [tactical satellite] for long-haul communications. That meant we had to link all our helicopters and fixed-wing assets to TACSAT.

For command and control, I had challenges communicating with my brigade commander on the ground and his battalion commander. Operation Anaconda quickly became a platoon fight led by platoon leaders. From that perspective, it was very decentralized. This was not a "push-to-talk" war.

We have a huge procedural and training issue we've got to work through with our Air Force friends. Because of the complexity of their precision munitions, they will not shoot JDAMs without either a GFAC [ground forward air controller] or ETAC [enlisted terminal attack controller] calling them in. There are not enough GFACs or ETACs in their inventory to support every ground maneuver element. And as I said, this war became platoon fights separated by distances in very rugged terrain with too few ETACs to go around.

Let me illustrate my point. On the first day of the operation, one platoon of 1-87 IN fought all day. That platoon happened to have the battalion commander and an ETAC in it. That night, the ETAC was extracted. For the next 24 hours until we could get the ETAC reinserted, not even the battalion commander could call in precision-guided munitions. What happens if the ETAC is injured and has to be MEDEVACed [medically evacuated] or is killed?

We need training and certification for our observers to call in JDAMS—any precision munitions or air support—to be universal observers, if you will. Our Field Artillery leaders, both in the 10th and the 101st Divisions, knew this would be an issue and worked hard to try to get their observers certified.

We have to be careful about employing UAVs [unmanned aerial vehicles]. I would characterize the view UAVs provide as "looking through a soda straw." You have to be careful to direct that view at what you need to see.

The UAV operator needs to be sitting next to the ground tactical commander. In this instance, he was sitting in Saudi Arabia. At times the UAV moved out of an area we wanted to look at, and we had to go through channels with a request to redirect the UAV's search. During the fight, the higher headquarters controlling the UAV adhered to that request, but we lost a target or two before we could redirect the UAVs.

Sometimes higher headquarters controlling the UAVs has a fixation on watching the close fight. It is human nature to want to look at who is being shot at. But sometimes the headquarters needs to back that UAV off to look at the deeper fight, to look at reinforcements coming in—which we did, but we also met resistance at times.

My inclination was to look at the bigger picture all the time to see how I could influence the fight. Occasionally, we had more than one UAV up at a time and could look at both the close and deep fights, but that was not true throughout the fight.

I'd like a lightweight counterbattery radar—not so much for the battle at Shah-e-Kot Valley, but for subsequent fights. In the Valley, we mostly fought mortars that tended to direct lay. We did destroy five D-30s near The Whale that were used to fire on helicopter landing zones. Down along the Pakistan border, we took some rounds from what we think were D-30 howitzers and other systems. The total number of howitzers we actually destroyed was about eight. We also found a few more howitzers in caves.

I had a Q-36 Firefindar radar at Kandahar Airfield and was prepared to move it into the valley once we had secured an area for it. But because we were experiencing very little indirect fire, I chose not to insert it.

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

A Tell the Field Artillery School to keep doing what it's been doing—we have some smart young officers and NCOs here in Afghanistan who have really made a difference.

Tell them I love 'em.

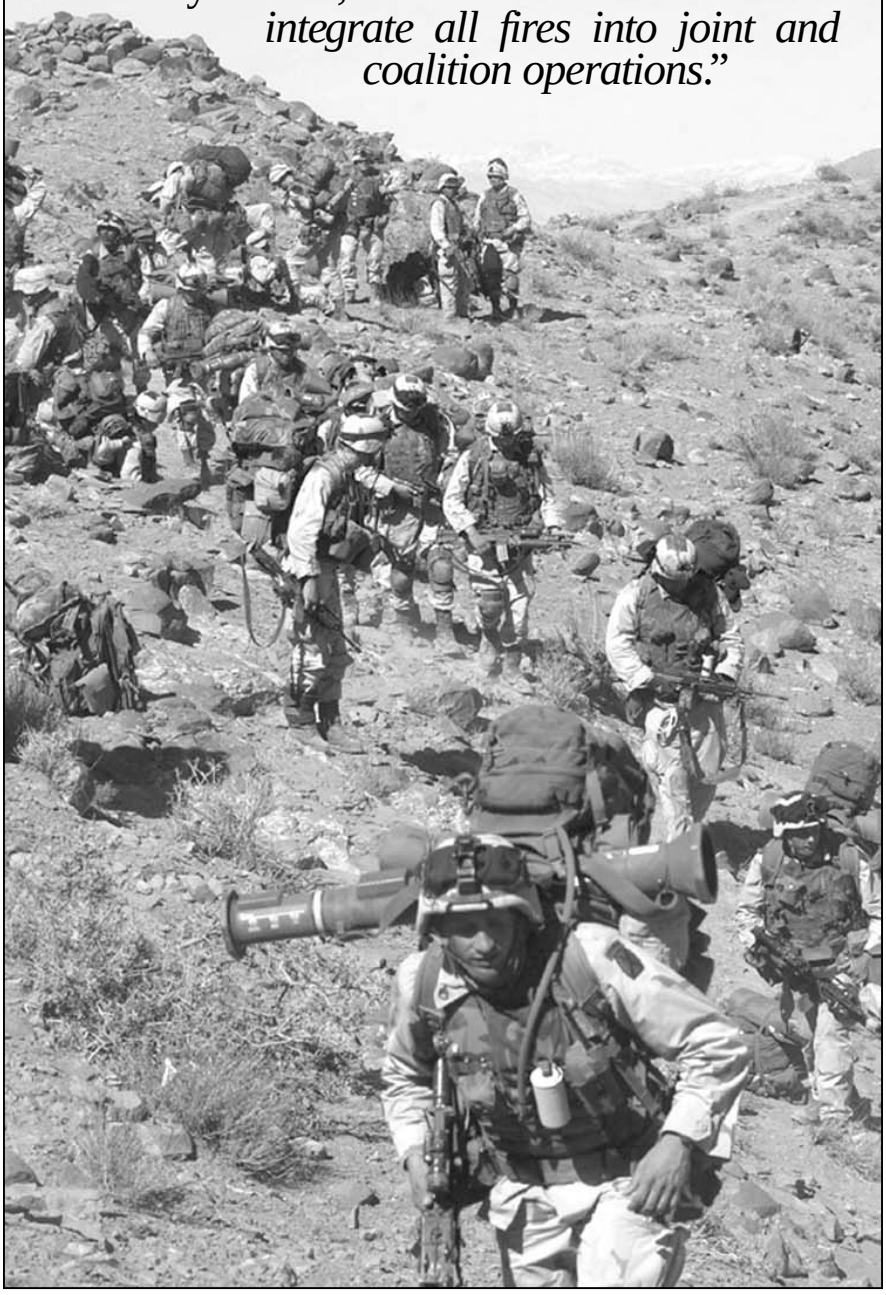
Major General Franklin L. Hagenbeck took command of the 10th Mountain Division (Light) and Fort Drum, New York, in August 2001, the same division in which he had served as Chief of Staff and G3 and commanded the 1st Battalion, 87th Infantry. In December 2001, he deployed to Afghanistan as the Commander of the Coalition Joint Task Force Mountain and served as the ground tactical commander during Operation Anaconda. In his previous assignments, he was on the Joint Staff as the Deputy Director for Politico-Military Affairs for Global and Multi-Lateral Issues and Western Hemisphere in the Strategic Plans and Policy Directorate (J5) and, later, the Deputy Director of Current Operations (J33), both at the Pentagon. Among other assignments, Major General Hagenbeck was the Assistant Division Commander (Operations) in the 101st Airborne Division (Air Assault), Fort Campbell, Kentucky, and Director of Officer Personnel Management in the Total Army Personnel Command, Alexandria, Virginia. He also commanded the 3d Training Brigade at Fort Leonard Wood, Missouri. He holds an MBA from Long Island University, New York, and a MS in Exercise Physiology from Florida State University. He has a Bachelor of Science from the US Military Academy at West Point.

Afghanistan

Joint and Coalition Fire Support in Operation Anaconda

By Lieutenant Colonel Christopher F. Bentley

Field Artillery Mission Statement (Revised): "To destroy, neutralize or suppress the enemy by cannon, rocket and missile fires *and to integrate all fires into joint and coalition operations*."



Soldiers from 4-31 IN, 10th Mountain Division, descend a steep hill to link up with American and Canadian troops. Photo by SPC Andres J. Rodriguez, 55th Signal Company

The ability of the United States to wage unilateral military action is unquestionable. But the reality of modern warfare is that US military actions without coalition forces will be the exception rather than the rule. The mission statement of the Field Artillery should reflect this change.

A mission statement with the limit of "combined arms operations" neglects the changing dynamic of modern warfare and focuses fire supporters only on assets available to the US Army internally rather than on the entire spectrum available in joint and coalition operations.

To meet the intent of the Coalition Joint Task Force Mountain (CJTF-Mtn) commander (Commanding General of the 10th Mountain Division), fire supporters in the Afghanistan Joint Operations Area (AJOA) met daily to integrate and synchronize joint and coalition force operations. The successful employment of fires in the AJOA, specifically during Operation Anaconda in the Shah-e-Kot Valley, demanded an unprecedented level of interoperability among disparate agencies and organizations.

The enemy is elusive, intelligent and committed and has few fiscal constraints. His tactics are similar to the enemy we faced in rotations at the Joint Readiness Training Center (JRTC) at Fort Polk, Louisiana, but in an environment more rugged than that of the National Training Center (NTC) at Fort Irwin, California.

Modern war has been defined as limited and carefully constrained in geography, scope, weaponry and effects (General Wesley K. Clark, *Waging Modern War*, New York: PublicAffairs, 2001, Page XXIV). Ongoing operations in the AJOA validate that description and the need to revise the FA mission statement. When we revise the statement, we must revise the processes involved in meeting the commander's intent.

Although much about Operation Anaconda is classified, I can address several important fire support lessons learned in targeting, fire support coordinating measures (FSCMs), fires execution and fire support team (FIST) resourcing and training. Undoubtedly in the future, more about this and other joint and coalition operations will be discussed in this forum.

Targeting Challenges. During the planning and execution of Operation Anaconda, we employed a combination of forces and assets. Planning started

with the targeting process and was refined throughout execution. Our targeting meetings were held daily at 1200, and the results were presented in a decision briefing for the commanding general.

Our *decide*, *detect*, *deliver* and *assess* (D^3A) targeting methodology is basically sound. However, coalition and joint operations in the AJOA identified a shortcoming: we failed to precisely articulate desired effects *as a means*. The best analogy to explain what I mean is the continuing confusion between the artillery community and maneuver commanders about what constitutes a "destroyed" target—is the destruction 30 or 100 percent? Now apply this analogy to an operation involving a host of services and nations.

Failure to communicate explicitly the desired effects on a target may result in the wrong system or munition being used. This is especially crucial in joint and coalition operations where a broad array of platforms and munitions are available to produce effects on a given targets.

For example, as effective as precision munitions can be against certain types of targets, they are not the optimum munition for every situation. The enemy in Afghanistan (and elsewhere) is not presenting the classic Battle Command Training Program (BCTP) Warfighter exercise target set. We face an opponent who chooses, in most cases, not to line up against our strengths.

While, I believe our intelligence and targeting systems are fundamentally sound, we must adapt to an enemy who doesn't present the type of tactical formations our intelligence, surveillance and reconnaissance (ISR) platforms are optimized to detect. In other words, the enemy "gets a vote."

The division analysis and control element (ACE) is the nucleus of the target decision-making process. The FA intelligence officer (FAIO) usually is an integral part of that team. However, during Operation Anaconda, the 10th Division also conducted simultaneous operations in 10 other countries, and we did not have the benefit of an FAIO in Afghanistan.

Within the CJTF-Mtn fire support element (FSE) we quickly identified a division of labor to accomplish the FAIO functions. The FAIO takes the intelligence generated by the ACE, applies his fire support knowledge and assesses those targets that require engagement.

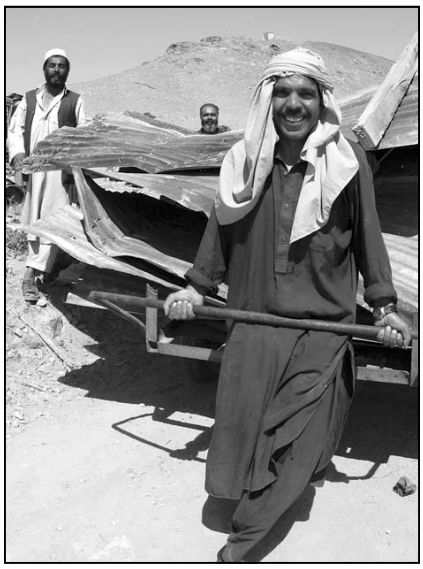


Photo by Senior Airman Bethann Hunt, 1st Combat Camera

Civilians on the battlefield or displaced civilians moving through the battlefield can be a virtual communications system for the enemy.

The FAIO is the subject matter expert on the capabilities and limitations of all assets, friendly and enemy. He then correlates the data and presents viable recommendations to the staff and commander.

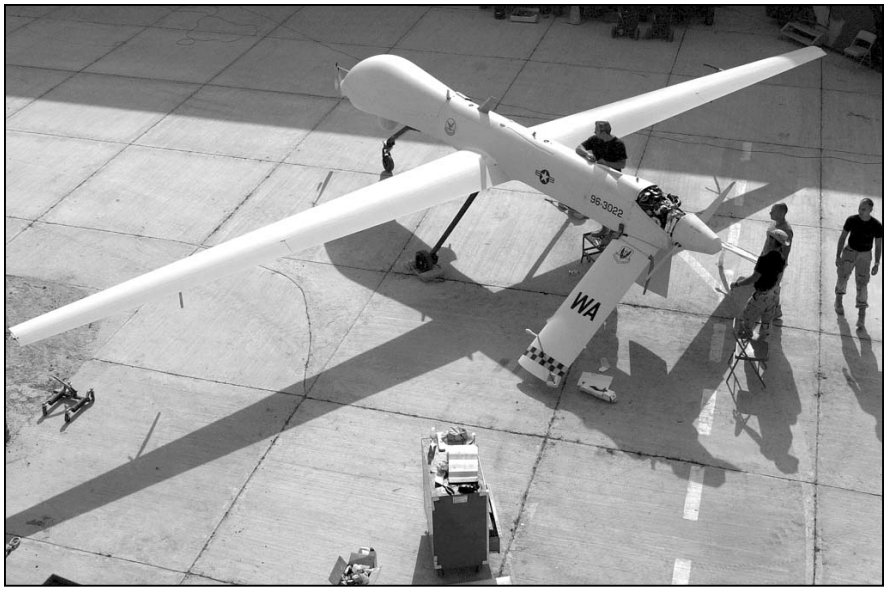
Units must not allow the FAIO slot to become an "economy of force" position. Of all the positions in the division FSE, the FAIO is, arguably, the most important.

We also must reassess our traditional target categories due to changing tactical, operational and strategic parameters. During Operation Anaconda, we were not allowed to recognize some targets in accordance with the prescribed target categories. For example, the enemy used trails as the primary lines of communication (LOC) to resupply, infiltrate and exfiltrate. Because LOCs identify strategic related infrastructure (such as bridges and railroads), legal constraints kept us from categorizing many LOCs as high-payoff targets (HPTs). Instead, we simply identified "trails" as HPTs.

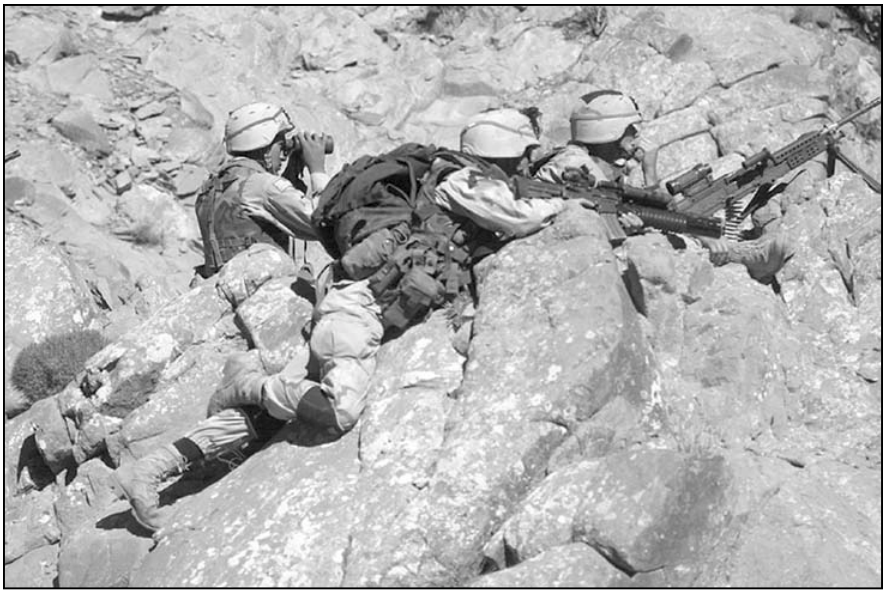
Civilians on the battlefield or displaced civilians moving through the battlefield can be a virtual communications system for the enemy—a characteristic emerging on the modern battlefield. As we continue to define the contemporary operating environment (COE), we must identify acceptable tactical target categories.

ISR Capabilities. We have an exceptional suite of ISR platforms. But what was clear early on was the immutable importance of terrain to an enemy who didn't want to be found. Afghanistan's rugged terrain is, in and of itself, a combat multiplier. It provided the enemy sanctuary, especially as he studied how we employed our systems. He learned that any large group of his forces quickly became a target list entry.

Our aerial ISR platforms did provide some "stand-off reconnaissance" that helped us select helicopter landing zones (HLZs) and gave aircrews some idea about the terrain. Additionally, the Predator unmanned aerial vehicle (UAV) supported our surveillance and reconnaissance (SR) teams as they infiltrated and exfiltrated.



The Predator unmanned aerial vehicle (UAV) supported our surveillance and reconnaissance (SR) teams as they infiltrated and exfiltrated. *(Photo by Tech. Sgt. Scott Reed, 1st Combat Camera)*



4-31 IN soldiers make eye contact with an enemy bunker in the Shah-e-kot Valley during Operation Anaconda. *(Photo by SPC Andres J. Rodriguez, 55th Signal Company)*

But it was apparent that imagery intelligence (IMINT) and the Predator were not going to identify robust target sets to engage when facing an enemy employing asymmetrical operations. Once we put our SR teams in and established a more intricate human intelligence (HUMINT) network, we did a better job of confirming or denying targets and particular enemy courses of action (COAs).

Overall, we learned that the synchronization of all intelligence means is imperative; more importantly, we learned that incisive and thoughtful analysis must complement raw intelligence data. Our challenge was to work with a number of incongruent agencies that normally do not work together and paint a solid ISR "picture" for the commander—a picture he could use as the basis for action.

Actionable intelligence is crucial. After the Gulf War, General Norman H. Schwarzkopf stated, "If you took all the intelligence products that I had access to during the conduct of combat operations, you could easily fill several large warehouses; however, very little of it was actionable." What is notable about General Schwarzkopf's quote is that he stated that after fighting on a linear, symmetrical battlefield against a nation-state enemy. Our intelligence challenges in AJOA were exacerbated many fold as we fought a non-state actor operating on an asymmetrical battlefield.

While the learning curve was steep, we developed solid ISR patterns that supported our targeting process. We were able to inject ourselves into the enemy's decision cycle, forcing him to become a casualty, surrender or seek sanctuary in neighboring countries.

Fire Support Coordinating Measures. FSCMs, both permissive and restrictive, must facilitate the tactical ground commander's ability to fire and maneuver. Doctrinally, permissive FSCMs facilitate movement while restrictive FSCMs protect friendly forces, innocent civilians and designated facilities, sites, etc. However, in a nonlinear environment involving multiple organizations and agencies, many of the FSCMs used were restrictive.

Restrictive FSCMs were the routine control measure to facilitate fires and maneuver during Operation Anaconda. This translated into well over 200 FSCMs across the various joint and coalition, conventional and unconventional forces.

Very quickly, the FSE made FSCM management a full time job for the FSE day and night shift NCOs. These stellar fire support sergeants adroitly managed a chaotic situation during Operation Anaconda; they coordinated and deconflicted FSCM as six million pounds of ordnance was dropped into a very tight valley.

In a joint and coalition environment, it is critical to clearly articulate the purposes, merits of and differences between restricted-fire areas (RFAs) and no-fire areas (NFAs). The enemy uses all terrain features, natural and manmade, to mask his movements and engage friendly forces.

During Operation Anaconda, the CJTF-Mtn FSE found the preponderance of issues with FSCMs originated with the other government agencies (OGAs) of the United States operating in theater. Most OGAs wanted large, comfortable NFAs over each of their positions—many of which covered key terrain of interest to joint and coalition unconventional warfare (UW) and SR teams. NFAs, by their nature, would deny these UW and SR teams the flexibility to engage targets in those areas. Instead, we used RFAs.

The use of RFAs allowed the approving ground tactical commander to engage targets as deemed necessary. RFAs facilitated UW and SR team movement and allowed us to set the conditions for future engagements.

The moral and legal imperative of the commander is to provide his soldiers all the resources they need to achieve victory. We wanted to establish permissive FSCMs over certain terrain features for the purpose of suppression; yet due to legal constraints, we were not allowed to establish doctrinal, permissive FSCMs.

Our goal was to achieve the desired effects and have the flexibility to deliver unobserved munitions on targets, as determined by the intelligence preparation of the battlefield (IPB) and all-source intelligence. For this purpose, we were allowed to establish special engagement zones (SEZs)—frankly, a euphemism for a free-fire area (FFA). Once the terminology was approved, we established SEZs along known and suspected infiltration and exfiltration routes. This became our "deep/interdiction" fight, setting the conditions for the close fight.

I am *not* advocating we include the term "SEZs" in our doctrine. We have established Army and joint doctrinal terminology, but there are times when working with joint and coalition forces that the doctrinal terms may not be appropriate or understood.

It is imperative to establish proper terminology early, ensuring all forces understand the meaning. This terminology must be based on the enemy's most dangerous COA instead of his most likely COA.

Fires Execution. During the first 24 hours of Operation Anaconda, we serviced more than 30 troops in contact with close air support missions. As successful as we were, we must not extol the efforts of fixed-wing support alone.

