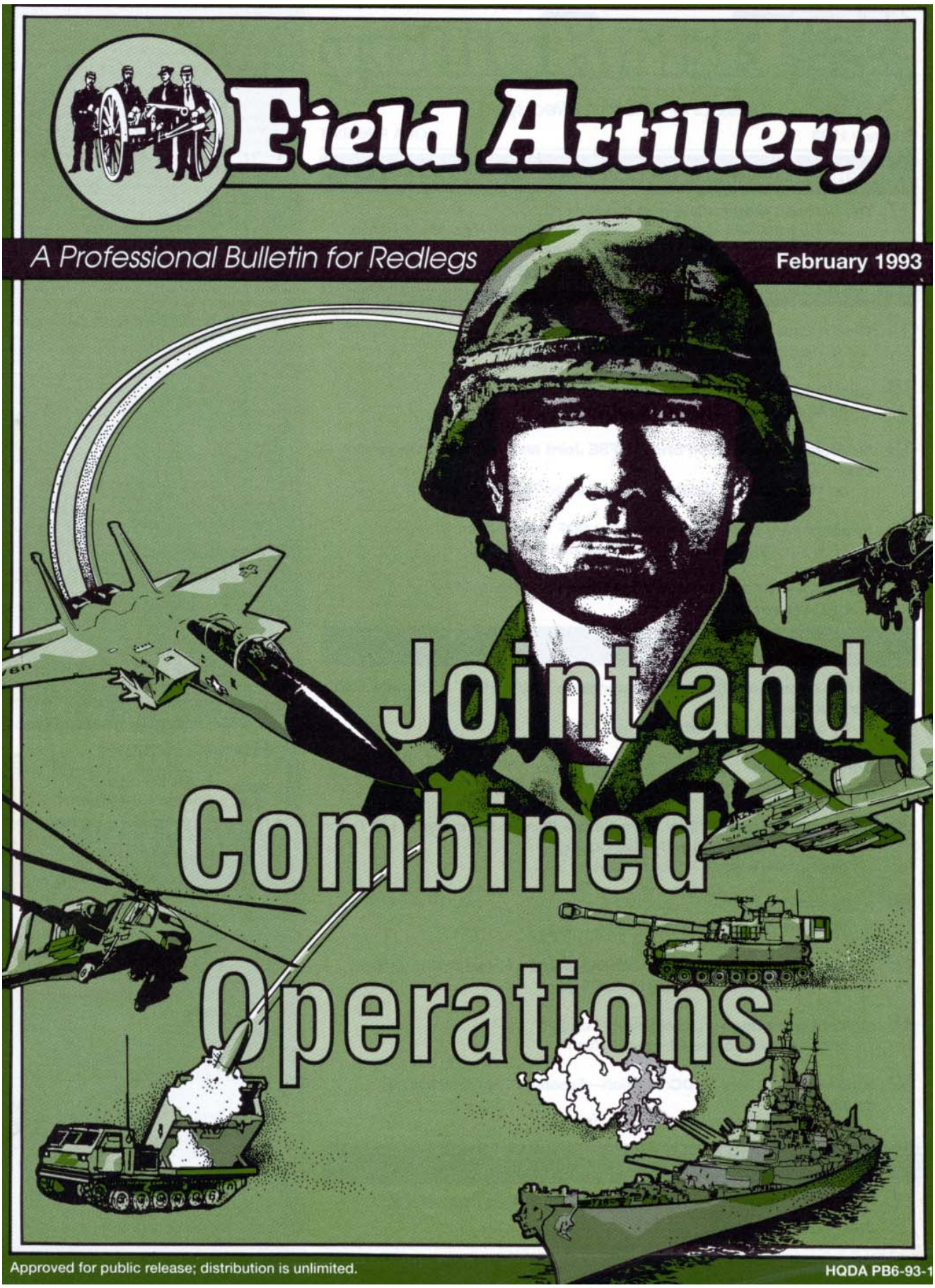
Field Artillery
A Professional Bulletin for Redlegs
February 1993
Joint and Combined Operations
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INTERVIEW

FEATURE ARTICLES: Joint and Combined Operations

ARTICLES

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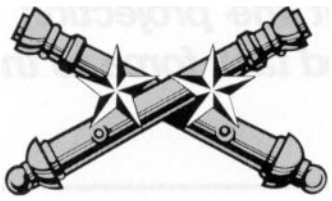
Synchronizing Fires in Joint and Combined Operations



"The coordinated fires we provide will afford the JTF commander the leverage to to achieve his unchanging imperatives of accomplishing the mission and protecting the force."

From World War II to the present, all major combat operations undertaken by US forces included multi-service or multinational representation. The end of the Cold War pushed us across a threshold to a new era. Gone are the days of general defense plans (GDPs)—pre-drawn orders to fight back the anticipated hordes. We now must concentrate on contingency operations, potentially, at any one of 150 hot spots throughout the world.

These efforts will continue inherently to call for joint operations. Additionally, many may call for US forces to participate as a combined force with our traditional allies or as part of a coalition of nonaligned nations.

One need only reflect on very recent events in Somalia, Southwest Asia and Panama to grasp quickly the diversity of missions our armed forces can expect to perform. The common denominator in each of these operations is the projection of power by a US joint task force (JTF).

As fire supporters, we must remain focused on fighting with fires. The coordinated fires we provide will afford the JTF commander the leverage to achieve his unchanging imperatives of accomplishing the mission and protecting the force. The weight of our fires must provide him the edge to win decisively with minimal casualties—no matter where we deploy.

The doctrine applied to providing joint indirect fires has evolved and changed considerably since early attempts to coordinate firepower in the sands of North Africa and on the beaches of Normandy. Up until the 1970s, combat operations were viewed as two separate fights. Ground forces were to fight the close battle and air power attack the enemy deep. Traditional wars of attrition against the communist-block "hordes" were the expected norm. The limited range of ground force weapons and "eyeball" acquisition capabilities kept ground operations relatively static.

The development of AirLand Battle doctrine more closely integrated the two fights into one. Air operations were planned to meter the flow of enemy echelons, and ground operations assumed a more audacious approach to defeating the enemy. This approach highlights a regaining ascendancy of maneuver warfare: close air support (CAS) and massed fires combined with bold maneuver thrusts and attack helicopter operations to smash the enemy throughout his depth. However, ground forces still lacked the systems to fully see and attack the enemy to his full depth.

Today, technology moves us toward one extended battlefield where shared and integrated systems from all services give us the ability to acquire and strike the enemy throughout the battlefield. Enhanced ground acquisition systems combined with aerial and space-borne platforms allow the JTF commander to detect the enemy across his entire area of operations. Once detected, complementary systems—ranging from howitzers to Tomahawk cruise missiles—can be selected to destroy the designated target. The extended range of new systems combined with precision munitions provide the commander even greater coverage and an increased assurance of target destruction.

With some certainty, we know that all forthcoming operations will include a joint, combined or coalition force. To achieve our goal of one extended battlefield, we must develop doctrine that facilitates sharing targeting information and executing fires from all accessible means. The key is *synchronization*.

Joint Fires

The synchronized use of all joint fires in complementary ways will contribute dramatically to decisive victory. As fire supporters, we must assume a primary role in coordinating all systems to allow the JTF commander to fight using all available fires.

We face many challenges in creating a new joint doctrine for one extended battlefield. A combined effort currently underway by all the services will help more clearly define the roles and missions of each element in a JTF. Efforts by the Joint Army-Navy Board last November at Fort Leavenworth, Kansas, and organizations like the Air-Land-Sea Application Agency (ALSA) at Langley AFB, Virginia, work to produce answers to these tough issues. The Field Artillery School here at Fort Sill, Oklahoma, provides significant input to this undertaking. The Joint Staff soon will publish new versions of *Joint Pub 3-0 Operations* and *Joint Pub 3-09 Doctrine for Joint Fire Support*. These documents will guide our efforts to harmonize the application of firepower on future joint battlefields.

The linchpin to fighting with fires in joint operations remains synchronization. A common joint targeting doctrine is essential, so all available means and systems can provide the JTF commander maximum combat power. We now have the systems to see and destroy the enemy anywhere on the battlefield, but the services don't share a common decide-detect-deliver methodology for using these systems.

The joint warfighting staff also needs a focal point for planning and executing

fires to support targeting. Currently, no provision exists for such a position or agency. A joint force fires coordinator (JFFC) would greatly assist the commander in synchronizing the fires of all components. The inclusion of a fire coordination element (FCE), modeled after current fire support elements (FSEs), would provide representation from air, ground and naval components. This agency would greatly streamline the flow of information and hasten the coordination process. The commander would receive a more focused effort, faster deconfliction of targets and shorter sensor-to-shooter time lines.

Combined and Coalition Fires

Beyond the synchronization of fires within our own JTF lies the challenges of coordinating fire support with our combined and coalition partners. This process is somewhat simplified with our current treaty partners. Documents like the NATO Standardization Agreements (STANAGs) and the American, British, Canadian and Australian (ABCA) agreements already bring us to a common ground. Longstanding relationships and exercises have improved our interoperability with these partners.

We also must actively prepare for operations with non-treaty nations. Peacekeeping operations and crises in many regions of the world may find us partners with armed forces possessing a vastly different mode of operation—Southwest Asia proved this point. The barriers of language and interoperability bear implications down to the firing-unit level. We must plan ahead and make provision for increased ad hoc liaison officers and work now to gain a better understanding of our potential coalition partners.

Training to Fight with *All* Fires

To build and sustain our proficiency in joint and combined operations we must train like we will fight—as a team. The best opportunities for this training are exercises like Ocean Venture, return of forces to Germany (REFORGER), Team Spirit and Bright Star. Contingency operations now are the norm as the base scenario for these exercises; the upcoming REFORGER in Italy is a prime example. The interaction by warfighting staffs and units during these exercises is our best chance to gain proficiency in dealing with our sister services and coalition nations.

"The location of our next contingency operation is uncertain, but the projection of force by a joint or combined task force to that location is certain."

The Louisiana Maneuvers present another opportunity to gain joint and combined training. This program, directed by the Chief of Staff of the Army and under development by the US Army Training and Doctrine Command (TRADOC), will take joint exercises to a new level of sophistication. These exercises refine and test our warfighting procedures by incorporating computer simulations at several remote sites. Staffs and units from all services combine to play out contingency scenarios, beginning with mission orders and deployment and moving through conflict and redeployment. The lessons learned from these exercises increase our warfighting skills while putting our doctrinal concepts to the test.

The Combat Training Centers (CTCs) also provide an excellent opportunity for joint and combined training. The Joint Readiness Training Center (JRTC) at Fort Chaffee, Arkansas, exposes units to the entire gambit of joint fire support issues. Last year's inclusion of naval gunfire observer/controllers from the US Marine Corps added another key opportunity for training.

The Combat Maneuver Training Center (CMTC) at Hohenfels, Germany, has begun including other NATO forces in its rotations. The lessons learned by these combined operations have proved invaluable toward helping the participants develop a greater understanding of how each army operates.

Training also is the key to leader development in joint and combined operations. To effectively provide fires for these operations, we must create leaders who understand the capabilities, limitations and operating systems of other services.

Joint schools provide an excellent opportunity to gain this knowledge and experience. The Air Force's Air Ground Operations School (AGOS) Staff Course at Hurlburt Field, Florida; the Marine Corps' Naval Gunfire School at Coronado, California; and the Joint Targeting Course taught at Fort Sill give leaders of all services a better understanding of how each component contributes to joint fighting with fires.

Interaction with other services also helps build a more in-depth understanding of their individual modes of operation. Opportunities for joint experience may take several forms. Assignment to a joint command headquarters stands out as one obvious method, but we must become creative in developing our strategies for obtaining joint experience. Leader exchanges and detailing observers to another services' headquarters during exercises both are excellent opportunities for interservice leader development. This exchange helps both groups learn about and appreciate procedures, conditions and standards of their partner services.

This mutual education expands easily to other nations. Partnership exchanges with NATO countries have a long tradition.

We must now expand these exchanges to our potential coalition partners. The lessons of interoperability learned now may prove invaluable in a future conflict or peacekeeping operation.

Our ever-changing world will continue to present challenges to our national interests and security. The location of our next contingency operation is uncertain, but the projection of force by a joint or combined task force to that location is certain. The joint doctrine under development will work to ensure a unified effort in our operations.

Fighting with fires demands training to improve our knowledge and skills necessary for providing the JTF commander the maximum capability to attain decisive victory. For, in conjunction with our warfighting partners, the fires we coordinate and provide will prove the edge for decisive victory. ***Field Artillery—On Time, On Target!***

INCOMING

LETTERS TO THE EDITOR

Artillery in Reserve

The United States Army Field Artillery School (USAFAS) white paper "Artillery in Reserve" [April 20, 1992, written by Warfighter Division, Fire Support and Combined Arms Operations Department] reflects what has, by necessity, evolved in the field. The concept should be part of our doctrine.

In the 3d Infantry Division (Mechanized) Artillery in Germany, we fully support the doctrinal analysis postulating that there may be times when the maneuver commander must allow the artillery to remain with a unit in reserve. The current absence of cannon battalions in the V Corps Artillery structure will frequently place us in the dilemma of deciding whether to support the current fight or the future fight with the artillery available.

The statement in the white paper, "The factors of METT-T [mission, enemy, terrain, troops and time available] will dictate what the maneuver commander and FSCOORD [fire support coordinator] are able to do with the artillery," is a statement of the obvious. But it seems to be a concept that we routinely *do not* apply when we are deciding Field Artillery organization for combat.

In the Marne Division, we believe we have overcome the dogmatic idea of never placing artillery with a reserve unit. We do allow the reserve brigade's artillery battalion to occasionally retain its DS [direct support] mission.

The importance of METT-T and the risk considerations stated in the white paper are right on the mark. We would, however, add one more consideration—the potential missions assigned to the reserve. The "be prepared" or "on order" missions of the reserve may dictate that the unit and, more importantly, the FSCOORD (DS battalion commander) be readily available to the reserve brigade. We mention the presence of the FSCOORD because he is a key player in the decision-making process and one upon whom the brigade commander will rely.

We must, as our maneuver counterparts do, consider the factors of METT-T in task organizing the artillery. METT-T may dictate that the reserve unit retain its artillery.

COL Alan A. Fox, FA
Cdr, 3d IN Div (Mech) Arty, Germany

Response to "The Battle of Antietam: the Creation of Artillery Hell"

Major Albert A. Mrozek's article, "The Battle of Antietam: The Creation of Artillery Hell" [August 1992] suffers from both a flawed conclusion and incomplete research. He states that the artillery of the Army of Northern Virginia "was able to accomplish the close support mission better than the Union artillery during the Battle of Antietam and outperformed a superior force." While the first statement may be arguable, the second is not.

The author leads one to believe that the Confederate artillery survived the Army of the Potomac's counterbattery fire intact. While it was not totally destroyed, by the time Richardson's division (II Corps) had overrun the Bloody Lane, it "had been overwhelmed by the mass of expertly handled Federal guns" (*The West Point Atlas of American Wars*, edited by Brigadier General Vincent J. Esposito). Further research (Freeman, *Lee's Lieutenants, Volume II*; Bridges, *Lee's Maverick General, Daniel Harvey Hill*; Murphy, *The Gleam of Bayonets*; as well as official records) supports the narrative in the *West Point Atlas.*

The Confederate artillery did ably support its infantry. However, the Federal artillery clearly outshot and outfought its opponents. Whole Confederate artillery battalions were pulled out of line to refit after being literally shot to pieces. S.D. Lee's battalion is a good example. The author contends that Lee's battalion displaced continuously to engage Federal infantry—not true; it kept moving to keep from being destroyed by Federal counterbattery fire. S.D. Lee complained at one point that his "line [was] enfiladed by about 20 rifle guns" (this was the reason Longstreet's staff had to man two guns during the action).

The Confederate artillery was in continuous close support as the battle progressed because there were not enough surviving infantry to man Lee's defensive positions. The uncoordinated, piecemeal Federal attacks shattered Lee's infantry to the point that he had to fill gaping holes in his line with any available artillery just to maintain a semblance of a solid front.

Veteran infantry units such as Jackson's "Stonewall Brigade" and Hood's Texans virtually ceased to exist because of the violence and prolonged nature of the Federal infantry assaults and their supporting artillery fires. Jackson complained that the Federal artillery continuously delivered "a severe and damaging fire" on his infantry and supporting artillery; Hood stated his division was "dead on the field."

The author further states that "the single event that best contrasts the strength of the Confederate artillery and the weakness of the Union artillery in providing close support occurred at the Sunken Road." He says the Federal infantry that had taken the Sunken Road could not advance farther because of massed Confederate artillery fire.

In fact, the Federals could not continue their advance because McClellan failed to reinforce Richardson and French with the Army's reserve to exploit the breach. Both Catton (*Mr. Lincoln's Army*) and Naisawald (*Grape and Canister*) state the line of guns facing the two Federal divisions were remnants of batteries and battalions overwhelmed by Federal artillery.

D. H. Hill, the Confederate general who commanded there, stated "all the ground in my front was completely commanded by the long-range artillery of the Yankees on the other side of the Antietam, which concentrated their fire upon every gun that opened and soon disabled or silenced it." If more Union infantry had been committed, the Confederate artillery holding that position would undoubtedly have been overwhelmed.

The author neglects the fact that both French's and Richardson's divisions had largely been used up and could not continue the attack. They needed infantry reinforcements; even if more artillery had been at this point on the battlefield, those two divisions couldn't have gone forward. Longstreet stated that "ten-thousand fresh Federals could have come through and taken Lee's Army and all it possessed."

The decisive element on the battlefield that saved Lee was McClellan's hesitation to commit Porter's V Corps to reinforce the success in the center. Suffering from the mistaken belief he was outnumbered, coupled with his natural hesitation and failure to either issue intelligible orders or attempt to control the battle, McClellan would not commit his reserve at the decisive time and place. Consequently, he settled for a tactical draw and a limited strategic victory instead of achieving a decisive victory and the destruction of the Army of Northern Virginia.

The Federal artillery dominated the battlefield (McLaws, one of Longstreet's subordinates, stated the Federal artillery "was so far superior" he would not let his guns engage in counterbattery fire) and the hard-won gains by the Federal infantry on the right and in the center gave McClellan the opportunity of a lifetime. Instead, his timidity and non-interference in the battle allowed Lee's army to escape and prolonged the war. This, and not Lee's artillery, was the major factor on the battlefield.

Naisawald comments at the end of his chapter on Antietam that "the blue gunners had things on the battlefield virtually their own way despite the gallant efforts by the Confederates in counterbattery fire." Additionally, he mentions that Jackson cautioned Lee against counterattacking retreating Federal infantry because of "the threat posed by the magnificent artillery of the Army of the Potomac." In fact, the excellent artillery support given the Federal infantry broke up all Confederate counterattacks.

Further reading of Naisawald leads to the assumption that the Federal batteries performed an adequate job of close support with their artillery, despite their deficiencies in artillery organization. They repeatedly defeated superior numbers of Confederate guns with one or two batteries in close support and, sometimes, only a section fighting off a Confederate battery.

Naisawald's comment on the perceived lack of support for Richardson at the Sunken Road ("the nadir in the history of the American artillery") is out of place with the facts Mrozek presents. In *Mr. Lincoln's Army,* Catton states that the Southern artillery at this point of the battle in this sector was a shambles ("batteries had been hammered all to pieces"). These facts disprove the author's theory on the effectiveness of the Southern artillery in the close support role. Catton also maintains that it was the failure to commit the infantry reserve (Porter) that allowed the Confederate center to hold. All Confederate counterattacks had been defeated as Jackson had predicted.

When writing an article of this magnitude and using a limited number of sources (all of which appear to be secondary—no primary sources are in the footnotes), the author supported his conclusion, but he left himself open to severe criticism. This methodology negates the otherwise superb effort; the author should have consulted some primary sources. The conclusion he may have reached could have shown that despite deficiencies in organization and command and control, the Federal artillery at Antietam accomplished its mission. What has been presented is purely revisionist history, not fact.

Capt. Kevin F. Kiley, USMC
Jacksonville, NC

The Myth of the Well-Rounded Artilleryman

In these days of the drawdown and reductions-in-force (RIFs), many early and mid-career artillery officers are taking a long, hard look at their personnel files to determine if their records will stack up and carry them through—ultimately to battalion command. Many things in an officer record brief (ORB) are given critical review by selection boards, to include types of assignments.

The 16 March 1992 issue of *Army Times* featured a hard look at how those officers who have served in training units are given less credit for their performance than those who have held positions of otherwise equal authority and responsibility in tactical units. Through no fault of their own, these officers are penalized for not having been fortunate enough to receive orders for a tactical unit. As the rationale for this unfairness goes, training unit command and staff positions just aren't as tactically and technically demanding as their tactical counterparts. These officers receive further prejudice in that they have been away from their branches, losing valuable years toward branch proficiency. They simply aren't "well-rounded."

In the FA Community, we have our own branch-peculiar problem of inequity and well-roundedness. Most readers will agree that some Field Artillery systems just aren't considered "real" artillery by the "mainstream" of the FA Community. Artillerymen who found themselves serving in nuclear warhead detachments, Pershing or Lance missile battalions, target acquisition batteries (TAB) or multiple-launch rocket system (MLRS) units also found themselves out of the mainstream of artillery—cannon and fire support. These non-cannon systems and jobs are the subject of much derision among "real" artillerymen. This same elitist viewpoint even has been found in many 155-mm direct support (DS) artillerymen's opinions of 8-inch general support (GS) gunners. Basically, too many think that if it ain't 155-mm DS, it ain't real artillery.

More than one reader will testify to the experience of reporting to his new cannon battalion commander and hearing, "I see you were a Lance (or Pershing, etc.) firing platoon leader. I'm sorry, but you probably won't command a firing battery in my battalion." Why? Is a cannon firing battery command so technically and tactically difficult to manage that this Redleg won't even be given a chance? Are cannon operations more difficult to learn and understand? I think not. Compare the minimum armed services vocational aptitude battery (ASVAB) test scores required to qualify for 13B (Cannoneer) versus 13E (Pershing), 13N (Lance), 13P (Lance/MLRS Fire Direction) or 13M (MLRS). Cannon systems aren't inherently more difficult to understand; in fact, it's the easiest artillery MOS to qualify for.

MLRS, for instance, is a more technically advanced and difficult system to gain proficiency in. Arguably, an MLRS firing platoon leader shoulders greater tactical responsibilities than his cannon counterpart. He must plan and execute all the tactical and logistical operations of his platoon while separated by 10 kilometers or more from his battery headquarters and commander. He's on his own for the most part, reliant on his personal experience and initiative in planning and executing

The FA azimuth points to a larger percentage of MLRS in the force—mainstream artillery.

Cannon systems aren't inherently more difficult to operate; 13B is the easiest of the FA MOSs to qualify for.

the semi-independent, decentralized operations required for MLRS. This (usually) second lieutenant leads a 25-man platoon that moves and fires on its own, resupplies itself as necessary from battery or higher and has the same firepower as a 155-mm battalion firing 10 volleys (263 155-mm rounds). This lieutenant's responsibilities more closely resemble those of the traditional cannon battery commander than a cannon battery fire direction officer (FDO), executive officer (XO) or platoon leader.

Likewise, the MLRS battery commander's responsibilities for command and control of a tactically and logistically self-contained battery over 20 to 30 kilometers of division or corps frontage more closely parallel the tactical operations of a cannon battalion. However, one rarely finds MLRS battalion commanders saying, "Oh, you've never been out of cannon artillery? Welcome to MLRS—we don't pull lanyards here. This is 20th century Field Artillery—we push buttons. You're out on your own in this weapon system, Captain. There's no headquarters and headquarters or service battery to support you here—it's all on you. You arrange for your own ammunition; petroleum, oil and lubricants (POL); Class I; maintenance; etc. No apron strings, understand? There's no battalion staff here to arrange everything for you while you lay your guns. Here you have to do both. Well, your limited experience shows me that you just don't have what it takes to be a firing battery commander in this decentralized, highly technical weapon system. Maybe in a year or two...."

One would think that an MLRS battalion commander would be more concerned than his cannon counterpart about his subordinate leaders' abilities and expertise. But they tend not to be. Since most MLRS battalion commanders began in another system (probably cannon), they tend to recognize that all artillerymen, be they Lance, Pershing, TAB or cannon, deserve the chance to acquire and demonstrate proficiency before being judged.

This cannon attitude or mentality that relegates other FA systems to lesser status is too prevalent in the FA Community. It's almost reminiscent of the 1920s and 30s debate between real (horse) cavalry and armor.

This is also apparent in the oft-used phrase well-rounded. Officers who served as lieutenants or captains in Lance, Pershing or MLRS are too often advised by their mentors to get cannon experience to make them well-rounded. (Not surprisingly, the mentor is the battalion commander whose own experience is, nine times out of 10, primarily cannon.) On the other hand, too few cannon battalion commanders will advise their charges to round-out their FA experience by getting some MLRS experience.

A personal acquaintance served his lieutenancy in a fire support team (FIST) and 155-mm DS cannon positions, and again served in a 155-mm DS battalion in Southwest Asia. On leaving the latter unit, he had decided to try for assignment to an MLRS battalion for his command tour instead of another DS 155-mm outfit, against the advice of his battalion commander, field grades and peers. One statement he vividly remembers is, "Stay cannon. No high-speed guys go MLRS." Oh really? Some MLRS folks I know would be surprised to discover that they're second-stringers!

The unfortunate outcome of this stereotyping and prejudicial attitude is that too few artillerymen with previous MLRS experience return to MLRS units where their expertise is needed. They heed the advice of the cannoneers to get out of MLRS and get well-rounded. Unlike cannon units where a wealth of institutional knowledge and system proficiency is common, MLRS units struggle with a lack of such wealth. A unit can't reach its full potential when the battalion commander, XO, S3, battery commanders, battalion staff officers and lieutenants are all new to the system. The few officers who choose to guide their assignments back to MLRS are often warned of the career self-destructiveness of such a non-rounded career path. Do artillerymen with pure cannon backgrounds receive such warnings? Is their one-system career path self-destructive too? Of course not. They're in the mainstream; they don't need rounding.