All available organic ground indirect fire support systems were employed

during Operation Anaconda. Of the 34 mortars available to Task Force Rakkasan, 26 were employed in support of task force troops in the Shah-e-Kot Valley. These systems provided timely, responsive, all-weather suppressive fires in support of ground forces. The remaining eight tubes were positioned as force protection assets at Kandahar and Bagram.

Within the first 48 hours of Operation Anaconda, the commander of Task Force Rakkasan recognized the need for responsive, massed fires with multiple shell-fuze combinations. The task force established a "mortar battery," combining 120-mm and 81-mm mortars and positioning the battery within the constraints of the weapon systems. The task force FSE provided tactical command and control, while the CJTF-Mtn FSE established procedural and doctrinal control with joint and coalition forces.

The time constraint placed on CJTF-Mtn in planning hindered the responsiveness of the targeting process. In the AJOA, a majority of the fire support assets available were aviation and subject to the air tasking order (ATO). The ATO required aviation assets be coordinated 36 hours out. There was little time for flexibility in the sequence of the daily targeting meeting with all coalition and joint liaison officers (LNOs), the approval of the HPT list (HPTL) and the pilot's pre-mission briefing.

The ATO is the best mechanism available to coordinate the hundreds of human and mechanical pieces involved in getting air on station, but it is conversely inflexible and not well-suited to support a nonlinear, asymmetrical battlefield.

The ATO must be flexible enough to change aircraft and munitions packages as the intelligence picture changes by the minute. Increasing the flexibility of the ATO cycle is imperative to responsiveness in today's COE.

Precision-guided munitions (PGMs) are not "silver bullets" for every target engagement. The array of armament packages in any ATO should be structured to respond rapidly to any situation.

In terms of quantities and percentages, more precision munitions have been dropped in support of Operation Enduring Freedom than any other military operation to date. A large percentage of the targets struck with these munitions do not fit into the more traditional target category of high-value targets—those targets that affect the enemy's centers of gravity. Traditionally, high-value targets are bridges, factories, military headquarters, communications nodes, motor pools, etc. But in Operation Anaconda, the targets we needed to engage were enemy maneuver elements on foot, mortar and heavy machinegun positions and specific terrain features.

Our PGMs were very effective against fixed targets; however, not all targets on the Anaconda battlefield were stationary. PGMs take too long to arm and deliver to attack small mobile targets and targets of opportunity. Although PGMs give the US military an unparalleled ability to strike any point on the earth precisely, the time required to mensurate a target's coordinates and determine the desired mean point of impact (DMPI) to ensure the PGMs can hit the target is generally a luxury troops in contact don't have.

The task force established a "mortar battery," combining 120-mm and 81-mm mortars and positioning the battery within the constraints of the weapon systems. *(Photo by SGT Keith D. McGrew, 55th Signal Company)*

The Army AH-64 Apache helicopter performed exceptionally well in Operation Anaconda. However, the limiting factors of altitude and terrain clearly detracted from what these helicopters were designed for: to stand off and attack armored formations. They were brilliant in their air assault escort roles, allowing us the flexibility to position fixed-wing aircraft in orbits near ground troops.

The optimum USAF close air support (CAS) platform was the A-10 Warthog. The A-10's capability to deliver a variety of munitions responsively and perform the duties of a forward air controller-airborne (FAC-A) greatly enhanced the ground force's ability to fire and maneuver.

Bomber and strike aircraft also provided CAS during Operation Anaconda, but these aircraft were limited by the inherent design of their airframes. In some cases, the inabilities of aircraft to break self-imposed USAF altitude restrictions, slow their strike speed down or strafe the battlefield (the latter in the case of the bombers) restricted these aircrafts' abilities to deliver timely munitions in close support of troops on the ground.

The AC-130 gunship emerged as the platform of choice at night. Its effectiveness was *amazing*. The enemy began referring to it as the "Spitting Witch."

Every light infantry division needs an AC-130 squadron. These platforms should be available for all light infantry training and military operations around the world.

FIST Resource and Training. Our FIST soldiers must understand how to employ the AC-130, and our forward observers (FOs) must be certified—not just trained—to employ all CAS assets, thereby making the fire supporter more universal.

If providing precision fires means "employing fires precisely where needed in the appropriate volume to achieve the desired outcome" (Major General Michael D. Maples, "Looking Back 200 Years and Forward to Continue the Legacy," March-April 2002, Page 1), then the Army fire supporter must become the premier observer. In the article "Universal Observers: Punching our FIST into the 21st Century" (May-June 1979), author Lieutenant Colonel Vance Nannini outlined this need.

The best intelligence or assessment capability available to CJTF-Mtn continues to be the soldier on the ground. *(Photo by SPC Andres J. Rodriguez, 55th Signal Company)*

Our young soldiers are the best in the world, yet they still don't have the best resources and training to employ fire support from all platforms—not just fires that come out of a tube or launcher. Once we resource and train universal observers, we will be able to provide precision fires with precision maneuver, making the operational and tactical land power decisive.

Part of resourcing our fire supporters is effective communications capabilities. Operation Anaconda was not an FM "push to talk" fight. Our FSEs and FISTs in the fight did not have the communication packages to talk to all delivery platforms.

We must look for other options, such as the MBITR M-117 radio. This system has FM, UHF, VHF and satellite communications (SATCOM) capabilities in one package with a greater range than current radios. Additionally, it runs on the same AA batteries the FISTer carries for his night observation devices (NODs), precision lightweight global receivers (PLGRs), etc.

In Operation Anaconda where the vast majority of fire support is provided by air assets, the FIST is dependent on the USAF TACP for Air Force support. Independent SR and UW teams were all operating simultaneously and all demanding the same fire support resources. If the TACP is taken out of the fight, in most cases there are not redundant certified observers or equipment to fill the gap. An example is when 1st Battalion, 87th Infantry (1-87 IN, 10th Mountain Division, part of Task Force Rakkasan) took mortar rounds on its HLZ five miles from the nearest TACP and could not call in Air Force air assets.

We should send fire support officers (FSOs) and fire support NCOs (FSNCOs) to the Joint Fire Power Control Course (JFCC) during the FA Officer Basic Course (FAOBC) and FA Basic NCO Course (FABNCOC), respectively. At the unit level, leaders must be responsible for sustaining their training and qualification as "TACPs."

Our FOs must be certified as ground forward air controllers (GFACs). This may be a sore spot with the Air Force, but I believe it to be nonnegotiable.

Very few of our FOs are trained to be universal observers. And until they are, we must do a better job of integrating our USAF TACP into ground maneuver training and operations. We cannot continue to operate with an add-on conglomerate of Air Force personnel, especially during combat operations. We must train and fight as a team.

In Operation Anaconda, the brigade and battalion task force FSOs and FISTs were at "the tip of the spear," and they performed magnificently. However, to ensure continued quality, we must fill these positions with our most experienced officers. The brigade FSO position must be the second branch-qualifying job for a major (after battalion S3 or XO), and the battalion FSO should be a post-battery command captain.

As a branch, we must clearly articulate the significance and importance of these critical fire support positions to the Army. The brigade FSO position must be seen as our "vote" for future battalion command. Using post-battery command captains as battalion FSOs raises their credibility with battalion task force commanders. To ensure the quality of these fire support positions will take discipline and patience from the Field Artillery community. We owe the ground tactical commander our best and brightest.

Conclusion. The best intelligence or assessment capability available to CJTF-Mtn continues to be the soldier on the ground. For all the advantages provided by the Predator, Global Hawk, P3AIP, U2, and all the other high-tech national assets, nothing came close to the intelligence yielded during sensitive site exploitation (SSE) operations conducted by soldiers at the end of Operation Anaconda.

The lessons learned in the AJOA continue to emerge as we prosecute the War on Terrorism. Fire supporters proved, once again, that trained soldiers and leaders help the maneuver commander bring synergy and firepower to bear. Soldier power is hard to replicate by any other means.

The author wishes to thank the following for their input into this article: Major Lou Bello, Assistant Fire Support Coordinator (AFSCOORD), 10th Mountain Division (Light Infantry); Major Brad Herndon, 2d Brigade FSO, 10th Division; Major Dennis Yates, 3d Brigade FSO, 101st Airborne Division (Air Assault); and Captain Scott Taylor, 1-87 IN FSE, 10th Division.

Lieutenant Colonel Christopher F. Bentley, until recently, served as the Deputy Fire Support Coordinator (DFSCOORD) in the 10th Mountain Division (Light Infantry), Fort Drum, New York, deploying to Afghanistan for Operation Anaconda. He now commands the 3d Battalion, 6th Field Artillery, 10th Mountain Division. He also has served as a Fire Support Officer and Fire Support Coordinator in the 25th Infantry Division (Light), Schofield Barracks, Hawaii, and the 82d Airborne Division, Fort Bragg, North Carolina; and as an Observer/Controller at the Joint Readiness Training Center, Fort Polk, Louisiana. Among other assignments, he commanded B Battery, 7th Battalion, 8th Field Artillery in the 25th Division, and served as the S3 for the 1st Battalion, 319th Airborne Field Artillery Regiment in the 82d Airborne Division.

Photo by SPC Jeremiah Johnson, Combat Camera

Counterfire in Afghanistan

By Warrant Officer One Scott E. Prochniak and Major Dennis W. Yates

On 2 March 2002, Task Force Rakkasan, the 3d Brigade Combat Team (BCT), 101st Airborne Division (Air Assault) with elements from both the 101st Airborne and 10th Mountain Divisions, assaulted into the Shah-e-Kot Valley in the Khowst-Gardez region of Eastern Afghanistan. The task force's units immediately came under intense fire from al Qaeda elements high in the hills surrounding the valley. Small-arms fire, rocket-propelled grenades (RPGs) and, in particular, 82-mm mortar rounds ricocheted and impacted all around task force elements as they advanced on their objectives.

For two days, the 1st Battalion, 87th Infantry (1-87 IN), 10th Mountain Division from Fort Drum, New York, and the 2d Battalion, 187th Infantry (2-187 IN), 101st Airborne Division from Fort Campbell, Kentucky, were shelled continuously by al Qaeda mortar crews hiding in caves, emerging to fire their weapons in direct-lay mode. The technique was simple yet effective. The enemy did not even bother to use bipods, opting to prop their tubes on piles of rocks built to help aim the mortars on pre-registered targets.

Although this tactic was not particularly accurate, it produced several friendly casualties and disrupted the task force's assault during its initial stages.

Air strikes and Apache helicopters destroyed most of the enemy mortars in those first two days. However, one enemy mortar crew proved highly resilient and harassed 2-187 IN for two days as the battalion moved to its objectives in the north of the valley. The enemy crew was perched outside a cave on a dominating ridgeline on the west side of the valley that was dubbed "The Whale." [See the map on Page 6.]

Late on 3 March, the commander of A Company, 2-187 IN finally had all of the shelling he was willing to stand. He devised a strike package to eliminate his harassers. Turning to his fire supporters, the commander said, "Okay, here's what we're going to do: ETAC [enlisted tactical air controller], call in a close air strike on that cave. FSO [fire support officer], work up a mortar fire mission on that position and prepare to fire on my command."

As the F-16 roared away after dropping its ordnance, the company commander gave the order, "Fire!" Several rounds left the tubes; the report of the mortars was masked by the boom of afterburning turbojets echoing through the valley floor. As predicted, the enemy crew (that had come through yet another air strike unscathed) exited the cave once more and began to set up their mortar. Before they could complete their task, the hillside erupted in a series of detonations as the American 60-mm rounds found their target.

As the smoke and dust cleared from the hillside, Alpha Company's forward observers (FOs) looked through their binoculars at the results of the mortarmen's handiwork. The enemy crew lay dead outside the mouth of the cave with their mortar tube smashed. The company began to cheer, finally having silenced their tormentors.

Such is the nature of the counterfire threat in the Afghanistan campaign. The 3d BCT, 101st Division, faced an enemy that uses guerilla tactics and makes the most of improvised and low-tech weapons and devices. Protecting the force against such a threat is hard work. Constant vigilance is a must. Pattern analysis is very difficult.

It is against this backdrop that the Q-36 Firefinder radar section from the 3d Battalion, 320th Field Artillery (*Red Knights*), 101st Division, deployed to Kandahar Airfield to provide counterfire coverage for the 3d BCT. The operational environment in Afghanistan has highlighted the limitations of the Q-36 and illustrated the need for a lightweight, omni-directional counterfire radar system to locate enemy elements.

The Environment. The environmental conditions at Kandahar are similar to those experienced during Operation Desert Storm in the Persian Gulf. The region around the airfield is a dry, dusty and sand-covered flatland with hills and mountain ranges in the far distance. This is an extremely harsh environment for both men and machines.

The *Red Knights* Q-36 crew quickly learned techniques to use to keep the radar operational. These maintenance lessons are listed in Figure 1.

Positioning the radar on the airfield is difficult, given the limited space available. For security, everything at Kandahar must remain inside the perimeter fence. The radar also must be positioned away from other electronic systems that potentially could interfere with its signals.

The radar position we used is comparable to those built at the National Training Center (NTC), Fort Irwin, California, with a platform for the antenna group and survivability holes for the shelter and generators. The antenna group is "bermed" to the bottom of the antenna face. With such a set-up, it almost would take a direct hit to disable the radar.

The Mission: Protecting the Force. A small part of the radar's mission is to locate enemy mortars launched at the airfield. A more important function, however, is for the radar to locate enemy rockets launched using improvised firing platforms and timing devices. Just such weapons attacked the airfield on 23 February. Many such rocket attacks have occurred across the country. The maximum range these rockets achieve is about eight kilometers. The maximum effective range of the 82-mm mortar is about four kilometers.

Using the Q-36 in extended-azimuth mode causes undue wear and tear on the azimuth drive motor because of the sand and strong winds in Afghanistan. Therefore, it is imperative for the brigade's S2 (security) section and fire support element (FSE) to work closely to develop named areas of interest (NAIs) to focus the radar's sector of search.

The sensor-to-shooter link also has to be given serious consideration because the airfield is located in the center of a fairly well-populated region. Indiscriminate use of high-explosive rounds to engage enemy attackers easily could result in the deaths of innocent civilians, causing untold damage to the coalition's efforts in the country. Therefore, we developed a battle drill to redirect a patrol or launch a quick-reaction force (QRF) to deal with a counterfire acquisition. We also developed an Apache helicopter QRF as an option available to the commander.

A better solution to provide effective counterfire coverage to the airfield may be to use an AN/TPQ-37. The Q-37 is designed for locating low-trajectory weapons, such as rockets. To mitigate the potential for rounds fired inside the Q-37's minimum range of 3,000 meters, the airfield's perimeter defense force uses its outstanding optics, perimeter towers with clear fields of fire and an aggressive patrolling schedule.

Doublestack the filters on the roadside air intake.
Blow out filters daily.
Disconnect, clean and reconnect data and power cables daily.
Keep shelter door closed as much as possible to reduce the dirt inside.
Ensure the shelter airflow remains clear of obstructions.
Ensure the top and side of the radar processor remains clear of obstructions so the air can move freely through the system's components.
Ensure the radar processor blower is free of dirt and sand.
Add a 400-Hz vacuum cleaner to basic issue items (NSN 7910-00-530-6260).
Upgrade the hard drives to 1.0 GB or more.
Use digital maps instead of paper maps.
Rotate the generators daily and give each a 24-hour break.
Write the hour/date of each service on the generator oil filter.

Figure 1: Q-36 Maintenance Lessons

Other Mission in the Area of Operations (AO). Another mission routinely given to the task force is to secure small, remote sites in the AO using platoon-sized security forces. As in other operations, the main threat is the enemy mortar or rocket attacks or direct-fire attacks using small arms and RPGs.

The AO does not offer much cover or concealment, and the attacks usually are in open terrain. As such, the terrain allows an enemy good observation. As often happens at the Joint Readiness Training Center (JRTC), Fort Polk, Louisiana, when the enemy can see the face of the Q-36's antenna, he knows to wait until it is facing away from him before firing his mortars.

Resupply occurs at random times and as infrequently as possible to avoid falling into a pattern easily identifiable by the enemy gunners and to save undue wear and tear on airframes. Therefore, it is not possible to deliver the fuel required to power the Q-36 for continuous operations at a remote site.

Given the threat, the terrain and the radar's logistical requirements, using the Q-36 with its relatively high profile, directional limitations and fuel consumption is an invitation for disaster. The radar is much more successfully employed at a base, such as Kandahar, where it can be properly maintained, serviced and supported and linked to a delivery asset.

Operation Anaconda. During the fight for the Shah-e-Kot Valley, the question was raised as to whether or not the Q-36 would have helped us locate the enemy mortar positions. The answer was, "Actually, not effectively." This is not to say that the Q-36 is no longer a valuable tool in today's counterfire fight. Terrain and other factors always determine the effectiveness of any system.

Operation Anaconda is an example of how the operational environment, in fact, can be so limiting as to render the radar unemployable. Three specific limitations precluded the use of the Q-36 during this fight: tactical lift capability, the severity of the terrain and the directional nature of the radar's location capability.

Tactical Lift. The primary constraint was lift. The altitude at which the operation took place (9,000 to 10,000 feet) had a limiting effect on aircraft loads. The

Army's CH-47D Chinook helicopter, even under ideal conditions, is the only practical choice of airframe to lift a Q-36 radar section into combat. The allowable combat load (ACL) for the CH-47 under the conditions at the time of the operation was considerably less than the maximum ACL under optimal atmospheric conditions (25,000 pounds). Given this ACL, it was theoretically possible to lift the Q-36 shelter truck, the heaviest component of the system, using slings. Doing so, however, would have been a high risk because external loads greatly reduce an aircraft's maneuverability and speed. Because of this, the task force used internal loads almost exclusively; it only used sling-loads for 5,000- and 10,000-pound cargo nets to resupply the force quickly when bad weather threatened to halt aviation operations.

The Army's CH-47D Chinook helicopter, even under ideal conditions, is the only practical choice of airframe to lift a Q-36 radar section into combat.

The second constraint to lift capability was the number of airframes available for the operation. Inserting the Q-36 system would have used four of the task force's 12 CH-47s on one of the initial lifts, thereby limiting the task force commander's ability to insert additional riflemen into the objective area.

Terrain. Terrain on the objective was the next most important factor affecting radar employment. The terrain was so broken that even movement by high-mobility multipurpose-wheeled vehicles (HMMWVs) would have been impossible. Therefore, once airlifted, the radar would have had to remain where it was inserted for lack of a prime mover and trafficable terrain.

Few places on the battlefield offered an occupation site with less than a seven-degree slope. The only place on the objective flat enough to allow occupation by the radar was the valley floor, which the enemy occupied.

Other possibilities included placing the radar in the mountain passes to the east, collocated with task force blocking positions. Those areas suitable for a radar site had to be used instead for helicopter landing zones (HLZs).

These areas also were surrounded on all sides by high hills. While the hills would have helped the radar's defense, they also would have raised the search fence considerably, reducing the probability of acquiring targets.

The contour interval of the terrain was, perhaps, the most striking feature of the objective area. The radar section leader, brigade targeting officer and the brigade executive officer used computer programs such as Falcon View to try to analyze the terrain, the enemy situation and the capabilities of the radar versus the tactics, techniques and procedures (TTPs) being used by the enemy.

The maps produced for the operation gave almost no indication of the broken terrain and severe slopes in the area. The severity of the terrain was not completely appreciated until the brigade FSO was inserted with the brigade tactical command post (TAC). He then was able to assess the terrain first-hand. Mask angles and site-to-crest were severe, easily

Once its on the ground, how does the radar system resupply?
Aerial resupply, which will cause additional blade time for aircraft.
How much fuel can be carried in on the initial lift, therefore increasing the lift requirement for insertion?
100 gallons of fuel, including fuel tanks on the prime movers and the use of the auxiliary fuel system on the generator set, thus adding 780 pounds to the total package weight.
How long will the radar generator run on a tank of fuel?
The radar set uses approximately 30 gallons of fuel each day when running 24-hour operations, thus allowing the system to operate for 72 hours before requiring resupply.
Who will the radar communicate with if no over-the-horizon communications are available?
The radar would talk to the brigade fire support element (FSE) and establish a quick fire link with mortars on the ground.
What repair parts, if any, should elements bring in with the system?
All small parts that easily could be damaged by direct fire systems, especially on the antenna group.
How long will the radar remain operational before being engaged with direct fire by the enemy?
Depending on the weapon identification skills of the enemy, the radar system might not make it to the fight without small arms fire rendering it inoperable. Enemy guerillas and indirect fire systems were visible from the task force blocking positions, plus aircraft returned from the battlefield with multiple bullet holes in their airframes.
How many infantry soldiers can four CH-47 Chinooks take into the fight instead of the AN/TPQ-36V(8)?
Given the same allowable combat load (ACL) restrictions as on the Firefinder system, the lift brought 172 infrantrymen, a large company, to the fight instead of the radar system.
What's a solution to the "dead space" problem of the Firefinder system?
A lightweight countermortar radar (LCMR) to complement the Q-36—not replace it.

Figure 2: Q-36 Employment Considerations

more than 120 mils. The objective area contained multiple wadis and gullies over 100 feet deep. The only practical location for a Q-36 would have been on top of a hill. This would have given the enemy an easy target for their mortars.

360-Degree Fight. The task force was involved in a 360-degree fight. The bulk of the enemy force was located on the south side of the objective area. The only relatively safe location in which to position a radar was on the north side of the objective. From there, the Q-36 only would have been able to acquire a small percentage of enemy rounds—those rounds fired from south to north. The enemy was firing at targets in all directions from firing points ringing the valley, negating the Q-36's ability to track rounds. Also, the low trajectory of rounds fired in direct-lay mode would have put many of the rounds under the radar's search fence. As it turned out, it was relatively easy to spot the enemy's firing positions anyway. Most of them were on mountain slopes above the task force. There was no vegetation to use as concealment, so it was easy to hear the report of the mortars and spot the smoke from the muzzles.

A Look at the Future. A possible means to provide 360-degree coverage would be to supplement the existing AN/TPQ-36 section with the lightweight countermortar radar (LCMR) developed by the Army's Special Operations community. With its range of six kilometers in the omni-directional mode, this may be the system to help fill the gaps currently left by the limitations of the Q-36. When set up in an inconspicuous place, the LCMR can provide 6400 mils of coverage without being easily visible to an enemy. It can be powered by a commercially available 60-Hz generator (as opposed to the 400-Hz generators used by the Firefinder family) or from batteries.

The lightweight countermortar radar (LCMR) developed by the Army's Special Operations community.

The target location error (TLE) of such a system need not be particularly accurate, just good enough to redirect a patrol or an aircraft to the firing point. The Army is likely to find itself in operational environments similar to that in Afghanistan where the rules of engagement (ROE) prevent targeting enemy mortars with more lethal fires.

An LCMR should be added to the Q-36 section and manned by two additional radar operators. The future AN/TPQ-47 Firefinder has a nine-soldier section—a reduction of three soldiers per section as compared to the Q-37 crew. These slots could be given to each light division to supplement their Q-36 sections with an LCMR and its operators.

The addition of this system to each light division's modified table of equipment (MTOE) would give the section new capabilities for the maneuver commander to exploit. The Q-36 would be available to conduct missions within its capabilities, and the LCMR would be able to fill gaps by providing the omni-direction coverage needed by the light forces. By using the systems together, with the smaller system covering the dead-space left by its larger cousin, the commander would be able to achieve 360-degree coverage close in and focus on NAIs at a greater range.

A near-term change to the Q-36 can reduce the lift required to move it. The AN-TPQ-36 can be reconfigured to resemble the future Q-47. Currently the Q-36 requires two C-130 airplanes or four CH-47 helicopters to transport it. By relocating the signal processor from the shelter to the antenna trailer and providing a mounting bracket for the portable operations suite in the generator truck, the Q-36 section would have a two-vehicle early entry configuration similar to its new big brother, the Q-47, cutting the lift requirements in half.

Conclusion. The lessons learned in Afghanistan and at our Combat Training Centers (CTCs) demonstrate the need for both a short-range, omni-directional counterfire capability and a long-range directional capability. Experiences in Afghanistan and at the NTC show that the threat to radar systems by the harsh desert environment is compounded when the terrain hampers transportation and logistics.

The solutions presented in this article would provide the tactical commander a more mobile radar section, one capable of providing 360 degrees of force protection. We acknowledge that there may be other solutions, but we believe these solutions provide the quickest way to ensure that future task force commanders will be able to protect their soldiers adequately from a light counterfire threat.

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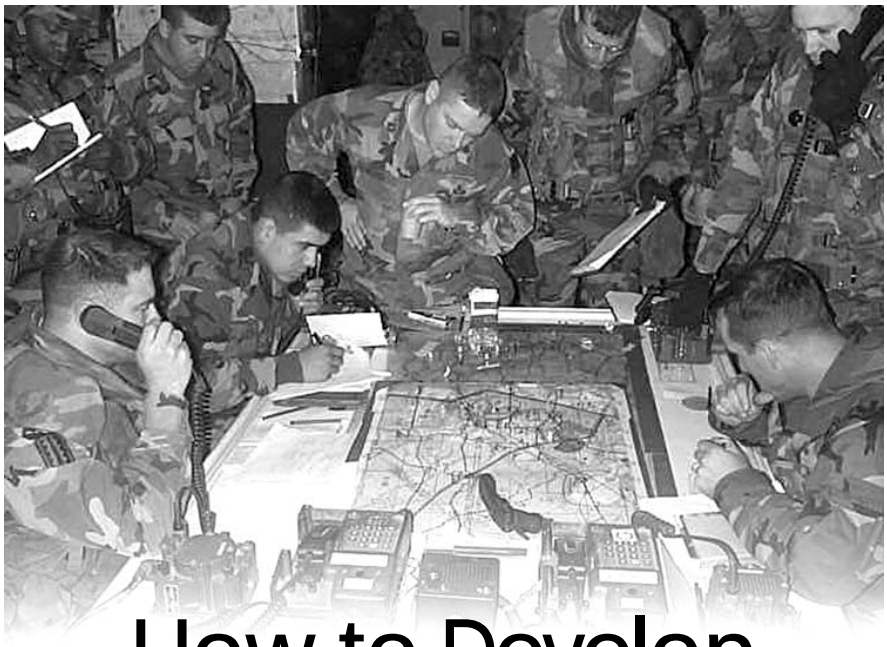

How to Develop the Best-Ever Fire Support System

By Lieutenant Colonel James L. Miller

Hammer Three Zero, this is COLT [combat observation lasing team] Three Zero. BRT [brigade reconnaissance troop] has identified 50 enemy vehicles moving north. Fire target group Hotel Three Mike, "At My Command," over.

Roger, Hotel Three Mike, "At My Command." Sky Hammer reports CAS [close air support] is on station; ACA [airspace coordination area] Mike is in effect.

COLT Three Zero, roger. Forward TACPs [tactical air control parties] already have eyes on the enemy formation, vicinity Whale Gap.

COLT Three Zero, Hammer Three Zero. Steel is ready on Hotel Three Mike; 36 rockets in effect.

Roger, fire Hotel Three Mike; we are clearing the CAS in hot, time now….

COLT Three Zero, Hammer Three Zero. It has been 10 minutes—status over?

Hammer Three Zero, roger. End of mission. Hotel Three Mike CAS is off station; target destroyed.

Request BDA [battle damage assessment], over.

Roger. There are too many dead vehicles to count right now—that's going to take awhile and I am little busy right now…besides, we got them all. Stand by to repeat on the second enemy battalion….

Our Combat Training Centers (CTCs) repeatedly have reported on the shortcomings of our fire support officers (FSOs) and their ability to provide close supporting fires for the maneuver commander. As fire supporters, this is not what we want.

The scenario is representative of the occasional fire support success the *Hammer* 3d Brigade Combat Team (BCT), 3d Infantry Division (Mechanized), Fort Stewart, Georgia, had at the National Training Center (NTC), Fort Irwin, California, last summer. In this engagement, the brigade's fire support system destroyed 51 vehicles in the enemy's lead formation as it exited Whale Gap. More importantly, our success was the result of a dedicated BCT effort to ensure we had a well-trained fire support system, one capable of providing accurate, timely and deadly fire support to our maneuver forces.

How did we do it? Simply put, we decided we wanted it and put a determined effort into it. Of key importance, that decision was made by and fully supported by the brigade commander. In addition, the division artillery commander put the full weight of his support behind it as well. The Field Artillery School, Fort Sill, Oklahoma, provided additional support in the form of a fire support focused rotation at the NTC.

Basically there are five reasons we were so successful: command emphasis, experience of our fire support personnel, training, integration and our equipment.

Command Emphasis. This is absolutely *the* most important factor for fire support to work. Maneuver commanders who have not made their fire support system a priority have no one to blame but themselves when their fires fail them in battle.

Fire support coordinators (FSCOORDs) who allow this to happen are doomed to failure as well. Talk is not enough.

Everything falls into place if command emphasis is there. In the *Hammer* Brigade, the brigade commander made fire support one of his priorities. He demonstrated its importance by learning all he could about fire support, understanding the guidance he needed to give and focusing the staff on an integrated, combined arms approach to combat. He provided all the resources available to improve his fire support system and participated in the training.

The brigade FSCOORD added to this emphasis by setting his own priorities

The ALOs and TACPs where manned by the best and most experienced airmen available. Most had more experience than the Army fire supporters, and many had been assigned as Ranger TACPs.

on fire support and dedicating limited resources, his best personnel and training time to build the fire support team. It all paid off with a fire support system that met the challenges of the NTC at an entry level that was well above the average rotational unit.

Experience of Fire Support Personnel. This is the second most important reason fire support systems are successful. We must put our most experienced, mature personnel in our fire support positions. The payoff is fire supporters who understand the system and use their experience to build success; their maneuver brothers will trust and respect them plus have confidence in them.

Our fire support element (FSE) was selected and manned in accordance with this principle, and it made a huge difference in our capabilities. Our brigade FSO was the senior major in the battalion and a previous battalion executive officer.

The assistant FSO was a new captain who had been with the battalion for three years and was selected because he had been the best lieutenant in the battalion. His selection came at great cost to the battalion as he was slated to be the battalion fire direction officer (FDO).

Our targeting officer was the senior warrant officer in the battalion and was selected for his excellence in fire support. The task force FSOs were all senior captains, prior battery commanders or had prior service experience that made them ideal fire supporters.

The task force targeting officers all were both former platoon leaders and company FSOs. One-third of the company FSOs were former platoon leaders. Our COLT was an elite platoon manned by the best fire support sergeants in the battalion and lead by the lieutenant with the most successful and lengthy fire support experience in the battalion.

Finally, our air support operations squadron (ASOS) also provided support in the same manner. The air liaison officers (ALOs) and TACPs where manned by the best and most experienced airmen available. Most had more experience than the Army fire supporters, and many had been assigned as Ranger TACPs.

One last comment on this point: we knew we had the right people in the right jobs when we started getting reports of maneuver commanders letting their FSOs run their staffs when the field grade officers could not be present.

Training. We trained the fire support system as a system every chance we got. When we couldn't train the system, we trained the individuals and teams that make up the system. If there is command emphasis, there is no excuse for not training.

Too often, FSOs try to train their soldiers and their sections without support from the remainder of the fire support system or help from the senior leaders in the brigade. More often, headquarters battery taskings overwhelm our fire support platoons.

Routinely units ignore lessons learned and negative trend reports about the shortcomings of the fire support system and don't train to correct them. Finally, when units do have the opportunity to train the fire support system, they often let concerns about gunnery overcome the need to train fire supporters.

Training FSOs. Units must train FSOs at every level and train them to train their soldiers. Our school system does an adequate job of teaching our officers fire support, but it does not train them to the level of proficiency needed. Key areas in which FSOs need unit training are listed in Figure 1.

FSCOORDS must have a system in place to train and evaluate their FSOs at times other than large exercises or command post exercises (CPXs). Maneuver commanders must be convinced to do the same—integrate fire support into as much training as they can. Whenever possible, training should be hands-on, in the field and evaluated.

Untrained and inexperienced FSOs will provide fire support that mirrors their shortcomings. We can't allow that.

Working Around Taskings. Taskings are an unfortunate reality in the Army. In direct support (DS) battalions, long-term damage has been done to our fire support soldiers by repeatedly assigning them taskings. This dulls their fighting edge, limits their chances for training and severely curtails their retention.

Unfortunately, this is a difficult nut to crack. One technique that worked for us was to establish a Red-Amber-Green Cycle of training within our fire support platoons. That system allowed the task force FSEs to train as a whole (usually with their supported task force) while the Red Cycle task force fire supporters took the taskings.

- Triggers
- Maneuver Operations and Tactics
- Observer Planning and Observation Post (OP) Selection
- Leading and Directing the Integrated Targeting Process
- Use of Mr. Sids and Terrabase for Targeting and OP Planning
- Recon and Surveillance (R+S) Planning
- Integration of Tactical Air Control Parties (TACPs) into R+S Plans
- Close Air Support (CAS) Planning and Employment
- Fire Support Planning
- Fire Support Execution
- Engagement Area (EA) Development
- Training in Units

Figure 1: Key Areas in Which Fire Support Officers (FSOs) Require Training

The brigade FSCOORD further emphasized the importance of fire support training when he added the requirement for the headquarters and headquarters battery (HHB) commander to task the brigade FSO for support. That allowed the FSO to select the soldiers who would have the least impact on training and allow the fire support training plan to continue.

Training to Reverse Negative Trends. We, as an Army, record lessons learned and negative trends to develop training and improve our teams. Sadly, too often we don't carry through with a concerted effort in training on lessons learned.

Observer/controllers (O/Cs) at the CTCs joke that they can write the after-action reviews (AARs) before the unit begins its rotation. The O/Cs' experience shows that units come to the CTCs doing the same things wrong.

In our brigade, we used our last NTC AAR and the Center for Army Lessons Learned (CALL) lessons as our starting point for developing brigade fire support training. By the time we went to the NTC again, we were not making the same old mistakes.

Training the Entire System. Every training event is a chance to train the fire support system; there are really no good excuses for not training the entire system.

Unfortunately, units usually use a list of fire mission types to drive FA gunnery exercises and simply fire the missions in the order listed. In this type of an exercise, no one gets trained but the fire direction centers (FDCs), a few observers and the gun crews—it is not the way we'll fight.

A fire support plan and a scenario that replicates the battalion's normal missions in support of its maneuver unit should provide "the drivers" for a Field Artillery battalion gunnery exercise. The FSOs should submit a plan for the artillery battalion to support and control the timing and triggering of the missions in accordance with the maneuver plan they support. Although this type of exercise takes more effort to prepare, it is well worth it and trains the fire support system as a whole.

Maneuver gunnery exercises should be supported by the FSE in the same way, and whenever possible, the FA battalion should use its supported brigade's gunnery exercises to train part or all of the fire support system. The more training for the fire support system, the more reliable it will be in combat.

Integration. Fire supporters must ask themselves, "How well integrated is my fire support system?" Fire support is an integrative process. As such, we must completely integrate our fire supporters into their maneuver units and encourage our maneuver brothers to join our fire support training.

In addition, we must integrate our supporting BRT and airmen into our teams long before we go to CTCs or into combat. We must develop integrated staffs to produce the synchronization that allows our fire support system to be successful.

Early integration and a team approach to fire support is the key to success. A well-integrated fire support team allows everyone to understand his role in the process, train to support that role and gain confidence in and understand the strengths and weaknesses of his teammates. Figure 2 lists opportunities we took to integrate as a team.

In most cases, I have found that this integration must be forced—it does not happen on its own. But once forced, it becomes the accepted way of doing business; it takes on a life of its own and success begins to breed more success.

The trick is to force the entire team to train and work together at every possible opportunity. It will pay off on the battlefield. In the end, if your fire support team, maneuver staffs and airmen are all voluntarily attending each other's hail and farewells, promotions and ceremonies, you have done well in integrating your fire support team.

Equipment. The Army has given us a lot of equipment to support our fire support mission. Much of it is old and weary, and we clearly need new systems in a hurry. Despite that, our equipment will perform its mission, given the proper emphasis on maintaining it and training your soldiers to maximize it. Soldiers must understand the limitations and capabilities of their systems and how to employ them. Waiting for the "new stuff" to come out is not an acceptable solution.

The new equipment being fielded is top-notch. The M7 Bradley FIST (BFIST), in particular, is a great and much-needed advancement in fire support equipment. (The A3BFIST will be fielded in FY04.)

But I add a warning—if we continue the maintenance practices used on the fire support team vehicle (FIST-V), the M7 BFIST will fall rapidly by the wayside as well. FISTs cannot be successful with poorly maintained equipment. Maintenance must be routine and a training and maintenance priority for the FSCOORD.

- Staff Exercises
- Staff Meetings
- Training Meetings
- Live-Fire Exercises (LFXs)
- Gunnery Exercises
- Command Post Exercises (CPXs)
- Hail and Farewells
- Unit Organizational Days
- Saint Barbara's Day
- Sports Events

Figure 2: Opportunities to Integrate Fire Support and Maneuver or Build Fire Support and Maneuver Teams

Finally, fire supporters must be trained to employ their systems on the battlefield. Even the new BFIST was worthless to us when the crews maneuvered in the open and did not use cover and concealment, getting themselves killed early in the fight. Our equipment is only as good as our training to employ it.

Your fire support system can be the best-ever. The solution starts at the top with the leaders. "Confident, audacious and competent leadership focuses the other elements of combat power and serves as the catalyst that creates conditions for success." (*FM 3-0 Operations*)

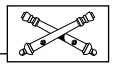

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Photo Courtesy of United Defense

Improving the Responsiveness and Lethality of Fires at the BCT Level

By Lieutenant Colonel Richard M. Francey, Jr.,
and Major Michael D. Hilliard

In recent years, fire supporters throughout the Army have struggled to maintain the edge against our number one demon—providing responsive fires. Many critics believe fire supporters have lost that edge and become unresponsive and ineffective, failing to support their maneuver commanders.

Some have even said we've "walked away from the close fight"—believe we are more interested in the counterfire and deep fights. While these fights are critical to the success on our next high-intensity battlefield, maneuver commanders must be convinced we're dedicated to ensuring fires are responsive and lethal in support of the close, decisive fight, the focus of the brigade combat team (BCT) commander.

Currently, the principal way we measure success is by deploying and fighting simulated combat vignettes at the National Training Center (NTC) at Fort Irwin, California; Joint Readiness Training Center (JRTC) at Fort Polk, Louisiana; or the Combat Maneuver Training Center (CMTC) in Hohenfels, Germany. Some say responsive and lethal fires are a replication issue during force-on-force operations. They say we never really get "full credit" for our fires because firemarkers and pyrotechnics lack the shock and fear factor that indirect fires bring to the battlefield. And although there may be some truth to the replication of fires dilemma during force-on-force operations, we need to refocus on some basic tactics, techniques and procedures (TTPs) as well as look for innovative ways to improve our responsiveness and lethality.

In the 4th Infantry Division (Mechanized), the *Ironhorse* Division at Fort Hood, Texas, we have taken on some initiatives to improve the responsiveness of fires, helping to make our maneuver counterparts more successful and lethal on today's fast-paced and fluid battlefield. Most of these initiatives are not new but simple modifications of and additions to our current doctrine and TTPs. They do, however, provide the framework for a brigade commander and his fire support coordinator (FSCOORD) to plan training and serve as a "base charge" to build their organization into a lethal combined arms team capable of bringing fire support systems to bear in the most responsive manner possible.

These initiatives include clarifying the commander's guidance for fire support, streamlining calls-for-fire, employing the close support battery for some task force (TF) missions, establishing habitual relationships, implementing a TF observation planning and integrating the direct support (DS) FA battalion training with the BCT's combat training. While alone none of these initiatives can fix the responsiveness issue, collectively they have made us more successful in providing the maneuver commander the fires he needs on today's fast-paced battlefield.

Clarifying the Commander's Guidance for Fire Support. Although the commander's guidance for fire support may not be the single most essential element in the delivery of responsive, lethal fires, it is one basic requirement for the success of indirect fires. On the surface, one might ask, "What does commander's guidance for fire support have to do with the execution of responsive and timely fires?" Guidance for fire support must be clearly articulated by the commander and fully understood by all subordinates in order to execute responsive, lethal fires. If fire support guidance is too general or lacks clarity, it opens the door for the poor execution of fires and, ultimately, the failure of an operation due to a lack of synchronization.

There are several doctrinal sources that outline principles. *FM 6-71 Tactics, Techniques and Procedures for Fire Support for the Combined Arms Commander*, dated 29 September 1994, offers commanders fairly simple guidelines for providing fire support guidance.

According to FM 6-71, commanders should address attack and engagement criteria, priorities for target engagement, guidance for special munitions (illumi-

nation, smoke, Copperhead and family of scatterable mines, or FASCAM) and, finally, how, when and where fire support should be employed in the development of courses of action (COAs).

Perhaps the most important part of guidance a commander can offer his fire supporter is what *effects* he wants indirect fires to have on a certain target. Artillery doctrine defines effects as "destruction, neutralization or suppression." Some Combat Training Center (CTC) observer/controllers (O/Cs) coach "destroy, delay, disrupt, limit or suppress" as effects that should be applied by combined arms commanders in relation to their fire support assets. The challenge we face is quantifying these terms into battlefield effects—clearly understanding what the commander wants his fires to accomplish.

In the 1st Brigade, 4th Infantry Division, the brigade commander makes it very simple. During the mission analysis briefing, he tells the FSCOORD and brigade fire support officer (FSO) what targets he wants to attack during each phase of the operation. He then issues fire support guidance in terms of "destroy, delay or suppress."

The critical part of issuing attack guidance in relation to the term "destroy" is to quantify effects. Simply saying, "I want to destroy the AGMB [advanced guard main body] in the passes west of the main defensive belt" does not provide clarity for subordinate commanders, fire supporters and the DS artillery battalion. This guidance would be much better articulated as, "I want to destroy two tanks and four BMPs of the AGMB west of the choke points as they line up in column formation."

Finally, the brigade commander determines what systems he wants to attack each target with during each phase, i.e., cannons, multiple-launch rocket systems (MLRS), close air support (CAS), etc. This guidance then provides the fire support planners the information they need to begin developing the brigade fire support plan and, most importantly, the essential fire support tasks (EFSTs).

Streamlining Calls-for-Fire or (Getting Rid of the Middle Men). In an effort to increase our responsiveness to the brigade commander, we reduced the amount of friction and number of intervention points (IPs) that characterize cumbersome and slow fire mission processing. At the NTC, it is not unusual to see fire missions that take 10, 20 even 30 minutes to execute from the initial call-for-fire to rounds on the ground. This is disturbing when you familiarize yourself with time standards for fire mission execution as outlined in *Army Training and Evaluation Plan (ARTEP) 6-115 Mission Training Plan (MTP) for the Cannon Battalion*. Too often, observers initiate a fire mission and then each fire support element (FSE) stops the mission and reviews and approves it before the mission reaches the firing unit.

We fully understand there may be times when centralized fire mission processing is necessary; however, routinely processing fires this way is clearly a stumbling block for responsive, lethal fires for the BCT. Therefore, we streamlined the call-for-fire process. During planning, the brigade fire support planner articulates in the fire support execution matrix (FSEM) which TF has priority-of-fires in each phase of the battle. This order is based on priority-of-fires guidance issued by the brigade commander and FSCOORD.

Then the TF commander and TF FSO determine which subordinate unit in their TF will have priority-of-fires during that particular phase of the battle. Based on that allocated resource to the subordinate TF, the subordinate observer—fire support team (FIST), maneuver shooter, TF scout, Striker, etc.—processes all calls-for-fire directly to the battalion fire direction center (FDC) for execution of his mission. In some cases, the observer sends his mission directly to a firing unit for execution.

This decentralized means of fire support execution is just one method of increasing our responsiveness and lethality.

Employing Close Support Battery in TF Operations. In addition to streamlining the call-for-fire process, we increased the responsiveness to the maneuver TF commander during the close fight by employing a close support battery. We chose the term "close support" battery and not "dedicated" battery, thus allowing the brigade commander and FSCOORD more flexibility when employing fires throughout the breadth and depth of the battlefield.