But things are changing. Lance, Pershing and warhead detachments are gone. Cannon slots are diminishing too, as 8-inch and 155-mm battalions, both DS and GS, fold their flags or convert to MLRS. MLRS, on the other hand, is expanding (at least for now). The Field Artillery azimuth points to a larger percentage of MLRS in the future force mix [objective of 35 percent by 2007]. The remaining percent of the force will be shared by cannon, fire support and TAB units. With the increasing emphasis on MLRS, it will clearly be mainstream—perhaps a bitter pill for some cannoneers to swallow.

MLRS's overwhelmingly successful combat debut in Southwest Asia has made many confirmed believers in the maneuver arms community. Maneuver folks are raving about the system that puts a blanket of steel on target. As a result, 2d Battalion, 32d FA (MLRS) [41st FA Brigade]

has made MLRS's first successful debut at the Combat Maneuver Training Center (CMTC) at Hohenfels Training Area, Germany. Firing in support of the 3d Infantry Division's cavalry squadron, as well as two other task forces, 2-32 FA was the first GS unit to fully participate in the battle. CMTC is a place where neither MLRS launchers nor 8-inch guns have previously trod.

Face it fellow Redlegs, MLRS, non-cannon artillery, has earned its place in the mainstream. Let's put away the unfair and inaccurate discriminators of "mainstream" and "well-rounded." MLRS has earned the respect and support of the maneuver arms; now how about the same from our fellow artillerymen?

CPT Robert P. Smith, Jr., FA V Corps Artillery, Germany

Accurate Predicted Fire

Meeting the five requirements for accurate predicted fires at the NTC [National Training Center, Fort Irwin, California] is a major challenge. It demands careful planning, tough training before deployment and precise execution. It also takes time—which sometimes keeps us out of battles. Our goal of first-round fire-for-effect and the requirement for safe fires drive us to demand satisfaction of all of the requirements for accurate predicted fire to avoid NTC check-rounds. I think this process has gone to the extreme and inadvertently has reduced our value in maneuver commanders' eyes.

1. The first requirement for accurate predicted fires is accurate *target location*. There's no denying that the observer must know where the target is and correctly transmit that to the firing unit. However, we often seem to focus on a point. Field Artillery really is an area-fire weapon system. We shoot at big things, like enemy battalions. Area targets are not points. We must not become so engrossed in selecting an aim point that we forget we're shooting at a large mass most of the time.

2. Accurate *firing unit location* is necessary to determine the range and direction to the target. Many tools are at our disposal, including the position and azimuth determining system (PADS), global positioning systems (GPS), conventional survey, hasty survey, simultaneous observation and aiming circles.

Due to our automation capability, we usually demand individual weapon locations rather than the battery center of a few years ago. Without a doubt, we must demand the best data available to minimize the sheaf impact versus aim-point error. But again, I say, consider the target. Does a 100- or even 200-meter firing unit location error really matter? If we're shooting at a large target, our historical use, I don't think even a 200-meter error matters. As long as the direction error doesn't cause a similar *sheaf* center-of-impact error, it also is usually immaterial.

3. Another requirement is for *accurate weapon and ammunition information*. With the advent of the M-90 velocimeter and expected future implements, obtaining muzzle velocities for each projectile and powder lot is much easier than a few years ago. Correcting for these non-standard conditions is a smart idea but, again, should not preclude firing if we're talking about a 200-meter or less sheaf to aim-point error.

4. Good *meteorological (met) data* is essential, just as good muzzle velocities are. Actual weather conditions will determine whether or not the error introduced by non-standard conditions is significant.

5. There's no argument against the requirement for *accurate computational procedures*. Fire direction centers must accurately compute firing data, or we'll never hit the target.

The Real Thing

Though uncomfortable for several years, I had no empirical data as a basis for my concern for timely, *sufficiently* accurate fires until I was a battalion S3 in Operation Desert Storm. Mobile armored, offensive warfare convinced me of the need for rapid fires and of the level of data accuracy actually required. My battalion's first mission after crossing the Iraqi border was to fire on a command and control complex (M109A2 howitzers in direct support). We fired it the morning of 25 February after moving for 15 hours and approximately 100 kilometers. We used GPS (100-meter accuracy) for grid location of battery center and aiming circles declinated before crossing the border for direction. Our ammunition was rocket-assisted projectiles (RAP). Range-to-target was 23,200 meters. Our battalion, two rounds with no met data, fire-for-effect (no adjustment) destroyed the target.

This mission was typical of our combat experience. When time permitted, we fired better data, but GPS and aiming circles worked. Our fastest emplacement and first-round down-range time was four minutes. Our standard for a battery to be in position and *firing* was 10 minutes. After the war, we found out several of our first-round fire-for-effect missions were danger close—one observer (a scout platoon leader) neglected to tell us at the time.

Train as You'll Fight

We must not become so technically focused that we forget our mission is to provide fires when tankers and infantrymen call for them. The requirement to provide the *most* accurate, predicted fires has subverted our ability to provide fires *sufficiently* accurate when requested. Ready-to-fire times of 20 to 90 minutes are unacceptable.

Some will call this a safety issue, but I don't believe it is. These accuracy differentials usually don't threaten friendly troops. They don't cause 100- or 1,000-mil deflection errors or charge errors or any other gross error that risks fratricide. The only time they apply to safety is when firing danger-close in the vicinity of moving formations. In that situation, speed could reduce any safety buffer to an unacceptable level.

The Field Artillery Community must focus on the mission at hand. Our training programs and centers must support what we'll do in war. Commanders must have the option to use their judgement to weigh the need for speed versus accuracy and shoot the data that best fits the situation as long as *safety* isn't the issue. An evaluator should provide feedback on the wisdom of that decision based on his assessment of the importance of speed versus accuracy and whether or not the rounds actually hit the target (usually not a point).

When it's real, we'll shoot the best data we have and worry about perfection later.

LTC John M. House, FA
XO, 24th IN Div (Mech) Arty
Fort Stewart, GA

General Robert W. RisCassi, Commander-in-Chief of the United Nations Command (CINCUNC), CINC of the Combined Forces Command (CINCCFC) and Commander of US Forces Korea (COMUSFK)

The Korean Theater—One-of-a-Kind

Interview by Patrecia Slayden Hollis, Managing Editor

What is the threat the Combined Forces Command (CFC) faces in Korea?

A considerable one. North Korea now has the fourth largest military in the world with more than 65 percent of its active forces in attack positions within 100 kilometers of the DMZ [demilitarized zone]. They're arrayed in four combined arms frontal corps, two artillery corps, two heavy tactical exploitation corps and three heavy operational corps (Figure 1 on Page 8).

Were North Korea to attack, it could do so with great speed in the hopes of achieving and exploiting strategic and operational surprise. It would be a firepower-intensive assault with the north employing its large artillery forces to attempt to pulverize the south's defense, its frontal corps to develop a breach and, then, its exploitation forces to exploit the penetration.

There are seven traditional north-south attack corridors that canalize attacking forces. These confine attacking columns to relatively constricted corridors of advance. They make the north's challenge of synchronizing an attack all the more difficult and its forces seriously vulnerable to interdiction. For its artillery, the fact that the terrain is more than 70 percent mountainous makes targeting and fires more difficult and complex.

Success against such an attack would depend on our skillfully using the terrain, exploiting the coalition's advanced systems, employing the CFC's superior air and naval forces and rapidly augmenting with ROK [Republic of Korea] reserves and US forces from out of theater.

Please describe the CFC's joint and combined organization and how it operates. What aspects of the CFC are unique?

First, it's important to understand the CFC is the largest standing military coalition in which the US participates. Unlike NATO, most of the South Korean active military forces are OPCON to [under the operational control of] the coalition commander...the CFC commander. That's

because the North Koreans have the advantage of a larger force they can mass vertically in multiple corridors against South Korea, and therefore, the CFC must have a defensive alliance capable of concentrating all available combat power, regardless of nationality.

CFC is bilateral from top to bottom (Figure 2 on Page 9). At the theater level, staffs are joint and combined. Tactical joint forces are task organized functionally to receive command and control from a unified command. There are no US or ROK sectors—only a combined battlefield. When the command is task organized for battle, some American tactical units will be OPCON to ROK commanders and vice versa.

Because of the nature of the North Korean threat and the terrain upon which a war would be fought, South Korea's combined defense must be seamless. Korean and American units must rely on each other for too many battlefield functions to allow national divisions to artificially separate one from another.

As CFC commander, what are your command and control challenges?

The challenges run the gamut from differences in language or culture—which lead to misunderstandings—to having common C^4I [command, control, communications, computer and intelligence] from the tactical through theater levels.

None of these are "stationary" challenges. Every time the US or the Republic of Korea introduces a new piece of communications gear or Fort Leavenworth [Kansas] or the US Joint Staff invents a new doctrinal phrase, it brings a new challenge to ensure our command and control will work smoothly and efficiently. Every time the North Korean Army adds new equipment, reorganizes or forms another unit, we must reevaluate and, potentially, change our operations. We review our theater plans annually to capture these changes and maintain communications systemically.

The only way to combat these challenges is through frequent exercises that stress our systems to see if they're working correctly. By concentrating on the battlefield operating systems [BOSs], we take a critical look at both the results of our systems and the decision apparatus that produces those results.

With the 2d Infantry Division's Third Brigade a ROK Army brigade and with US units under the operational command of a ROK Army corps, what are the US support, sustainment and interoperability challenges?

Because of unique equipment and the need for units to train habitually with their organic support elements, we receive the ROK Army brigade in the division with its own support package. Ideally, our coalition partner would buy 100 percent American, making our combined support, sustainment and interoperability infinitely easier. But technology transfers can be sensitive, so the South Koreans also buy arms in the ever-growing international market place or make their own,

based on their requirements. Having different equipment isn't impossible to deal with, but we'd like to mitigate that effect on the battlefield.

Creating a relationship between the division and its ROK Army corps headquarters isn't as complex, in many respects. The division continues to draw its support from US Forces Korea and its component, Eighth Army. It's OPCON to the corps, and therefore, the command and control relationship is for the operational employment and direction of the division.

However, we still watch carefully to ensure that interoperability problems don't cause dysfunction. There are equipment differences in communications, fire support control and in many other areas—the control network—that have to be bridged. Bilingual personnel are assigned to critical nodes to ensure clear lateral and horizontal communications, and where necessary, liaison officers are assigned.

The keys to making these arrangements work are first, a cooperative and enthusiastic attitude by all concerned and, second, a training program that continuously tests and refines unit procedures. I believe we have both, and if these organizations must fight, they'll operate smoothly and extremely effectively together.

In the 2d Infantry Division's recent battle command training program (BCTP), it participated as part of the ROK Army VII Corps—a first. What lessons did they learn or validate that are applicable to operations throughout CFC or other combined commands?

The most fundamental lesson is the need for allies to share a common understanding of doctrine—I can't overemphasize the importance of having common doctrine in combined operations. Doctrine is the professional language with which we communicate with one another in battle to describe command relationships, mission statements and plans. Unless we talk the same technical language, there will be a great deal of unwelcome friction. The division and its corps headquarters understood this before the BCTP exercise, and it was revalidated.

The second point is that it's difficult to sustain a rapid decision cycle in combined operations—much more difficult than when operating alone. Even the most common tasks, such as sharing intelligence, must await translation before data can be passed throughout the command. This, in turn, slows the development of a plan, which, in turn, slows the other elements of the decision cycle. Even minute differences in how we plan or organize our plans can lead to untimeliness.

The last lesson is that BCTP is invaluable for preparing coalition forces to fight together—in welding them together. In fact, the ROK armed forces have been so impressed with BCTP that they're building their own BCTP capability.

Please describe the exercise Ulchi-Focus Lens and unique aspects of the training.

Our theater training program is based on a CFC white paper for joint and combined doctrine, allowing subordinate commands to incorporate into their levels of training those tasks, procedures and requirements outlined as critical in the paper. This combined doctrine is vital because it creates a level of understanding in both national forces that leads to decentralized preparation and training. Our exercises then build on this training and focus on theater-level tasks.

Ulchi-Focus Lens was a theater simulation-based exercise that involved nearly all the active Korean armed forces, the forward deployed forces of the USFK [US Forces Korea] and a large number of the US units that would augment Korea in the event of a crisis or conflict.

The host for the exercise was our automated theater bilingual command and control system, TACCIMS [tactical command and control information management system], paired with our theater exercise and simulation center. We conducted the exercise through computer links with the Warrior Preparation Center in Germany and simulation centers at Fort Lewis [Washington] and Fort Leavenworth—a first using satellite communications channels in the distributed wargaming network that linked three continents. This enabled us to expand participation and improve the scenario base.

At the same time, we successfully prototyped a DARPA [Defense Advanced Research Projects, Arlington, Virginia] interface that, for the first time, bridged three services' warfighting models, including the Navy's RESA [research and evaluation systems analysis], the Air Force's AWSIM [air warfare simulation] and our own CBS [corps battle simulation] exploded up to the theater level. In addition, the JECEWSI [joint electronic combat/electronic warfare simulation] and the logistics TTSM [theater transition sustainment model] played in Ulchi Focus. We had a worldwide network of joint models supporting a theater war plan, the viability of which was being examined under CBS through TACCIMS, with all joint battles fought simultaneously.

The bridge between the war plan and TACCIMS was the theater decision support system, or TDSS, which we developed

Total Active Forces	***1,206,000***
Ground Forces	
Active Duty Personnel	1,066,000
Reserve Personnel	5,000,000
Conventional Corps	8
Mechanized Corps	4
Combat Divisions/Separate Brigades	70
Combat Maneuver Battalions	700
Special Operations Forces (SOF) Brigades	22
SOF Personnel	80,000
Medium Tanks	3,500
Light/Amphibious Tanks	400
Assault Guns	200
Armored Personnel Carriers	4,000
Self-Propelled Artillery	5,400
Towed Field Artillery	3,000
Multiple Rocket Launchers	2,400
Anti-Aircraft Weapons	8,800
FROGs	20+
SCUDs	54
Air Force	
Personnel	80,000
Jet-Capable Airfields	26
Total Aircraft	1,400+
Total Jet Fighters	748
MIG-15/17/19s	480
MIG-21s	120
MIG-23s	46
MIG-29s	10+
Light Transports (AN-2)	250
Light Bombers (IL-28)	82
Fighter/Bombers (SU-7)	20
SU-25s	20+
Helicopters (MI-2/MI-4/MI-8/H-500)	300
Naval Forces	
Personnel	60,000
Bases	25
Total Combat Ships	650+
Patrol Frigate	1
Coastal Patrol Boats	388
Missile Attack Boats	39
Mine Warfare Boats	23
Amphibious Craft	194
Hovercraft	30
Attack Submarines	24
Midget Submarines	35+
Air Cushion Vehicles (LCPA)	50+

Figure 1: Unclassified North Korean Threat Array (Current as of June 1992)

here in Korea. The operating system for TDSS is "windows"—a system that allows decision makers to select window displays of battlefield operating systems from the most detailed lower levels to the big picture integrated with other BOSs. The BOSs feed their information into the windows in TDSS in real time, focusing on the information the theater CINC and his staff need to know—must know—to make the most effective combat decisions in a timely manner. All BOSs see the same window screens and data at the same time. TDSS is not only a dynamic decision aid, a medium to provide staff and component assessments, it's also a tool to synchronize the execution of the CINC's campaign plan.

What lessons did you learn in Ulchi-Focus Lens?

The most important lesson we learned was that our newly rewritten War Plan 5027 is executable. There's a total understanding and acceptance of the war plan's phases and the conditions for transitioning from one phase to another.

The new war plan is structured in a classic format with a few unique exceptions. Probably the most unique is the commander's intent includes conditions for changing actions—outcomes, if you will. For example, a condition might be expressed as *neutralizing* a given force, rather than *destroying* it. The conditions stated are outcome-based rather than process-based. That allows subordinate commanders to immediately understand the commander's intent fully and gives them some flexibility to adjust, where necessary, during combat to meet that intent.

Another lesson we learned during Focus Lens was that, given the plethora of intelligence sensors available, we were overwhelmed by the amount of data coming through, making it difficult, at best, to sort out the critical information bits. In the last Focus Lens, from the time something happened in a fox hole at the frontline until the time it was visible at the theater level was five hours—a change from the 31 hours of the previous year's exercise. We had corrected the previous year's time lag with data processes and technological improvements. But with the reduced time lag, we received an enormous data dump. (That indicates the staff is focusing on process as opposed to output—easily correctable by putting in filters or gates to meter the information flow.) So in Ulchi Focus, we learned the importance of picking off the right bits of information to graphically represent the battlefield from the mass of information flowing from our sensors.

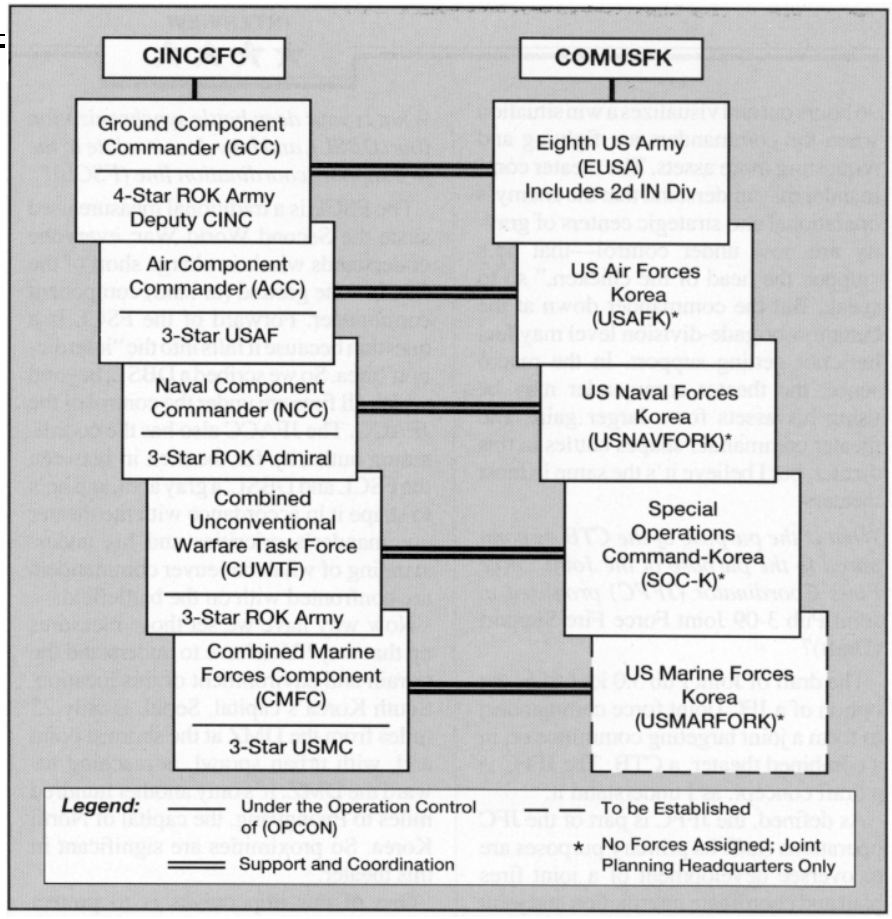


Figure 2. Two of the four "hats" General RisCassi wears are as Commander-in-Chief of the Combined Forces Command (CINCCFC) and Commander of US Forces Korea (COMUSFK). Note the combined organization of the CFC; for each component where a ROK officer is the commander, a US officer is the deputy commander and vice versa. General RisCassi also wears hats as CINC UN Command (CINCUNC) and Senior US Military Officer in Korea.

How does your Combined Targeting Board (CTB) help synchronize the deep battle?

The CTB is a centralized committee under the JFACC [joint force air component commander] that oversees the deep targeting process. It's joint and combined with members from both national forces and the various components.

The CTB receives fire support requests for deep targeting from the components and manages these within the construct of the CINC's overall campaign plan, ensuring assets are allocated to meet theater objectives. It performs this task by making recommendations to the JFACC, who's responsible for executing deep battle operations, as well as other operations under his purview.

The vehicles for the CTB's output are the SPITL [single prioritized integrated target list] and ITO [integrated tasking order], which are based on the CINC's intent—constantly bounced off the intent. (The ATO [Air Force's air tasking order] is a sub-product of the ITO.) Because the SPITL and ITO are integrated target and tasking lists, they eliminate duplicate targeting and bring the right mix of systems together synergistically.

Do the CTB's organization and process afford ground commanders the flexibility to attack deep and shape the battlefield?

Most certainly, but within the limits established by the theater commander. The GCC [ground component commander] is represented on the theater-level CTB. Thus, the field commanders' requirements are fed continuously to the CTB and, if possible, are met. If not, the issue is forwarded to the theater commander for decision.

But given the nature of this theater, the shaping is done at the theater level. Thus the theater commander looks at the battle

96 hours out and visualizes a win situation when the commanders are fighting and requesting more assets. The theater commander may understand that the enemy's operational and strategic centers of gravity are now under control—that he's "nipped the head of the chicken," so to speak. But the commander down at the battalion-brigade-division level may feel he's not getting support. In the macro sense, the theater commander may be using his assets for a larger gain. The theater commander shapes battles in this theater, but I believe it's the same in most theaters.

What is the purpose of the CTB as compared to the purpose of the Joint Force Fires Coordinator (JFFC) proposed in Joint Pub 3-09 Joint Force Fire Support (Draft)?

The draft of Joint Pub 3.0 identifies the option of a JFC [joint force commander] to form a joint targeting committee or, in a combined theater, a CTB. The JFFC is a draft concept, as I understand it.

As defined, the JFFC is part of the JFC operations staff. Its primary purposes are to oversee development of a joint fires plan and coordinate interdiction and joint fire support with other members of the joint force staff, as well as other commands. Thus, it's a theater-level instrument to ensure joint fires are apportioned in accordance with the JFC's operational needs and cross-integrate component capabilities as needed.

From a JFC perspective, several principles guide his decision on how to structure his organization. First, commanders are responsible for operations—staffs are not. Whether the JFC delegates interdiction or deep operations or retains control determines his organization. Second, whatever the architecture, the joint fires coordination instrument must meet balanced, integrated operational criteria. The CTB works in a combined theater, and I believe it's well-placed with the JFACC, particularly if the majority of assets are air assets.

What this says, then, is doctrine should not dictate a single solution for managing deep fires. As with other operational decisions, a JFC's decision should be based on factors of METT-T [mission, enemy, terrain, troops and time available]. Unity of command should be protected; therefore, the integrating body should be placed where it makes the most sense in operational terms.

What is your deep battle synchronization line (DBSL), and how does it relate to the fire support coordination line (FSCL)?

The FSCL is a traditional measure used since the Second World War; everyone understands who's in charge short of the FSCL—the ground (or land) component commander. Forward of the FSCL is a question because it falls into the "interdiction" area. So we scribed a DBSL, beyond which all fires are under the control of the JFACC. The JFACC also has the coordinating authority for the area in between the FSCL and DBSL, a gray area, and he's to shape it in accordance with the theater commander's priorities and his understanding of what maneuver commanders are confronted with on the battlefield.

Now why have we set those measures up that way? You have to understand the terrain and environment of this location. South Korea's capital, Seoul, is only 25 miles from the DMZ at the shortest point and, with urban sprawl, is reaching toward the DMZ. It's only another hundred miles to Pyongyang, the capital of North Korea. So proximities are significant in this theater.

One of our imperatives is to protect Seoul from penetration by North Korean forces. So we focus the frontline field armies on the close-in battle. Therefore, we scribe the FSCL very close—closer than you'd draw in the academic environment, clearly closer than for a fight in Europe and fundamentally closer than what you saw in Operation Desert Storm.

How you shape interdiction, then, becomes very important. So in the ITO, we have systems that can shape the battlefield in areas beyond the FSCL; Army TACMS [tactical missile system] is one of those. As a consequence, our tasking order isn't selective—it includes other types of systems, ground systems, that we've given to the JFACC.

This then begs the question, "Why not change the rules that apply to the FSCL to make it a restrictive fire line and thus alleviate the need for a new control measure?" In some instances, there's a range of activity beyond the FSCL but short of the DBSL that's of fundamental concern to various component commanders—sort of a zone where all should be able to target high-payoff targets based on their individual requirements. We didn't want to make this targeting process overly restrictive or untimely. Thus between the FSCL and DBSL, we gave the JFACC coordinating authority over all fires and devised a streamlined or quick-fire channel parallel to the CTB's to manage joint fires within this band.

With the large number of North Korean hardened artillery sites (HARTS) along the DMZ, how do you plan to fight and win the counterfire battle?