The term "close support" battery describes a nonstandard tactical mission and support relationship whereby a Field Artillery battery organic to a DS artillery battalion fulfills a modified and prioritized list of inherent responsibilities with a battalion-sized maneuver unit or TF. It is important to understand that the close support battery is not a battery "dedicated" to the supported TF.

The brigade commander, relying on the FSCOORD's recommendation, approves the close support battery mission. There are several factors that determine the need for a close support battery. (See Figure 1.)

Once the decision is made to employ the close support battery, there are several questions the brigade fire support planner must include as part of his portion of the brigade's second warning order (WARNO) sent out to subordinate units during the brigade's military decision-making process (MDMP). The fire support planner also must include the close support battery mission directives in Annex D to the brigade operations order (OPORD). (See Figure 2 on Page 24 for the questions asked in the WARNO and the directives in the OPORD).

Establishing Habitual Relationships Between Firing Batteries and Maneuver TFs. To further enhance the execution of close support battery rela-

Units Employ a Close Support Battery-

- In a movement-to-contact to support the lead task force when responsive vice massed fires are critical.
- In an attack to support a task force when the chance of losing the ability to provide responsive fires is high (e.g., losing long-range communications to the task force or when the task force is attacking through a distant mobility corridor).
- In the defense to provide immediately responsive Copperhead fires to the main effort task force.
- When the chance of unanticipated enemy fires is high, such as an ambush.
- When command and control from the task force to brigade to FA battalion probably *won't* be jeopardized.
- When the brigade scheme of fires and execution of essential fire support tasks (EFSTs) demand the FA battalion be able to mass fires during critical events.

Figure 1: Considerations for Employing the Close Support Battery

Questions for the WARNO-

- Which battery will support the designated task force?
- What time or event triggers the start of the close support relationship with the supported task force?
- What time or event triggers the end of the close support relationship with the supported task force?
- In which phases and (or) specific events should the task force *not* rely solely on the supporting battery for fire support? [This is usually based on EFSTs that require the force FA to mass fires or when the task force is engaged in a support effort.]
- In which specific events must the task force plan for additional fires from the remainder of the force FA? [These events are usually the EFSTs in which the task force has primary execution responsibility.]
- What is the initial supporting battery movement and position area guidance? [These are based on the brigade EFSTs, communications, survivability and logistical requirements, etc.]

Information for the Fire Support Annex-

- The specific brigade fire support events during which the supporting battery will provide fires.
- The supporting battery movement and position area requirements for each event. [The task force FA battalion must know exactly when and where the supporting battery must move to or be in position to support the brigade scheme of fires.]

Figure 2: Close Supporting Battery Questions and Information Required in the Military Decision-Making Process (MDMP). The brigade fire support planner includes these questions in the brigade warning order (WARNO). He must include the other information in the fire support annex of the operations order (OPORD).

tionships, it is vital to develop habitual relationships between firing batteries and the TFs they may support during combat operations. As a matter of standing operating procedure (SOP), we aligned each firing battery in the DS artillery battalion with a maneuver TF in the BCT.

These habitual relationships serve several purposes. First, they enhance deployability. In our role as the Forces Command (FORSCOM) division ready brigade (DRB), each maneuver TF may deploy to a theater of operations as a division ready force (DRF). A DRF is a combat battalion TF (part of a DRB) with combat support (CS) and combat service support (CSS) units included in its deployment package. As a part of that DRF package, each maneuver TF may deploy with a supporting firing battery. Therefore, we have standardized which of the three firing batteries will deploy with each of the three maneuver TFs in the BCT.

Additionally, habitual relationships provide a foundation for combined arms training at home station. Such training further solidifies the relationship of the close support battery and its maneuver TF during combat operations.

Home station training between habitually related firing batteries and supported maneuver TFs helps increase the responsiveness of fires during combat operations. It allows the firing battery commander, TF FSO, TF operations officer and TF commander to begin developing their relationships well before they are organized for combat on foreign soil. Before combat operations begin, the habitual relationship allows the firing battery commander to "get into the TF commander's head" and understand how he fights and what his expectations are of the firing battery commander.

One example of this team building training at home station is the execution of Abrams tank and Bradley fighting vehicle tables and the integration of indirect fires into live-fire training. Each habitually supporting firing battery is built into the live-fire training plan of his TF. The artillery battalion S3 (operations) and TF S3 coordinate the training plan that includes the integration of indirect fires into platoon-, company- and battalion-level direct fire tables.

This is just one way to improve home station training to build the BCT into a stronger, more lethal fighting force.

Implementing a TF Observation Plan. While delivering responsive fires is critically important, the use of observers in the execution of the brigade commander's fire support plan must have the undivided attention of all fire support leaders to synchronize all assets. Strikers, company FISTs and maneuver shooters are all critical to the execution of fires across the 21st century battlefield. And although these assets are not new, we are leveraging their capabilities to their fullest potential in the *Ironhorse* Division.

First, we examined how we were using the company FSO during the execution of fires and found we needed to modify his traditional role during certain missions. When executing the observation plan, company FSOs are often out of position to be able to observe critical targets that support the TF and (or) brigade commander's EFSTs.

If the mission is an offensive operation, the company FSO often follows the company commander's tank or Bradley and does so at his own peril. The bottom line is that a tank or a Bradley and a fire support team vehicle (FIST-V) should not be trying to get to the same piece of terrain. Unfortunately, those units still equipped with the M981 FIST-V are at a marked disadvantage when trying to maintain the same tempo as that sustained by their maneuver brethren.

Additionally, there are times when company FSOs don't understand the overall intent for fires in the TF or BCT zone or sector, namely the purpose of those fires as outlined in the EFST. They tend to be more focused on serving as a company-level FSCOORD as opposed to providing the eyes necessary to execute the TF or brigade fire support plan.

Taking these failings into consideration, we implemented "TF FISTs." The TF FIST's role is similar to that of a brigade Striker team. The FSO gives the TF FIST specific observation missions. He positions the TF FIST to observe and execute a TF- or brigade-level target or group of targets.

During such missions, the TF FSO does not work for the company commander or serve as his FSCOORD. It is essential for the TF commander to understand that the company FIST is his resource to inject into the fight as he sees fit.

We have not completely abandoned employing the company FIST in its traditional role. However, there are times when a TF commander or FSO must position one or more company FIST to improve responsiveness of fires within the BCT zone or sector.

Additionally, we are leveraging the technological advances of the M1A2 system enhancement program (SEP) tank, M1A1D and the M2A3 Bradley

fighting vehicle. Maneuver shooters have always played a vital role in the execution of indirect fires at the company level. However, the ability to obtain an accurate target location was often difficult at best. Now with the improvements to the far target locating devices in these combat vehicles, the maneuver shooter's ability to obtain an accurate target location is significantly enhanced.

The maneuver shooter simply identifies a target that meets the tactical trigger and quickly determines its 10-digit location by lasing the target. The vehicle commander then transmits his call-for-fire rapidly to the company FIST via the digital Force XXI battle command brigade and below (FBCB^2). The company FIST's FBCB^2 automatically transmits the call-for-fire to the forward observer system (FOS) lightweight computer unit (LCU). The LCU operator then transmits the call-for-fire to the battalion FDC's advanced FA tactical data system (AFATDS) for processing to the firing unit.

Special Note: When receiving a call-for-fire via FBCB^2, the FIST must input the target's altitude manually before sending the data to the FDC. If maneuver sends the 10-digit grid via FBCB^2 using the "short form" call-for-fire, then the message will not include the altitude. In that case, the FOS automatically will enter the last self-location altitude of the FIST. If maneuver sends the data directly to the battalion FDC (or FSE), it will enter the altitude of the firing unit. If maneuver sends the data via FBCB^2 using the "long form" call-for-fire, the altitude is optional—again, the FIST should ensure the target's correct altitude is entered.

Advances in technology allow maneuver shooters to have a significant impact on the execution of indirect fires.

Company FISTs and maneuver shooters bring a tremendous capability to the battlefield. However, there are no more lethal indirect fire killers in the BCT today than the brigade reconnaissance troop (BRT) and their Striker platoon. These soldiers give the brigade commander a significantly enhanced means to take the indirect firefight to the enemy.

The Striker platoon's primary mission is to execute the brigade commander's deep fight and then hand off targets to the TF scouts and TF FISTs. Recent technological advancements have improved the lethality of the BRT and the Strikers.

The addition of the long-range advanced scout surveillance system (LRAS^3) to the BRT gives the brigade commander a significant advantage in executing his observation and surveillance plans. Our BRT scouts now can gain and maintain surveillance as well as attack the enemy with indirect fires well beyond 15 kilometers. The Striker platoon still has the ground/vehicular laser locator designator (G/VLLD) with a range out to 10 kilometers.

When organizing the BRT and Strikers for combat, one scout team is with a combat observation lasing team (COLT) and has the LRAS^3. The LRAS^3 allows the observers to begin to attack targets at longer ranges. The capabilities of this tremendous system provide the brigade commander another tool to increase the lethality and responsiveness of fires.

Training the DS Battalion for Combat. As we prepared for our upcoming Paladin Table XVIII (battalion-level live-fire qualification) and NTC rotation, we examined the types of fire missions we needed to train to best prepare for our NTC rotation or combat, whichever came first.

We focused the training on missions for the howitzer sections, FDCs and fire supporters in a scenario-driven live-fire exercise. We broke the scenario down into offensive and defensive missions. This allowed the DS battalion staff to work through the military decision-making process (MDMP) and issue an FA support plan (FASP) to the battery commanders. Once we began executing the mission, observers provided intelligence calls via spot reports, enabling the battalion fire direction officer (FDO) and S3 to anticipate the battalion's next significant event.

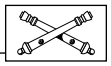
During the defensive scenario, we executed missions, such as firing FASCAM, marking rounds for CAS, suppression of enemy air defenses (SEAD) for CAS and (or) attack aviation and at linear targets (the enemy delayed at an obstacle). Once we transitioned to the offensive scenario, we focused on suppression, obscuration, security and reduction (SOSR) actions, such as firing obscuration smoke, continuous suppression as well as group and series of targets.

Additionally, each battery had a close support role during the Paladin Table XVIII and fired fire missions in support of its TF. As part of the close support evaluation, the observer requested additional fires on the target through the brigade FSO or FSCOORD; once they were approved, the battalion FDO massed the remainder of the battalion on the close support battery target.

We also tested the battalion's fire-for-effect shift times. The observer initiated a battalion fire-for-effect and in the middle of the mission, sent an "end-of-mission" message and then initiated another fire-for-effect mission.

Training on these types of missions not only allows the FSCOORD to assess the effectiveness of his organization during live-fire conditions, but also enhances the responsiveness of the BCT FISTs.

Fire supporters must strive continually to increase the effectiveness and lethality of fires. Leaders at all levels must be adaptive, conduct innovative training and increasingly provide our maneuver brethren the most responsive, lethal and devastating fires—whenever and wherever the BCT needs them.



Lieutenant Colonel Richard M. Francey, Jr., until recently, commanded the 4th Battalion, 42d Field Artillery (4-42 FA), part of the 4th Infantry Division (Mechanized) at Fort Hood, Texas. Currently, he is the Senior Fire Supporter (Wolf 07) at the National Training Center (NTC), Fort Irwin, California. Among other assignments, he was the Deputy Fire Support Coordinator for III Corps, also at Fort Hood; Executive Officer (XO) of the 17th Field Artillery Brigade, part of III Corps Artillery at Fort Sill, Oklahoma; Deputy Fire Support Coordinator for the 101st Division at Fort Campbell, Kentucky, the same division in which he was the S3 of 2d Battalion, 320th Field Artillery. He was a Brigade Fire Support Officer (FSO) in the 7th Infantry Division (Light) during Operation Just Cause in Panama.

Major Michael D. Hilliard, until recently, was the S3 of 4-42 FA at Fort Hood. Currently, he is the XO of the 4th Infantry Division Artillery. Also at Fort Hood, he was the Assistant Fire Support Coordinator and FSO for the 1st Brigade Combat Team, both in the 4th Infantry Division. Major Hilliard was a Firing Battery Combat Trainer on the Werewolf Fire Support Training Team at the NTC, Fort Irwin. He commanded A Battery, 3d Battalion, 1st Field Artillery, part of the 3d Infantry Division (Mechanized) in Germany, the same division in which he served as a task force FSO. During Operations Desert Shield and Storm, he was the S1 for the 4th Battalion, 5th Field Artillery, 1st Infantry Division (Mechanized) out of Fort Riley, Kansas. He is a graduate of the Command and General Staff College, Fort Leavenworth, Kansas.

The Close Support Battery

in Task Force Operations on the 21st Century Battlefield

By Captain David B. Tabor

As the Army moves forward with transformation, many changes are affecting the combined arms team. One area in which we, as Field Artillerymen, cannot afford any lapse is the ability to provide effective, continuous fire support to the maneuver commander in the close fight.

In the *Straight Arrow* 4th Battalion, 42d Field Artillery, 4th Infantry Division (Mechanized), Fort Hood, Texas, we developed close support battery operations that helped accomplish our brigade combat team (BCT) objectives.

Advances in technology have increased the ability of commanders at all levels to visualize the battlefield, while increases in lethality, accuracy and range have produced lethal combined arms teams that are more agile, responsive and able to deal the decisive blow to the enemy. Prior to the development of these technologies, the average brigade area of responsibility at the National Training Center (NTC), Fort Irwin, California, involved two maneuver corridors. Due to the capabilities of the Army battle command system (ABCS) provided by such systems as the advanced FA tactical data system (AFATDS), Force XXI battle command brigade and below (FBCB^2), maneuver control system (MCS), air and missile defense work station (AMDWS), all-source analysis system (ASAS), combat service support control system (CSSCS) and the tactical unmanned aerial vehicle (TUAV), the average brigade area of responsibility has grown more than 50 percent to include three NTC maneuver corridors.

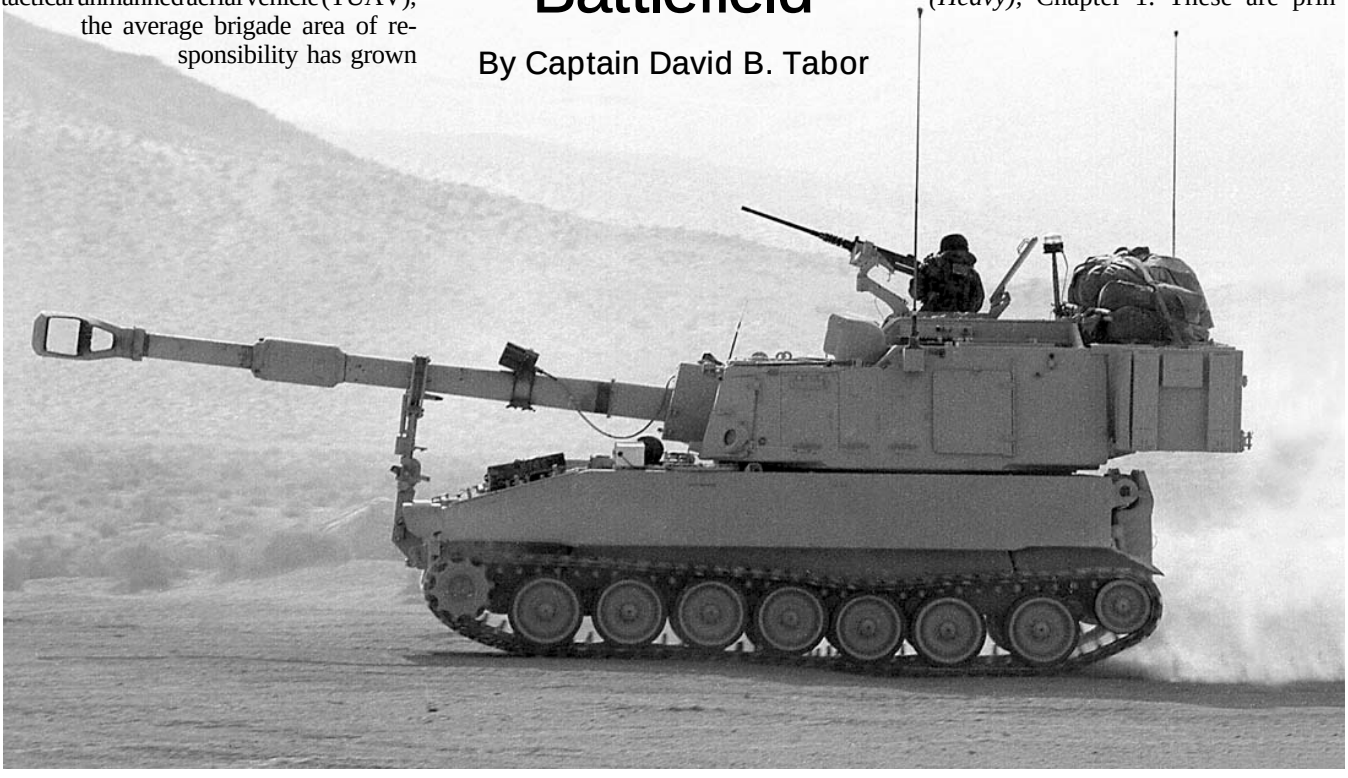
We now can communicate over longer distances with the fielding of the enhanced position location reporting system (EPLRS) and FBCB^2, the streamlining of the flow of fire missions in AFATDS and the increase in our targeting capabilities with the TUAV.

Yet, as these brigade areas of responsibility increase in size, so do the areas allocated to maneuver task force (TF) commanders and their fire support coordinators (FSCOORDs) with their direct support (DS) artillery. While the ranges of weapons have not changed, the artillery, more than ever, must take steps to ensure it can contribute to the close fight.

In 4-42 FA we have taken doctrinal concepts and added the capabilities provided by these new digital systems to create several close support tactics, techniques and procedures (TTPs) for use in today's digital battlefield.

The "close support" battery concept is a modification of the doctrinal "dedicated" battery discussed in *FM 3-09.21 Tactics, Techniques and Procedures for the Field Artillery Battalion,* Chapter 1. The purpose of the close support battery is to provide responsive fires to the supported TF commander when the immediate responsiveness of fires is required and (or) the operations of the maneuver TF are independent from the BCT.

The term "close support" battery describes not only the nonstandard tactical mission of the battery, but also a support relationship between a battery and a battalion TF. This builds upon the 13 principles of fire support planning and coordination found in *FM 6-20-40 Tactics, Techniques and Procedures for Fire Support for Brigade Operations (Heavy),* Chapter 1. These are prin-



ciples the brigade FSCOORD, brigade fire support officer (FSO) and DS battalion S3 need to consider when determining if a battery should be in close support of a maneuver TF. (See Figure 1.)

As part of the brigade-level military decision-making process (MDMP), several other factors help the brigade FSCOORD, brigade FSO and DS battalion S3 determine when close support battery fires are required and best fit the tactical situation. Mission, enemy, terrain, troops, time available and civilians (METT-TC) are just a few of the factors to consider. The ability of the close support battery to provide synchronized fires to the TF while maintaining the capability to mass fires with the remainder of the DS battalion also must be considered.

During the battalion's train up and NTC Rotation 02-05, we discovered that tasking a battery with a close support mission was one way to help keep fires in the close fight. This method allowed the DS artillery battalion to support a maneuver brigade spread over three corridors at the NTC.

Receive the Mission. Once the brigade FSCOORD decides to assign a battery to a close support mission, the commander of the close support battery must have TTPs in place to facilitate early and continuous fire support to the maneuver commander. Upon receipt of this mission, usually in the form of a warning order (WARNO-1) from the DS battalion, the role of the battery commander immediately increases threefold. He remains the commander of the close support battery, but he also has to take on the additional roles of "TF FSCOORD" and "Battery S3."

Develop a Battery WARNO. The battery commander immediately develops a WARNO-1 and disseminates it along with any graphics via the FBCB^2. This technology not only benefits the battery commander, it also allows the platoon leader, fire direction officer (FDO) and platoon sergeants to begin their troop-leading procedures (TLPs) at the earliest possible moment, thereby increasing planning and preparation time.

Then the battery commander links up with the TF commander and FSO via the FBCB^2 and single-channel ground and airborne radio system (SINCGARS) to verify the timeline for the TF MDMP.

Participate in the TF MDMP. The battery commander's participation in the TF MDMP is absolutely critical.

1. Provides early and continuous fire support.
2. Follows the commander's targeting guidance.
3. Exploits all targeting assets.
4. Considers all fire support means.
5. Uses the lowest echelon capable of providing effective fire support.
6. Uses the most effective means.
7. Furnishes the type of fire support appropriate for the mission.
8. Avoids unnecessary duplication of fires.
9. Considers airspace coordination.
10. Provides adequate fire support.
11. Provides rapid and effective coordination.
12. Remains flexible.
13. Provides for safeguarding and the survivability of the force.

Figure 1: 13 Principles of Fire Support Planning and Coordination (*FM 6-20-40 Tactics, Techniques and Procedures for Fire Support for Heavy Brigade Operations*, Chapter 1)

The close support battery commander acts as the TF FSCOORD and presents his battery's current status and capabilities to the TF commander and S3. He must understand the TF commander's guidance and intent for fires and be able to furnish the type of fire support appropriate to the upcoming mission.

It is at this time that the battery commander ensures the battery can support not only the TF fire support plan in the TF's zone of action, but also the brigade essential fire support tasks (EFSTs). To do this, the brigade FSCOORD determines which brigade-level EFSTs require the close support battery's fires in order to mass the battalion and achieve the desired effects. The brigade FSCOORD should minimize, if not eliminate, the close support battery's role in brigade-level EFSTs, whenever possible.

The TF FSO and battery commander integrate the brigade EFSTs into the TF fire support plan. The battery commander develops these EFSTs into essential FA tasks (EFATs) at the battery level.

While at the TF tactical operations center (TOC), the battery commander coordinates operations with the supported TF. Items such as positioning, movement, force protection and logistical support are coordinated directly with the TF S3, the DS battalion S3 and the TF FSO. The battery commander plans to position his battery to accomplish the EFATs assigned from the DS artillery battalion and the TF fire support plan. Also, the battery commander manages the timeline for the mission and ensures the battalion EFATs do not conflict with the TF fire support plan.