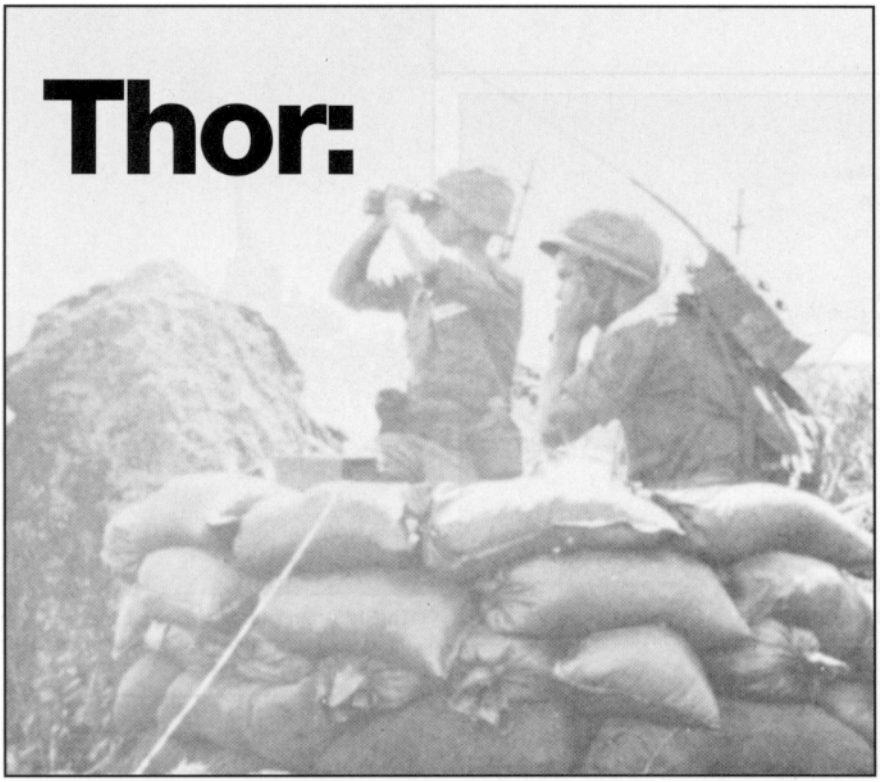
The HARTS make counterfire a bit more difficult but still winnable. We have munitions capable of destroying North Korean HARTS. And contrary to what many people believe, the North Koreans can't fire out of those sites—they must move out into firing positions. Therein lies their vulnerability, for once they move, they're subject to our air dimension, one of the strongest in this theater.

Our greatest challenge, however, is simply negating or destroying the large number of North Korean artillery systems, HART or mobile. If the north attacked, it would take synchronized counterbattery and air power to decimate a majority of those systems.

What message would you like to send to Redlegs worldwide?

Korea isn't the only threatened theater in the world or, necessarily, the one most likely to see conflict. However, forces here have a strong training program in a unique theater. I encourage you, as part of the best Field Artillery in the world, to seek an assignment in Korea.

General Robert W. RisCassi is the Commander-in-Chief (CINC) of the United Nations Command, CINC of the Combined Forces Command and Commander of the US Forces Korea in the Republic of Korea. He has served in a number of key assignments, including as Vice Chief of Staff of the Army, Director of the Joint Staff and Deputy Chief of Staff for Operations and Plans, all in Washington, D.C.; Deputy Commanding General of the Training and Doctrine Command and Commanding General of the Combined Arms Center, Fort Leavenworth, Kansas; Commander of the 9th Infantry Division (Motorized), Fort Lewis, Washington; Assistant Division Commander of the 8th Infantry Division (Mechanized) in Germany; and Assistant Commandant of the Infantry School, Fort Benning, Georgia.



A Case Study in Multi-Service Coordination

by Lieutenant Colonel (Retired) Faris R. Kirkland, Ph.D.

Land, sea and air forces are most effective when they act in concert so the capabilities of each compensate for the vulnerabilities of the others. But even with the care and foresight that have gone into developing joint doctrine and procedures, coordinating multi-service operations is not easy. The services compete for resources, develop divergent languages and procedures and have infrequent opportunities to work together in peacetime. As a result, many soldiers, sailors, airmen and Marines prefer not to rely on the efficiency of members of another service in combat. Because supporting fires are routinely delivered by more than one service, artillerymen are responsible for many of the most complex and delicate coordination tasks.

A successful, but little known, joint operation conducted during the War in Vietnam was Operation Thor, a seven-day Army-Navy-Marine-Air Force attack by fire on a North Vietnamese fortified zone in July 1968. The attack destroyed 93 enemy field, coastal and air defense artillery weapons and neutralized the North Vietnamese offensive potential in the Demilitarized Zone (DMZ) for three years (Headquarters, XXIV Corps Operational Report, 20 August 1968). There was one US serviceman killed in action (KIA) and one wounded in action (WIA) (Headquarters, XXIV Corps Artillery Operational Report, 25 August 1968).

The principal lesson from Thor was that coordination is a psychological as well as a doctrinal, technical and tactical process. Adhering to doctrine and procedures, checking with all agencies concerned and incorporating their input, writing a comprehensible order and providing information does not complete coordination. If they are to do their utmost, the members of each component need to *know* their opposite friendly numbers and trust them. Trust cannot be imposed—only earned.

Thor illustrates how the behavior of staff officers can facilitate the development of the trust essential in joint operations. As Ardant du Picq put it, "Discipline in battle...springs from a knowledge of comrades and...trust..." (Colonel Charles-Jean-Jacques-Joseph Ardant du Picq, *Battle Studies*, Stackpole, Harrisburg, Pennsylvania, 1958).

Situation

In the early summer of 1968, United States and North Vietnamese Army (NVA) forces faced each other in an unstable stalemate along the DMZ. The Americans had defeated NVA forces that had seized Hue during the Tet Offensive the preceding February.

A new headquarters, Provisional Corps Vietnam (PCV), had been organized during the first two weeks of March to coordinate counterattacks in the region between Hue, the DMZ and the Laotian border. In the first week of April, PCV, under the command of Lieutenant General William B. Rosson, attacked NVA forces surrounding the Khe Sanh combat base (Operation Pegasus). At the end of April, PCV forces conducted Operation Delaware, the first raid on NVA logistical bases in the A Shau Valley (Headquarters, US Military Assistance Command, Vietnam, or MACV, *Command History*, Saigon, March 1969).

But along the DMZ held by the 3d Marine Division, the NVA dominated. Their long-range, flat trajectory 122-mm and 130-mm guns and 152-mm gun howitzers were well-suited for the low, flat country along the eastern end of the DMZ (Major General David E. Ott, *Field Artillery, 1954-1973*, Government Printing Office, Washington, DC, 1975).

The NVA had more than 100 artillery pieces that could outrange all US artillery except eight 175-mm guns of the US 8th Battalion, 4th Artillery; 12 175-mm guns of the 2d Battalion, 94th Artillery; and six guns of the Marines' 5th 155-mm Gun Battery.

NVA guns routinely and effectively shelled the 3d Marine Division's logistical base at Dong Ha, and they dominated by fire the supply routes from Khe Sanh to Dong Ha along the Cua Viet River and Route 9. (See Figure 1 on Page 12)

At the beginning, and again at the end, of May, the NVA attacked Dong Ha. The latter attack was in divisional strength. Both came out of the Cap Mui Lay region in the southeastern corner of North Vietnam. The NVA had fortified Cap Mui Lay with field, coastal and air defense artillery in sufficient strength that few US ground forces occupied permanent positions north of Route 9 or the Cua Viet River. No warships would approach within 20 kilometers of the coast. Neither light aircraft nor high-performance reconnaissance aircraft had flown over or near the region for several months.

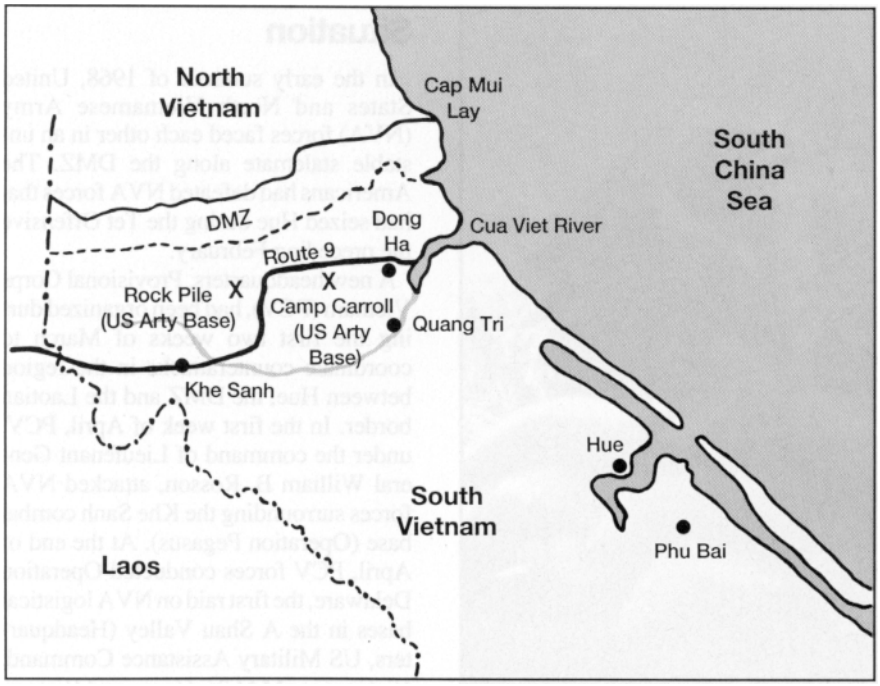
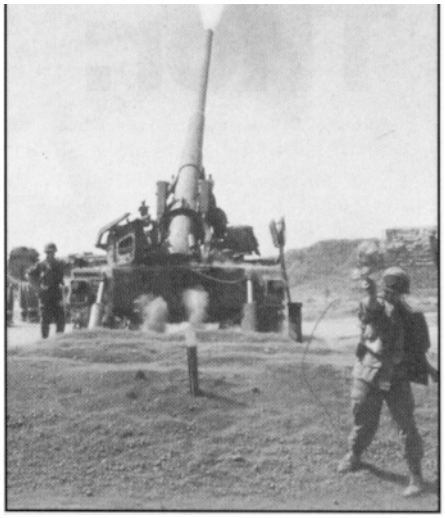
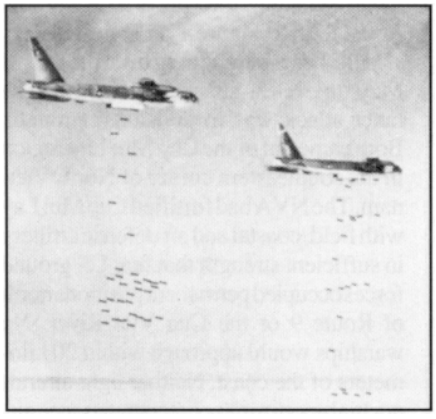


Figure 1: The Situation Before Operation Thor. The NVA guns routinely shelled the 3d Marine Division's logistical base at Dong Ha and dominated the supply routes from Khe Sanh to Dong Ha (Route 9) and the Cua Viet River.



The 175-mm gun was one of the systems used to neutralize missile batteries that threatened B-52s.

The corps artillery for PCV had begun counterbattery planning in March. The skill of the NVA in camouflaging and digging in their weapons, the impossibility of aerial observation north of the DMZ and the lack of American long-range artillery complicated the task. The PCV Artillery staff devised a plan (later to be code-named Operation Thor) to attack the guns in the Cap Mui Lay fortified zone using Field Artillery (see Figure 2), naval gunfire, fighter bombers and B-52 high altitude bombers. These complementary delivery systems each had capabilities that could cover vulnerabilities of the others.



B-52 strikes made up a significant portion of the first two days of Operation Thor.

The short-ranged 155-mm and 8-inch howitzers of the 12th Marines (3d Marine Divisional Artillery Regiment) and PCV Artillery would be moved into forward positions close to the DMZ. This would extend their range seven or eight miles into North Vietnam. Any NVA ground attack against the exposed batteries would be met with fires from naval gunfire, batteries of PCV Artillery, the light batteries of the 12th Marines and concentrated attacks by fighter bombers.

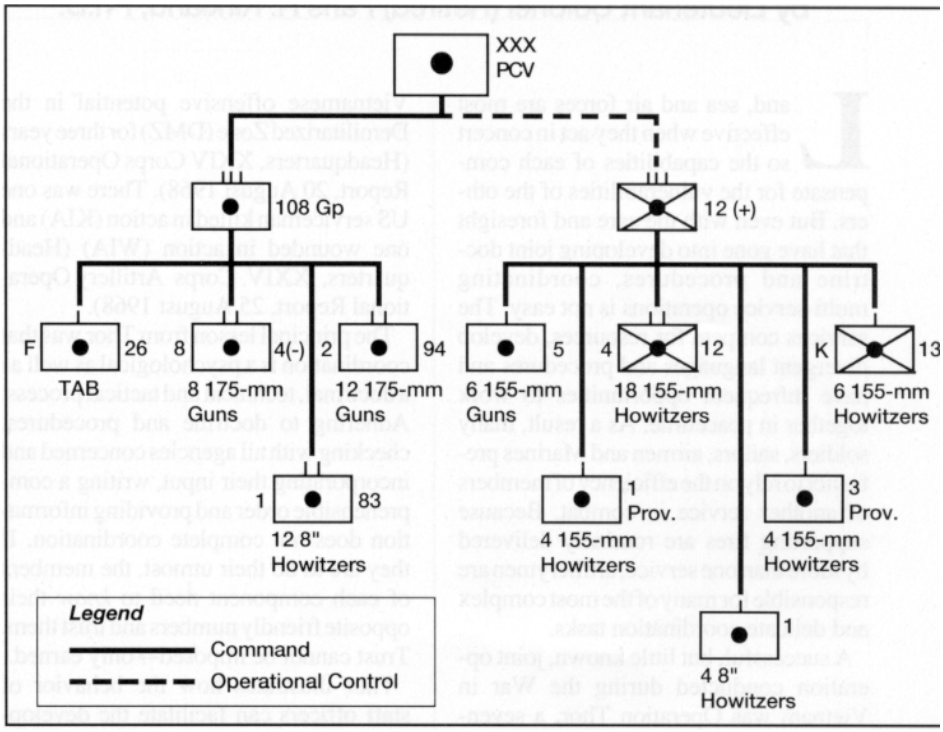


Figure 2: Artillery Units Available for Operation Thor. Only medium (155-mm howitzer) and heavy (155-mm gun, 175-mm gun and 8-inch howitzer) units were used in Operation Thor. There were six light artillery battalions in the area of operations. Four were direct support units for the Manne infantry regiments operating along the DMZ, and two were attached to the PCV Artillery.

Artillery and naval gunfire would strike air defense gun and missile positions as fighter bombers began their attack runs with bombs and napalm. Fighter bombers, 8-inch cruiser guns and 175-mm guns—also moved into forward positions—would neutralize missile batteries that could threaten B-52s. Field Artillery and fighter bombers would attack any coastal artillery that revealed its positions by firing on warships (Headquarters, Provisional Corps Vietnam, Operations Order 15-68, 24 June 1968).

As known and suspected air defense positions were neutralized, aerial reconnaissance by light aircraft would begin. The aerial observers would have priority on ground, sea and airborne fire support systems. Any anti-aircraft gun that fired would become the target of a concentrated attack. Finally, comprehensive aerial photographic missions would be conducted to penetrate the umbrella of secrecy that shrouded Cap Mui Lay and reveal any preparations for ground attack across the DMZ.

The commanding general of PCV Artillery, Brigadier General Lawrence H. Carruthers, briefed the plan to General William C. Westmoreland's MACV at the end of April. Within a few days, word came back that the Air Force would not participate unless it had complete control. The Air Force was not the optimum component to coordinate the operation. The artillery had what little targeting data there was and would be in continuous action. Only a few air units would be in action at one time, and there would be periods when none were active. The plan was dropped.

A month later, a division-sized attack came out of Cap Mui Lay. It was repulsed, but intelligence indicated that a two-division attack was planned for July. The Paris Peace Talks were in progress, and any territorial gain by the NVA south of the DMZ would strengthen their negotiators' position. MACV directed the attack on Cap Mui Lay, now code-named Operation Thor, be executed beginning 7 July. General Westmoreland specified that Seventh Air Force would coordinate the first two days, consisting mostly of B-52 strikes. PCV was to coordinate the remaining five days. (See Figure 3.)

Westmoreland committed one carrier-borne air group, all naval gunfire support ships, 210 B-52 sorties and 350 fighter-bomber sorties to reinforce the 1st Marine Air Wing and the artillery of the 3d Marine Division and PCV.

On 19 June, Lieutenant General Rosson moved the start date for Thor up to 1 July. The next day, NVA artillery hit the ammunition dump at Dong Ha, destroying the ammunition stockpiled for the operation (Headquarters, 1st Battalion, 44th Artillery Operational Report, 7 August 1968).

Pre-Attack Coordination

Technical, tactical and psychological coordination was necessary to assure Thor succeeded and did not become a debacle. The participants in Thor had limited experience working with other services. Gunners, flyers and sailors perceived their tasks in Thor to be dangerous in the extreme. Many used the coordination sessions to point out that the plan was impossible to execute and should be canceled.

One issue that arose involved perceived incompatibility between Air Force, Navy and Marine ground-based navigation and blind-bombing systems. In a stormy meeting, Air Force representatives insisted they could not function in the Marine electronic environment in the DMZ area. Marines then proposed procedures they thought would enable the Air Force to

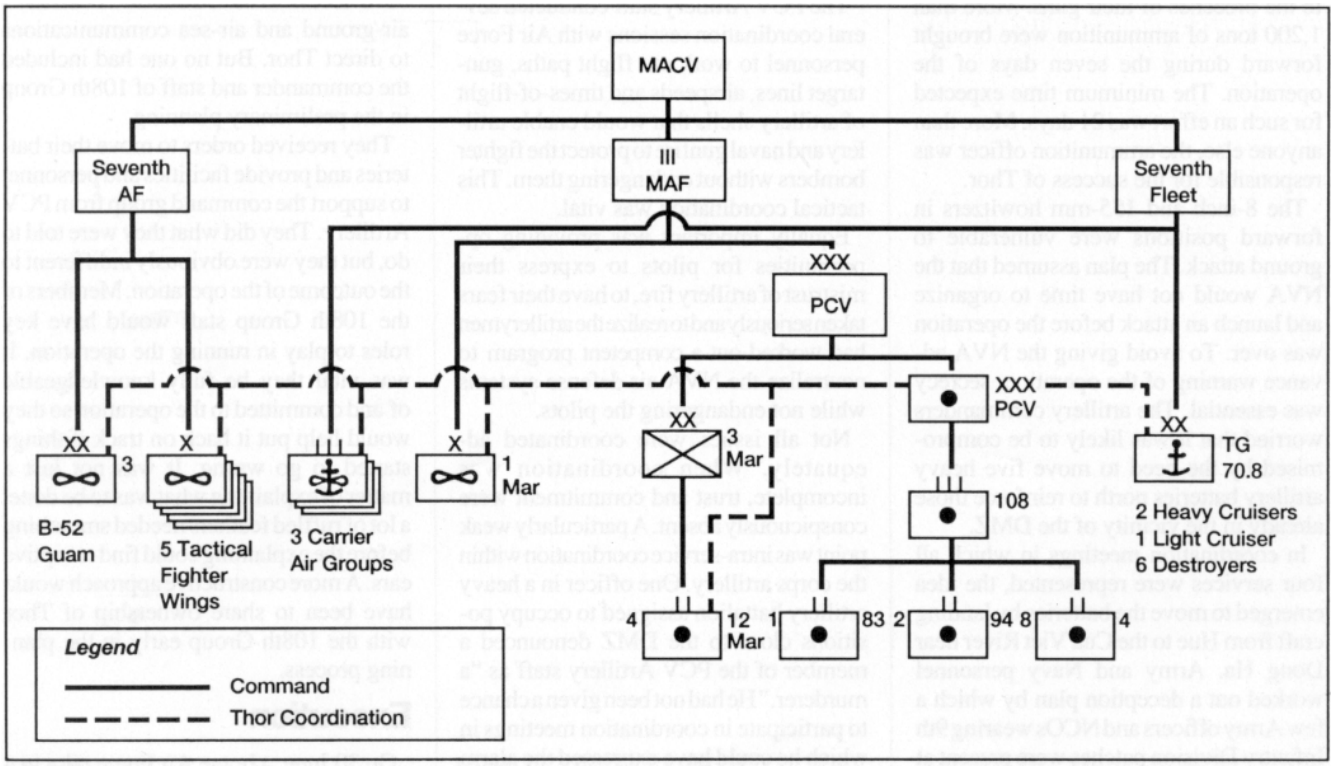


Figure 3: Command Relationships and Coordination Channels for Operation Thor. The seven-day, multi-service operation was coordinated by the Seventh Air Force the first two days, consisting of B-52 strikes. The PCV coordinated the multi-service attack the other five days.

operate. Together, they were able to resolve the difficulty because the people with the solution were in the same room with and understood the worries of the people with the problem. In the process of working out the solution, the participants got to know and trust each other.

During the initial discussions, the corps ammunition officer was convinced the ammunition resupply system could not support an attack of the magnitude of Thor. He could have stifled the operation at the outset. But the PCV Artillery staff had been in close, daily contact with him from the beginning, and he got interested in it. In his own planning coordination, he built a network of committed people in Air Force transport squadrons, Marine and Army truck units and ammunition depots throughout Vietnam.

Though all his plans were dislocated when the date was moved up and the dump at Dong Ha was lost, he and his network had become dedicated to Thor. They set up a chain of C-130 transports that picked up pallets of shells from stocks throughout Vietnam and unloaded them in the Quang Tri/Dong Ha area directly onto trucks. The trucks went straight to the batteries where the cannoneers took the shells from the tailgates of the trucks to the breeches of their guns. More than 1,200 tons of ammunition were brought forward during the seven days of the operation. The minimum time expected for such an effort was 21 days. More than anyone else, the ammunition officer was responsible for the success of Thor.

The 8-inch and 155-mm howitzers in forward positions were vulnerable to ground attack. The plan assumed that the NVA would not have time to organize and launch an attack before the operation was over. To avoid giving the NVA advance warning of the operation, secrecy was essential. The artillery commanders worried that it was likely to be compromised by the need to move five heavy artillery batteries north to reinforce those already in the vicinity of the DMZ.

In coordination meetings in which all four services were represented, the idea emerged to move the batteries by landing craft from Hue to the Cua Viet River near Dong Ha. Army and Navy personnel worked out a deception plan by which a few Army officers and NCOs wearing 9th Infantry Division patches were present at the embarkation point to suggest to NVA observers that the artillery was headed south, not north. The vessels set forth at sunset so their course, once they were out at sea, could not be discerned from the shore. The idea emerged from coordination between Army artillerymen, who had a problem and Navy landing craft commanders who had a capability.

The safety of the Air Force, Navy and Marine fighter bombers depended on ground and sea-based artillery neutralizing air defense weapons. For the suppression to be effective, the time interval between the bursting of the last shell and the arrival of the strike aircraft over the target had to be too short for the NVA gunners to get out of their holes and bring their guns or missiles into action. This required precise coordination because the artillery fire that was to protect the strike aircraft could also pose a danger to them.

Navy aviators were used to flying against heavily defended targets in North Vietnam, but they had never had artillery available for flak suppression. Air Force and Marine pilots flew primarily close support missions against targets in South Vietnam that did not have sophisticated defenses and for which flak suppression was not always necessary. For Thor, flak suppression was essential, but many pilots were unfamiliar with artillery and did not trust it.

The PCV Artillery staff conducted several coordination sessions with Air Force personnel to work out flight paths, gun-target lines, airspeeds and times-of-flight of artillery shells that would enable artillery and naval gunfire to protect the fighter bombers without endangering them. This tactical coordination was vital.

Equally important was providing opportunities for pilots to express their mistrust of artillery fire, to have their fears taken seriously and to realize the artillery men had worked out a competent program to neutralize the NVA air defense systems while not endangering the pilots.

Not all issues were coordinated adequately. When coordination was incomplete, trust and commitment were conspicuously absent. A particularly weak point was intra-service coordination within the corps artillery. One officer in a heavy artillery battalion assigned to occupy positions close to the DMZ denounced a member of the PCV Artillery staff as "a murderer." He had not been given a chance to participate in coordination meetings in which he could have expressed the alarm members of his battalion felt facing a deployment that departed dramatically from doctrine. He had not heard the Air

Navy fire support ships moved close to shore to provide support to Operation Thor.

Force, Marine aviation, Navy gunfire support ships and other artillery units describe how they were prepared to protect his unit. As a result he concluded, quite reasonably, that Thor was a product of "chair-borne" staff thinking at corps that posed a danger to his command.

A second internal breakdown was coordination with subordinate group headquarters. On 26 June, the PCV Artillery S2 and S3 sections moved from Phu Bai to the headquarters of the 108th Artillery Group at Dong Ha. There they would have access to the 3d Marine Division's air-ground and air-sea communications to direct Thor. But no one had included the commander and staff of 108th Group in the preliminary planning.

They received orders to move their batteries and provide facilities and personnel to support the command group from PCV Artillery. They did what they were told to do, but they were obviously indifferent to the outcome of the operation. Members of the 108th Group staff would have key roles to play in running the operation. It was vital they be fully knowledgeable of and committed to the operation so they would help put it back on track if things started to go wrong. It was not just a matter of explaining what was to be done, a lot of ruffled feathers needed smoothing before the explaining could find receptive ears. A more constructive approach would have been to share ownership of Thor with the 108th Group early in the planning process.

Execution

On 30 June, a brave Air Force pilot in a RF-4 made a very high-speed photo run over Cap Mui Lay. Thor began early on 1 July with three days of B-52 strikes and

For seven days, a ton of high explosive per minute was rained on NVA positions.

artillery fire directed by aircraft flying within friendly lines. Targets were field, coastal and air defense artillery positions identified from the aerial photos and by the sensors of the PCV Artillery target acquisition battery (TAB), Battery F, 26th Artillery. To protect the B-52s, five 175-mm gun batteries in forward positions and two cruisers with 8-inch guns attacked surface-to-air missile installations that covered Cap Mui Lay. They attacked from positions 10 to 15 miles inland and north of the DMZ.

From the perspective of the Thor command team, it appeared most of the B-52 strikes on the first day did not fall in zones in which NVA fire units had been identified. Coordination with the strategic bomber force had been indirect—through MACV to Seventh Air Force Headquarters. There were no representatives from the B-52 command at any of the skull sessions at PCV Artillery headquarters, and no PCV Artillery representative had been able to go to Guam to brief units.