Coordinate for Communications and Logistics. The close support role changes the normal or doctrinal communications structures, reporting procedures and logistical support. These changes require the attention of many key leaders as well as agreements between the DS artillery battalion and the maneuver TF.

Figure 2 on Page 30 shows the typical communications structure for battalion operations and the changes required for close support battery operations.

Additionally, the TF and the close support battery can establish text messaging via FBCB^2. Messages—such as operations orders (OPORDs), WARNOs, free-text messages (overlays of current and future operations plus obstacles and fire plans), and report formats (such as logistics; nuclear, biological and chemical report one, called NBC1; and spot reports) can be built and saved in the system during preparation. This helps overcome SINCGARS difficulties, such as the need to maintain line-of-sight, limits on long distance transmissions or enemy jamming, that could impede the flow of information throughout the BCT.

The changes in the communications structure should be part of the pre-combat checks and inspections (PCCs and PCIs) and the technical rehearsal that the maneuver TF fire support element (FSE) and the close support battery conduct as early as possible. This alerts the leadership to potential problems that could disrupt the battery's ability to support the TF fire plan.

In terms of logistics, considerations such as distance, terrain, travel time and location all help the DS artillery battalion staff determine how to keep classes of supply flowing to the battery in the close support mission.

In normal operations, the DS artillery battalion provides all logistical support. But based on logistical considerations, certain classes of supply may be provided by the supported maneuver TF. For example, Class III (petroleum, oil and lubricants) and VIII (medical supplies) must come from the TF, while the flow of other classes of supplies, most

notably Class V (ammunition), remains the responsibility of the artillery battalion.

The artillery battalion staff may determine it is more feasible to attach other elements to support the close support battery. These could include, but are not limited to, an extra palletized loading system (PLS) for Class V haul, survey capability, a battalion maintenance contact team and additional medical support.

The DS artillery battalion and maneuver TF coordination for the logistical support of the close support battery is critical and is done at an early stage of the MDMP. Coordination between the FSCOORD, TF FSO, S3 and the battery commander helps to ensure the close support battery can provide early and continuous fire support.

Plan for Force Protection. As the TF commander, close support battery commander and TF FSO develop a TF fire support plan that integrates brigade EFSTs and requirements, they also determine the level of force protection needed to ensure the battery can meet its objectives. This is based on several factors: enemy capabilities, terrain and distance.

For example, if there is a high mounted threat from the flank and the battery must be positioned on the flank to achieve the effects required for a TF or brigade EFST, then a hunter-killer team(s) may be positioned with the battery to protect it.

Develop Battery WARNO-2 and the FA Battalion Support Plan. Once the initial coordination is completed, the battery commander issues WARNO-2 via FBCB^2 or SINCGARS. This allows key battery leaders to continue their TLPs as well as updates them on the mission while the battery commander is en route to the battalion TOC to help develop the FA support plan (FASP).

During FASP development, the close support battery commander ensures the DS battalion and TF fire support plans are synchronized. The battery commander also keeps both the DS battalion and the TF S3s informed of any changes in the level of logistical, force protection and communications support required for the next mission.

Issue Battery Orders. The battery commander develops and briefs his battery order. He covers all assigned EFATs from both the artillery battalion FASP and the TF fire support plan. He pays special attention to the triggers for each event. Triggers to move, execute targets and resupply are briefed and rehearsed.

The close support battery commander also coordinates with any attachments (force protection assets, medical support, maintenance contact teams, additional ammunition sections, etc.) and ensures they attend the battery orders briefing. As part of the order, the battery timeline is based on the DS artillery battalion and maneuver TF timelines and includes PCC/PCI completion times, rehearsal times and the not-later-than time for the mission.

An additional process that is invaluable is the issuing of overlays down to each section chief via FBCB^2. This allows every FBCB^2-equipped vehicle in the battery to know the routes of march, current and future position areas and the scheme of maneuver for the next fight. When tied in with the verbal information received in the battery orders briefing, these overlays provide the widest dissemination of information and ensure all subordinates know both the maneuver TF commander's and the FA battalion commander's intents and the TF and brigade operation plans.

Rehearse the Plan. The battery commander synchronizes his unit with the maneuver TF and the DS artillery battalion. To do this, he and the FDO participate in the TF mounted, TF fire support and TF digital rehearsals. This

Nets	Constants			Battalion Ops			Close Support Ops		
	Bde FSE	TF FSE	Bn FSE	Btry Cdr	FDC	Obs	Btry Cdr	FDC	Obs
FA Bn Command				X			+		
Ammunition/Logistics									
Bn Fire Direction (Voice)			X		X			+	
Bn Fire Direction (Digital)			X		X			+	+
Btry Command				X	X		+		
Btry Fire Direction (Voice)					X			+	
Btry Fire Direction (Digital)					X			+	
Bde Fire Support (Voice)	X	X	X			X			
Bde Fire Support (Digital)	X	X	X			X			
TF Command		X					+		
TF Fire Support (Voice)		X				X			+
Mortar Fire Direction									
CS Fires								+	+
Div Arty Counterfire			X						
Div Arty Fire Control			X						
Co Command						X			+

Legend: **Btry =** Battery **Cdr =** Commander **Co =** Company **Div Arty =** Division Artillery **Obs =** Observers

Figure 2: Typical Communications Structure for Battalion Operations (x) and Changes for Close Support Battery Operations (+). The communications structure remains constant for the brigade (Bde) and task force (TF) fire support elements (FSEs) and the battalion (Bn) fire direction center (FDC).

ensures the artillery battery, maneuver FSOs and observers all understand the task, purpose, method, effects and trigger for each target in the fire support plan.

The rehearsals help identify possible problems with movement, resupply or synchronization between the DS artillery battalion's EFATS (that support the brigade's EFSTs) and the TF fire support plan. Because the TF rehearsals usually coincide with the DS battalion rock drill, the battery executive officer attends the rock drill in place of the battery commander. This facilitates synchronization among the units.

The battery commander attends the brigade combined arms rehearsal. This is his final check on the synchronization of fires and allows him to hear any late changes to the brigade scheme of maneuver.

The brigade combined arms rehearsal sets the final "contract" among the brigade commander, TF commander and DS battalion commander in regards to the close support battery. This contract establishes when the close support battery will provide fires for the critical TF EFSTs and when it will provide massing fires for the brigade EFSTs. With this knowledge, the close support battery commander can finalize his planning for the upcoming fight.

Based on the amount of time allocated before the brigade operation, the battery commander takes part in any battery rehearsals that are key to accomplishing the close support mission.

The platoon leaders and platoon sergeants usually rehearse routine battle drills, such as casualty evacuation (CASEVAC), react to NBC attack and direct fire drills. However, for mission-critical events, such as firing Copperhead targets using the Copperhead standing operating procedures (SOP) or firing family of scatterable mines (FASCAM) in the defense, the battery commander and FDO need to be present.

These rehearsals should be mounted, if possible, and early enough in the preparation phase to fix any difficulties. For example, if the battery must fire FASCAM from an alternate location and then move back to its primary position area at near zero percent illumination, several challenges could arise. A mounted rehearsal helps the battery leadership identify movement triggers and times, ammunition requirements, the time required to fire FASCAM and the best route to take during the fight. It also helps the individual vehicle commanders and drivers to visualize their portion of the close support fight.

An Artillery Battery with a Mission of-	Close Support
1. Answers calls for fire in priority from	1. The direct support (DS) artillery battalion. 2. The supported task force. 3. Own observers (radar, aerial observers, scouts, etc.).
2. Has as its zone of fire	The zone of action of the supported task force and supported brigade combat team (BCT).
3. Furnishes the fire support team (FIST) or fire support element (FSE)	And the battery commander as the fire support officer (FSO), if none in the supported task force.
4. Furnishes a liaison officer	No formal requirement.
5. Establishes communications with	The FSOs and supported task force headquarters.
6. Is positioned by	The DS FA S3 and supported task force S3.
7. Has its fires planned by	The DS FA battalion and supported task force.

Figure 3: The Seven Inherent Responsibilities of the Close Support Battery. This matrix is modeled after Table 1-1 in *FM 6-20-20 Tactics, Techniques and Procedures for Battalion Task Force and Below.*

Fighting the Battle. During the fight, the battery commander positions himself at the key point of the battlefield. There are several locations from which he can fight, but his primary responsibility during the close support fight is to keep both the TF commander and DS artillery battalion S3 informed as to the status of the battery.

While the battery commander works to achieve the goals of the TF fire support plan, he also understands he is not in a DS role to the TF commander. As such, the close support battery continues to answer calls-for-fire from the DS artillery battalion first and then from the supported maneuver TF. This ensures the DS artillery battalion can mass the battalion on key brigade EFSTs.

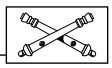
Figure 3 shows the seven inherent responsibilities of the close support battery. Following this matrix, the battery can support the maneuver TF fire support plan while ensuring it can mass with the DS artillery battalion on brigade EFSTs. The close support battery commander, brigade FSO and TF FSO play key roles during this phase of the fight as they execute all brigade EFSTs and meet the TF commander's intent for the close support battery.

As the fight progresses, the TF FSO ensures battery reports are maintained and forwarded to the TF and DS artillery battalion. The TF FSO, battery commander and battery operations center (BOC) update the DS artillery battalion on the firing unit status during execution, to include the status of fire missions, movement, maintenance and personnel.

Reporting is a continuous process throughout the fight and is simplified through the use of the FBCB^2. Preconfigured reports allow the firing battery to rapidly update both the DS battalion and the TF on the status of all classes of supply, battery location, personnel, obstacles and spot reports.

Thus, the BOC keeps two separate command and control nodes informed, allowing both command posts to incorporate the near real-time status of the close support battery concurrently into their planning. Both nodes can facilitate the rapid resupply of the close support battery and prepare it for follow-on missions.

As the modern battlefield expands, the Field Artillery must support close fires at both the brigade and TF levels. The close support battery is one initiative to ensure our maneuver brethren have the fires they need to defeat any enemy on today's or tomorrow's battlefield.



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Krasnopol-M 155-mm

Krasnopol: A Laser-Guided Projectile

By Walter L. Williams and Michael D. Holthus

Technological advances in foreign precision weapons and their components are having a revolutionary impact on US combined arms doctrine and tactics. Currently there are three members of the family of advanced artillery munitions that are forcing a change in how we deploy and fight. They are semi-active laser-guided projectiles, course-corrected munitions and fuzes, and sensor-fuzed munitions.

The purpose of this article is not to discuss all these advanced artillery munitions. Rather, it focuses on the semi-active laser-guided projectile known as "Krasnopol"—the description of the projectile and its capabilities, its proliferation, the training required for it, employment of it and countermeasures to Krasnopol.

Description and Capabilities. Krasnopol is a Russian-developed and Russian-produced projectile designed to defeat armored vehicles; multiple rocket launchers; self-propelled artillery systems; command, control, communications, computers, and intelligence (C^4I) centers; defensive fortifications; bridges; and water crossings.

Fielded in 1987, Krasnopol provides cannon artillery units several advantages. First, these units can fire at individual targets—to include pinpoint targets such as tanks, infantry fighting vehicles (IFVs), field fortifications, etc.—with a high probability of a first-round kill. Thus, the traditional requirement for an area fire or artillery barrage is eliminated. Second, a tube artillery unit can fire at group targets using the same gun settings computed relative to the center of mass of the group target.

Third, the Krasnopol can be fired without meteorological and ballistic data at a range not to exceed 10 to 12 kilometers. This last capability stems from the "footprint" of the seeker (about 2,000 meters long and about 1,600 meters wide) that allows the projectile to "see" the designation spot regardless of Met-induced deviations coupled with sufficient projectile mobility to steer the projectile back to the designated target.

Krasnopol Variants. Krasnopol is produced in three variants derived from the 152-mm Krasnopol: the Krasnopol-M 152-mm, Krasnopol-155 (KM-1) and Krasnopol-M 155-mm (KM-2). (See the figure.)

The base round for the three variants is the Krasnopol 152-mm (3OF-39). It is a two-section projectile designed to operate with both towed (D-20, 2A36 and 2A65) and self-propelled (2S3, 2S5, and 2S19) guns and howitzers. Originally, it was designed for operation with the D-20 and 2S3 howitzers. The Krasnopol 152-mm requires a special charge when fired from 2A36 and 2S5 guns.

However, a drawback to this round is its incompatibility with the autoloader of the 2S19 and ammunition stowage cells on all self-propelled howitzers due to the projectile's length. This characteristic led to the development of the first variant, the Krasnopol-M 152-mm. This single-piece projectile is about 600-mm shorter than the original and fits into the 2S19 autoloader.

The second variant of the Krasnopol was the modification of the original round to allow it to be fired from 155-mm howitzers. The Krasnopol-155 (also known as KM-1) has a 155-mm slipping obturator and a bourrelet to ensure ballistic stability in larger bore howitzers. The third variant, Krasnopol-M 155-mm (also known as KM-2) was developed for use in 155-mm howitzers. It is based on the shorter Krasnopol-M 152-mm and has a slightly larger diameter obturator to fit the rifling on 155-mm cannons.

Comparison of Krasnopol to Copperhead. The information in the figure is from the Krasnopol producer and compares the operational characteristics of the Krasnopol, Krasnopol-M and the US Copperhead laser-guided munitions. Copperhead is the only artillery-delivered laser-guided munition in the US inventory.

Both the Krasnopol and Krasnopol-M are superior to the Copperhead in the areas of range, projectile weight, target types engaged, attack profile and operational field handling. However, there is a 15 percent range difference (three kilometers) between the Krasnopol and the Krasnopol-M.

Operating the Krasnopol. The Russians designed the Krasnopol to operate within an assigned sector or what could be referred to as a "shoot straight ahead" philosophy. A Krasnopol-equipped battery normally is assigned a specific operating frequency for the laser target designator. For example, in a Krasnopol-equipped battalion, Battery A would get one frequency, Battery B, a second frequency, and Battery C a third for operations within their respective sectors of operation.

The frequency setting on most of the rounds ranges from three (for the Krasnopol) to 30 (for the Krasnopol-M). There is a switch at the base of the 3OF-39 and the KM-1 Krasnopol projectiles that the operator turns to set the frequency.

The Krasnopol-M has six switches on the outside of the projectile that set the following: time of flight to ballistic cap removal (two switches), glide/ballistic mode (one switch), frequency setting (two switches), quick or delay fuze setting (one switch).

Normally, the frequency setting switches are adjusted upon receipt of the projectiles at the unit ammunition supply point and before being stored in the howitzer. However, the time of flight, glide/ballistic mode and fuze settings are mission dependent. Therefore, these settings are prepared before firing a mission.

These three settings must be accomplished in less than one minute during the prep for firing. For example, one crewmember may be adjusting the frequency while another is simultaneously

preparing the charges. Therefore, the difference in the Krasnopol and Copperhead preparation times is not significant.

The 2K25 Krasnopol complex includes the 3OF-39 Krasnopol projectile; a 1D22, 1D20 or 1D15 laser target designator (LTD); and the 1A35 shot synchronization system (1A35K command device and 1A35I observation post device). Normally, an LTD operator aims a laser at a target and one to two rounds are fired for target engagement. A signal confirming the firing of the projectile is transmitted from the firing unit (via a communications link from the 1A35K to the 1A35I) to the battery command observation post (COP).

The LTD operator continues to illuminate the target with a laser beam during the terminal phase of Krasnopol's flight. The Krasnopol's gyroscopic homing head locks onto the target beam, and aerodynamic control surfaces (on the projectile body) guide the projectile to the target. Once the target is destroyed, the LTD shifts to another target and continues to engage either planned targets or targets of opportunity.

Most foreign users are employing Krasnopol in the manner in which it was intended—that is, engaging dug-in fighting positions. Infantry with crew-served weapons, anti-tank guided missiles positions and observation posts, entrenched or with overhead cover, are notoriously difficult to destroy with indirect fire, even when fires are observed. One or two Krasnopol projectiles can destroy these positions quickly, and the number of rounds dramatically reduces the chances of counterfire.

Laser Warning Devices. Although the observers have to be able to see the target to designate it, the infrared laser pulses are invisible to the naked eye. The pulses are only visible if observed through a platinum-silicide (PtSi) CCD camera (similar to a home video camera) or night-vision devices operating in the near-IR spectrum (0.7 to 3.0).

Laser-warning receivers mounted on vehicles and equipment can detect the laser pulses. Various open-source publications disclose that western laser-warning receivers are more sensitive than Russian laser-warning receivers.

In several instances, laser-warning receivers have been mounted on various former East European armored vehicles. However, there are no laser warning receivers fielded on US Army armored vehicles.

Proliferation. The original Krasnopol and its variants are proliferating rapidly. The projectile has been sold to at least 12 countries in Africa, the Middle

Characteristics	Krasnopol (3OF-39 & KM-1)	Krasnopol-M (KM-2)	Copperhead
Caliber (mm)	152/155	152/155	155
Firing System (The systems on this row are presented as examples for each projectile caliber.)	Towed: D-20, 2A36, 2A65, TR-1, M198, G-5 SP: 2S3, 2S5, 2S19, M109 Series, AU-FI	Towed: D-20, 2A36, 2A65, M114A2, M198, G-5; TR-1 SP: 2S3, 2S5, 2S19, M109 Series, G-6, AU-F1, FH-77B	Towed: M114A2, M198 SP: M109A2/3, M109A6
Range (Km)	20	17-20*	16
Warhead Type	Frag-HE	Frag-HE	HEAT
Length (mm)	1,300	955	1,370
Weight (Kg): Projectile	50	43	62
Warhead	20.5	20	22.5
Explosive	6.5	6.2	6.7
Targets Engaged	Armored Vehicles, C^4I Posts, Field Fortifications	Armored Vehicles, C^4I Posts, Field Fortifications	Armored Vehicles
Target Attack Profile	Diving Top Attack	Diving Top Attack	Laser Illuminated Point
Range Assist	Rocket Motor	Base Bleed	None
Guidance: Initial Phase	Free Flight	Free Flight	Free Flight
Middle Phase	Inertial	Inertial	Inertial
Terminal Phase	Semi-Active Laser Homing	Semi-Active Laser Homing	Semi-Active Laser Homing
Max Field Storage Time without Shipping Case	No Restrictions	No Restrictions	No longer than 72 hours inside SP artillery systems in polyethylene bag.
Seeker Head Protection While Handling the Projectile	Protected by a nose cap discarded in flight.	Protected by a nose cap discarded in flight.	None. The seeker head must be protected from impact.
Pre-Fire Preparation	Connect both parts of the projectile.	Same as a standard conventional munition.	Before loading, seeker dome and tail fin slots must be inspected for damage and contamination.
Requirements for Loading	Same as a standard conventional munition.	Same as a standard conventional munition.	No sand, dust or moisture. The projectile must be protected from impact with other surfaces.

*Depends on the length of the gun tube and charge scheme of firing the weapon. It has been reported that Krasnopol-M eventually exceeded 22 kilometers when fired from 155-mm/52 caliber cannons.

Legend: **C^4I** = Command, Control, Communications, Computers and Intelligence; **Frag-HE** = Fragmentary High Explosive; **HEAT** = High-Explosive Antitank; **SP** = Self Propelled

Krasnopol and Copperhead Comparative Operational Data

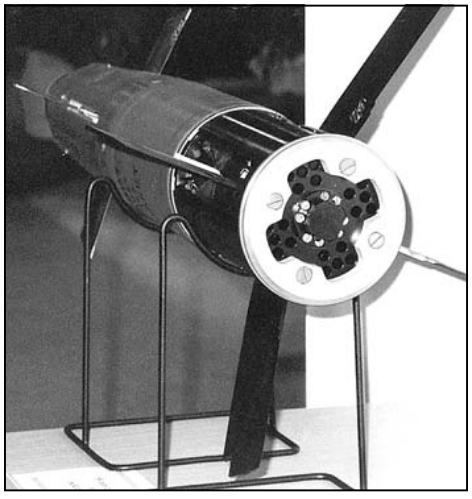
East and Asia. At least nine other countries are considering purchasing the projectile. The Russians have used the Krasnopol in combat in Chechnya and Dagestan. Additionally another foreign buyer recently reported destroying eight of 10 tanks engaged during a combat situation.

Known buyers include China, India, Ukraine and Belarus. China is currently producing both the 3OF-39 Krasnopol and the 155-mm version of the Krasnopol-M.

India, in particular, is an interesting case study. Reportedly India fired between 500,000 and 700,000 medium-caliber artillery projectiles in the recent fighting in the Kargil Region. In spite of these vast expenditures, many of the insurgent positions still had to be assaulted and destroyed by Indian infantry soldiers.

The Indian purchase of the Krasnopol is noteworthy in its scope (initial purchase of 1,000 projectiles with associated laser designators) and potential impact on future operations in the Kargil Region and near the Siachen Glacier. These remote areas are served by rudimentary road networks that make the resupply of large amounts of artillery ammunition expensive and difficult.

Cost-Effectiveness. While Krasnopol may cost $30 to $55 thousand (US) per projectile, conventional ammunition is not cheap, especially when considering the quantities necessary for target destruction or neutralization. Indian officials shopping for replacement ammunition expect to pay between $800 to $1,200 (US) per complete 155-mm round for basic high-explosive (HE) projectiles. Russian calculations indicate the Krasnopol can be 20 to 50 times as effective as conventional HE projectiles.



The Krasnopol-M projectile showing base-bleed gas ports and deployed fins.

Other "hidden" aspects of cost effectiveness include the Krasnopol's ease of handling, storage and transport as compared to conventional ammunition; less tube wear when firing it; and reduced crew fatigue.

Although laser-guided projectiles may be more expensive than conventional HE projectiles on a one-for-one basis, they are more cost effective than conventional projectiles in many cases. In fact, some fire missions, particularly destruction missions at long ranges, only can be accomplished with laser-guided projectiles.

Ease of Firing Table Addendum. Virtually any modern 155-mm howitzer can fire Krasnopol (KM-1) and Krasnopol-M (KM-2) fitted with a 155-mm diameter slipping obtruding band. Before they can be employed in combat, however, a firing table addendum must be prepared for the propelling charges and the howitzer used.

The test team must determine the muzzle velocity for each charge used to fire the Krasnopol and the chamber pressure/acceleration associated with the firing. A ballistically matched dummy projectile (commonly referred to as a slug) is fired with two crush gauges placed in the chamber. A radar is used to determine the muzzle velocity, and the crush gauges are used to derive the chamber pressure/acceleration.

Once the muzzle velocity at a given elevation is determined, a computer can be used to calculate the firing table. This is checked or verified by firing working Krasnopol projectiles and checking the achieved range versus the calculated range.

Training. Russian and other nations' artillery units train under realistic field conditions to use laser-guided munitions. The training includes both gun crews and LTD operators engaging and destroying stationary and moving targets.

The targets are arrayed as a threat or foreign army would deploy forces on the battlefield. Thus, the LTD operator learns the skills required to determine targets and conditions that either enhance or degrade the use of the munition.

Predicting when a target will enter a kill zone is a very difficult task when using a laser-guided munition. Therefore, LTD operators learn how to plan kill zones along avenues of approach or counterattacks to engage and destroy moving targets.

Timeliness is critical during the engagement of a moving target. The likelihood of a Krasnopol achieving a first-round hit is severely reduced if the projectile is not delivered on time. Even the likelihood of a second-round hit is diminished due to the variation in location of a moving target. Therefore, the employment of the Krasnopol is enhanced through the training of units in preplanning kill zones.

Before the engagement, the LTD operator conducts a terrain reconnaissance of the kill zone using the laser rangefinder on the target designator. The LTD operator predetermines the points of engagement covered by the Krasnopol's seeker footprint (one-kilometer radius or a two-kilometer diameter). The gun range and azimuth settings are calculated (in advance) by the battery fire direction center (FDC) and recorded by the gun crew chief. This translates into a higher probability of a first-round hit and the destruction of the moving target. LTD operators and firing units train to the standard of achieving a direct hit on a moving vehicle on the first or second shot.

Another technique is to target an obstacle, wait until the lead element stops to clear the obstacle, then fire the projectiles at the halted vehicle.

Russia is exporting training and doctrinal employment packages to foreign Krasnopol buyers.

Employment. There are many variations in the types of equipment sets for Krasnopol firing units. The various tactical situations and firing systems dictate the overall employment of the Krasnopol.

FM 100-60 Armor- and Mechanized-Based Opposing Force: Organization Guide—soon to be replaced by *FM 7-100.5 Opposing Force (OPFOR) Organization Guide*—lists a typical OPFOR 152-mm self-propelled howitzer battalion as having four sets of the Krasnopol-M. Each set is composed of the LTD (1D22, 1D20 or 1D15), the 1A35 shot synchronization system and 50 projectiles per LTD. Thus, a total of 200 Krasnopol projectiles are fielded to a typical 152-mm self-propelled howitzer battalion.

One battery of the battalion can be designated as the special-weapons or Krasnopol battery. The Krasnopol battery commander designates one pla-

toon (possibly on a rotating basis to maintain crew proficiency) as the principal Krasnopol firing unit. A Krasnopol platoon's basic load consists of the Krasnopol, smoke and illuminating rounds. The Krasnopol firing platoon might retain 140 Krasnopol projectiles while the 60 remaining projectiles are distributed throughout the battalion at a rate of four Krasnopols per tube. One LTD is distributed to each battery COP (three per battalion) and the battalion's mobile reconnaissance post.

The LTD operator uses a concealed location to position the LTD within a 30-degree arc left or right of the gun target line and no more than seven kilometers (preferably five kilometers) from the target. The LTD operator follows standard fire mission procedures in determining the target coordinates.

During engagement, each gun (in the Krasnopol platoon) fires one Krasnopol projectile in succession, either on the LTD operator's command or on a predetermined time sequence with less than 30 seconds between projectiles per designator. Upon destruction of the initial target, the LTD operator shifts the designator to subsequent targets upwind (from the previous engagement) to reduce smoke and dust interference with the designator.

Countermeasures and Counter-Countermeasures. A major shortcoming of employing the Krasnopol (as well as other laser-guided munitions) is the requirement to illuminate the target with the laser beam for five to 15 seconds. Long target illumination times enable enemy targets equipped with laser warning detectors to employ countermeasures that prevent the target from further illumination by the laser beam. Thus, the guidance of the Krasnopol is disrupted, and the target survives the engagement.

The most effective means of protection are laser-warning detectors that automatically cue grenade launchers to fire a number of smoke grenades within two to three seconds after detecting a laser beam. A smoke cloud builds up around the vehicle six to eight seconds after firing. The cloud bends or reflects the laser beam and provides a false homing point for the Krasnopol. In essence, an effective laser protection screen is deployed around the target within eight to 11 seconds after laser detection.

The LTD operator can counter this countermeasure by using an initial laser offset procedure. This procedure requires the LTD operator to first determine a land feature or easily referenced landmark within the kill zone. The operator surveys the kill zone for background conditions that may cause backscatter (from other reflecting surfaces) that would provide the target an early warning of the LTD laser beam.

The LTD operator then lases at the predetermined offset point (15 to 20 meters from the target) at the beginning of the fire mission. The LTD operator or his assistant is alerted to the Krasnopol's appearance in the target area beam either by a "munition approach" light-emitting diode on the 1A35 shot synchronization equipment or a blinking signal light in the optics of the LTD. The LTD operator begins shifting the laser target designator crosshairs toward the center of the target four to five seconds after the signal prompt. He shifts the laser beam from the offset point to the target two to three seconds before the terminal phase of projectile flight.

The offset procedure takes six to eight seconds. Thus, the Krasnopol potentially can hit and destroy the target before the target can employ laser countermeasures. The offset procedure requires a skilled LTD operator due to the requirement for increased hand-eye coordination during the laser beam shifting process.

Another countermeasure procedure is called "fake" or "decoy" designation. The objective of this procedure is to make the vehicle crew react and employ countermeasures, such as smoke grenades, against a LTD position that is at a different angle than the actual LTD position.

This procedure requires two LTD operators or one LTD operator and an observer equipped with a laser rangefinder. Once the target has entered the kill zone, the first LTD operator or the observer lases the target to make the laser-warning receiver cue the vehicle crew to employ smoke grenades as a countermeasure. As the smoke cloud builds up around the vehicle with an orientation toward the perceived LTD position, the second LTD operator lases the target from a different angle and the firing battery fires the Krasnopol projectiles for the engagement.

Conclusion. The United States demonstrated during Desert Storm that the force that initially attains and maintains fire superiority has the advantage of freedom of maneuver and reduced casualties from enemy artillery fire. The Krasnopol and Krasnopol-M provide users the ability to destroy targets at lower expenditure rates and shorter firing times with substantial reductions in the logistical burden.

155 mm Krasnopol-M with stabilizing fins deployed and nose cap/fuze removed.

The proliferation of these rounds is providing potential US adversaries a means to attack and destroy targets ranging from thinly protected C^4I systems to armored vehicles at a critical place and time on a future battlefield. As a niche technology, Krasnopol and other laser-guided projectiles are potential force multipliers for otherwise relatively low-technology forces (including guerrilla forces or terrorists) against a more advanced force across a wide spectrum of conflicts.

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Improving Close Contact Fires:

Dedicated Batteries Linked to Parallel Clearance of Fires

By Lieutenant Colonel Mark R. Mueller

During the past few years, the fire support community has looked for ways to get fires back into the close fight. We developed essential fire support tasks (EFSTs), created the Striker concept and developed innumerable tactics, techniques and procedures (TTPs) for improving our plans. Yet, still, there seems to be a lag between maneuver expectations and the fire support system's ability to deliver.

Clearly, we have worked hard and done well to improve our ability to focus our fires on close support. We have improved our ability to attack "targets or objectives that are sufficiently near the supported force."[1] Yet the perception exists that the fires needed to enable maneuver success, fires that support close contact at the task force (TF) and company commander levels, are not there.

The May 2000 final draft of *FM 6-20-40 Tactics, Techniques and Procedures for Fire Support for Brigade Operations (Heavy)* lists one of the four tasks of the direct support (DS) Field Artillery battalion as providing "responsive FS [fire support] that *protects and ensures* freedom of maneuver to forces in contact with the enemy" (emphasis added).[2] Yet, in the view of many maneuver commanders, fires fall well short of their expectations of protecting and ensuring their freedom of maneuver when in contact with one of the Combat Training Center (CTC) opposing forces (OPFORs). Accuracy, responsiveness and availability are their primary issues.

The perception is Field Artillery fires and close air support (CAS) support the brigade operation only. In one article criticizing fire support, an Infantry lieutenant colonel author said, "If a fire mission happens to aid a battalion ground movement, it is a coincidence. Maneuver commanders cannot make it happen intentionally."[3]

Why have we drifted toward close fires vice close supporting fires? The provision of close supporting (contact) fire support is tough. When a maneuver force comes into direct fire contact, the battlefield's character radically changes. This environment can be characterized as time-sensitive (fires must be fast when the race goes to the swift). There is a very small margin for error (fires must be accurate when they inherently are dangerously close). The situation is fluid and confused (fires must be flexible when clearance is difficult). And there are multiple critical demands for fires *now* (fires must be overwhelming when assets are limited).

To be decisive, fires must be fast, accurate, flexible and overwhelming. Fires, both direct and indirect, must produce complementary or reinforcing effects. This environment requires an agile combined arms response.

As a combined arms community, we must improve our ability to rapidly focus fires in support of a company-team that has just made contact. Failure to respond rapidly with fires may allow the enemy to render opportunities gained with close fires (sufficiently near the supported force) moot.

The combined arms community can use two techniques to provide "close contact" fire support and improve both the responsiveness and availability of fires. The first technique is to allocate a "dedicated" battery in support of a main effort TF in contact. The second is to use a parallel process for clearing fires while adjusting on them to the target.

The Dedicated Paladin Battery. Part of slow response hinges on a lack of clear standards for tactical decision making and rapidly accessing the fire support system to attack a target in support of a company-team in contact. Typically, unless the fires are planned as part of an essential fire support task (EFST), the brigade combat team (BCT) commander and (or) the fire support coordinator (FSCOORD) have to decide whether or not to shift from one target to attack a newly identified target. Training standards do not dictate how fast the commander or the FSCOORD must make that decision.

Clearly, if it takes any time at all, for the company-team in contact, it is too long. This is especially true if fires are needed to protect the main effort TF or company-team and preserve its freedom of maneuver so it can accomplish its task and purpose at a later time in the fight.

Another of the inherent responsibilities of the DS battalion is to provide fire support for any possible contingency. Fire support assets must be identified and marshaled for execution at the right time and place. The brigade commander must retain control over *enough* firepower to influence the battle as necessary.[4]

The question is, how much is enough? Typically the BCT commander retains control of all fire support assets, with the exception of mortars, to influence the fight. We traditionally have used EFSTs to articulate tasks and critical targets to speed the process.

But often, EFSTs do not address close contact fires. Often, despite success with close fires (those fires attacking sufficiently near the supported force), BCT fires for shaping operations is for naught because the maneuver force is engaged unexpectedly in a direct fire fight and cannot access fast, accurate, flexible and overwhelming fire support. Often, losses in the direct fire exchange are such that the BCT does not have sufficient combat power to accomplish its mission. Too often, the fire support system has not protected and ensured freedom of maneuver for forces in contact with the enemy. This does not have to be the case.

The Paladin M109A6 155-mm self-propelled howitzer provides the FSCOORD enough flexibility to place a battery in a nonstandard dedicated role to provide fast and flexible fire support to forces in contact. The FSCOORD can do this without significantly degrading the DS battalion's ability to support EFSTs.

We are ingrained with the need to mass the battalion. Formerly a DS battalion massed fires as a standard—first, to reduce the battalion's exposure to counterfire and, second, to achieve rapid effects on a target.

The M109A6 can shoot a large number of volleys and then move, reducing the threat from counterfire. While the battery fires more volleys, the Paladin platoon can move immediately after the mission or during the mission, the latter by moving individual sections while the mission is in progress.

We do lose the effect of 12 to 18 rounds landing at once. But that, too, may not be required in the close contact fight. The fires of two to four howitzers (assuming one howitzer per platoon is moving at any one time) from a dedicated battery, complementing direct fire, is possibly all that is needed to allow a company-team in contact to continue its mission while eliminating a threat. The requirement to mass is not vital for the close contact fight.

Photo Courtesy of United Defense

For the rest of the EFSTs, the fewer number of firing units available does reduce the number of targets the DS battalion can attack; however, the availability of rapid fires to preserve combat power and retain freedom of maneuver as the BCT moves to an objective is paramount.

To preserve flexibility, we modified the dedicated mission somewhat. First, the dedicated battery responds to calls-for-fire solely from a force in contact. This reduces the decision-making time at the TF level and above and provides one or two company-teams direct access to the Field Artillery delivery system. This allows the fires of the platoon or battery to be immediately responsive.

This relationship does not allow the TF to start planning fires in support of targets "sufficiently close" to the supported company-teams and the formation of additional TF EFSTs. That would drag the focus of fires for close contact to shaping fires. If there is a large divergence between the brigade EFSTs and what the main effort TF needs to support its fight, then there is a problem with either the BCT EFSTs or the TF scheme of maneuver as it fits into the BCT plan.

The modification of the dedicated mission provides the main effort TF the close contact fires needed to protect and retain freedom of maneuver while still maintaining some flexibility to support shaping fires or the attack of high-payoff targets (HPTs). At a minimum, the organization for combat still maintains enough force (two batteries) to continue to shape the close fight at the BCT commander's decisive point and attack targets "sufficiently near the supported force."

In a recent deliberate attack fire coordination exercise (FCX) conducted by the 1st Battalion, 6th Field Artillery, 1st Infantry Division (Mechanized) in the close combat tactical trainer (CCTT), one battery was placed in a dedicated role to a TF for close contact support while two batteries focused on achieving the BCT EFSTs. In practical terms, this meant each battery commander maneuvered his platoons and bounded by section to provide continuous fires as required to support EFSTs (a 30-second response time for two Paladin sections and a 75-second response time for a third Paladin section). Fire support officers (FSOs) established a direct link with one or two of the lead companies in the TF to the dedicated battery to respond to immediate requests for close contact fires.

The dedicated battery commander moved to the main effort TF command post with the mission of responding rapidly with fires for forces in contact. His objectives were to preserve the TF's combat power and retain its ability to maneuver.

Despite some growing pains in training TF FSOs in how to employ this battery, the concept proved powerful. The TF company-teams could maneuver to the decisive point with the dedicated battery firing about one-quarter to one-third of its missions as close contact fires (fires immediately responsive to a force in contact).

When the battalion fire direction officer (FDO) identified close contact targets as HPTs, he reinforced the fires of the dedicated battery. If not, then the remaining two batteries continued to focus fires on the brigade's decisive point. As part of the battalion massed in support of the BCT EFSTs, the dedicated battery fired approximately two-thirds to three-quarters of the fire missions. In an offensive scenario, most of these fires were fired as the BCT crossed the line of departure (LD) initially and when the lead TF neared the point of breech or point of penetration.

The result of using the dedicated battery was that fires were available to support a company in contact while the DS battalion accomplished the BCT commander's EFSTs. Both close contact fires and traditional close fires could be delivered simultaneously. Response time for fires in support of a company in contact was reduced by two to four critical minutes.

As the dedicated battery rapidly engaged a HPT that was influencing the brigade scheme of maneuver, the battalion FDO could complete a mission on another target and reinforce the effects of the dedicated battery by massing all three batteries on the target. In most cases, fires did not work in isolation but complemented or reinforced the effects of direct fires on the target, enhancing the effectiveness of the combined arms response.

Both the rapid decision-making and immediate access drastically reduced the time required to attack targets in support of forces in contact and allowed the TF to move rapidly in zone with greater combat power. These fires also denied the enemy the ability to reposition his covering forces back into his main battle area as they were either destroyed or blocked by the TF's rapid maneuver.

Parallel Mission Processing. If the maneuver commander cannot rapidly clear fires in zone or sector and the fires are inaccurate, then again, the company-team takes losses while it trades volleys with the enemy and (or) loses its freedom of maneuver.

The 2002 Fire Support Conference "Field Artillery Azimuths Information Paper" indicated a growing perception that it takes 28 to 42 minutes to shoot missions with clearance being the predominant factor in slowing response.[5] If an FA battalion meets the mission training plan (MTP) time of two minutes, 30 seconds to conduct a fire-for-effect (FFE) mission with dual-purpose improved conventional munitions (DPICM) (high explosive with a time fuze) during gunnery, which many battalions can do routinely, then it is taking in excess of 12 minutes to clear a mission for firing. Once cleared, an analysis of more than 180 missions from 10 rotations at the Combat Maneuver Training Center (CMTC) at Hohenfels, Germany, showed that more than 85 percent of all missions had a target location error (TLE) of greater than 250 meters and that 60 percent had a TLE of more than 300 meters.[6]

Even with the improved availability of fires to support a maneuver element in contact and increased responsiveness, the question of accuracy in close contact fires must be solved. A solution to these problems is to establish time standards for fire mission clearance and a process that supports adjust fire, not FFE, as the standard.

Fire support doctrine provides some guidance for fires clearance, such as positive clearance, centralized or decentralized control, or pre-clearance of fires. However, there is no clear combined arms standard for the battle drill to rapidly clear targets nor is there a standard for the speed with which target clearance must occur at all levels.

Fire support doctrine does advise the use of fire support coordinating measures (FSCMs) to speed response. In the close fight, the most basic of these FSCMs is a boundary.

The best way to ensure rapid clearance is by using a boundary. However, to preserve flexibility for rapid maneuver, it's rare for the commander of armored forces to impose boundaries be-

low the TF level. It is rarer still in division or higher operations, despite the use of boundaries, that a TF or BCT commander "owns the ground" to engage targets quickly, requiring coordination and clearance only within his organization.[7]

Division assets such as general support (GS) and general support reinforcing (GSR) artillery and radars, intelligence collectors and brigade reconnaissance troop (BRT) scouts are just a few of the clearance challenges. In most cases, positive clearance of fires is required. FM 6-20-40 defines positive clearance as requiring (1.) the best available method of target location; (2.) positive identification of a target as enemy; (3.) eyes on target, if at all possible; and (4.) clearances from appropriate external elements if the target is outside unit boundaries.[8]

Clearing fires with external elements is what takes time. If the TF has not used company boundaries and scouts have not provided accurate reports, positive clearance is required to clear a mission. In attempting to clear a mission, many times, FSOs at all levels have to go to the commander or executive officer (XO) to obtain clearance. Tactical operations center (TOC) staffs then spend valuable time trying to contact key leaders on the ground to clear a target.

At the BCT level, if the BRT, ground surveillance radars, combat observation lasing teams (COLTs) and other BCT or divisional assets are not tracked in detail, the process takes even longer. Add communications problems to the mix, and fires are delayed even longer. In a close contact fight where fires must be fast, accurate, flexible and overwhelming in the time taken to clear a target, we may have lost valuable combat power before indirect fires can have an effect.

Unfortunately, there are no training standards for the time and procedures the combined arms community uses to clear targets. Therefore, clearance takes…as long as it takes. (See Figure 1.)

As a combined arms community, we must insist on battle drills at all levels that enable rapid clearance similar to the Field Artillery counterfire standard. Time becomes a forcing function to streamline the clearance response. *Army Training and Evaluation Program (ARTEP) 6-115-Mission Training Plan (MTP) for the Cannon Battalion* sets a training standard of one minute, 30 seconds for counterfire—55 seconds for the observer and 35 seconds for the fire direction center (FDC) from acquisition until the mission is transmitted to

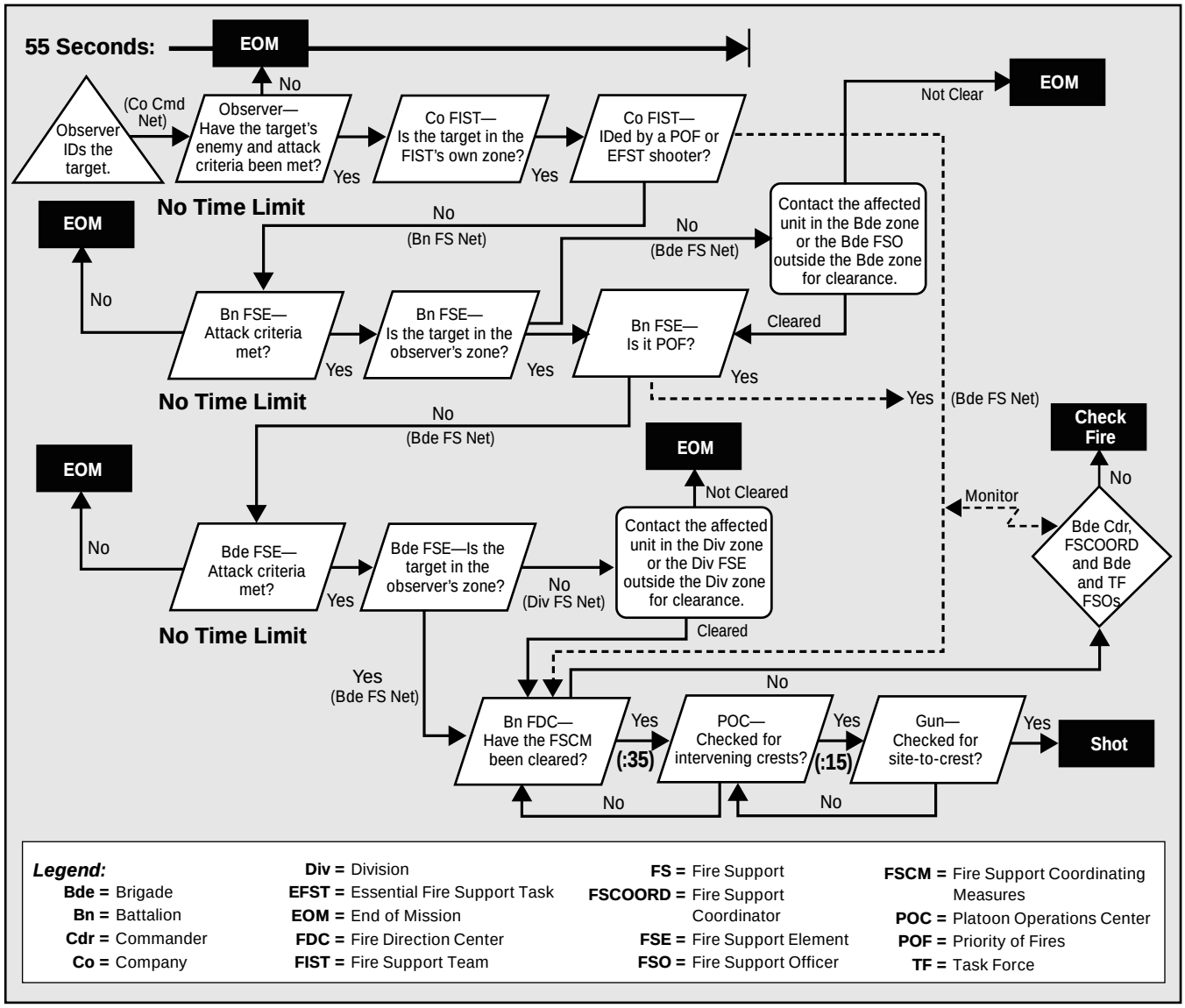

Figure 1: Current Clearance of Fire Battle Drill. How long does it take to clear fires on a target? It takes as long as it takes—no time standard.