On the fourth day, Army and Marine artillery observers and Marine and Air Force forward air controllers (FACs) approached the DMZ in light aircraft. They began to adjust artillery fire and air attacks on targets they saw or that fired at them. As the first Air Force fighter bomber strike was en route, the Air Force airborne command post called the Thor command post to direct all artillery to cease fire 30 minutes before the aircraft were due to arrive in the target area.

While the importance of continuing flak suppression until the strike aircraft began their runs had been worked out in detail with the fighter bomber squadrons, it had not been coordinated specifically with people in the airborne command posts. The airborne controller was adamant; they had always had a 30-minute artillery ceasefire. The Thor duty officer gave him a rapid class via radio on flak suppression, and to his everlasting credit, the controller had the courage to amend his procedures. But it was close. The operation was so interdependent that the loss of any component would have compromised the safety of all others.

For the next four days, the Army and Marine air observers and Air Force FACs penetrated farther and farther into the Cap Mui Lay area. The fire support ships came in close to the shore, ammunition relay for the Field Artillery worked and flak suppression was effective. Additionally, fighter bombers came in low to attack hardened enemy positions, such as cannons in caves, with heavy bombs and napalm.

For seven days, a ton of high explosive per minute had been rained on the NVA positions. By the end of the operation, most of the enemy guns had been destroyed, observer aircraft were able to operate deep within the operational zone with no losses and naval gunfire support ships closed to within five kilometers of the shore without being fired on. There were no NVA ground attacks for the duration of the Paris Peace Talks.

Conclusion

Even discounting the predilection for military commands to exaggerate their successes, Thor appears to have accomplished its purpose. Its failures were the result of threadbare coordination: a sense of being abandoned among some artillerymen, discontent among the 108th Group staff, B-52 strikes on empty jungle and incomplete understanding within the Air Force about flak suppression by artillery.

Its successes were largely the result of coordination that built understanding, confidence and trust among artillerymen, sailors, airmen and Marines. Herein lies the reason Thor is worth studying.

Warriors, whether they fight on land, sea or in the air, all understand one basic set of truths: their specialty is the most important, difficult and dangerous—and the least understood and appreciated—in the war-making business. Though the work of the J7 and joint doctrine people in all the services have enormously reduced the uncertainties associated with joint operations, no commander or staff officer organizing a multi-service operation can foresee all the problems facing the people whose actions he is coordinating. But he can do three things:

• Get the people who will be protecting each other together and facilitate their talking out their fears and problems. Ask them, "Do you have any concerns about working with these people?"

• Consult the people who will do the work early, often and on their turf. Let them be stockholders in the operation.

• Seek to understand the difficulties and dangers facing the participating units, and convey appreciation of their contributions and problems in written and oral presentations of the project.

The purpose of coordination is to increase the likelihood an operation will succeed while minimizing friendly losses. Coordination is the medium for resolving technical issues, arranging time sequencing and establishing lines of authority, communication and liaison. It's also the means of reassuring the participants they have grounds to trust the people who will support and protect them and trust the coordinating headquarters to respect their contributions and understand their vulnerabilities.

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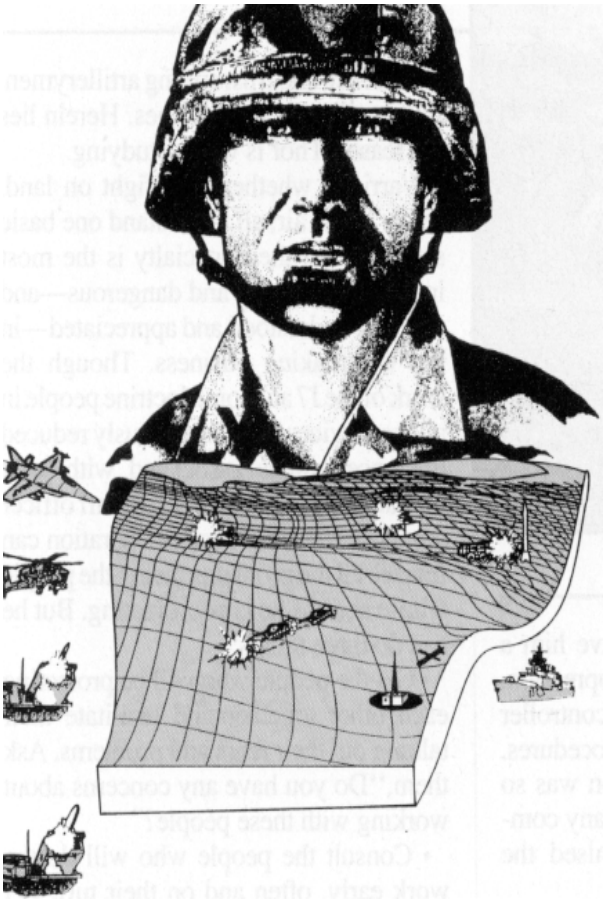


Joint Precision Strike—
The Field Artillery Contribution

by Major Johnnie L. Bone, Jr.

"...JPS is the attack of high-value targets at extended ranges with precision accuracy in support of national military objectives. The Army, Air Force, Marine Corps and Navy....each has unique capabilities that must be viewed as complementary, not competing."

It's 0500 on D-Day, and offensive operations began 20 minutes ago. You're the battalion commander of a multiple-launch rocket system (MLRS) battalion in general support to the corps. Enemy tactical missiles are the highest priority target on the joint task force (JTF) land component commander's (LCC's) high-payoff target list. He has decided to attack all tactical missiles with the Army tactical missile system (Army TACMS) as soon as the enemy missiles are acquired. Because your battalion has Army TACMS-capable batteries, the corps commander has tasked your battalion to attack the enemy missiles.

The corps G2 provided intelligence preparation of the battlefield (IPB) products depicting several known or suspected enemy long-range missile locations. Your S3 has given the joint surveillance and target attack radar system (Joint STARS) ground station module (GSM) operator this information to focus the acquisition effort. You've briefed your battery commanders on the mission and its time-sensitivity.

The GSM operator just reported that Joint STARS detected movement out of three of the possible enemy tactical missile locations developed by the G2's IPB. The battalion S3 assigns one mission to each of the batteries and begins clearing airspace with the airborne command and control center (ABCCC). The battery commanders each move launchers from hide to launch positions and await word of the actual target location.

One by one, the suspected tactical missile launchers stop their movement, and their target locations are determined. This information is sent to the batteries for technical computations. Additionally, the target locations and the launch positions are passed to the ABCCC to complete airspace coordination. The ABCCC clears two missions for immediate launch, but the third mission can't be cleared in time for the attack to occur. Four missiles are launched at the suspected enemy targets. This information is reported to the corps fire support element (FSE), and a request for battle damage assessment (BDA) is initiated.

Intelligence sources indicate enemy launch of a tactical missile from the other target location, and the GSM operator reports to the S3 movement out of that location. The S3 receives a report over the air defense net of a successful intercept by the Patriot battalion in the corps sector. Several minutes later, the GSM operator reports the enemy vehicles being tracked have stopped and provides the grid location.

The S3 then contacts the battery commander with the fire mission and tells him to launch four missiles at the target location when the airspace has been cleared. Coordination with the ABCCC clears the airspace, and the battery launches the missiles. Once again, the S3 reports the information to the corps FSE and requests BDA.

A few hours later, your battalion receives the BDA. The first two missions destroyed the enemy missile launchers and command vehicles. The BDA for the third mission indicated the destruction of two missile launchers, two ammunition transport vehicles, several command vehicles and a fuel tanker. These missions helped accomplish the LCC's operational counterfire mission and illustrate both proactive and reactive counterfire in Joint Precision Strike (JPS) attack operations.

This article describes the JPS concept and the Army's considerable contribution to this joint effort, in particular attack operations at the corps and echelons above corps (EAC) levels.

Simplistically, JPS is the attack of high-value targets at extended ranges with precision accuracy in support of national military objectives. The Army, Air Force, Marine Corps and Navy all have something

to contribute. Each has unique capabilities that must be viewed as complementary, not competing. The key to JPS is to understand and employ these unique capabilities through the application of precision combat power where and when the commander wants or needs it.

To appreciate JPS and the Army's role requires an understanding of the strategic setting, force projection requirements, leveraging technology and joint and combined operations. We must think in terms of the new strategic environment that demands the armed forces be prepared for anything from a show-of-force to all-out-war. Deploying a tailored force to counter a specific threat and getting that force to the fight in the right sequence to accomplish the mission is critical. JPS requires we operate jointly at all levels using published and emerging doctrine. We also must leverage available technology while realizing our opponent also may have a high degree of sophistication. After considering these points, the Field Artillery's contribution to JPS is more easily understood.

Strategic Setting and Force Projection

Today we are less certain of our specific opponent than in years past. The days of the Fulda Gap and the general defensive plan (GDP) are history. We have a global responsibility to react to any contingency where US interests are threatened. And our potential enemies may possess advanced technology, particularly in the areas of intelligence collection and target acquisition, missiles, air defense systems and, probably, weapons of mass destruction. Our mission spans the operational continuum, causing us to face anything from small, essentially light forces to large standing armies with modern armored vehicles. We must be prepared to operate anywhere in the world 24 hours a day in all weather conditions.

To operate in this strategic setting, we must be able to rapidly project combat forces. Our Army is smaller—essentially a continental United States (CONUS)-based force with a worldwide orientation. Even forward deployed units must be capable of conducting "out-of-area" operations. On the next battlefield, we might not have the luxury of deploying to the theater and preparing to fight—we might have to fight going in. We must consider the mission and determine the capabilities needed and deployment sequence, including the mix of Active and Reserve Components. Our society demands quick, decisive victories with minimum losses. The keys to doing all of this are to fight jointly and capitalize on technology.

Our warfighting philosophy has evolved with our technological capabilities. In the Active Defense era, we basically had two battles: an air battle and a ground battle. The Air Force destroyed as much of the enemy as possible, then the Army fought the close battle. We had limited acquisition capabilities, no precision attack means and limited range with our weapons systems. With AirLand Battle, we still had two battles, but they were more integrated. The deep fires, primarily Air Force, metered the flow of enemy forces into the two-dimensional battle area.

Today, we have one extended joint battlefield. The joint capability to see and attack deep in conjunction with high-speed maneuver dictates a nonlinear battlefield. Combined arms operations demand the synchronization of maneuver and fires throughout the depth of the battlefield. What we can see, we can attack with precision at depth. The application of these complementary attack systems from the air, ground and sea must be focused to achieve the synergistic effects required on the future battlefield. We must give any opponent no place to rest or hide—overwhelming his ability to control his forces and stripping him of any chance to gain the initiative.

Realizing Technology's Potential

Leveraging technology enables us to meet future warfighting requirements. Today's long-range acquisition systems allow us to see a "real-time" picture of the entire battlefield. We can strike deep throughout the battlefield with air, ground and sea-based systems. The Army TACMS Block I with anti-personnel and anti-materiel submunitions allows the commander to kill soft targets at a range greater than 100 kilometers. The fielding of the tri-service standoff attack missile (TSSAM) or the Army TACMS Block II, which both carry brilliant anti-armor (BAT) submunitions, will allow the commander to kill moving armored vehicles. If the decision is made to procure the extended-range Army TACMS, the Army will be able to attack out to the treaty limits. Field Artillery weapons such as these make any future war a 24-hour, all weather fight. With the introduction of precision munitions, we will also have the ability to kill any target identified.

Realization of technology's potential requires a viable warfighting doctrine; a responsive command, control and communication (C^3) system; and a focused materiel acquisition strategy. Our decide, detect and deliver targeting methodology provides a warfighting focus and is especially applicable to JPS. We have an established joint fire support coordination

"[With] participants from all services providing devastating, coordinated fires in concert with one another....the combined arms commander can control the tempo of battle by attacking the enemy to the depth of his weapons systems at the times and places of his choosing; his foe—any foe—will have no place to hide and no time to rest."

Major General Fred F. Marty
Chief of Field Artillery
"State-of-the-Branch 1992," December 1992, *Field Artillery*

structure from battalion to corps, and new joint fire support doctrine identifies the requirement for a joint force fires coordinator (JFFC) at echelons above corps (EAC).

Our materiel acquisitions are based on a "system of systems" that includes target acquisition, attack assets, support and sustainment and C^3. But we also must consider the capabilities of the systems of all other branches and services. All pieces of our system of systems play critical roles. Doctrine, organizations and materiel all have to be in place to ensure the maximum return on our investment of increasingly scarce resources.

Fighting with Fires

In JPS, simultaneous fires throughout the depth of the battlefield can be described in terms of tactical and operational fires. These are joint fires, not unique areas for each type of support. Joint acquisition, attack systems, support and sustainment systems and C^3must be focused against the total target array.

Tactical fires are keyed to supporting the combined arms forces, ordinarily brigades and divisions, closer to the forward line of own troops (FLOT). The combination of tactical air support, attack helicopters, naval gunfire, artillery and maneuver forces are applied simultaneously to destroy the enemy and his will to resist. This can be viewed as a joint air attack team (JAAT) that engages all targets with precision. The challenge is to conduct the JAAT at the operational level.

Simultaneous Attack with Fires. At the operational level, joint fires extend the battlefield. JPS achieves operational objectives by destroying the enemy's ability to generate and sustain combat power. These fires, conducted at corps and EAC, may include operational maneuver supported by tactical fires. Army TACMS with Joint STARS provide the operational commander the ability to immediately apply responsive fires against the total target array.

Operational "Counterfire." Operational counterfire, both proactive and reactive, can now be conducted against tactical missiles, probably the most fleeting and dangerous target set. But we must attack the full target set—the enemy's C^2, acquisition means, support structure and missile systems.

Proactively, the operational commander can destroy his missile system while in the hide position. This option is demanding on sensors but is less time-sensitive. Another option is to track his launcher to its firing position and attack while he's preparing to fire. This option is demanding on sensors and hyper time-sensitive.

Two options are available for reactive operational counterfire; both rely on air defense to shoot down the missile and protect the force. Option one is to attack the enemy after he fires when he is vulnerable to acquisition, but time is critical. Option two is to track him back to his reload site, then attack. This requires an intensive, coordinated effort that's demanding on sensors but is less time-sensitive. Proactive or reactive, the operational commander now has the capability to conduct counterfire.

Operational "Interdiction" Fires. JPS also can be used to interdict maneuver forces. Army TACMS—in conjunction with air support and attack helicopters—can destroy threat forces before they're introduced into the fight. This is where the operational-level JAAT synergy pays off. Army TACMS can destroy soft targets (air defense, target acquisition, logistics and lightly armored vehicles) while attack helicopters and fixed-wing aircraft kill tanks and other armored vehicles. Simultaneous application of fires is essential for success.

In the future, the fielding of TSSAM or Block II Army TACMS with BAT submunitions will allow the Army to destroy moving armored vehicles deep without putting pilots and expensive airframes at risk. Field Artillery systems provide the responsiveness and availability to conduct operational-level interdiction.

C^3 Countermeasures and DIAD Fires. Army TACMS also can destroy operational-level C^3 nodes and their integrated air defense umbrella. The same basic approach—simultaneously employing artillery, attack helicopters and fixed-wing aircraft—could destroy the enemy's ability to command and control his forces. Air defense coverage may be too demanding on our air assets, making Army TACMS employment essential to success.

The destruction of integrated air defenses (DIADs) is synchronized with the attack by air assets. Army TACMS is the weapon of choice due to its responsiveness, accuracy and low risk. Additionally, Army TACMS can destroy the soft components of the C^3 nodes. We have this capability now—but its successful employment requires synchronization at the operational level.

A Proven Fire Support System

The Field Artillery participates in JPS today, but we have a long way to go to meet the challenges of the future and win the next war. From the fire support perspective, we must focus the application of the total system with complementary pieces from all branches and services to achieve synergism. The idea is to concentrate effects on targets without concentrating forces.

To execute JPS at the operational level we must have the doctrine and C^3 structure to meet the objective time lines. The bottom line is obvious—joint fires are essential to winning future battles.

Major Johnnie L. Bone, Jr., is a Concepts and Technology Staff Officer, Directorate of Combat Developments, Field Artillery School, Fort Sill, Oklahoma. His previous assignment was as the Operations Officer and Assistant Fire Support Observer/Controller for the Battle Command Training Program (BCTP), Fort Leavenworth, Kansas. He commanded A Battery, 2d Battalion, 83d Field Artillery, 41st Field Artillery Brigade in Germany, and both the 11th and 28th Field Artillery Detachments in Italy. Major Bone has served as a Battalion S1 and S2 and as a Battery Executive Officer and Fire Direction Officer. He is a member of the Army Acquisition Corps.

"Army TACMS with Joint STARS provide the operational commander the ability to immediately apply responsive fires against the total target array."

Air Attack!

12th Aviation Brigade FSE
Joint and Combined Operations in ODS

by Major Clark O. Riddle, Jr., and Captain Maxwell G. Carroll

On 12 August 1990, the 12th Aviation Brigade (AB), V Corps, Germany, was alerted to deploy to Saudi Arabia. The brigade's initial mission was simple: provide additional tank killing capability to light forces being deployed to the theater. However, the unit's mission changed many times during Operation Desert Shield and Operation Desert Storm (ODS) and provided a wealth of insights for developing deep operations doctrine and for what the relationship should be between the artillery and the corps aviation brigade. Additionally, the missions provided frequent opportunities to work with the Air Force, Marine air and naval gunfire liaison company (ANGLICO) and the Eastern Province Area Command (EPAC) multinational forces stationed along the Kuwaiti border.

This article is about the requirement for an element that's not authorized in the current tables of organization and equipment (TOEs)—the corps aviation brigade fire support element (FSE). The requirement for the FSE became immediately evident to the 12th AB when it analyzed its mission after being notified for deployment.

The brigade requested an FSE from V Corps Artillery, which had habitually supported it during exercises. The corps artillery wasn't manned to provide this support and would have been incapable of doing so had it also been deployed. But in this situation, the request was filled with a robust section capable of meeting any combat requirement. The section included nine personnel, two of whom were support personnel with three high-mobility multipurpose wheeled vehicles (HMMWVs). In addition to standard artillery-related missions, the brigade FSE was responsible for integrating the actions of the air liaison officer (ALO) and the attached Stinger air defense platoon.

The brigade commander was a strong proponent for fully integrating all battlefield operating systems (BOSs) to maximize the effectiveness of the brigade. Artillery and Air Force assets were key portions of the brigade's planning. In deep operations, artillery was planned to clear a path through first-echelon Iraqi air defenses; Air Force electronic warfare (EW) assets were planned to provide jamming; and Air Force "deep" close air support (CAS) was planned for use in conjunction with attack helicopters to destroy the enemy. In the close battle, artillery and CAS were planned to increase the lethality of the brigade and maintain contact should any gaps in direct fire develop due to rotating units or time and distance problems. All these plans were facilitated by an FSE and ALO that were quickly integrated into the brigade tactical command post (TAC) and tactical operations center (TOC) and participated fully in all training and combat operations.

The missions assigned to the brigade during both Desert Shield and Storm demonstrate the extreme flexibility of the corps aviation brigade. The brigade served as a corps asset in the traditional sense, was assigned as a divisional asset, had a mission as a covering force, was assigned a defensive sector as part of a division, served as the corps reserve and supported the EPAC forces. Most of these missions required detailed fire support coordination equal to (and in most cases in excess of) that required of a ground maneuver unit. Additional fire support requirements resulted from the flexibility of the aviation brigade—it's ability to quickly support anywhere in the corps sector and the speed with which it could react. This diversity of missions accentuated the need for an experienced FSE more than any single element throughout the deployment.

Operation Desert Shield

During the majority of Desert Shield, the corps aviation brigade was assigned to the 101st Airborne Division (Air Assault) with a three-phased mission of supporting the EPAC forces arrayed in front of US forces, providing what was in essence a divisional covering force to the 101st Division in conjunction with the 101st Aviation Brigade (see the figure) and assuming a defensive sector with ground maneuver forces on the left and right flanks. These phases of the plan resulted in three distinct fire support efforts.

The first and undoubtedly the most difficult fire support challenge was integrating the fires of EPAC forces with the observation assets of the brigade while providing support to EPAC. The language and some of the equipment compatibility problems were overcome by the ANGLICO, which had firepower control teams (FCTs) down to the EPAC battalion level. These teams were assigned to EPAC units to help them integrate US ground and air support. They provided the only means of communicating with EPAC and were the critical links for clearing aviation battle positions and engagement areas, coordinating CAS and requesting fires from EPAC. They were responsible for clearing all types of US support in the EPAC sector, which extended south to Phase Line (PL) Shovel. There were, however, equipment and doctrinal differences in Marine versus Army operations that required resolution.

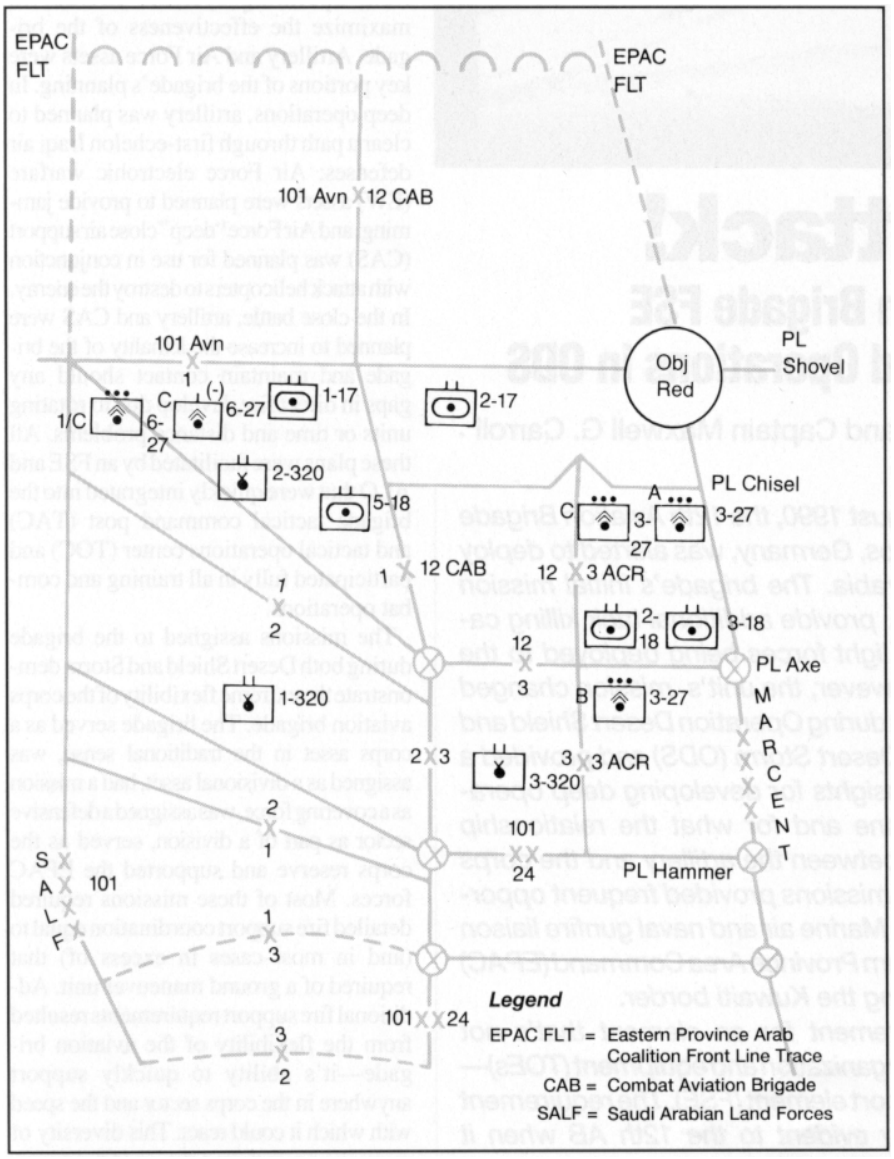
The Marines were accustomed to using attack helicopters as a fire support asset more than as a maneuver asset like the Army does. In addition, the complications of maneuvering over a foreign, although friendly, ground force meant the brigade had to be cleared into an area and had to clear its engagement area very much as artillery must be cleared in another unit's sector.

This coordination fell on the shoulders of the brigade and battalion FSEs—the logical choices because they communicated with the ANGLICO elements to request fire support and were experienced with clearing fires. All communications and coordination from the battalion FSEs were executed voice over FM radios, one net per FCT. The EPAC sectors correlated closely to the attack helicopter battalion sectors, so each battalion FSE communicated with one FCT; the brigade FSE communicated with the ANGLICO headquarters by AM and FM radios.

The second area that required detailed attention was radios. Although the Marines had compatible FM radios, they preferred the more reliable and longer range AM radios. The brigade only owned one secure AM radio, which was in the command and control aircraft. However, the brigade also relied heavily on the AM radios in the ALO vehicle and the tactical air control party (TACP) vehicles, which were intended to be dedicated to Air Force operations but proved *critical* to our operations as a whole.

The brigade operated a ground TAC and TOC as well as the command and control Black Hawk helicopter that served as the jump TAC. This meant that radio nets were severely restrained in the aircraft due to the limited number of radios and that AM communications in the TAC and TOC were dependent on the support provided by the ALO. These AM radios also were used in all three phases to coordinate fires with the Marines across the Army Central Command/Marine Central Command (ARCENT/MARCENT) boundary.