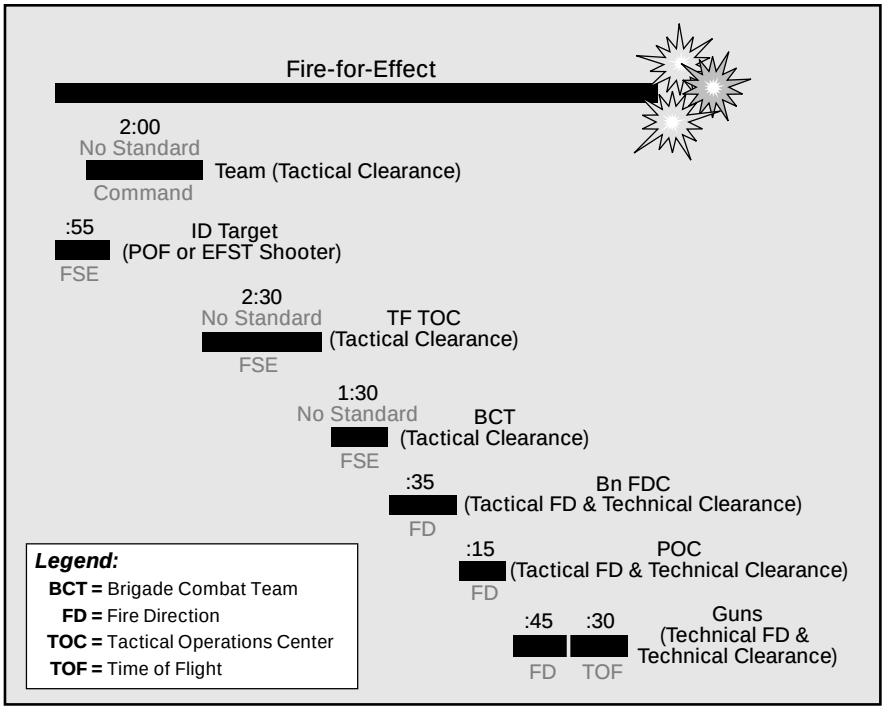

Figure 2: Today's Standard Call-for-Fire (CFF). On a *great* day, it is nine minutes from CFF to the first volley impacting. Today's CFFs tend to occur sequentially, have loosely defined standards for clearing targets and processing them tactically and have no battle drills by echelons with fixed responsibilities.

the delivery unit for target attack.[9] In fact, a streamlined counterfire drill used at the CMTC, held to a strict time standard, has resulted in a positive counterfire trend.

Again, in the same analysis of 10 CMTC rotations, friendly forces on the average lost only three to five vehicles per battle to OPFOR fires and "greater than 80 percent of enemy indirect missions are one-time events. The OPFOR [is] unwilling or unable to follow-up due to friendly counterfire."[10] This trend is the result of streamlining the clearance battle drill to meet a target exposure time.

For a force in contact where minutes can be measured in lost combat power for a maneuvering force, the same type of battle drill tied to time is just as critical. Link slow clearance to poor target location and the rounds are inevitably too late and nowhere near the target.

Often we approach mission processing sequentially (see Figure 2). The observer identifies a target, the fire support team (FIST) converts the target into a fire mission (99 percent of the time the mission is an FFE) and then mission clearance procedures begin. Often the battalion FDC does not get the fire mission until it is cleared at the TF and BCT levels.

Tracking several missions at the CMTC, it takes a minimum of two minutes to positively clear a target at the company-team level; two minutes, 30 seconds at the TF level (if the target is outside unit boundaries or if no company-team boundaries are used); and one minute, 30 seconds at the BCT level to deconflict BRT scouts and COLTs. Using the current standards for an FFE mission (ARTEP 6-115-MTP) and sequential clearance (as shown in Figure 2), the best time for any mission, sensor-to-shooter, is nine minutes. If the mission is off target, as is the trend, then the observer begins to adjust on to the target and the mission takes even longer.

Inevitably, fires are not effective in meeting the task and purpose required. Unfortunately, the blame is often laid entirely at the feet of the fire support community, not the combined arms community. One way of reversing this trend and increasing the accuracy of fires is to use a parallel process for simultaneously clearing and processing missions.

The parallel process is very simple in execution. Instead of conducting an FFE mission that has been sequentially cleared and processed as already described, the target is cleared as the observer initiates an adjust-fire mission on a target. (See Figure 3.) This process increases responsiveness, clears the mission as the firing unit processes it and adjusts the fire, the latter dramatically improving target attack accuracy.

As a unit makes contact and begins its maneuver, the observer (usually a maneuver shooter) initiates an adjust-fire mission on the team command net. As clearance procedures begin at the team level, the FIST verifies the target is the enemy, the observer is using the best method of target location and the observer has eyes on the target (the first three requirements for positive clearance). On the TF fire support communications net, the company FIST contacts the dedicated battery (or platoon) FDC and initiates the mission as cleared for adjustment while the FFE clearance progresses.

The TF fire support element (FSE) begins clearing the mission with the TF and external agencies (the fourth requirement for positive clearance) as the adjustment progresses. The mission is not cleared for the FFE phase until the process is complete.

Within two minutes, 10 seconds (assuming a 30-second time of flight) the initial round impacts and the observer adjusts the round. At some point less than three minutes from target identification, the TF FSE reports to the dedicated FDC that the mission is clear (a clearance standard of two minutes, 10 seconds is preferred, but not practicable). These three minutes are for simultaneous external clearance of the target at each level (team, TF and brigade) before the FFE phase is reached.

Once the TF FSE has determined the mission is clear, the dedicated battery fires for effect and rounds hit the target at approximately four minutes, 40 seconds from identification (assuming a 30-second time of flight and DPICM in the FFE phase of the mission). Accurate, responsive and, to the maximum extent possible, safe fires are on the target to protect the force in contact and ensure it is free to maneuver.

Using the parallel process for fire missions certainly creates a greater risk of fratricide. However, in a close contact fight where the environment is fluid and confused, what is the cost to the maneuver force of not providing responsive, accurate fires? In an interview with Lieutenant General (Retired) Harold Moore about his book *We Were Soldiers Once…and Young*, he was asked, "How close did you call in artillery?" His answer was—"You call it in

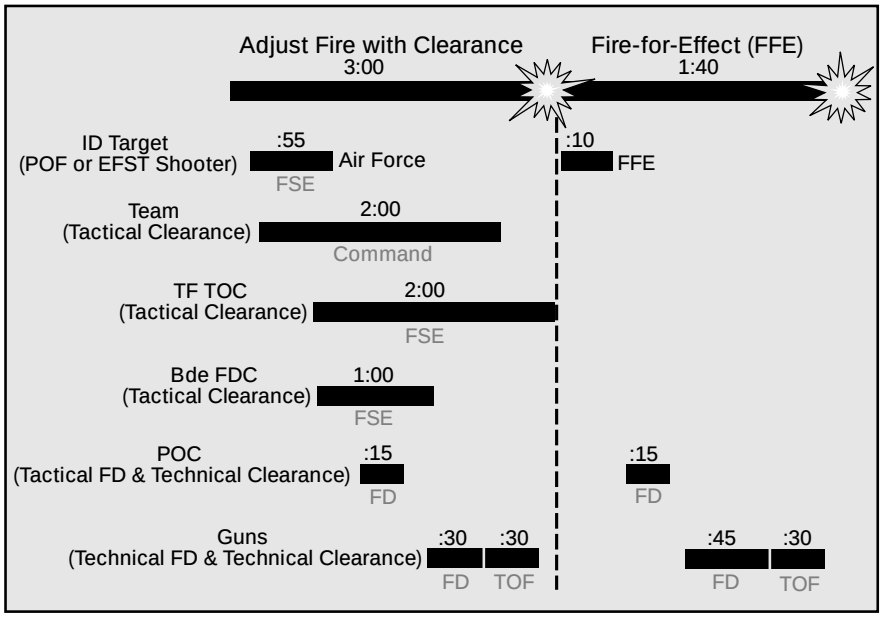

Figure 3: The Parallel Clearance of Fires Process Linked with a Dedicated Battery. Within three minutes, the target is cleared. The total time it takes to adjust fire and then fire-for-effect is 4:40—from call-for-fire to first volley impacting.

where the enemy is…30 yards or less if you have to. You may take some friendly casualties, but you'll take a helluva lot more from the enemy if you don't bring your fires in close enough to do some good."[11]

To provide close fires in support of forces in contact, we must accept a certain amount of fratricide risk; without providing those fires, the potential cost in lives and failure of the mission is too high. However, that does not mean that we cannot mitigate that risk.

If the risk is accepted, then the parallel clearance and fire mission processing helps mitigate the risk. The parallel process meets the first three of the four requirements for positive clearance before fires are adjusted onto the target. Risk is further mitigated by using high explosives (HEs) in the adjust-fire phase because of their smaller bursting widths: 155-mm is 50 meters and 105-mm is 30 meters. Also, because the observer adjusts the mission, accuracy increases.

The commander may further mitigate the risks by using more boundaries and other FSCMs. Although the maneuver commander must weigh flexibility for maneuver against a rigidly defined battlespace, he can mitigate risk by enforcing better reporting at all levels. However, outside of digitized units, absolute fidelity of the location of individual maneuver elements is extremely difficult once the unit is in contact.

At the same time, we cannot have a maneuver force being decimated in a direct firefight while staffs work through a vaguely defined clearance battle drill. The result of slow clearance and inaccurate fires are platoons and companies lost in contact while staffs attempt to ascertain the location of a lone scout team with whom they have lost communications.

The parallel process for clearing fires while adjusting on to a target linked with the dedicated battery trained to meet MTP standards for target attack ensures accurate fires within four minutes, 40 seconds or less after the call-for-fire is initiated.

The ability to provide fires in support of a force in contact is an area in which we can improve. EFSTs and the concept of supporting the brigade commander's decisive point has often left the TF in contact with little more than four mortar tubes to provide indirect fire. In an era of increasing ability to acquire and hit targets at longer ranges in a high-intensity environment where one well-positioned and unanticipated enemy tank or anti-tank system can slow and inflict terrible casualties on a maneuver force, the TF needs fast, accurate, flexible and overwhelming fires.

Generating effective fires in support of a force in contact is not solely a Field Artillery issue. It is a combined arms issue. Without the inclination of the BCT commander to decentralize at least some of his artillery to provide contact support to his main effort TF, there can be no dedicated battery. This means he may have to reduce the number of fire support tasks his DS battalion performs to shape the battlespace at the decisive point.

The combined arms community must be willing to establish and adhere to time standards and procedures for clearing fires. Without this willingness, fires will not be any more responsive and forces in contact will wait "as long as it takes" for TOCs to grind through the clearance process. The time that grind takes puts soldiers' lives at risk.

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Endnotes:

1. *FM 6-20-40 Tactics, Techniques, and Procedures for Fire Support for Brigade Operations*, Final Draft (Washington, DC: Department of the Army, May 2000), 4-42.
2. Ibid, 3-02.
3. Lieutenant Colonel Robert R. Leonhard, "Classical Fire Support vs. Parallel Fires," *Army* (April 2001).
4. FM 6-20-40, 3-02.
5. "Field Artillery Azimuths," 2002 Senior Field Artillery Leaders Conference Panel Backbriefs, Fort Sill, Oklahoma, April 2002, 9-12.
6. "Training Insights," 1st Infantry Division, Wurzberg, Germany, January 2002.
7. FM 6-20-40, 3-109.
8. Ibid, 3-113.
9. *Army Training and Evaluation Plan (ARTEP) 6-115-Mission Training Plan(MTP) for the Field Artillery Cannon Battalion Command and Staff Section, Headquarters and Headquarters Battery, and Service Battery* (Washington, DC: Department of the Army, 1 April 2000), A-28.
10. "Training Insights."
11. Colonel Thomas G. Waller, "First Response to Three Responses to 'Is the FA Walking Away from the Close Fight,'" *Field Artillery* (January-February 2000), 3.

AVP:
Increasing Laser Target Location Accuracy at Max Ranges

By Sergeant First Class Stephen R. Hekeler

One fire support observation at the National Training Center (NTC), Fort Irwin, California, is that, too often, lasing teams inaccurately engage targets of opportunity with indirect fire. This occurs even when they use the highly range accurate ground/vehicular laser locator designator (G/VLLD). Targets viewed through the 13x optics for the G/VLLD in daylight and with no obscuration can distinguish between friendly and enemy vehicles at 7,500 meters. Enemy targets acquired by lasing systems normally are engaged at ranges of 3,000 to 5,000 meters from the observation post (OP) instead of maximizing the system and lasing them at 7,000 to 8,000 meters.

Any azimuth inaccuracies applied to the lasing system are amplified the farther away the target is from the lasing system. During force-on-force battles at the NTC, observer teams are commonly inaccurate in determining their observer-to-target azimuths by as much as 120 mils. If the target had been lased at 7,000 meters, the initial indirect fires would incur a target location error (TLE) of as much as 840 meters to the left or right of the target.

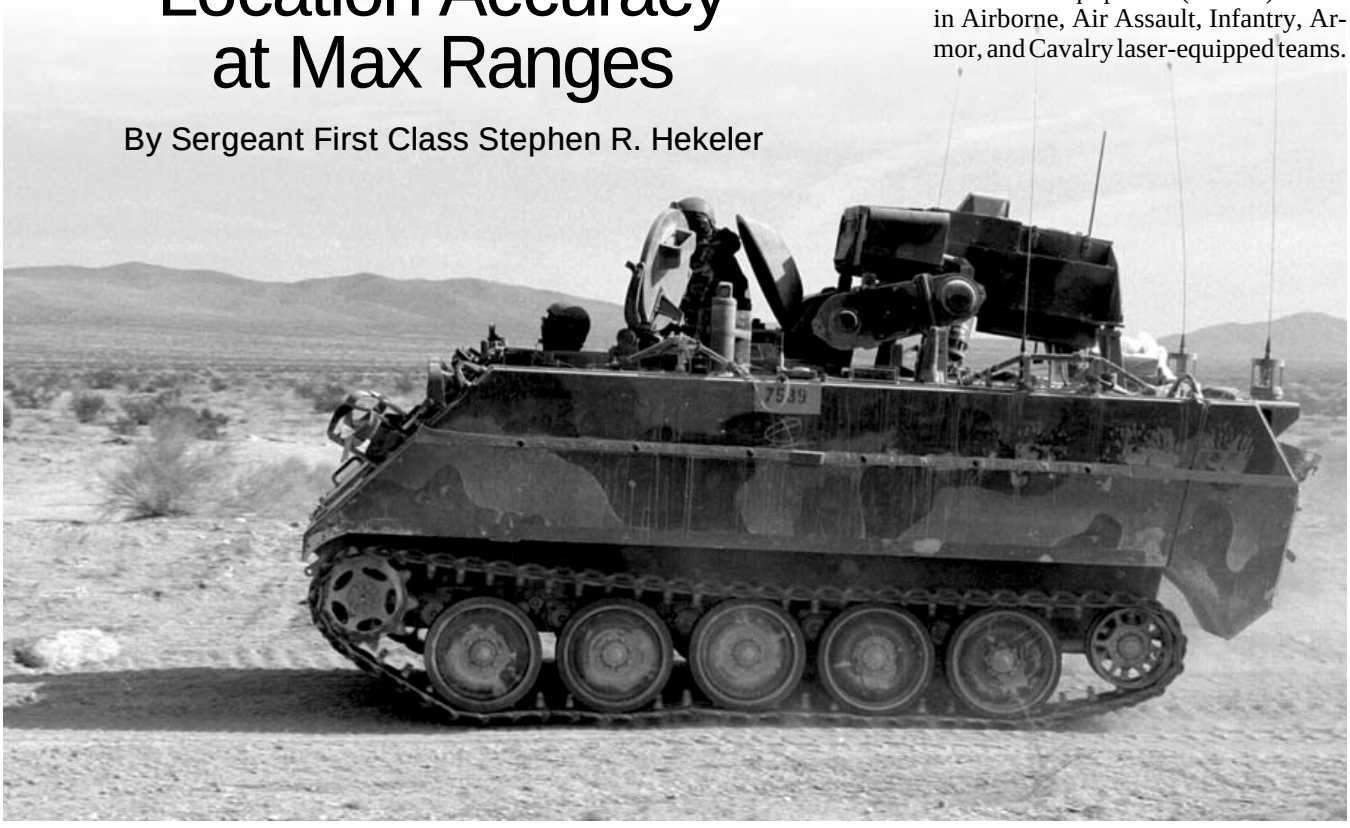
The G/VLLD is range accurate to +/- one meter at 9,999 meters and azimuth accurate to +/- 1 mil; however, it requires manual input of the most accurate azimuth possible. Yet observers seem to have difficulty determining accurate azimuths to input into the G/VLLD and other lasing systems.

Current doctrinal minimum standards for the M2 compass are not accurate enough to engage targets effectively at the maximum potential of the lasing system. In the Soldier's Training Publication (STP) 6-13F 14 Soldier's Manual (SM)-Training Guide (TG**)** Task No. 071-074-000, "Determine a grid azimuth using an M2 compass," a soldier is allowed a +/- 60 mils error in determining a grid azimuth to a target. At this tolerance rate, a first round fire-for-effect at 7,000 meters could have a 420-meter TLE left or right of the target location.

In response to this deficiency, I researched and developed the azimuth verification point (AVP) method. Once implemented as an additional step in the existing OP occupation battle drill, the AVP greatly increases the determination of a grid azimuth to an average of only +/- 12 mils in error. When the AVP method was compared to FA battery survey points (OS/EOL), the AVP, on an average, matched these points at +/- 12 mils.

To determine more accurate target locations at greater ranges and increase the accuracy of indirect fires, laser-equipped units must use current technology effectively and incorporate the AVP method. The AVP is a fixed point on the ground determined by using the precision lightweight global positioning system receiver (PLGR). The observer team can reference this point for updates throughout its operations at the OP. The AVP can be an existing terrain feature or a manually installed point established by the observer team.

The AVP system can be applied with the standard modified table of organization and equipment (MTOE) found in Airborne, Air Assault, Infantry, Armor, and Cavalry laser-equipped teams.



FIST-V at the NTC.

This article discusses tactics, techniques and procedures (TTP) for AVP to increase the accuracy of the G/VLLD (and other systems) and the effectiveness of indirect fires at their maximum observable range.

TTP for AVP. The observer prepares to use the AVP method by assembling the right equipment. He needs a lasing system, PLGR and a visible marking device. In limited visibility, observers can use a chemlight, infrared beacon or strobe light.

1. The lasing system must be operational and stabilized or sandbagged. The observer can use the G/VLLD or Hellfire ground support system (HGSS) in the dismounted mode, the G/VLLD/HGSS mounted in the fire support team vehicle (FIST-V) or the mini eye-safe laser infrared observation set (MELIOS) on the tripod. An operational PLGR must be set up to record/display in grid azimuth and mils.

2. The observer determines the location of the AVP. The AVP is established during the "position improvement" phase of the OP occupation battle drill: security, location, communications, terrain sketch, observation and position improvement (SLoCTOP).

• Defensive Operations. During defensive operations, the observer usually has the time and ability to enter the engagement area (EA). The AVP site can be either close in or out in the EA during EA development. The observer can use target reference points (TRPs), battlefield debris, prepared obstacles or trees as the AVP.

• Offensive Operations. Because of the tactical nature of offensive or reconnaissance and surveillance operations, the AVP is positioned close to the OP. It should be positioned under the cover of darkness. If the observer is unable to move forward of the OP, he can position the AVP behind the OP, perhaps in the vicinity of the OP's hide position. He also can establish it on the left or right limit of the OP. In the desert where trees are almost nonexistent, the team can carry a short u-picket to establish the point. The observer must take precautions to minimize movement in the area of the OP and reduce the risk of detection.

3. The observer locates the laser in the PLGR. (The remainder of these steps detail a team employing the AVP near its OP. If the AVP is employed in the EA, the team can apply the steps to the selected feature.) The lasing team places the PLGR on the laser in the "averaging mode," averages the satellite "hits" to 500 times and then "marks as waypoint" the laser in the PLGR, naming it "OP1." This takes seven to 10 minutes, if done correctly.

4. The observer locates the AVP in the PLGR. One member of the observation team moves down either the left or right limit lines of the OP's observation fan for a distance of 150 to 300 meters. He verifies with hand-and-arm signals or, if at night, predetermined infrared flashes with PVS-7s that he is at a point visible from the OP. He then pounds a short u-picket stake into the ground. He tapes the chemlight in the "U" of the picket oriented back toward the OP, masking the chemlight on the enemy side. He then sets the PLGR on the picket while in the "averaging mode" to average 500 times. This takes approximately 10 minutes; the soldier should take up a prone position and pull local security. Once the averaging is complete, he marks the u-picket as a waypoint in the PLGR, naming it "AVP1." The soldier returns to the OP.

5. The observer calculates the grid azimuth from waypoint to waypoint (OP1 to AVP1) and inputs it into the lasing system. He uses the PLGR "distance calculate" to determine the grid azimuth from the OP to the AVP. He then orients the lasing system, for example the G/VLLD, on the AVP, and manually inputs this azimuth into the traversing unit of the G/VLLD tripod.