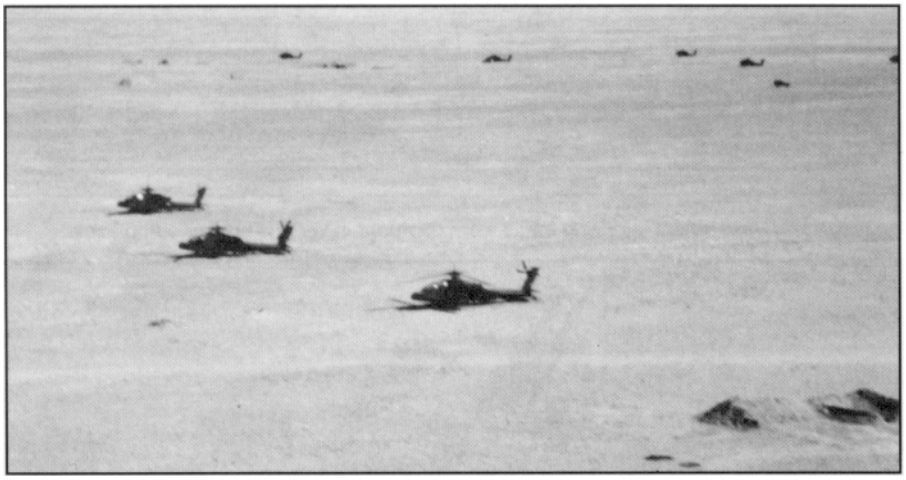
The most complex portion of this operation was the processing of calls for fire. The optics, speed and laser targeting of the Apache and OH-58D helicopters provided a tremendous capability when used to target artillery. When the brigade was operating in conjunction with EPAC forces, it was usually out of range of US artillery; therefore, requests for fires had



The 12th CAB supporting the 101st Division during its covering force mission in Operation Desert Shield.

The 12th CAB forward operating base (FOB) during the early phases of Operation Desert Shield.

Captain Mike Bryson, commander of D Company, 5-158 Aviation and Captain Max Carroll, Assistant Brigade FSO, at FOB Bastogne.



A 12th CAB assembly area in Iraq.

to be sent by a cumbersome process of calling the FCT for the area and having him relay the request for fire to the EPAC unit that would fire. Although the brigade fully integrated fire support assets into all operations to increase its effectiveness and survivability, the relay process was tenuous, at best, because of the time delays and communication problems. This was one of several instances where longer range fires from US artillery would have been extremely valuable and would have increased the effectiveness of the brigade.

The second phase of the operation occurred as the EPAC forces moved into the range of US artillery, conducted a passage-of-lines and then entered the brigade sector south of PL Shovel. The 212th Field Artillery Brigade and the 2d Battalion, 17th Field Artillery from the 75th Field Artillery Brigade provided fires in support of EPAC out to 10 kilometers beyond the ARCENT/EPAC boundary, known as PL Shovel. During this phase, the reverse of the relay process for calls for fire described previously occurred with all the associated time-consuming communications and clearance problems. Additionally, the artillery providing the support past PL Shovel was positioned in front of US ground troops, which meant communications between the artillery and aviation was critical to the survivability of the artillery; if any threatening Iraqi elements slipped through the EPAC/AB net, it was imperative the aviation units neutralize them or notify the artillery units in time for them to move.

The third phase of this operation was a standard mission of fire support in a maneuver sector. The unique and non-doctrinal part was that the only maneuver force (excluding the artillery that laterally displaced behind ground maneuver forces as quickly as possible) was an aviation brigade with only limited organic support assets on the ground.

The artillery and Air Force were key to the success of this portion of the battle plan. It was essential to obtain the synergistic effects of all BOSs to retain control of the brigade's sector without ground elements. This included extensive planning for joint air attack teams (JAATs) as well as artillery and air support to slow and attrit advancing units when attack aviation assets were rotating and not in battle positions.

FM radios were a problem during all phases of Operations Desert Storm and Shield. The range of the FM systems was insufficient for fast-moving aviation operations. Frequently, voice communications would be established with the supporting artillery only to be disrupted at a critical time because the aviation assets had repositioned to a small depression for survivability. Digital communications were even worse.

The solution was to use radio relay stations for what would often seem like short FM ranges. The use of the multiple-launch rocket system (MLRS) and its capability to process tactical fire direction system (TACFIRE) transmissions from OH-58Ds through a KY57/58 secure radio was an added plus for the FM systems, however, and negated the requirement for cumbersome code books.

Operation Desert Storm

The brigade's primary mission for Desert Storm was to be the XVIII Airborne Corps reserve. In reality, however, the brigade remained committed throughout and supported long-range surveillance unit (LRSU) operations, the 6th Light Armored Division (FR) and was eventually committed with the 101st Aviation Brigade north of the Euphrates River along the main road from Basra to Baghdad.

From the fire support perspective, it proved to be a different challenge from the missions assigned the brigade during Desert Shield. The emphasis quickly shifted from supporting the brigade as a maneuver unit to deep attack planning and coordination with the French for OH-58D support. This included an extensive requirement for Air Force EW support as well as artillery suppression of enemy air defense (SEAD).

The Deep Attack. Deep attack planning was used for the three cross-forward line of own troops (FLOT) operations executed before G-Day as well as the numerous LRSU insertions and extractions. The planning process for the attack battalion cross-FLOT and LRSU operations were identical, but frequently the artillery SEAD wasn't executed for LRSU operations because the mission dictated a stealth approach and the risk analysis supported a crossing without lethal SEAD.

Unlike V Corps, which operated a very centralized deep attack planning and coordination cell in the corps FSE, the XVIII Airborne Corps didn't have a centralized effort to coordinate the deep attack. This extended the capabilities of the brigade to the maximum and required considerably more work at the brigade level as well as more coordination and detailed information from corps elements.

The FSE proved to be a key link to the corps in several operations. It requested preplanned air strikes against targets along the flight routes that posed a potential threat to the success of deep operations. Although few of these targets were ever engaged, a constant liaison was required with the corps FSE to update targeting information.

Undoubtedly the most important function of the FSE during Desert Storm was the coordination for Air Force EW assets for cross-FLOT operations, including those of EF-111 (Raven), EC-130 (Compass Call) and F4G (Wild Weasel). In particular, the jamming assets were considered critical to mission success and were provided for all missions. This required extensive coordination with the corps EW element. The coordination began with an initial request 72 hours before the mission—often only a best guess because mission assignments usually weren't firm that far in advance (but fulfilled an Air Force requirement). As the war progressed, the 72-hour requirement was dropped, and the initial request went in 36 hours in advance, a much more realistic time.

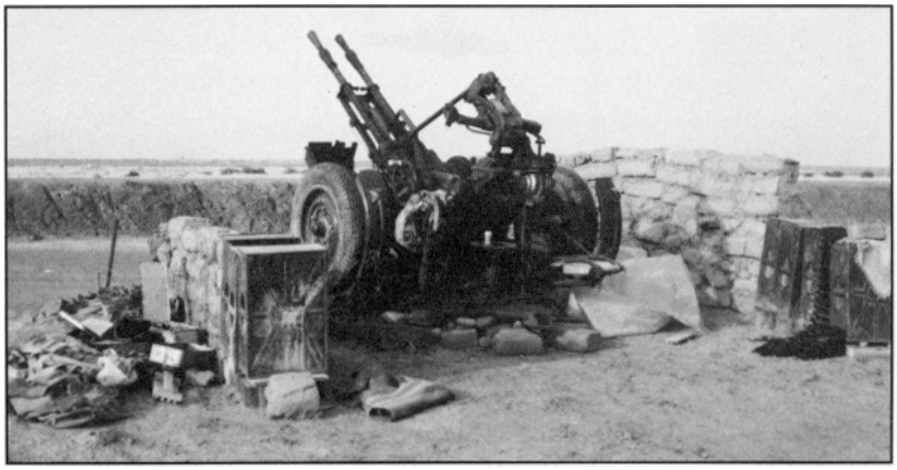
The requests were updated, and more detailed information was added at 36 hours and, again, at 24 hours before the mission. These updates required details on the flight routes, flight times and the radio frequencies to be protected. The call signs and frequencies of the Air Force assets supporting were passed to the brigade several hours before the mission. The final coordination was a confirmation from the corps that the aircraft were launched for the mission on time. The ALO tried several times to confirm that aircraft were on station and providing support, but this method rarely worked and demonstrated a weakness in the support system.

Support of the French. The brigade also supported the 6th Light Armored Division with OH-58Ds. These aircraft were to assist in artillery and Air Force integration and to provide a laser capability to the French. This mission required extensive coordination with the French by both the battalion and brigade FSE. The OH-58Ds also provided eyes for the 18th Field Artillery Brigade which was reinforcing the 6th Division Artillery. During this phase of the battle, OH-58Ds also coordinated CAS that resulted in several tank kills by the OH-58Ds lasing for Mavericks from A-10s.

The execution of fires in the French sector was very simple when compared to the process used with EPAC. The OH-58Ds would send their missions straight to the artillery brigade or battalion or to the regiment or division liaisons where the target would be cleared by the French liaison. This resulted in no time loss due to clearing fires. Although simple, this process required extensive training before combat to ensure it worked effectively.

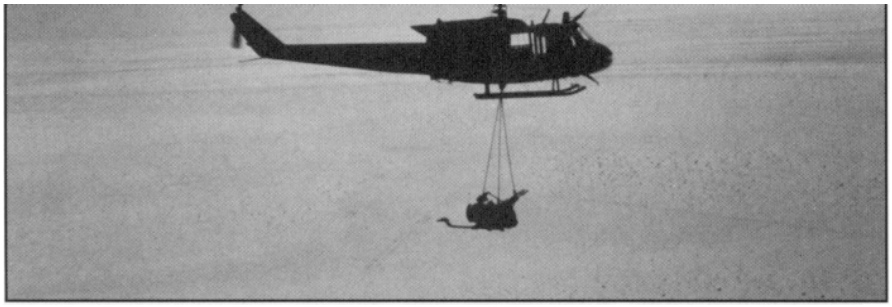
CPT Maxwell G. Carroll

Jalibah Air Base where surviving Iraqis were captured in various bunker complexes.



CPT Maxwell G. Carroll

An abandoned ZSU-23-2 anti-aircraft gun position protecting the approaches to An Nasiriyah.



A captured ZSU-23-2 being moved for processing as captured enemy equipment.

An Iraqi ammunition storage area near Jalibah Airfield.

Lessons Learned

Robust FSEs in corps aviation brigades and battalions are required. This requirement was clear from the start and proved to be justified throughout both Operations Desert Shield and Desert Storm. The flexibility of these combat elements allows them to be assigned almost any maneuver brigade combat mission and accomplish the fire support tasks inherent in those missions. In addition, the corps aviation brigade is the pivotal element in the corps deep attack, which, regardless of how the corps is organized, requires extensive coordination with the corps FSE and execution of fire support tasks. All these tasks can best be coordinated by trained artillerymen who work daily with the aviation unit.

Artillery must integrate aviation assets as sources of targeting and other information. These assets provide a wealth of information on battlefield targets and movements and incorporate laser capabilities for precise targeting. They frequently have the best overall picture of the battlefield simply because of the area they cover in a short time. In addition, they can provide a maneuver commander great insights into where to apply fire support assets as well as warn of potential fratricide problems, a task often accomplished in the French sector where there was a language barrier between forces. As more deep attack capabilities and systems emerge, such as the joint surveillance and target attack radar system (Joint STARS), the potential will increase for artillery effectiveness when tied to deep attack helicopter operations.

The artillery needs an inexpensive intermediate-range rocket for MLRS. Aviation assets with their long-range day and night optics can provide critical targeting information to the artillery for long-range fires, whether the assets are part of a divisional covering force or a corps deep attack. This was a problem in Desert Storm because of the very limited deep fire capability.

Realistic SEAD training must be conducted. Field Artillerymen are responsible for planning, coordinating and ensuring lethal and nonlethal SEAD missions are executed. Whenever possible, threat antiaircraft radars should be made available, EW coordination links established and US Air Force EW aircraft made available to realistically train non-lethal SEAD in support of combat aviation units during major training exercises.

Both artillery and aviation units can increase their effectiveness by closely coordinating and integrating artillery fires in attack helicopter operations. The smart aviation commander will continue to integrate all BOSs in his plans, and the FSE can assist him in this effort.

On the other hand, the artillery community should readily seek the battlefield information the aviators have because of their bird's eye view. This information is real-time and can provide the pinpoint accuracy required for targeting. The 12th Aviation Brigade's great success in training and combat was, at least in part, due to the cooperation of aviators and artillerymen.

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The authors gratefully acknowledge the assistance of Captain Eric Fournier (French) in writing this article. Captain Fournier is an Instructor at the French Artillery School in Draguignan, France. During Operation Desert Storm, he was the French Liaison Officer to the 18th Field Artillery Brigade.

Synchronizing Fire Support and Joint SOF Operations

by Lieutenant Colonel James H. Van Buskirk, SF

The world has changed with the fall of the Soviet Union as the preeminent threat, but the probability of US armed forces conducting contingency operations in response to regional crises is high. This fact, combined with the reshaping of the US armed forces, requires that joint and combined operations become the norm.

This article makes the case for exercising Special Operations Forces (SOF) and conventional force fire support procedures. The discussion includes an overview of joint special operations (SO), joint SOF force structure, current SOF capabilities and requirements inherent in the interaction of fire support officers (FSO) with SOF elements. Finally, it discusses on-going initiatives to solve problems arising from these interactions.

The environment where Field Artillery and joint systems can reach into areas that Army, joint and combined SOF are operating require all elements work in close harmony to improve effectiveness.

Joint SO: Organization and Missions

Joint SO are activities conducted by specially organized, trained and equipped military and paramilitary forces to achieve military, political, economic or psychological objectives. According to Public Law 10, US Code 167, SO include direct action, special reconnaissance, unconventional warfare, foreign internal defense, counterterrorism, civil affairs, psychological operations, humanitarian assistance, search and rescue (in the context of SO) and other activities specified by the National Command Authority (NCA). SOF are those specifically organized, trained and equipped to conduct SO.

In 1986, after executive approval of an amendment to the Goldwater-Nichols Department of Defense Reorganization Act, the US Special Operations Command (USSOCOM) was established at MacDill AFB, Florida. Its mission is "to prepare assigned forces to carry out special operations, psychological operations and civil affairs missions as required and, if directed by the President or Secretary of Defense, plan for and conduct special operations."

The Commander-in-Chief (CINC) USSOCOM, has organized his assigned forces into three service component commands and a Joint Special Operations Command to accomplish these missions (see Figure 1).

US Army SOF, both Active and Reserve Components, are commanded by the US Army Special Operations Command (USASOC) at Fort Bragg, North Carolina (Figure 2). In addition to the organizations listed in Figure 2, USASOC has a SO support battalion and a SO signal battalion to provide dedicated support to deployed elements. The command can conduct operations in all five SO mission areas and emphasizes regional orientation and language qualification as well as the "hard" skills of air, sea and land infiltration or exfiltration; demolitions; long-range, secure communications; and medical and weapons training.

US Air Force Reserve and active Air Force SOF are under the command of the 23d Air Force at Hurlburt Field, Florida, which serves a dual role as the Air Force Special Operations Command (AFSOC) and as one of the three numbered air forces of the Military Airlift Command

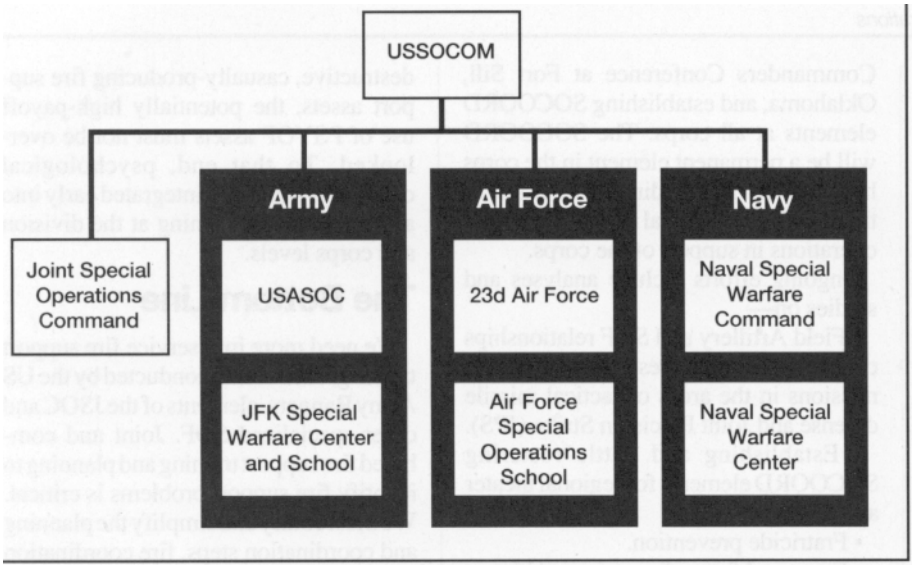

Figure 1: US Special Operations Command (USSOCOM) Organization, Headquarters at MacDill AFB, Florida.

(MAC). More than 100 airframes are in direct support of SO. They include the AC-130 Spectre gunship, the HC-130 tanker, the MC-130 Combat Talon fixed-wing and MH-53 Pave Low and MH-60 Pave Hawk helicopters. Additional Air Force SOF assets include EC-130s, SO combat controllers and weather teams; the pararescue or "PJs" may be placed in "harm's way" while conducting their missions.

US-based naval SOF are controlled by the Naval Special Warfare Command with its headquarters at the Naval Amphibious Base, Coronado, California. These SOF include active and Reserve sea-air-land (SEAL) teams, SEAL delivery-vehicle (SDV) teams and special-boat squadrons. Naval SOF assets can conduct beach reconnaissance and survey, intelligence collection, ambushes, port and harbor shipping attacks, coastal and riverine patrol and interdiction and harassment operations. SEAL teams are capable of insertion by sea, air or land using SDV or special-boat squadron assets, various aircraft or overland movement.

The Joint Special Operations Command (JSOC) is a standing joint task force with the inherent capability to command and control assigned and supporting forces in the conduct of SO and other operations as assigned by the Joint Chiefs of Staff (JCS) and NCA. Located at Pope Air Force Base, North Carolina, its assigned forces include Air Force combat controllers, an Air Force command and control element and a joint communications element.

The five principal SO missions are unconventional warfare (UW), direct action (DA), special reconnaissance (SR), foreign internal defense (FID) and counterterrorism (CT). Because of their training, skills, equipment and tactics, SOF also are suitable for employment in a range of "collateral" SOF mission activities, such as humanitarian assistance, counternarcotics and personnel recovery operations. For a more complete definition of the SOF mission and activities, see *JCS Test Pub 3-05 Doctrine for Joint Special Operations*, October 1990. Not all SOF perform all SO missions, but the force as a whole can support all national and theater SOF strategy and taskings.

Relevance to Fire Support Officers

What does this mean for the FSO? Why worry about squad and smaller size units well forward of the forward line of own troops (FLOT)? Historically, little interface or coordination was necessary between SOF and the FSO because doctrinally their operational areas did not overlap—they weren't even contiguous. This is no longer the case. The post-Cold

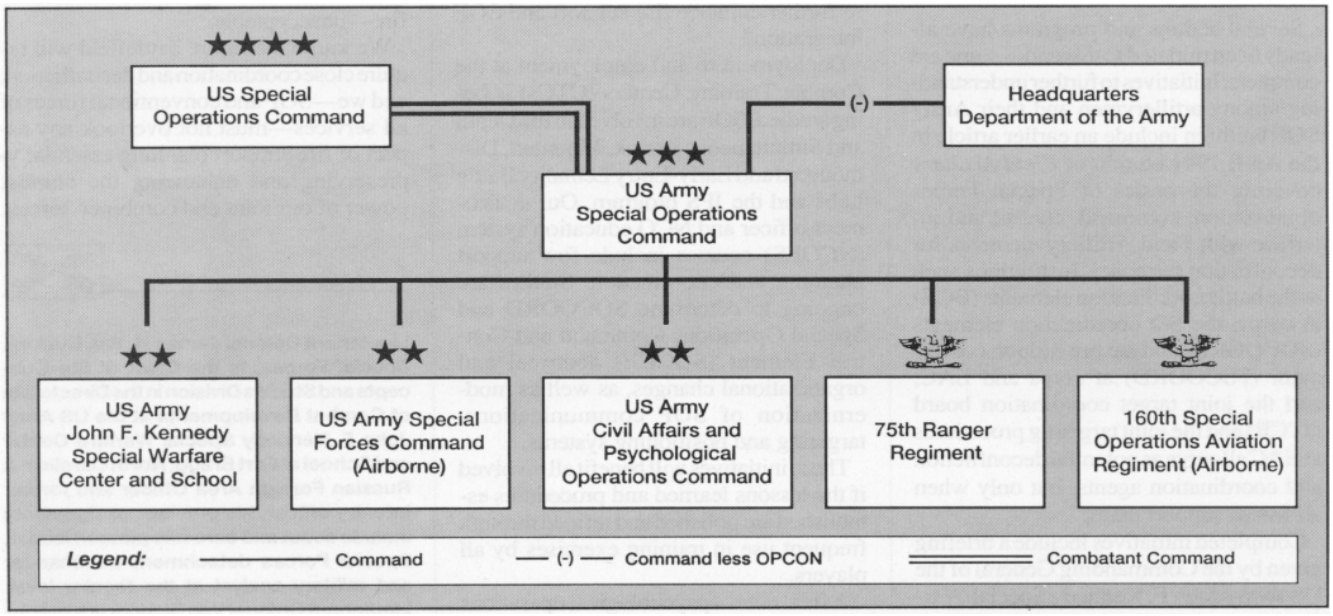

Figure 2: US Army Special Operations Command (USASOC) Organization, Headquarters at Fort Bragg, North Carolina.

War era focus on regional operations, technological advances that bring most of the contingency theater within the range of FA systems, coalition warfare and the potential for fratricide call for close coordination between the SOF and FSO. To increase effectiveness, FA and joint SOF need to become more closely associated and continue to work on tactics, techniques and procedures (TTP) for targeting, sensor and shooter cueing, target handoff and deconfliction.

Several articles have been written in *Field Artillery*, the Tactical Air Command's *ALFA* newsletter and elsewhere in the military professional community about coordination and deconfliction procedures for firepower resources of the corps and echelons above corps (EAC). While these are good starting points, we must think and communicate more on the intangibles—the Clausewitzian "friction" of war.

What happens when "Murphy" comes to your war? When you factor in the theater CINC requirements, coalition and allied doctrines and tactics, problems of language, terrain, weather, poor intelligence, faulty coordination, fatigue and general confusion on the battlefield, it's apparent that unless SOF and the FSO work effectively with each other, the potential for miscue, error and deadly misperception is high.

Ongoing Initiatives

Several actions and programs have already been initiated to this end—some are complete. Initiatives to further understanding among artillerymen and their Army SOF brethren include an earlier article in the April 1991 edition of *Field Artillery* covering the basics of Special Forces organization, command, control and interface with Field Artillery elements for deconfliction purposes. Institutions such as the battle coordination elements (BCE) at corps; the SO coordination elements (SOCOORD) and the fire support coordinator (FSCOORD) at corps and EAC; and the joint target coordination board (JTCB) and the joint targeting procedures at EAC all serve as potential deconfliction and coordination agents, but only when all forces support them.

Completed initiatives include a briefing given by the Commanding General of the US Army John F. Kennedy Special Warfare Center and School (USAJFKSWCS) at Fort Bragg to the 1992 Field Artillery Commanders Conference at Fort Sill, Oklahoma, and establishing SOCOORD elements at all corps. The SOCOORD will be a permanent element in the corps headquarters to coordinate and assist in the planning for Special Forces and ranger operations in support of the corps.

Ongoing efforts include analyses and studies on—

- Field Artillery and SOF relationships concerning mutual responsibilities and missions in the areas of tactical missile defense and Joint Precision Strike (JPS).
- Establishing and battle rostering SOCOORD elements for regional theater and field armies.
- Fratricide prevention.
- Force and future force composition.
- Conventional and SO targeting doctrine in *FM 100-5 Operations* and joint publications.

Concepts still on the drawing board include support during coalition warfare, with its inherent complications, and use of non-lethal fires and weapons in support of conflicts at the low-intensity conflict end of the operational continuum.

Army and SOF are jointly studying and addressing fire support coordination issues. How will SOF forces acquire fire support assets, control them and ensure they help, not hinder, mission performance? What training, leader development, doctrinal, organizational and materiel fixes do we need to implement? How can we design joint and service exercises to further enhance fire support and SOF integration?

Deployment to and employment at the Combat Training Centers (CTCs) is being studied. SOF are involved in the Depth and Simultaneous Attack, Mounted, Dismounted and Early-Entry Lethality Battle Labs and the JPS program. Our detachment officer and NCO education system (NCOES) courses include fire support planning and coordination. Studies are ongoing to determine SOCOORD and Special Operations Command and Control Element (SOCCE) doctrinal and organizational changes, as well as modernization of SOF communications, targeting and positioning systems.

These initiatives will benefit all involved if the lessons learned and procedures established are polished and refined through frequent use in training exercises by all players.

A final note—psychological operations (PSYOP) forces are also "fire support" assets. Though this article focuses on destructive, casualty-producing fire support assets, the potentially high-payoff use of PSYOP assets must not be overlooked. To that end, psychological operations should be integrated early into any operational planning at the division and corps levels.

The Bottom Line

We need more interservice fire support training, such as that conducted by the US Army Rangers, elements of the JSOC and other specialized SOF. Joint and combined fire support training and planning to identify fire support problems is critical. We must codify and simplify the planning and coordination steps, fire coordination measures and interaction needed when using US or non-US Army, Navy or Air Force assets to support US and non-US SOF activities.

The bottom line is that all the written doctrine, tactics, training, techniques and standard operating procedures (SOPs) are useless unless they become second nature through constant practice and by being included in every exercise—whether SOF are players or not. If that doesn't happen, when the contingency operation occurs and time is short, the critical coordination and deconfliction won't be *automatic* as live rounds are fired. The "bill payer" may be a special operations soldier, sailor or airman down range who didn't have enough fire support when he needed it or was in the bursting radius of friendly fire—unacceptable.

We know the future battlefield will require close coordination and deconfliction, and we—SOF and conventional forces of all services—must not overlook any aspect of fire support planning essential to preserving and enhancing the combat power of our joint and combined forces.

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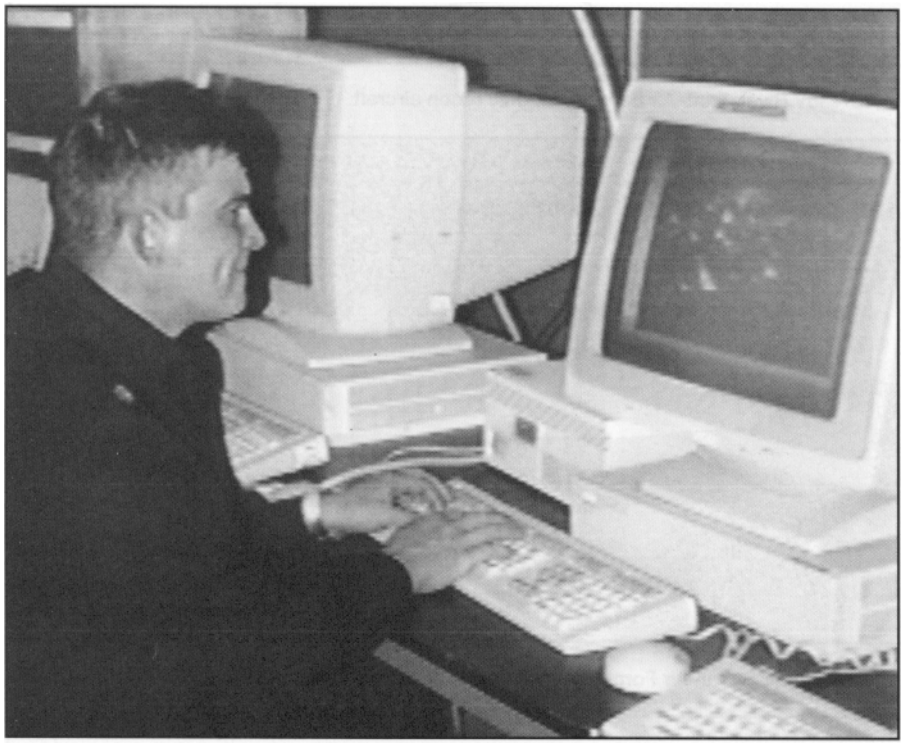
Blue Flag—

Air Force Exercises for Theater Interoperability

by Catherine Lennon



One of the greatest challenges of modern warfare is to effectively employ diverse capabilities in the conduct of operations. To meet this challenge, the US Air Force's Air Combat Command (ACC) created the Air Warfare Center's 41st Training Group "Blue Flag" exercises at Hurlburt Field, Florida. Blue Flag stresses the interoperability of theater command, control, communications and intelligence (C^3I).

Each Blue Flag scenario emphasizes combat command and control (C^2) and support training for battle commanders in realistic threat environments. To do this, theater war games are played using computer simulations of combat. Within the computer's air and ground movements, battles are fought, creating combat situations to which the battle staff commanders must react. Two computer models provide responses to players' actions and generate reports from simulated areas of operation.

Ground Combat

The first model is the theater exercise intelligence simulator (TEXIS). TEXIS was derived from the Army's tactical simulator (TACSIM) developed by the Test and Experimentation Command (TEXCOM) at Fort Hood, Texas. To meet the needs of Blue Flag training, the original TACSIM has been extensively modified and redesigned. The resulting model is a theater-level computer simulation that moves enemy ground forces on the battlefield.

For each Blue Flag scenario, essential information about enemy ground forces is built into the computer. Maneuver elements, sites, lines of communication, objects with descriptions of their features and activity patterns, such as attacks, convoy movements and assemblies of forces, are programmed into the game.

Preplanned enemy movements designed to meet specific enemy objectives of the theater being exercised are entered into the computer. During the game, movements and unit strengths can be modified by the exercise control staff to accommodate play.

As the war proceeds, TEXIS updates and changes the face of the battlefield in response to friendly attacks and troop movements. Attrition during the game is computed using the Joint Munitions Effectiveness Manual (JMEM) tables for probability of kill ratios. Updates occur as the game progresses.

TEXIS manipulates the play data to provide intelligence information that replicates reconnaissance mission reports. The computer produces reports in both the volume and format generated during actual combat operations. Reconnaissance simulations imitate a variety of collection platforms. These include Air Force electronic reconnaissance aircraft, such as Quick Look (RV-1D), Rivet Joint (RC-135) and the high-altitude Senior Ruby (U-2); the tactical recon RF-4C; the imagery recon OV-1D, which has side-looking radar (SLAR); other aircraft equipped with the SLAR UPD-4 system; and the Navy recon Prowler (EA-6B). The reports are generated in the US message text format (USMTF) and simulate imagery interpretation reports, reconnaissance exploitation reports, tactical reports and tactical electronic intelligence (ELINT).

More specific reports, such as fixed-site battle damage assessments (BDA), unit information and others, provide the control side of the game with information that's passed to the players as the game evolves. Additionally, BDA information that occurs as a direct result of air strikes flown in the Air Warfare Simulation (AWSIM) is also provided by TEXIS in the form of mission reports (MISREPS).

Air Combat

AWSIM is the USAF's theater air warfare model. It provides the air picture for the game. A direct, two-way interface with TEXIS allows for a complete air and ground picture of the area of operations. For example, damage that results because of a bomb dropped from an aircraft flown

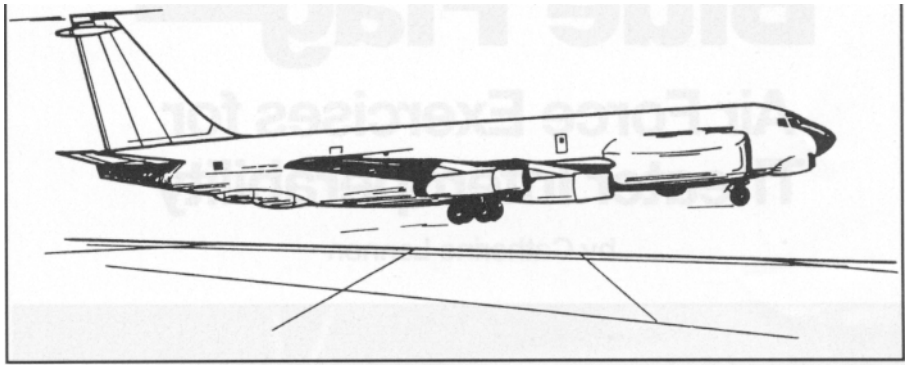
in the AWSIM model is reflected in the destruction of a target in the TEXIS model.

Within the AWSIM system, simulation of theater air warfare takes place in a real-time arena. AWSIM permits two-sided and interactive play where the blue, or friendly, forces meet the opposing forces (OPFOR). Within the framework of AWSIM, each side defines, structures and controls both air and air defense forces.

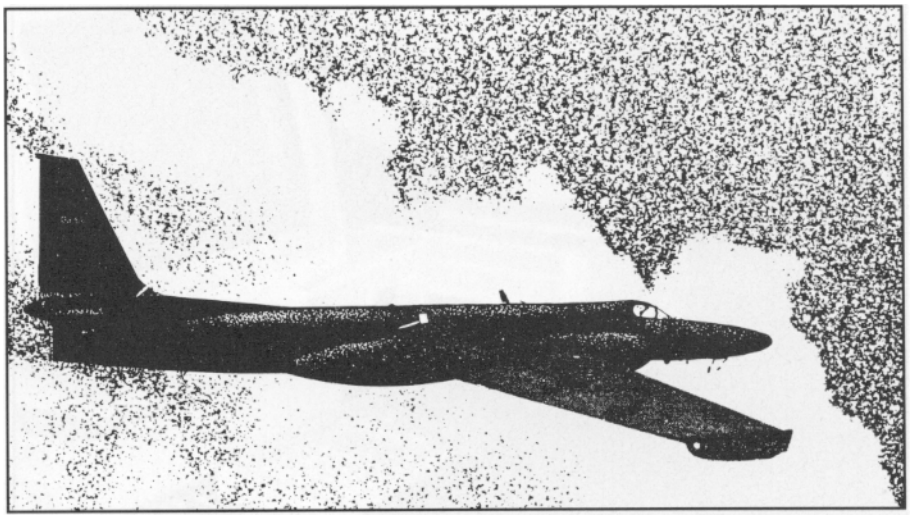
View of the air battle comes to the players by high resolution, geographic displays coupled with information from automated status boards (ASTABs) that reflect the AWSIM situation and provide the players information concerning air availability, mission status and engagement histories, among others. Up to 60 ASTABs can be selectively viewed, although not all information is available to the players.

To replicate the delays and misinformation in reporting that actually occur in battle, the control staff delays the release of information that would not be instantaneously available to the players and (or) modifies information when appropriate. Depending on the function, player or controller, various degrees of information regarding the status of friendly and enemy units are available at each workstation.

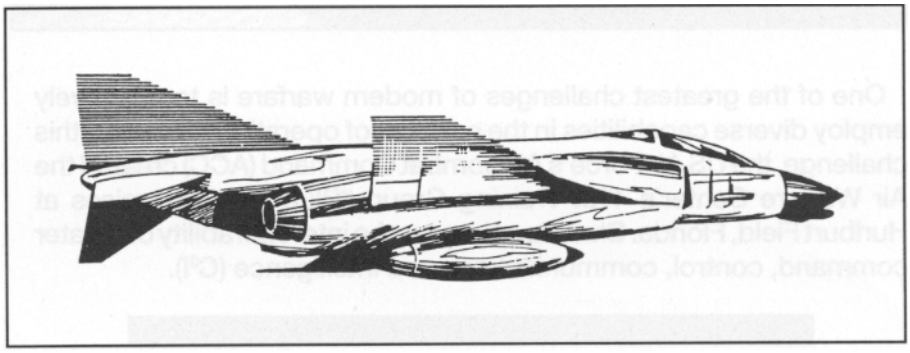
For every Blue Flag exercise, all assets available for play are loaded into the AWSIM system before the exercise. Aircraft, weapons, bases, ships, radar and surface-to-air missile (SAM) sites and communications systems are among the types of objects that AWSIM portrays. Once these objects are built, they're assembled into a scenario file. Within this format, there's the capability for both prescripted and free play. As the computer simulation progresses, the movement of assets, combat engagements and detection of the OPFOR occurs.



RC-135V Rivet Joint-Air Force electronic recon aircraft.



U-2R Senior Spear-Air Force strategic and tactical recon aircraft.



RF-4C-Air Force tactical recon aircraft.

Integrated Warfare

Actual battles are fought through the interaction between TEXIS and AWSIM. Unlike other ACC "flag" exercises that use live-flight formats, the computer "flies" all sorties in Blue Flag. Thus, at Blue Flag, it isn't flying skills that are exercised, but rather the planning and conducting of C^2 procedures for theater-level, regional and limited-intensity conflict.

Theater-level operations require more diverse use of military power than air assets alone. While Blue Flag is not chartered as a joint exercise, the nature of the training requires all combatant services to understand the procedures and doctrine of and cooperate with each other. As a result, Blue Flag has a distinctively joint flavor.

Each Blue Flag scenario integrates Army, Navy and Marine participation, with the Army's the largest. Through Forces Command (FORSCOM), the Army provides an advisory element, a permanent Army staff, within the organizational structure of Blue Flag to achieve Army representation and to assure optimum training. This training spans the scope of operations from the theater army down through the corps and division levels to the team.

Coordination of airspace management, fire support, joint air attack, close air support (CAS) and suppression of enemy air defenses (SEAD) are key aspects of Army participation in Blue Flag exercises. These are accomplished both on the player and the controller sides of the game. At the corps level, the Army works with a

numbered Air Force staff as player or driver participants. Yet, at the division level. Army participation takes on a control function.

The main thrust of the Army's involvement comes from the ground scheme of maneuver of the corps. Within the Air Force's air operations center (AOC), the Army liaison is involved in four functional areas—logistics, intelligence, plans and operations. Through the AOC, the Army becomes familiar with the joint force air component commander's (JFACC) joint targeting procedures. Here, the need to mediate Army targeting requirements is balanced against the JFACC's available resources and his targeting requirements. Simultaneously, the Air Force players learn about Army targeting doctrine and procedures. The interplay between fires, air defense missile coverage and aircraft coverage is sorted and exercised in a force-on-force scenario.

Blue Flag is the only forum where the Army has the opportunity for joint battle training using a full numbered Air Force AOC and a full battlefield coordination element (BCE) representing the ground component commander.

Exposure to Air Force procedures provides positive and significant training to Army commanders. Within the framework of the air tasking order (ATO) process. Army players are made aware of the critical need to keep the Air Force informed of the fire support coordination lines (FSCL) to ensure that projection of the Army's needs can be conveyed to the AOC. As the employment of air assets is based on apportionment (the division of air assets into types of missions), the need for Army input well before the ATO becomes clear to the players. The entire process stresses and exercises the interaction between the services in the development of the ATO.

Another aspect of Army training in Blue Flag involves exercising the Air Force's air support operations center (ASOC). The ASOC coordinates and directs CAS and other immediate tactical air operations in support of ground forces. Typically, the ASOC is collocated with the corps headquarters and serves as its conduit into the tactical air control system.

In addition to exercising coordination between the Army and the Air Force, Blue Flag exercises provide the opportunity to increase all services' familiarity with diverse weapons systems. Coordination of the Army tactical missile system (Army TACMS), effective use of Patriot missiles and proper use of aircraft to achieve deconfliction of systems and assets yield a greater understanding of the synchronization of different weapons systems. Participation in Blue Flag by Army commanders and their staffs gives them the opportunity to exercise the procedures necessary to facilitate joint operations in a mature theater.

Participation, synchronization and coordination of all assets are key to Blue Flag training. This is done in a dynamic arena. The TEXIS-AWSIM models allow for free play against a reactive OPFOR. This requires the Army players target enemy systems, adjust fires and redirect assets while keeping in close communication and coordination with air forces.

Current doctrine and tactics from each unified theater exercised are employed. While it isn't the focus of Blue Flag to settle doctrinal issues, the nature of the play allows staffs to experience current plans and policies in an objective setting. Strengths and shortfalls of doctrine can then be discussed and explored as a result of lessons learned from the Blue Flag training experience.

The exercise of C^2 synchronization between services includes participation at the general officer level. While coordination of assets goes on at the three-star Army-to-Air Force level, training also includes a mix of active duty, Reserve and National Guard units to assure C^2 functions are exercised throughout the total Army. In FY 92, more than 750 Army personnel participated in Blue Flag exercises. Each year the largest scenario played is the Central Command (CENTCOM) Southwest Asian theater.

Desert Storm underscored the importance of realistic training for commanders and senior staffs. Displayed in the front offices of the 41st Training Group at Hurlburt Field is a letter from Lieutenant General Charles Horner, former Central Air Force (CENTAF) commander, to Major General John Corder, former commander of the Air Warfare Center. In the letter, General Horner states, "Blue Flag made Desert Storm a success." Since the Gulf War, Army participation in Blue Flag exercises has more than doubled.

Blue Flag Evolution

Blue Flag currently exercises seven unified theaters. Additionally, the Blue Flag staff, in cooperation with the Army, continues to define the requirements for interface between the AWSIM model and the Army's prime wargaming model, the corps battle simulation (CBS). The goal is a higher level of training for all participants during joint exercises.

Realistic simulation of theater operations that develop and conduct Air Force and joint service C^3I training for combat leaders and battle staff personnel is the mission of Blue Flag. Since 1979, Blue Flag has exercised a command post exercise format using a computer-assisted (CAX) framework. Through evolution and necessity, Blue Flag computer simulations and wargaming models have expanded to meet changing defense needs.

The new distributed wargaming system (DWS) is one example of innovative training techniques used at Blue Flag. DWS combines satellite links and land-based communications to send wargaming data to remote locations. Secure telephone, fax and video teleconferencing, along with a computer data stream to carry the AWSIM-TEXIS models, give Blue Flag the capability to train more individuals at their home bases or at remote sites. The opportunity to provide training to units at their home stations opens the door to further joint training and expands the scale of wargaming and simulation training.

Combat commanders manage their own forces in Blue Flag's interactive training. Command decisions directly affect the outcome of battles fought in the game. Short of actual combat, Blue Flag simulations provide senior leaders the best opportunity to face the challenges of battle and maximize the diverse capabilities available for the conduct of modern warfare.

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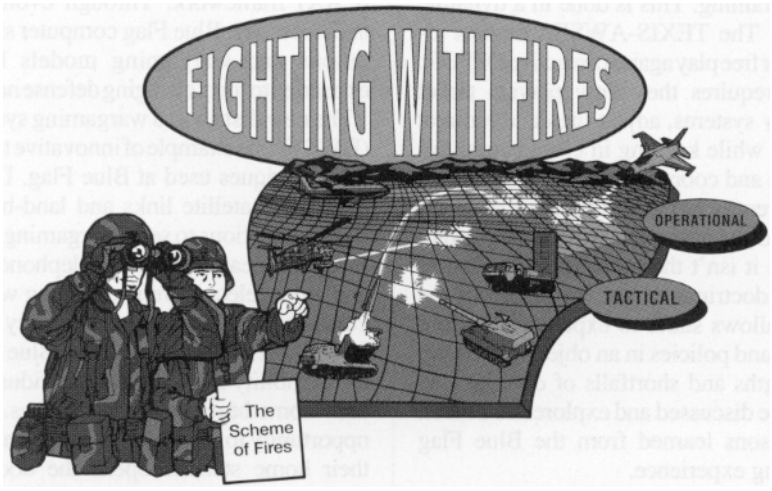
Fire Support Coordination = Supervision of the Plan:

A Brigade FSO's Perspective

by Major John W. Harbison



What constitutes fire support coordination at the maneuver brigade level? Is it just the allocation of assets or much more?

After observing and controlling maneuver brigade fire support officers (FSOs) at the Combat Maneuver Training Center (CMTC) at Hohenfels, Germany, for more than 12 months, I found most brigades either micromanage task force (TF) assets or abdicate responsibility.

Many brigade FSOs fail to follow through or supervise the brigade plan. Overlooking this key step has minimum impact at the Combat Training Centers (CTCs) when concentrating on the TF level. However, with the ever-increasing emphasis on brigade operations—a minimum of two maneuver TFs on the ground—proper coordination and supervision is becoming more important. So what is fire support coordination?

Commander's Concept for Fires

Coordination begins with understanding the brigade commander's intent. From this overall intent, a concept for fires must be developed. The responsibility for developing the commander's concept for fires lies with the *brigade commander* with advice from his fire support coordinator (FSCOORD), the direct support (DS) battalion commander. However, often this task is given to the brigade FSO. Based on his involvement in the planning process, he develops the concept for fires. Unfortunately, the brigade commander rarely sees *his* concept for fires.

The FSCOORD is the chief adviser to the brigade commander on how fire support can best support his plan. He also accompanies the brigade commander to the most crucial meetings and decision briefings and, therefore, should most clearly understand the plan, as established by the brigade commander. With this perspective, the FSCOORD can help the brigade commander clearly articulate his concept for fires. Then the FSCOORD can incorporate into the concept for fires the essential items the task force FSOs need to fully understand the plan and employ fires (see Figure 1).

What are some indicators of an unclear commander's concept for fires? Three occur most often.

The first is "measle sheet" fire planning by the brigade FSO—planning targets on terrain features that have no meaning or purpose. The fire plan doesn't support the scheme of maneuver, and the task force FSOs feel betrayed by the brigade FSO. Instead of providing guidance and resources, the brigade FSO confuses the situation and burdens the task forces with meaningless targets.

The second common indicator is the converse of the first. The task forces receive no guidance and, therefore, plan in isolation. As a result, task force plans aren't synchronized across the brigade.

Finally, a third indicator is the failure to use or the misuse of available assets, such as close air support (CAS) or Army aviation. These effective, lethal fire support assets are either not allocated or not planned for use according to the commander's intent and, therefore, are wasted.

Once the brigade commander and the FSCOORD develop a good commander's concept for fires, the coordination or supervision of the plan begins. The brigade FSO must issue the (brigade commander's) plan for fire support to the task force FSOs in the form of a fire support execution matrix. This extremely important document has caused many problems not only in coordinating fires, but also in executing the fire plan.

- Incorporates higher commander's intent.
- Specifies how, when and where to kill the enemy.
  - —What systems and how much to shoot at the enemy (attack criteria).
  - —What enemy elements to shoot (engagement criteria).
  - —Who has priority of fires (priority of fires/priority targets).
- Includes all fire support assets and special munitions.

Figure 1: Commander's Concept for Fire Support. The FSCOORD incorporates essential items into the commander's concept for fires, ensuring FSOs fully understand and can implement it.

Fire Support Execution Matrix

FRAGO/OPORD _____ DTG: _____

Commander's Concept for Fire Support: _____

_____

_____

_____

	Graphic Control Measure/Event	Graphic Control Measure/Event	Graphic Control Measure/Event	Graphic Control Measure/Event
Phase				
Brigade				
COLT				
TF				
TF				
TF				
Priority of Fires				
#Priority Targets				
#Final Protective Fires				
FSCM				
Target Allocations				
High-Payoff Targets				

Legend: FRAGO/OPORD = Fragmentary Order/Operations Order
DTG = Date-Time Group
COLT = Combat Observation Lasing Team

Figure 2: Example of a Fire Support Execution Matrix. Whatever format the brigade FSO uses, the matrix must be clear, simple, convey the commander's concept for fires, convey the brigade FSO's plan for execution and be easy to work with and detailed enough to implement.

Fire Support Execution Matrix

The fire support execution matrix should be the blueprint for executing the fires portion of the plan. There's no "school solution" for how a matrix should be set up. However, *FM 6-20-40 Tactics, Techniques and Procedures for Fire Support for Brigade Operations (Heavy)* offers several examples.

The important thing is to develop a matrix that works for the brigade FSO and his subordinate FSOs. Too often, brigade FSOs have fire support execution matrices that are unfamiliar to them or ones upon which they haven't been adequately trained. The matrix should be the document attached to the operations order that clearly articulates the brigade commander's concept for fires and spells out how the fire plan will be executed.

At the brigade level, the matrix should allocate resources, assign responsibilities for observing brigade targets and define the transition from the brigade to the task force fight. Because the brigade is primarily a resource allocator, the first stipulation is obvious.

Through the fire support execution matrix and rehearsals, the brigade FSO can ensure those targets planned at the brigade level will be observed during the plan's execution. This process helps ensure coverage, identifies problems (if too many targets have been planned without concern for observation) and verifies target validity.

Brigade FSOs and FSCOORDs should not overlook the transition from the brigade to the task force fight. In some cases, task forces don't have fire support priority until the enemy is on top of their positions or behind them. By clearly defining a trigger for turning the fight over to the task forces (based on a given priority) the FSCOORD or brigade FSO can establish a predetermined battle hand-over that facilitates the task forces' executing the plan.

Two final points about the fire support execution matrix: clarity and executability. First, the matrix should be clear, simple, convey the commander's concept for fires, convey the brigade FSO's plan for execution and be easy to work with and detailed enough to implement the concept. It should be tied to the same events on the brigade decision support matrix. This helps show what event triggers a particular fire support event. Figure 2 gives an example of a detailed fire support execution matrix, only one of a number the brigade FSO could use.

Second, and probably most important, the brigade FSO must develop a fire support execution matrix that works for him and his subordinates and train with it. It must be a useful tool that enhances fire support. The matrix doesn't have to please anyone else, just help the brigade FSO do his job of putting steel on target.

Supervision of the Plan

Once the brigade issues the order, along with the fire support execution matrix and target list, the brigade FSO's job is done, right? *Wrong*. This attitude is fostered by a similar attitude espoused by some brigade commanders who don't want to tell a task force commander how to "fight his fight." But it's a brigade fight, not a task force fight. It's also a superior's responsibility to check on his subordinates' compliance with his orders. Why should this be any different when issuing a brigade operations order?

For several reasons, the brigade FSO must receive a copy of all task force plans and analyze them. He must ensure the plan—

- Is doctrinally sound (targets are planned along the route of march, on the objective, and beyond to help protect the force in case of a counterattack).

• Meets the brigade commander's intent (assets are planned for areas in which the brigade commander wants to kill the enemy, and the fire plan supports the task force and brigade scheme of maneuver).

• Doesn't duplicate targets among the task forces.

• Uses all assets assigned to the task force (has plans for all priority and family of scatterable mines, or FASCAM, targets and plans to use CAS, if available).

• Assigns observers for all brigade targets assigned to the task forces down to the company or team level.

The brigade FSO's checking the task force plans helps him identify problems or mistakes in the overall plan and facilitates solving problems before a rehearsal. It also gives the task force FSOs a chance to do some bottom-up refinement through their interaction with the brigade FSO. For example, if the brigade assigns a target to a task force for observation, but the task force scheme of maneuver won't support observation of the target, the time to resolve this issue with the brigade FSO is *before* the rehearsal. The brigade FSO can then cancel the target, or (if the brigade commander feels the target is important enough) he can direct the task force commander to change his scheme and observe the target. The point is that bottom-up refinement is necessary for a plan to be successful and must occur before the rehearsal.

Rehearsal

An important step in clearly understanding a plan is to rehearse it—a principle no less applicable to the fire support plan than to the maneuver plan. However, too frequently the fire support plan is either not rehearsed or rehearsed poorly. If done at all, a typical fire support rehearsal occurs so close to execution that any changes made can't be disseminated properly. Another common error is that all key players or executors of the plan aren't present or "on the net" for the rehearsal.

Probably the most common error is that the rehearsal isn't a rehearsal—it's a war-gaming of the plan. A war game is an analysis of a "course of action against likely enemy courses of action....During the war game, the course of action can be changed or modified..." (*FM 71-123 Tactics and Techniques for Combined Arms* ***Heavy Forces: Armored Brigade, Battal****ion, Task Force and Company/Team,* Page 1-31). Whereas, "A rehearsal is the act or process of practicing an action in preparation for the actual performance of that action" (FM 71-123, Page 2-50). Fine tuning may occur during a rehearsal—not major revisions or "what If-ing" of the plan.