6. The observer records the AVP and data on the terrain sketch. If the AVP is to the rear of the OP, the data is recorded in the margins of the terrain sketch.

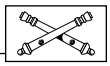
7. The lasing team orients the laser to the AVP every two to three hours to verify the azimuth. The traversing unit of the G/VLLD tripod can "drift" off azimuth as much as three mils an hour. If there is more than a five- to eight-mil difference, the traversing unit realigns to the original AVP azimuth—see *TM 9-2350-266-10 Fire Support Team Vehicle (FIST-V),* Page 2-286, Paragraph 16. Traversing unit drift is very common in older and heavily used equipment.

AVP for MELIOS. To correct any azimuth inaccuracy in the MELIOS, the observer uses the 12-step alignment method before stabilizing/sandbagging the tripod. When manually inputting the declination into the compass/vertical angle measurement (CVAM), he only adds or subtracts the difference necessary to bring the MELIOS on line with the grid azimuth to the AVP. Although the operator's using CVAM is more accurate than using an M2 compass, the CVAM (+/-20 mils) can be taken to further accuracy with the AVP (+/-12 mils).

FIST-V Turret Operations. The north-seeking gyro (NSG) integrated into the head of the FIST-V, which gives the G/VLLD orientation, is quite accurate. But changes in its accuracy occur each time it is updated and realigned. The observer can employ the AVP to provide an azimuth on which to reference the system after the NSG is realigned. Although there is no way to alter the azimuth in the turret system manually, discrepancies can be noted by the operator and applied to the grid conversion.

Determining accurate grid azimuths is a challenge for observers at the NTC. This is a perishable skill that has to be trained on a consistent basis in various conditions and at various ranges during home-station training. Successful units at the NTC have junior leaders and soldiers who can execute these TTP to standard in combat conditions. Incorporating the AVP in training will improve the accuracy of target location with all lasing systems at greater ranges and, ultimately, the accuracy of fires.

The fire support observer is responsible for one of the five requirements of accurate, predicted fire: target location. The effectiveness of fires massed by the artillery battalion on a target at a specific time and place depends on the observation team's locating the target accurately.



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Maneuver Commander's Guidance for Fire Support— What We Really Need

By Lieutenant Colonel William S. Rabena

Is it really fair to continue to tell our maneuver commanders that fires aren't right because the guidance they provide us is unsatisfactory? Granted, the maneuver commander is responsible for his fires. However, it's time for us to take a hard look in the mirror before pointing fingers at maneuver and ask ourselves, "What can we do to make it easier on the commander?"

The "broken record" guidance trend briefed throughout the Army may be true for some, but it should be put on "sabbatical leave" until we, as fire supporters, clean up our publications, field manuals and white papers. Our white paper "Fire Support Planning for Brigade and Below," dated 1998, is as close to getting it right as I have seen. It links essential fire support tasks (EFSTs) to proper Task terminology (of the EFST Task, Purpose, Method and Effects) and makes it easier for the commander to convey guidance to us.

However, for the most part, we have not been clear about what we need from the maneuver commander and have provided conflicting versions of what we need. The fire support community is making valiant efforts to fix the manuals discussed in this article, and some of the revisions look promising for fire support guidance, but our current arsenal of publications is unsatisfactory.

Publications on Commander's Guidance. The old *FM 71-123 Tactics and Techniques and Procedures [TTP] for Combined Arms Heavy Forces: Armored Brigade, Battalion Task Force, and Company Team* had nothing in it about guidance for fire support. Its replacement, the *FM 3-90 Tactics* followed suit. That's easy to fix. Once we determine the best method for conveying guidance to us, we can get the Combined Arms Command (CAC) at Fort Leavenworth, Kansas, and the branch schools to insert it in their manuals as part of the planning process. Our combined arms brothers will welcome the addition.

Next is the FM 6-20 series. *FM 6-20-40 TTP for Fire Support for Brigade Operations* is representative. The brief discussion on Page 2-3 puts more effort into addressing the guidance from the higher fire support cell than it does the construct of the maneuver commander's guidance. Hopefully, our maneuver commanders are not reading this page, or we might receive something patterned in the form listed on Page 2-3. It states, "As a minimum, this guidance should include the following: fire support asset allocation and status, commander's target attack guidance, and fires in the zone planned by higher headquarters." Surely we can do *better*.

The *FM 101-5 Staff Organization and Operations*, Appendix B-1 "Commander's Guidance Guidelines," provides a list of what fire supporters need that would burden a maneuver commander if he provided guidance on most of it. To a great extent, it makes a staff officer out of the commander. To its credit, the appendix begins with the disclaimer that none of the items are mandatory and commanders should tailor the list to their needs. The problem is that the most important item on the list, Item Six "Task and Purpose of Fires," is buried in the list with no special emphasis or suggestions as to how to convey it.

The old *FM 6-71 TTP For Fire Support for the Combined Arms Commander* (Pages 3-5 through 3-6) probably does the most to confuse maneuver commanders. FM 6-71 is not all bad and the next version, FM 3-09.31 of the same name, looks promising with not much further to go before it could be used as a stand-alone tool for maneuver commander's guidance.

With that said, the current FM 6-71's engagement criteria advice to the commander to tell fire supporters the "size and type of units he wants engaged at different points in the battle and priorities for target engagement" is sound. However, it misses the mark with attack criteria and the portion specifying how, when and where to attack. It lists "destroy, neutralize or suppress" as the attack criteria and then cautions that FA terms may not mean what the maneuver commander thinks the terms mean. Haven't we confused maneuver commanders enough with this tiring destroy-neutralize-suppress mind bender?

FM 6-71's replacement, while a marked improvement, still falls short of providing a user-friendly format for commander's guidance. The improvement is that it tells commanders to word their guidance for fires in a "Task and Purpose" format. It states, "Consider stating the task as an effect on the enemy formation [per *FM 6-20-10 TTP for the Targeting Process*, *FM 3-09 Doctrine for Fire Support* (final draft), *FM 3-100.40 Environmental Considerations in Military Operation* and *FM 3-13 Information Operations*] (a specific element or sub-element of the enemy) that provides the enemy a function."

The downfall of this section is twofold. First, it also provides a laundry list of other items that should go in the guidance, which clouds the guidance and becomes staff work. Second, but more important, is that rather than list the Task terms with user-friendly definitions, we refer our commanders to four other manuals.

Three of the four manuals lead our maneuver commanders down the ambiguous path of which terms are proper. Only FM 6-20-10 makes it abundantly clear that "disrupt, delay, limit, divert, and damage" (disrupt, delay and limit are usually the most appropriate) are the proper Task terms when addressing the effects on enemy formations' functions.

The manual goes on to tell commanders not to use or confuse "suppress, neutralize and destroy" with the proper terms when referring to enemy formations. "These terms are used as attack criteria to determine the degree of damage or duration of effects on a *specific target*." [Emphasis added.] In other words, the targeting team will determine which individual targets need to be destroyed, neutralized or suppressed in order to achieve the commander's guidance of disrupt, delay or limit for a enemy function.

In its discussion of EFSTs and commander's guidance, the white paper "Fire Support Planning for Brigade and Below," poses a better way of verbalizing Task terminology. It says the commander should use "disrupt, delay or limit" in the Task portion of the Task, Purpose, Method and Effects parts of the EFST. These Task terms, in conjunction with the commander's Purpose, lay the maneuver groundwork. The design for the commander's guidance has been in front of us all along—just not in writing other than in the white paper.

The Guidance Design. The Task and Purpose design of the guidance have some underlying assumptions.

First, the maneuver commander should not have to do staff work. He shouldn't have to tell the staff which delivery system to use. The staff should do this for him in the course-of-action (COA) development phase of the military decision-making process (MDMP). The Method portion of the EFST also details the delivery systems during this phase.

Of course, some commanders may want to direct their assets; this is their prerogative. But the point is that commanders shouldn't feel compelled to do it.

Next, we need to maximize the commander's guidance with maneuver terms. This means his guidance should be effects-based but defined in maneuver-based effects.

The commander does this in two ways. First, he uses Task terminology that is maneuver-based: "disrupt, delay or limit" to apply to an enemy formation's ability to perform its functions and, subsequently, to alter the enemy's COA. (See Figure 1.)

Second, he conveys a well-defined maneuver Purpose (wordy is Okay). The staff uses his Purpose to determine the Effects (end state). In other words, the more vivid the Purpose, the easier it is for the staff to determine "how many of what needs to be destroyed, neutralized, or suppressed" to meet the guidance. This then drives the Method of how fire support (lethal and nonlethal) fulfills the Task and Purpose.

The commander must not feel hamstrung by trying to word the maneuver Purpose to describe how the Effects contribute to the mission only in terms of friendly maneuver . He should convey the Purpose in terms that will be easiest to *see* during execution. Sometimes this is best conveyed in terms of friendly forces; other times it is best conveyed in terms of the enemy.

Limiting Purpose to one or the other often has left maneuver commanders tongue-tied for meaningful words. The result is the ever-popular yet meaningless "…to facilitate maneuver" Purpose.

A clear maneuver Purpose is invaluable. During execution of the battle, validating the Purpose was met is easier to do and a better measure of whether or not the EFST was accomplished than validating the Effects were achieved.

In summary, we need the commander's guidance format to be Task and Purpose. The Task terminology should be "disrupt, delay or limit." In the Task, we need to know the formations/functions the commander wants attacked and where the attack is to occur. The "where" helps the staff pick the right attack asset. In addition, we need a well-defined maneuver Purpose. And this is *all* we need in the commander's guidance.

During mission analysis, additional items (as tailored to a unit's standing operating procedures, or SOP) are the commander's approving the high-payoff target list (HPTL) and force protection priorities.

Examples of Maneuver Commander Guidance. The following are examples of the maneuver commander's guidance (Task and Purpose).

• *Commander's Guidance in the Defense in Terms of the Enemy.* The brigade commander realizes the enemy regimental forward detachment (RFD) is a lynchpin for the regiment. He knows that while the RFD is terrain-oriented, the regimental commander's Task and Purpose of having it establish a breach for the main body battalions warrants special attention. If the friendly maneuver commander can take away the RFD's ability to breach, the enemy will lose momentum and the regimental commander could be forced to employ a main body battalion to assume the breach mission, hope the enveloping detachment can breach or look for bypasses.

Part of the friendly maneuver commander's guidance could sound like this: "I want to disrupt the RFD west of the passes, in the passes and east of the

Disrupt: Preclude the efficient interaction of enemy combat or combat support systems. More important, it means to keep the enemy formation from performing a certain function: not let it do what it's supposed to do.

Delay: Alter the time of arrival of a specific enemy formation or capability. It focuses on keeping the enemy from doing some function when he wants/needs to.

Limit: Reduce an enemy's options or courses-of-actions. It normally focuses on keeping the enemy from doing some function *where* he wants to.

Figure 1: Tasks in Commander's Guidance. *FM 6-20-10 TTP for the Targeting Process* also includes "divert" and "damage," but "disrupt, delay or limit" are more appropriate.

passes in order to deny it the ability to establish a breach for the main body battalions in EA Bronco and to force the regimental commander to use his main body battalions to establish their own POP [point of penetration]."

This guidance does a lot for the staff. Priority intelligence requirements (PIRs) can be developed to ensure the brigade can attack the RFD early and throughout the battlespace until the RFD culminates. Analysis can be done to keep fires focused on the RFD rather than some other formation. The "where" (west of the passes, in the passes and in EA Bronco) probably points the staff in the direction of employing CAS early, rockets and cannons in the passes, and cannons in EA Bronco.

This maneuver Purpose tells enough for the Brigade S2 to determine how much of what needs to be destroyed to satisfy the commander's guidance (the EFST's Effects). In this example, the commander wants to ensure the RFD cannot breach for the main body battalions. The S2's estimates will drive which delivery systems to use and the number of volleys they will have to deliver.

A residual benefit of a well-defined maneuver Purpose is that, during execution, it is easier to *see* if it was achieved than to determine if the battle damage assessment (BDA) had the Effects the S2 estimated would achieve the commander's intent. The S2's estimate is just that: an estimate. If he is wrong and we achieve those incorrect Effects, we could begin transitioning to the next EFST before we should. If we use the commander's Purpose as the measure of success, then we won't transition to the next EFST until we see we have achieved that Purpose.

At this point, perhaps some maneuver readers are questioning why we even need to know Effects expressed in terms of systems/personnel affected. The reason is we still have to line up the right delivery system(s) and plan for the right number of volleys and range to achieve the desired Effects—which are calculated to accomplish the commander's Purpose.

In the majority of cases, the true measure of whether or not we have met the commander's guidance (and can end an EFST) will be if we accomplished the maneuver Purpose—not whether or not we achieved the Effects defined in terms of number of items destroyed. The commander on the ground is often the best judge of whether or not the enemy formation/function has culminated (Purpose in terms of enemy maneuver forces) or whether or not he is postured in accordance with the friendly maneuver Purpose (a Purpose in terms of friendly forces).

• *Commander's Guidance in the Offense in Terms of Friendly Forces.* In a movement-to-contact, the brigade commander recognizes that while the enemy forward security element is force-oriented, the enemy commander wants it to operate on advantageous terrain. An L-shaped ambush joined by the enemy's advanced guard main body (AGMB) on terrain the forward security element chooses would set the conditions for the regiment's success. The friendly maneuver commander recognizes that by delaying the forward security element with fires, his brigade could deny the regiment the key terrain and establish contact on its own terms.

His guidance would sound something like this: "I want to delay the forward security element 20 minutes west of TIR [Terrain Index Reference] 40 in order to allow the advanced guard company of our lead task force to reach the key terrain vicinity TIR 41 first."

The commander's guidance provides the staff everything it needs for this formation. In addition, because the maneuver Purpose is so well-defined, it will be clear during execution that once the advanced guard company of the lead task force reaches TIR 41 first, the staff can start implementing the maneuver commander's guidance for the next formation/function.

• *Commander's Guidance in the Defense Using the Task Term "Limit."* The two previous examples of commander's guidance used the Task terms "disrupt" and "delay." "Limit" is another powerful Task term that is often appropriate yet sometimes confuses staffs and leaders.

A commander who uses "limit" correctly knows exactly what he wants. He is not saying he wants to keep a certain formation from *ever* performing its Task and Purpose. To accomplish that can be resource-intensive. "Limit" translates into "I don't want this enemy formation to perform its Task and Purpose where he wants to." Better yet, "I don't want the enemy to do it where I don't want him to do it."

In the defense, here is an example of the commander's guidance using "limit." The friendly maneuver commander expects to see an airlifted light infantry company with AT-5s enter his battlespace with the task of fixing/defeating a mechanized or armor company. He does not want this light infantry to emplace the AT-5s on a particular piece of high ground that overlooks the EA where the brigade commander wants to defeat the main body battalions. He recognizes that while, ultimately, he does not want the light infantry to be able to perform its Task and Purpose anywhere, he absolutely cannot accept giving away the high ground. Doing so could result in the AT-5s targeting one of his companies in the battle position (BP) that defends EA Wrangler—a BP that defends along an anchor point in the brigade obstacle. With that company ineffective, the RFD could breach almost unopposed.

An example of the commander's guidance would be: "I want to limit effective light infantry AT-5 fires from the high ground vicinity A in order to keep the company in BP B intact to deny a breach and remain at 90 percent combat power."

The "where" portion of commander's guidance is somewhat taken care of with the term "limit," but the commander should emphasize that he expects the staff to develop a plan that attacks the enemy as soon as identified.

With this guidance, focused PIRs and a portion of the observer plan will be dedicated to finding the light infantry in the air. Sentinel radars could provide early warning for air defense artillery (ADA) to attack first. Targeted, templated landing zones could be assigned to a combat observation lasing team (COLT)/Striker or task force observers, and fires (direct and indirect) could be focused on limiting the light infantry's ability to get AT-5s into position. This could mean the brigade either destroys the AT-5s or forces the light infantry to occupy somewhere else that does not concern the commander— achieving the conditions under the term "limit."

• *Commander's Guidance in Counterfire in the Offense Using the Task Term "Limit."* "Limit" is also the most viable term to use when a commander wants to focus his counterfire fight. Most often, commander's guidance and EFSTs addressing the counterfire fight are worded incorrectly. They usually are conveyed as "…neutralizing the RAG [regimental artillery group]." Once again, we use attack guidance for a specific target instead of a correct Task term geared at affecting a formation's function.

Of course, the commander wants to win the counterfire fight and would be

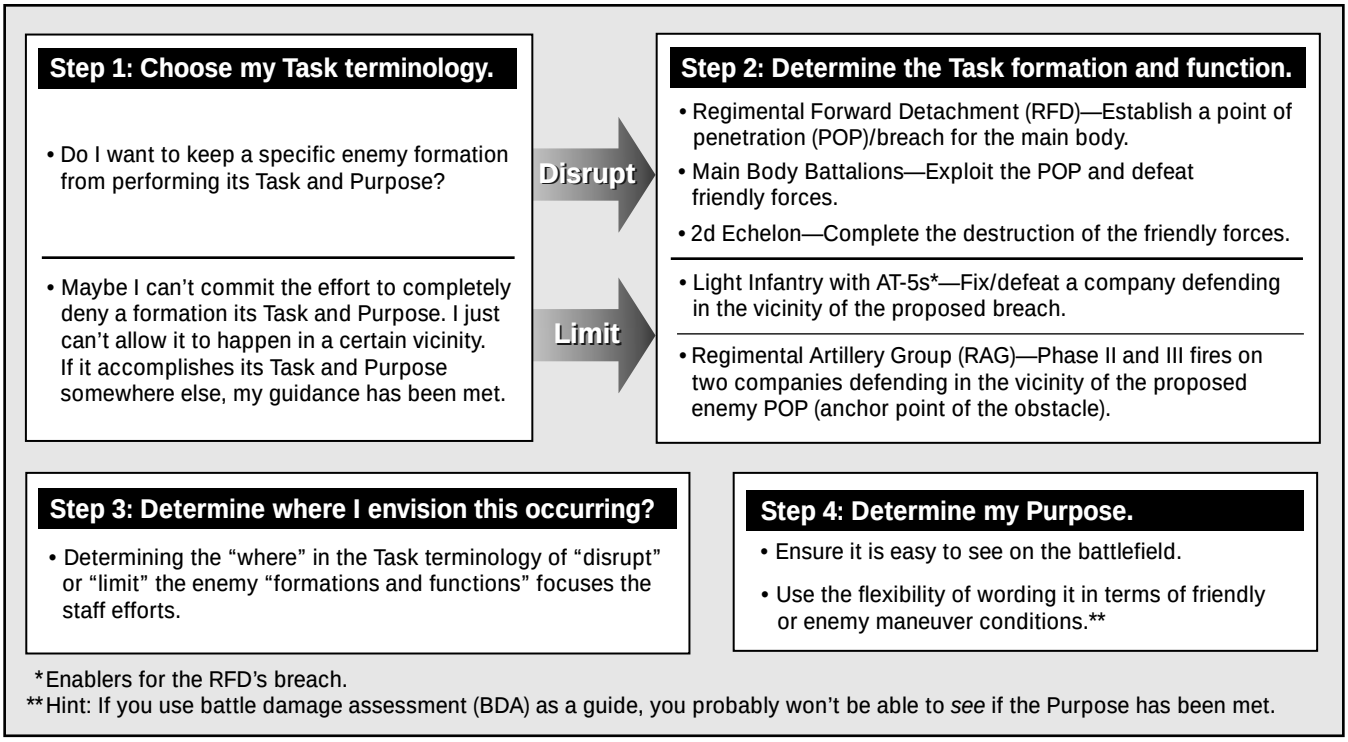

Figure 2: Example of Steps the Maneuver Commander Takes to Determine His Guidance (Disrupt or Limit in the Defense). This shows the process maneuver commanders go through to determine their Task and Purpose for fires (commander's guidance).

happy if it occurred before he crossed the line of departure in an attack. But short of an incredibly effective proactive counterfire effort, that probably won't occur. The commander expects us to wage and win the counterfire fight; telling us that is unnecessary. However, in his guidance, he can express where he will not accept losses to enemy indirect fire. "Limit" is the term to use.

In the attack, he could say: **"**Limit effective enemy artillery and mortar fire against the support force when it occupies SBF1 [support-by-fire position 1] and the breach force in order to sustain the momentum at the breach site and keep the support force at 90 percent when the assault force passes through the lanes."

In this example, the commander expects enemy artillery fire in many places before his force defeats it but wants it stopped immediately on his breach force and support force. Notice that the crucial difference between "limit" and "disrupt" is that in the "limit" examples, we only take away the enemy's ability to perform its Task and Purpose at a specific location or event of the maneuver commander's choosing. "Disrupt" denies a particular formation the ability to achieve its Task and Purpose and may mean culminating the formation at all costs. Sometimes "disrupt" is necessary.

The commander who can visualize the difference and uses the two properly will be the commander who will better focus his fires. (See Figure 2.)

The Fixes. We need to establish one method for the maneuver commander to convey his guidance in our publications. The format of Task with a well-defined maneuver Purpose should be in-grained in our maneuver commanders as the proper method to use.

Concurrently, fire supporters should talk their commanders through maneuver-based Task terminology, as outlined in the FM 6-20-10 and the white paper. Using these terms is more powerful—they have a universal meaning. Maneuver commanders should feel more comfortable wielding them.

Third, as fire supporters, we should use the commander's Task and Purpose as the EFST's Task and Purpose. What I have done is work the white paper's method of developing EFST backwards to link it to the part it scantily addresses: the commander's guidance.

Fourth, the brigade S2 should add translating the maneuver commander's Purpose into Effects as a step in the early stage of COA development. He determines the number and types of systems within that formation/function that need to be "destroyed, neutralized or suppressed." After all, brigade S2s are the experts we rely on during wargaming in the action/reaction/counteraction drill to assess casualties after an event (usually with the brigade executive officer). When the S2s add the step, the system will work and commanders' guidance will be more meaningful and congruent across all brigades—getting maneuver commanders out of the business of guessing what fire supporters need.

Let's allow maneuver commanders to give guidance in maneuver terms and staffs to do their jobs and put the mystery of commanders' guidance for fires to rest.

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