If it's a brigade rehearsal, it should be conducted along the entire brigade front and include the brigade S2's assessment of the most likely enemy actions that trigger friendly events. The wargaming technique of "avenue in depth" is often used by brigades as their "rehearsal" technique. The outcome is the lack of synchronization across the brigade front because the "rehearsal" doesn't address multiple enemy avenues and friendly counteractions.

Unit commanders may want preparation or assault fires on different objectives at the same time. FASCAM may be planned for execution at the same time during the battle when a subordinate task force expects to execute a key engagement area. It's the brigade's responsibility not only to allocate resources, but also to synchronize those resources on the battlefield.

Synchronization requires brigade and task force commanders and staffs rehearse a plan (war-gamed earlier) that's sound enough to require only minor adjustments, has key players present and occurs well before execution. Such a rehearsal ensures leaders at all levels fully understand the overall plan and their portions of the plan.

So, what is fire support coordination at the maneuver brigade? It's more than the allocation of resources. Fire support coordination at the maneuver brigade is a continuous process that begins with planning based on the commander's intent, continues with preparation and supervision of the plan and ends only when the plan is executed and the mission is complete.

Most brigade FSOs don't stay involved with the task force FSOs through the planning and preparation phases. If the brigade commander's intent is to be met, the brigade FSO must not only develop targets and allocate resources, but also supervise and coordinate the plan. If he fails to stay involved, he makes an already difficult task even more difficult.

Giving a subordinate the resources he needs for a mission doesn't remove the senior's responsibility for supervising that subordinate as he accomplishes that mission. Ensuring the subordinate's plan is doctrinally sound, in accordance with the brigade commander's intent and in concert with the rest of the brigade plan isn't telling a subordinate how to fight. But it does help the brigade commander synchronize his plan, and it does make sense.

"Fire support coordination at the maneuver brigade is a continuous process that begins with planning based on the commander's intent, continues with preparation and supervision of the plan and ends only when the plan is executed and the mission is complete."

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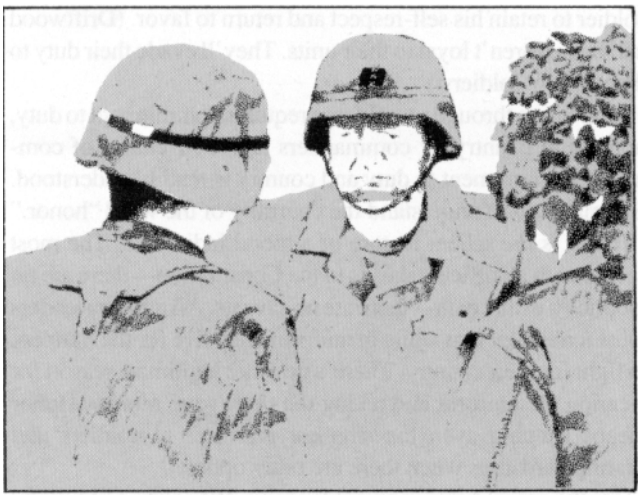
Commandership

by Brigadier General Huba Wass de Czege



"Commandership" is a special kind of leadership. First, like all military leaders, commanders must be able to ask soldiers to risk their lives in combat. Second, special legal authority and responsibility is vested in them. Company, troop or battery command is the first level at which leadership becomes commandership.

While we often talk of commanders juggling many glass balls, command in peace and war boils down to only four functions: provide purpose, establish direction, generate motivation and sustain unit effectiveness. Units for which these functions aren't accomplished are ineffective. Command failures result less from personal attributes and style than from one or more of these functions being poorly performed. Successful commanders perform these four functions well, and their success is in direct proportion to how well they perform them.

Providing Purpose

Commanders must make a clear connection between higher purposes and the task at hand. This is putting mission in context, restating it, setting and articulating overall unit goals and objectives—determining intent.

Subordinates perform best when they know why something is to be accomplished. This gives their actions and sacrifices meaning. Commanders must trust subordinates to use initiative to align their individual aims and actions with those of a higher purpose in ways that can't be forecast before battle.

Commanders must define more than just immediate goals; they must instill a vision of the future they wish to create and communicate it clearly. They must "sell" these goals to the unit members to orient the energies of the organization. Without orientation, organizations are rudderless bureaucracies. In the stress of combat, such units dissolve and are defeated piecemeal.

Successful commanders draw on Army and unit traditions and history and distill published and verbal guidance from commanders at least two levels higher. Most importantly, before launching on any task or mission, they clearly have in mind the intent of the next two higher commanders. (This may not be easy because intent is not always clearly and explicitly stated when tasks or missions are assigned and may require some deduction and questioning.)

Establishing Direction

This is troop leading, standards and values setting, the application of doctrinal practices, use of standing operating procedures (SOPs) and maintenance of discipline.

Troop leading is gathering information, analyzing, making decisions, communicating intent and issuing orders, supervising execution and assessing the result of actions. Each step is important, and there is a well-documented art and a science associated with each. This is the explicit side of establishing direction.

There's an implicit side as well. Built-in stabilizers (as in an autopilot) make it unnecessary for leaders to be everywhere at once. They allow them to go to the decisive place at the decisive time to focus the unit's main effort without concern about the many supporting tasks being accomplished elsewhere.

The higher commander's intent becomes the focus of action and provides an immediate orientation. Communicating intent in clear and unambiguous terms down through an organization can be extremely challenging. The payoff, however, is high. It speeds action, especially when conditions change rapidly and previous orders and instructions are overcome by events.

Unit values, standards and discipline determine *how* things are done when the boss isn't checking; SOPs, doctrine and training determine *what* is done without a need for orders.

Setting and enforcing standards is a difficult art, but there are some guiding principles. All standards must have a clearly defined purpose and be reasonable. Once standards are set, they must be adhered to 99 percent of the time. Unenforceable or unenforced standards teach indiscipline. Discipline, the "cheerful" obedience to orders, is the inner direction that ensures tasks are accomplished to standard even when the boss isn't there.

Teaching and enforcing the use of accepted doctrine and SOPs during training simplify the task of establishing direction in the press of time.

Maintaining a disciplined unit also is a difficult art. The key principle, though, is never give an order unless it's to be carried out. Its corollary is to enforce every order until it's rescinded or amended. Commanders must have the self-confidence to do this

as situations dictate. This applies to SOPs, written or verbal.

"Bending the rules" in one area erodes the standing of rules in all areas. It's best to minimize rules, amend or rescind rules as reason dictates and then zealously enforce those that exist. The most pernicious threat to discipline is for leaders to violate their own rules. To establish discipline, commanders set and enforce *appropriate* standards, place responsibility and hold people accountable.

Generating Motivation

It isn't enough that subordinates know what's to be done and why. They must have the will to do their utmost to achieve the objectives set under the most difficult circumstances. Moral force is the most effective source of will. Moral force is based on the self-respect of individuals, the values of the organization, the loyalties of people to their units and their leaders and the honor, commitment, competence and tenacity of leaders.

Followers demand leaders meet a higher ethical standard than they, if they're to be followed. Maintaining this linkage of mutual trust and respect is a two-way responsibility, but leaders have the greater weight of responsibility. Leaders must be competent, and their soldiers must see them that way. Commanders must place a premium on the competency of their chains of command. These things always must be tended to.

Individuals in units fall into three categories—"stalwarts," "driftwood" and "ballast." Stalwarts are the ones who do the work. They're the ones most motivated by moral force. The driftwood does just enough to get along and not cause any trouble—they drift with the current and are seldom really noticed. The ballast are those who tend to work against the organization by either actively sabotaging its work or taking up a great deal of leadership time.

The best course is always to tend to your stalwarts, develop more stalwarts out of driftwood and expeditiously dump your ballast, if they can't be made into stalwarts. Successful commanders make stalwarts of sufficient soldiers to accomplish the mission.

Rewards and punishments *do* motivate. And a climate in which rewards and punishments are seen to be fair will enhance the bond of trust and respect between the leader and led. Punishment usually can make ballast into driftwood, but it takes more to make a stalwart. The unfair administration of rewards can turn stalwarts into driftwood.

Self-respect is what sets stalwarts apart. Take away self-respect and a former stalwart becomes driftwood. Soldiers without self-respect won't respect the wishes of their leaders. (Only the potential loss of self-respect overcomes fear. If a soldier has none to lose, his fear will make him a coward.) Good leaders can chew a soldier out and still keep the door open for the soldier to retain his self-respect and return to favor. (Driftwood and ballast aren't loyal to their units. They'll evade their duty to their fellow soldiers.)

Motivating through moral force requires commitment to duty, honor and country by commanders and their chains of command. Commitment to duty and country is readily understood. But many don't understand the enormity of the word "honor."

Honor is *the* salient feature of a moral individual. The most sacred oath an officer takes is to the Constitution—there are no loopholes in that oath—there are no caveats. All military leaders must remember that while in uniform, they live for the moment to fight for their country. There's no other legitimate reason for wearing the uniform and taking the taxpayers' money. Honor means keeping even the smallest promises to soldiers and sharing hardships when there are other options.

Finally, moral force requires tenacity. When the fight really gets mean, soldiers look for any excuse to pull back. Staying one more round, five more minutes or one more assault is often the difference between victory and defeat.

Sustaining Effectiveness

Commanders, like all leaders, must sustain effectiveness in their units for the next and later missions. In machinery, we strive for efficiency in process; in organizations, we seek success in terms of goals and objectives. Both are effectiveness.

Effectiveness requires a focused investment in people and a husbanding of resources. In the short run, leaders may have to concentrate their efforts on sustaining effectiveness through the current mission only, but commanders always must consider the missions beyond. There are several things a leader can do to sustain effectiveness.

Successful leaders provide for their own succession—personally mentoring subordinates with potential, ensuring schooling and experience is provided for growth and doing those things necessary to build a strong chain of command.

Good leaders get and keep good people. While junior officers must work with whomever they get, they certainly influence reenlistments. Reenlistment decisions most often hinge on the soldier's experience at the platoon level. Therefore, junior officers shape the future through those they reenlist.

Effective leaders train seriously. Units are continually learning and unlearning procedures, habits and skills. Commanders must ensure all unit leaders first know what needs training and then focus on mission-essential tasks, applying the principles of performance-oriented training. Leaders must be prepared to use training time and resources to the fullest and be creative and maintain interest.

Leaders must make the most of the resources they have and do what's necessary to get what they need in the future. For junior officers, this is enforcing supply discipline, conducting preventive maintenance and anticipating and ordering supplies and other resources.

Finally, leaders make a long-term investment in unit values, attitudes and physical well-being—take care of the troops. Values such as "we always pull together" are invaluable to unit effectiveness but take a considerable effort to establish and keep in place. The values of an organization are those shared by its members. They cannot be empty slogans.

Some experts speak of developing a "winning attitude." Others use the term "moral ascendancy." Many respected warriors say moral ascendancy is the primary determinant of battle outcome. In battle, moral ascendancy overcomes fear. Fear affects all, and each of us has a limit.

Moral ascendancy is supported like the seat on a three-legged stool—one leg is technical competence, the second a climate of discipline and the third esprit de corps. Good, stimulating training is the key to competence, the first leg. Such training builds knowledge, skills, attitudes and sound habits. To maintain the second leg, discipline, takes constant tending. Building a climate of discipline requires consistent enforcement of standards by leaders who set the example. For the third leg, commanders must build morale and esprit by caring about soldiers. Soldiers have to *believe* their leaders care, and officers have to *prove* that care again and again by checking health, clothing, weapons and gear and by holding sergeants accountable for these. Leaders also show their care by sharing hardships. But the best care leaders can give soldiers is tough, realistic training—sweat now saves blood later.

Leadership can be summarized in a different way. In our Army, we talk about what leaders must Be, Know and Do. To be successful, commanders must Be, Know and Do the following:

Commanders must be—

• Above reproach in ethical behavior. Commanders must demonstrate the moral force to have the credibility to ask soldiers to do difficult things in trying circumstances.

• Loyal to superiors and country. There must be a positive link between the sacrifices commanders ask of their soldiers and the good of the larger organization.

• Loyal to his soldiers. Without this loyalty, the sacrifices asked of soldiers will be fulfilled in diminished terms.

• Self-disciplined. Commanders must have the perseverance, stamina or will to do what must be done for soldiers, superiors or country. All warfare is a game more of the spirit than the body. The victor is often he who wills strongest and hardest.

• Flexible-minded. Warfare is more like basketball than football. Good commanders look for the fast break and don't get locked into patterns—there's often no lull in the action to call a new play. Speed is very important, and things can get sloppy and chaotic. The commander's job is to make order of chaos—on the move.

• Forward-looking. Good commanders have the courage and professionalism to do what's right for the long term.

Commanders must know—

• Their people--what their soldiers can and can't do. They must know how to motivate them—what makes them tick. Commanders should always try to know what soldiers are thinking and what their concerns are.

• Their business. Soldiers, superiors and the country deserve a knowledgeable commander. Commanders should never stop learning; they can't learn too much. It's a commander's duty to read and educate himself.

• Themselves. Good commanders don't let themselves be less than they can be. They know their strengths and weaknesses and are honest with themselves about same. There's too much at stake for their soldiers, superiors and country to do otherwise.

• The big picture. Good commanders always know why they are doing whatever they're doing. If what they're doing doesn't make sense, chances are their immediate or next higher superior wouldn't want them to do it. Commanders are paid to mentally reach beyond the realm of their individual tasks and assignments. If they can't explain the purpose of assigned missions to themselves, they can't explain it to their soldiers. If they are not explicitly told and can't implicitly determine the purpose of assignments, they must ask the right questions. Their piece of the action has to fit into the higher unit's mission, or they may waste the blood of their soldiers and the treasure of their country in actions that have no purpose.

Things commanders must do—

• Put the safety, honor and welfare of their country first—always and every time.

• Put the honor, welfare and comfort of the soldiers they command next.

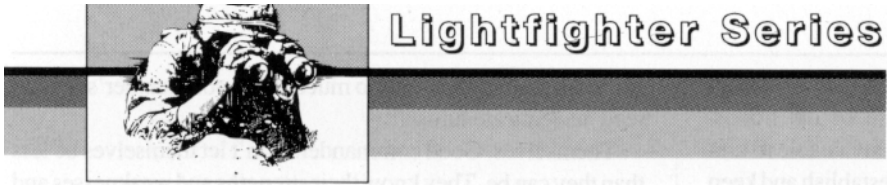
• Put their own ease, comfort and safety last—always and every time.

• Think, plan and anticipate—always and every time.

Everything written so far on commandership can be encapsulated in General George Washington's advice to his officers at Cambridge, Massachusetts, on 10 November 1775:

"The best general advice I can give...is to be strict in your discipline; to require nothing unreasonable...but see that whatever is required be punctually complied with. Reward and punish each man according to his merits; hear his complaints...and impress upon the mind of every man, from the first to the lowest...what it is they are contending for."

Brigadier General Huba Wass de Czege is the Assistant Division Commander (Maneuver) for the 1st Infantry Division (Mechanized) at Fort Riley, Kansas. He commanded two platoons, two companies, a battalion and a brigade. During two years in Vietnam, he commanded an airborne rifle company and a Ranger battalion advisory team. He developed, organized and was the first Director of the School of Advanced Military Studies (SAMS) at the Command and General Staff College, Fort Leavenworth, Kansas. Also at Fort Leavenworth, he was the primary author for the 1982 revision of *FM 100-5 Operations* to reflect AirLand Battle doctrine. He holds a Master of Arts in International Politics and Economics from Harvard.



Artillery TTPs for the Danger-Close Fight:

LID in the Movement-to-Objective and Initial Contact

by Captain David D. Hollands, USAR

This article is the first in a series of three on artillery tactics, techniques and procedures (TTPs) for danger-close combat in the light infantry division (LID) by Captain David D. Hollands, US Army Reserve. Until recently, he was on active duty, last stationed with the 7th Infantry Division (Light).

The second article in the series will cover danger-close artillery TTP for the LID in the attack; the third will discuss TTP for preventing LID fratricide in the danger-close fight.

The successful conclusion of Operation Desert Storm generated a renewed interest in large-scale fire support operations and new tactics and doctrine. Those members of light forces who were out of the spotlight have continuing needs for techniques to execute fire support plans on other types of battlefields.

During 1991, the 7th Infantry Division (Light), Fort Ord, California, renewed its emphasis on fighting "the last 1,000 meters to the objective," focusing on TTPs for the danger-close fight. This article summarizes the danger-close skills needed by company fire support teams (FISTs). The fire support procedures addressed are generally not found in doctrinal publications. They are the product of combat experience, Combat Training Center (CTC) lessons learned, observations from external evaluations and other military experiences. I present them, not as the only solutions to tactical problems, but as options.

Almost all offensive operations consist primarily of movement. Gaining contact with the enemy, deploying to more advantageous positions and seizing objectives are common reasons for movement. The FIST members have several responsibilities during movement: communications, reporting, navigation and the preparation of responsive fires.

The first three tasks are procedures common to FISTs whenever they go "walking in the woods" with the infantry. All four tasks are closely linked. Without communications, it's difficult to report and almost impossible to prepare responsive fires. Without proper navigation, reports become worthless and fires become hazardous. But the bottom line is that without responsive fires, all other efforts are meaningless. This is the primary reason forward observers (FOs) and FISTs are present.

This discussion of techniques during movement centers on the use of priority targets to increase responsiveness.

Establishing Priority Targets

Priority targets are special instructions to firing units requiring them to lay on specific targets. Generally, a unit assigned priority of fires for an indirect fire system may establish priority targets with that system. Controlling authorities may allocate targets to subordinate units: the company commander allocates 60-mm mortar targets, the battalion commander allocates 81-mm mortar targets and the brigade commander allocates direct support (DS) artillery targets, which battalion commanders usually sub-allocate. The purpose of priority targets is to increase the responsiveness of fires on critical targets. Response time is a few seconds, not the several minutes required for an initial call-for-fire (CFF).

All fire units in primary support of a company should receive priority targets. If the FIST doesn't establish priority targets, it fails at one of its basic tasks: maximizing responsiveness. During movement, priority targets provide the easiest means of rapidly delivering fires onto the enemy during initial contact.

Example: as your platoon is moving, you take fire from your direct front. As the FO, you hear the platoon leader demanding suppressive fires on the enemy positioned 100 meters ahead of the lead element. As you look to your map and formulate a CFF, the clock is ticking. Because of your skill as an observer, you transmit your CFF in one minute.

The fire direction center (FDC) now begins its work on the target, and in 90 seconds, a round is on its way to your general vicinity. Depending on your skill at map reading under pressure—on the ground, under attack (throw in darkness to really complicate things)—the round will, hopefully, impact where you want it. You pray the two to three minutes it took to get there isn't that important to the lead squad you're trying to help.

Now consider this alternative: as FO for 1st Platoon, you coordinated for a priority target with the battalion mortars on Hill 460, 600 meters to your front. After moving 100 meters, the lead squad makes contact. You hit the ground with the rest of the platoon.

As the platoon leader calls for you to suppress the enemy, you simply transmit either a voice command, "Fire Priority Target Blue," or press the transmit button on your digital communications terminal (DCT), which is programmed for the target. Seconds later, mortarmen drop rounds

into tubes already oriented on your target. Twenty-five seconds later, four mortar rounds crash down on Hill 460, and you notice an immediate lessening in the enemy's volume of fire.

As the platoon leader begins to maneuver the squads, you send the FDC the direction to Hill 460 (which you can get from your compass, even lying on the ground at night) and shift the fires 200 meters closer to the enemy. A minute later, the tubes reward you with another platoon volley just behind the enemy position. A correction of "Drop 100, 50% WP [white phosphorus]" both blinds and suppresses the enemy. The enemy fire abruptly ceases, and the platoon routs the remnants of their forces.

The effect of immediate firepower directed against an enemy ambush seizes the initiative from the attacker. He begins to question the success of his attack, particularly as fires creep closer to his position. In two or three minutes, an enemy could destroy a platoon in a well-prepared ambush or disappear to hit the unit again later. If 30 seconds after the enemy attacks indirect fires impact near his position, he'll seriously question who has the upper hand.

The lead platoon of a company should try to maintain a priority target on a visually identifiable feature 300 to 700 meters away. This requires established procedures and preplanning (Figure 1 below).

- The company allocates priority targets to platoons.
- The platoon FOs coordinate their targets, either directly with the firing units or through the FIST headquarters.
- The FSO plans for shifting priority targets during movement. The FIST and firing units rehearse and wargame this plan before execution.
- Firing units understand the maneuver scheme and aggressively track unit progress.

Figure 1. Requirements for Maintaining Priority Targets While Moving. Following established procedures and preplanning will allow the lead platoon to maintain a priority target on a visually identifiable feature 300 to 700 meters away.

Shifting Priority Targets During Movement

There are several methods for shifting priority targets during movement. You can

During movement, priority targets provide the easiest means of rapidly delivering fires onto the enemy during initial contact.

(1) shift from planned target to planned target, on order; (2) shift from planned target to planned target, event triggered or (3) shift to visible features identified during movement.

Method 1, shifting from planned target to planned target on the order of the FO, requires a series of targets established along the march route. As targets are no longer needed, the FO calls the fire unit and orders it to shift to the next target.

Event-triggered shifting (Method 2) ties priority targets to control measures, such as phase lines. As a unit reports crossing a phase line, the firing unit automatically shifts its tubes to the next scheduled target. Using a fire support matrix greatly facilitates this technique by clearly presenting triggers and targets to the firing unit.

FOs using Method 3 select subsequent priority targets based on identifiable features selected during their movement. It requires providing new grids to the firing unit each time the target shifts.

Advantages. The easiest for FOs to execute is Method 2. Standing operating procedures (SOPs) generally require them to report phase lines anyway; this system imposes no new burden upon them.

Method 3 requires the least initial coordination because FOs select targets during movement. It also ensures targets are clearly visible to the observer while preselected targets aren't.

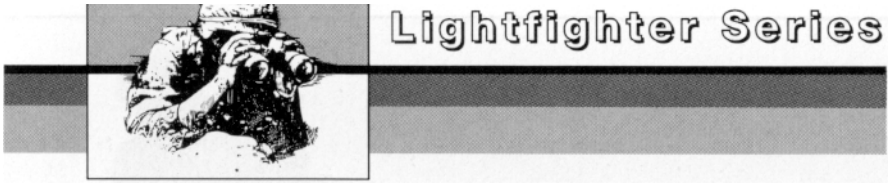
FISTs can improve the reliability of their target selection in Methods 1 and 2 by using sand tables or visibility diagrams to analyze vantage points and target observation before selection.

Disadvantages. For Methods 1 and 2, there will be many targets (a six-kilometer move would require eight to 15 targets). The large number of targets can tax a generally overburdened targeting process. In addition, these planned targets may not be readily identifiable to FOs on the ground, negating their value.

Method 2 relies on FDCs and fire support elements (FSEs) to closely follow friendly movements. Failure to report a trigger point or monitor or respond to a report creates the potential for fratricide.

Method 3 requires proactive FOs who are constantly evaluating the terrain, selecting subsequent targets and coordinating the shifting of assets. At night, fatigued by the heavy loads imposed on FO parties and struggling to keep up with the platoon while monitoring its position, this task can stress an already preoccupied observer.

The Choice. Choosing an approach depends on the training level of the FOs, planning time available and factors of mission, enemy, terrain, troops and time available (METT-T). The most important points are that properly using priority targets greatly enhances fire responsiveness and employing them during movement-to-contact or infiltration should be routine. Thoroughly briefing and rehearsing all elements of the fire support system is critical for success.



Initial Contact with the Enemy

The culmination of movement during offensive operations is usually contact with the enemy. When we know his location and are able to control when contact occurs, it's an attack. But most times, the initial contact is a surprise. This type of engagement requires special techniques to maximize the chance of success.

Initial CFF. Instead of adjusting rounds from a secluded hilltop several kilometers away, most initial FIST CFFs will be for a platoon in contact with an enemy within small arms range (50 to 300 meters). The FO initiates the CFF while prone, trying to avoid enemy fire, or while moving with the platoon headquarters to maneuver against the enemy. These conditions don't lend themselves to detailed target analysis, referencing terrain sketches or conversing at length with fire direction personnel.

What the lead man in the lead squad of the company's lead platoon needs is immediate fire support to suppress and destroy the enemy weapon systems arrayed against him. The entire fire planning process at the company level must facilitate this requirement.

As discussed in the movement portion of this article, the most responsive technique for providing fire support while moving is firing established priority targets. Figure 2 outlines the requirements to fire these targets while in contact.

A significant problem in responding to initial contact is the reluctance to engage targets close to friendly forces. Light infantry combat dictates that danger-close fires are the rule, not the exception. FOs and maneuver personnel must become accustomed to using indirect fires at very close ranges. During training, AR 385-63 Safety Policies and Procedures for Firing Ammunition for Training, Target Practice and Combat allows artillery and mortar firing well within the 600-meter range, which defines danger close (exact range depends on several factors). This should indicate that smaller buffers apply during combat operations.

- The FOs constantly track their progress in relation to priority targets. FIST headquarters monitors the company's priority target plan.
- The FOs know the exact locations of priority fires. If an FO can't visually identify the targeted area, he knows the basic direction and distance to the target.
- The FOs or FIST headquarters have communications with units firing priority targets.
- The FOs refine priority targets to ensure firing units lay on the point most advantageous for bringing rapid fire on the enemy.

Figure 2. Requirements for Firing Priority Targets While in Contact. The most responsive technique for providing fire support when in contact is to fire priority targets.

Adjustment Procedures. If the FO uses priority targets to initiate fires, shift procedures are the quickest way to move the fires to the enemy. The tendency among FOs is to rule out fire support when the enemy engages friendlies within 50 to 200 meters. In fact, precise adjustments progressively closer to enemy positions are extremely effective in reducing the enemy's will to fight. *FM 6-30 Observed Fire Procedures* cautions observers to use creeping techniques that call for no more than 100-meter corrections. Depending on the situation, using smoke can decisively alter the course of an engagement at that range and defeat the enemy's plan.

Put yourself in the shoes of the leader of an *ambushing* force: after preparing concealed firing positions for all your men, you wait for a suitable target. An enemy infantry company moves into your kill zone, and you unleash your devastating firepower, confident that surprise and your cover and concealment will provide the margin of victory over a superior force. You watch the initial panic hit the enemy unit as your men rake the kill zone with fire.

Suddenly, mortar rounds land several hundred meters behind your positions. This surprises some of your men, who stop firing to look in the direction of the explosions. Sensing a letup in firing, you shout to the men to focus on the kill zone. The stunned enemy is now gathering strength, and your reduced fire allows them some maneuver room.

A second volley of mortar rounds lands 150 meters behind your men. Concern ripples down the line as interest shifts from the kill zone to the new threat to their rear. You detect an enemy squad maneuvering out of the kill zone, setting up flanking fires. Enemy fire has intensified, just as your fire has slackened.

Another volley lands just 50 meters away, and you realize your ambush is a failure. You order the men to fall back to the objective rally point, but enemy fire now makes movement difficult. A steady stream of mortar rounds now falls just feet away, causing casualties when men leave their holes. Troops freeze in their positions, squeezed by small arms fire to their front and a wall of steel to the rear. Now smaller rounds impact near the machine gun position. A shower of steel knocks it out of action.

The enemy systematically targets key positions with his 60-mm mortars while the 81s hold you in place. Alas, all is *lost*.

If this story isn't running through the head of the last commander you fought in an ambush or meeting engagement, the corrective action is simple: keep priority targets where you need them; prepare yourself for the unexpected by thinking through actions on contact every few minutes; and act decisively and aggressively.

Winning or losing a fire fight depends on the few critical minutes it takes one side to break the other's will.

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Is the FPF Dead?

by Major Jeffrey W. Yaeger

The history of the artillery final protective fire (FPF) is rich and colorful. Most senior artillerymen know at least one story that describes the efficiency and devastation this type of fire is capable of inflicting. But that history is dimming.

While the FPF is not dead, it is rapidly becoming an unfamiliar task in the artillery. Few leaders at the maneuver brigade or direct support (DS) artillery battalion level have ever fired an FPF in conflict. The number who have done so in a training environment is even smaller. Impact area restrictions, time and ammunition constraints, budgets and safety concerns all combine to make the FPF "too hard to do." Consequently, the skills required are slipping away from the artillery community's collective memory. If this seems to be farfetched, try asking your section chiefs to define an FPF or how many rounds they fire on an FPF. Look at your battalion standing operating procedure (SOP) for details on the planning and execution of the FPF—you may be surprised.

The FPF is defined as "an immediately available preplanned barrier of fire designed to provide close protection to friendly positions by impeding enemy movement into defensive areas." This article will examine some tactics, techniques and procedures for executing this "Granddaddy" of fire support tasks.

The Maneuver Perspective

The FPF originates with the brigade commander's concept and intent for the fight. The brigade commander and his fire support officer (FSO) must do a mission, enemy, terrain, troops and time available (METT-T) analysis to determine the validity of the FPF in a given situation.

Mission. The FPF is obviously a defensive tool and must be defined in terms of the defensive mission. In *FM 100-5 Operations*, there are two types of defend missions: area and mobile. An area defense is terrain-oriented, focused on retaining a particular portion of ground. Damage to enemy forces is a secondary consideration. A mobile defense is enemy-oriented, focused on inflicting a specified criteria of damage on the enemy force. Retention of specific ground becomes a secondary consideration.

In this context, the FPF is certainly more applicable in an area defense (Figure 1 on Page 40). There will be times when units have a "hold at all costs" mission, and the FPF becomes "desperation fires." But few maneuver commanders ever fight a pure form of either type of defense. The maneuver commander's concept may lead to either or both definitions of the mission. In an area defense, the FPF will be indispensable, while in a mobile defense, it hardly will be worthwhile. In a combination, with one force holding ground while another maneuvers to engage, one force may get an FPF and one may not. While this may seem simple enough in presentation, too many FSOs think that every defensive situation means an FPF is automatic. The use of an FPF must be decided within the commander's concept of the fight.

Enemy. For the most part, FPFs are most effective against light or dismounted forces but less effective against mechanized or armored forces. Since the FPF is a "wall of steel" designed to serve as a barrier, by definition, it will not be shifted easily. The time spent by the enemy force under the effect of the fire will determine its effectiveness. Obviously, dismounted soldiers moving on foot will be affected more than mechanized forces who may succeed in penetrating the barrier. This is not to say that FPFs are ineffective against mechanized forces, but the purpose of these fires may change, depending on the enemy. The FPF may be "disengagement fires" rather than "desperation fires" when facing a mechanized threat, allowing the defender to reposition while delaying the attacker with fires.

Terrain. Terrain must be considered to determine an FPF's effectiveness and contribution to the commander's plan for

Defending Force		Attacking Force	
		Light	*Heavy*
Light	Mobile Defense	Questionable	Probably Invalid
	Area Defense	Valid	Valid
Heavy	Mobile Defense	Questionable	Probably Invalid
	Area Defense	Valid	Valid

Figure 1. FPF Concept Validity. The FPF concept is most applicable in an area defense. But the use of an FPF must be decided within the commander's concept of the fight.

the defense. In the open expanses of a desert, the FPF may serve only to distract. It could cause the enemy to alter his route, especially if his objective is not the terrain on which the defense is situated (a valid use of the FPF in this situation.) But, in the close quarters of a valley or in the confines of a jungle, the FPF may become a "show stopper" for the enemy. While these extremes illustrate a point, real decisions are not easy.

Troops Available. With FPFs, troops available translates to firing units. Doctrinally, the rule is one FPF for every fire direction center (FDC) available. The brigade commander could have up to six FPFs available from the DS battalion (in a 3x8 configuration). But should six be planned? The artillery will probably be forced to move during the fight. If so, the moving element will be unable to fire an FPF. Accordingly, a good wargaming process must be conducted to anticipate how many stationary artillery firing units will be available in the worst case. That should guide the number of FPFs allocated. The DS battalion commander, his S3 and the brigade FSO must all be involved to ensure the optimum number is determined, providing the maneuver force with a number that will not overwhelm the artillery's ability to execute. The process must account for ammunition, range, weapons types, unit status and personnel strengths.

Time Available. From the maneuver perspective, the time available for preparing the defense will govern most actions. This is true for the FPF. Once allocated, the unit receiving the FPF must be informed as soon as possible. This allows the commander to build the FPF into his defensive plan rather than adding it as an afterthought.

As a priority target, the FPF should be one of the first targets planned and sent to the firing unit. The location must be determined and the data transmitted before the FPF can be adjusted or called for by the maneuver unit. Therefore, the planning process must not be allowed to take that time away from the commander on the ground or the firing unit assigned the FPF. The decision to allocate FPFs must be made early in the process to allow adequate preparation.

Once the METT-T analysis is done at the brigade level, the FPFs are allocated to the subordinate task forces (TFs). The TF commander and his FSO must do a similar, if abbreviated, analysis. Their decision is based on the most likely enemy avenue of approach and the main effort of the defense. They then allocate the FPFs to the user—the company.

At the company, the problems become quite different. Here the issue is how to employ and where to put the FPF. The company commander must decide whether he wants to use the FPF to complement his direct fire plan or to supplement an area he is unable to effectively cover with his organic weapons systems. There is no right answer; his decision will be dependent on the situation, terrain and nature of the enemy. Regardless of how it is integrated into the defense, the commander decides where on the ground he will place the FPF in relation to his position.

Traditionally, the FPF is considered a close-in defensive tool, but it's not an isolated element. It's a part of the total plan. The commander will call for it at that point in time when he can't handle the fight any longer. In a light force, this means the FPF is normally 200-400 meters (danger close) in front of the position. This would be the area in which all direct fire weapons are most effectively brought to bear on the enemy. If that does not stop the attacking force, the commander calls for the FPF.

In a heavy force, the FPF may be employed at a much longer range. Given the effective ranges of infantry fighting vehicles, anti-tank weapons and tanks, a commander may make the critical decision about his capability to control the defense at a range of 1,000 meters or more. This may be close-in for his defense, the point where direct fires are maximized and the enemy is either defeated or the FPF is required.

The FSO needs to be well-versed in these considerations. His advice to the commander is critical. Additionally, he should be able to discuss the times related to firing the FPF. The company commander will want the FPF at that point in the battle when he is no longer able to control the enemy with his weapon systems. But the FPF will require, at best, communications time plus time-of-flight (TOF) to arrive. A technique must be developed to ensure the fires impact when needed—not minutes later. During the wargaming process, a trigger point must be determined. For example, if more than 10 vehicles pass Target Reference Point (TRP) 3, the FPF will be called. If TRP 3 is located at a calculated time or distance from the FPF, the fires arrive with the enemy.

The FSO also recommends whether the FPF should be "fired in." This recommendation is based on two factors: time and the enemy. Given time, it is desirable to fire the FPF to enhance the accuracy of the fires. The observer asks for a "right-by-piece" from the firing unit and adjusts each round into proper position using creeping fire. (Automated systems abbreviate this process by adjusting only the center piece.) The drawback to adjustment is the other factor in the recommendation—the enemy. Adjusting the FPF may provide the enemy with information. Most obviously, it lets the enemy know where the FPF is and how to avoid the fire. It also can reveal the overall setup of the defensive position.

Finally, the FSO must be well-versed on how to call for the FPF. This should be a matter of SOP. To fire the FPF digitally, an authenticated quick-fire message (FM:QF) is all that is required. The observer prepares the format and transmits when directed by the maneuver commander. The commander is the decision maker on firing the FPF, but there must be some redundancy built into the system. If digital communications are down and voice communications are being used, will the FDC execute only if the commander's call sign is heard? What if

the commander is killed or disabled? If the FSO is delegated the authority to fire, he must know the criteria upon which to base the decision and must tell the FDC of the delegation of authority. When using voice communications, is the FPF fired on a code word, by use of a target number, or by simply calling for the FPF? Is the call authenticated before firing starts, or is it executed and stopped if the caller cannot authenticate? Is authentication needed if the caller is using a frequency-hop, secure radio system?

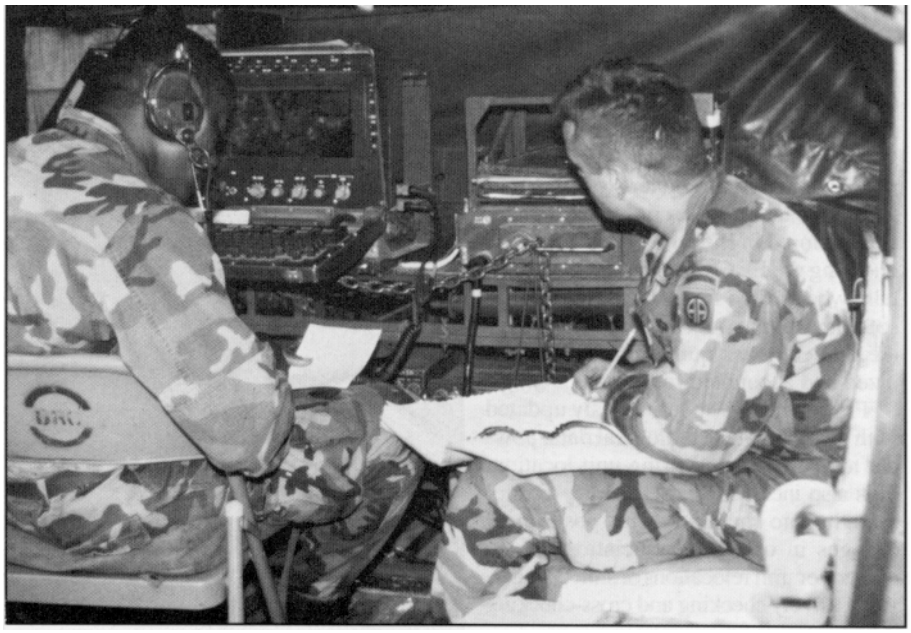
The procedures for terminating the FPF also must be addressed. It will be fired until the order to cease firing is given (digital or voice) or the unit runs out of ammunition. Thought must be given to the possible outcomes for the maneuver unit. Systems must be in place to deal with retreat, defeat, loss of communications, loss of key leaders or the negative effects of the fires. These questions must be thought-out and addressed in the unit SOP (maneuver and artillery) or resolved when the FPF is planned.

The Artillery Perspective

Once the FPFs have been allocated, the artillery S3 must wargame the battle and then assign the FPFs to firing units. Tracking the status of these units, their positions, ammunition counts and ability to deliver these fires is critical. Forethought is required to ensure the assigned FPFs are transferred as units move or experience battle losses.

A call to fire one or more of the FPFs is also a key indicator to the artillery battalion about the tempo of the battle and may trigger a number of responses beyond just firing the FPFs. It may cause a concentration of all fires into the area, initiate lateral repositioning of other firing units or initiate requests (demands!) for fires from general support and general support-reinforcing units. The S3 must have criteria, agreed to by the brigade commander, as to when or if the firing unit is allowed to save itself, if necessary.

At the firing unit level, the assignment of an FPF brings a myriad of responsibilities. The questions discussing calling for and executing the FPF must be fully resolved. The FDC must be aggressive in obtaining data on the location of the FPF and the observer associated with it. The FDC must quickly and accurately derive and store data for the mission. With automated gunnery solutions, care must be taken to input all applicable variables. The battery computer system (BCS) requires specific FPF entries. An observer must be associated with the "X" entry in the ASNFPF (assign FPF) field (Figure 2). This allows the observer to use the FM:QF to call for the FPF by entering an X in the FPF field (Figure 3).



FDCs must be aggressive in obtaining data on the location of the FPF and the observer associated with it, and then must quickly and accurately derive and store data for the mission.

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; P ;2 ;SB ; / / / / ; C ; ETO ; SG ; , ; DT ; , / / ; ID ; ; A ; ;
FM ; RFAF ; ; TGT ; HJ7058 ; KNPT ; ; CORD ; 39200 / 14200 / 140 ;GZ ; ; SPHERE ; ;
OB ; 05 ; FST ; ; DIR ; / ; DIST ; ; SHIFT ; / / / / ;
LAS ; ; TYPE ; / ; DOP ; ; SIZE ; 200 / 1 ; ATT ; 1200 ; RV ; ;
CONT ; / FFE ; ME ; / DC ; TOT ; / ; MIS ; ; PRI ; ; EOM ; X ; RAT ; ; ASNFPF ; X ;
ASF ; / ; LOT ; / ; CHG ; ;UFFE; / / / / , / / / / ;
SH ; HE / ;FZ ; Q / ; STR ; ; VOL ; ; ZF ; / ⅎ
ADJ ; ; RD ; ; PTF ; ; HOB ; ; SF ; / ;
SPTF ; / / / ; RDS ; / ; LOTS ; A/G/ / ; CHGS ; 4/ ;
SHEAF ;SPCL ; VOLCMD ; ; CSLOAD ; ; RG ; ; TOF ; . ; MAXORD ; ; FFRDR ; ;

PROMPT ; HE HEA HEB HEL HEF HER SMA SMB SMC ILA
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Figure 2: BCS Format to Plan/Store a Final Protective Fire

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; P ;2 ;SB ; / / / / ; C ; ETO ; SG ; , ; DT ; , / / ; ID ; ; A ; ;
FM ; QF ; FIRE ; ; FPF ; X ; ENDFPF ; ; UPFPF ; ; ASKNPT ;
OB ; 05 ; FST ; ; TGT ; HJ7058 ; KNPT ; ;DELETE ; ; CPHD ; ; MIS ; ⅎ SHEAF ; ;
PTF ; ; SH ; / ; FZ ; / ; RDS ; / ; LOTS ; / / / ; CHGS ; /

PROMPT ; 1 TO 99
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Figure 3: BCS Format to Fire FPF

To derive a "linear," as opposed to a "circular," sheaf solution, the BCS requires the FPF size to be defined and an attitude described. There is no default for size—it must be specified. Standard sizes are 200x50 meters for a four-gun 155-mm platoon and 210x35 meters for a six-gun 105-mm battery. Once computed, the FPF can be stored in Buffer 4 or 5 of the BCS, allowing the FDC to expedite firing digitally when called for by the observer. (As software changes occur and new systems are fielded, these quirks must be recognized and accounted for in the FDC.)

FPF data must be continuously updated with changing meteorological data, powder temperature and firing unit location. This also includes updated survey control brought into the firing unit position or changes in observer association due to maneuver unit relocations or shift changes. Aggressively checking and cross-checking is key.

Since the FPF is a priority target, the guns will lay on this data when not engaged in an active mission or not laid on another priority target. (The FPF may not be the first priority target in the plan for the defense. The maneuver force may engage the enemy with priority targets at greater ranges first.) To speed delivery of the FPF, the gun sections must have rounds prepared for firing. The number should be considerably more than most units expect, based on training experiences, because the number of rounds fired will probably exceed any mission the gun crew has experienced previously.

Historically, the FPF has been fired using high explosive (HE). Fuzed for point detonating (PD), this combination allowed for a relatively close location while providing lethal effects. This remains the standard shell and fuze combination, but given the variety of munitions now available, other options present themselves. For an FPF at a range of 1,000 meters from defensive positions, designated for use against a mechanized attacking force, dual-purpose improved conventional munitions (DPICM) may be a better choice.

Traditionally, the FPF is fired at the maximum rate of fire. The FDC needs to consider the available shell and fuze combinations in the firing unit and compute firing data for these in the event the HE rounds are depleted. Consideration also must be given to actions taken if the unit uses all available ammunition in firing the FPF.

Depleting all available ammunition can't come as a surprise to either the supported unit or the artillery battalion. Both must be informed of the ammunition status to make appropriate decisions. The FPF may need to be shifted to other available firing units or passed to reinforcing units. The maneuver commander needs as much time as possible to make decisions on the disposition of his force before losing the fires.

The FPF is normally fired using high explosive with a point-detonating fuze; however, given the variety of shell and fuze combinations available, other options present themselves.

Standard sizes for FPFs are 200 x 50 meters for a four-gun 155-mm platoon and 210 x 35 meters for a six-gun 105-mm battery.

The battery commander (BC) and his chain of command need to have a well-thought-out plan for the eventualities of the mission. Ammunition management is inherent in the task, but so are considerations for survival of the unit. Depending on the unit location, movement of nonessential sections and preparation for self-defense become critical. The BC may be forced to move the firing unit, based on the S3's movement criteria, whether the supported unit called for cease firing or not. Additionally, some thought should be given to unit morale. Soldiers will discern the criticality of the situation if an FPF is being fired. Positive leadership from the front will ensure executing the FPF to the standard the maneuver unit will need to achieve success.

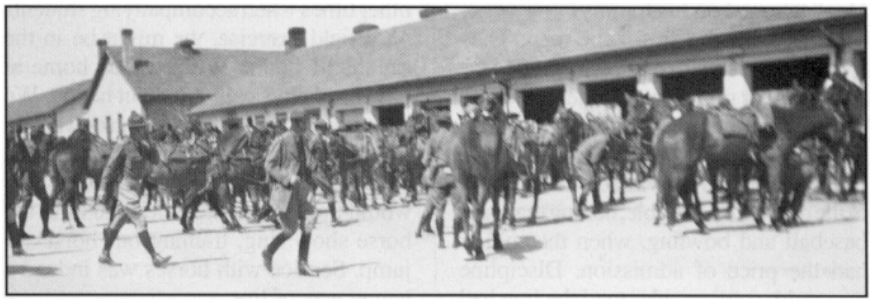
Conclusion

The FPF is potentially a vital key to a maneuver defensive plan but has not been used since the end of the Vietnam War. If units are unable to practice the FPF in live-fire training, the procedures for planning and executing it must be debated, established and rehearsed on a regular basis. Familiarity with all aspects is a must. Otherwise, the price paid while the artillery relearns these techniques could be steep.

Major Jeffrey W. Yaeger is a US Army officer serving as an Assistant Division Fire Support Coordinator (AFSCOORD), 2d Marine Division, Camp Lejeune, North Carolina. He has served as Fire Support Officer and Battery Executive Officer, 1st Battalion, 37th Field Artillery, 172d Infantry Brigade (Separate), Alaska; Battalion Fire Direction Officer, A Battery and Headquarters and Headquarters Battery (HHB) Commander, 1st Battalion, 5th Field Artillery, Fort Riley, Kansas; Fire Support Instructor, Chief of the Fire Support Branch and Personnel Management Officer, the Infantry School, Fort Benning, Georgia; and Executive Officer, 1st Battalion, 15th Field Artillery, 2d Infantry Division Artillery, Korea. He received a bachelor's degree from St. Mary's University, a master's degree from Troy State University and is a graduate of the Command and General Staff College, Fort Leavenworth, Kansas.

Cannoneers with Hairy Ears—

Serving with the Horse-Drawn Artillery



by Colonel (Retired)
Robert B. Partridge

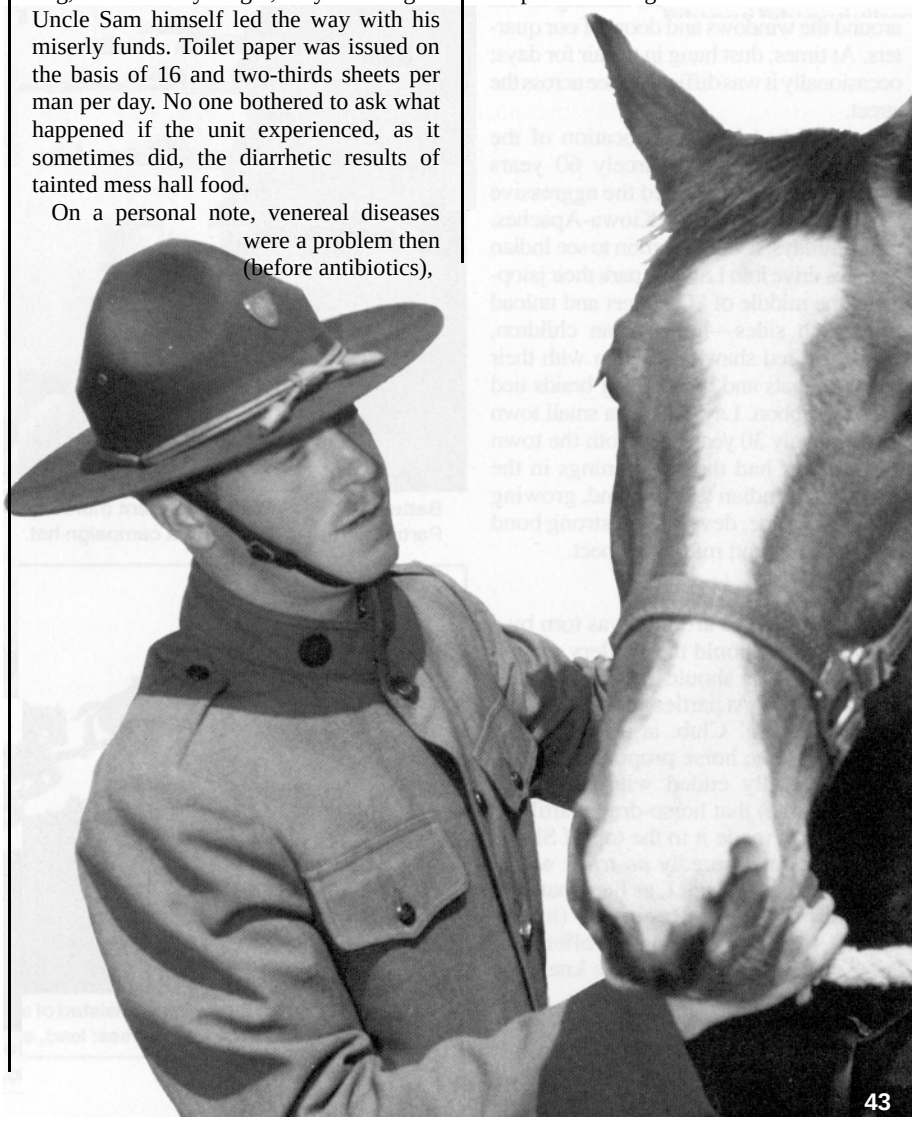
We reported to our first duty station at Fort Sill, Oklahoma, in early September, 1936. There were five of us fresh out of West Point: Westy Westmoreland. Ted Clifton, Dud Hartman, Willie Cairnes and myself, Bob Partridge. We were the first second lieutenants for years to be assigned directly to the prestigious School Troops units, and the entire garrison was appalled to think of raw young lieutenants serving in School Troops batteries. After all, in those days, battery commanders typically had 17 years of service and battery executives had at least 10. Young shavetails, it seemed self-evident, were bound to foul the works. Even worse, were we to succeed, we would show up those old-timers—unthinkable!

It was a different world then and a different army. The total strength of the Army, including the Air Corps, was 168,000 men, of which 13,500 were officers. Second lieutenants received 125 dollars in base pay and 20 dollars ration allowance; privates in the ranks were paid the ridiculous total of 21 dollars, a sum made even more absurd by an immediate deduction of 25 cents for the Old Soldiers' Home. After further deductions for tailor, cobbler, barber and other expenses, a soldier counted himself lucky to walk away from the pay table with enough dollars for a once-a-month wing-ding night in Lawton. But to put it in perspective, those were the days of the Great Depression, and 15 measly bucks was a lot more than many Americans had in their wallets.

The depression brought us many of our better soldiers, men who were down on their luck, men who had lost good jobs or gone bankrupt, men who, by and large, were reliable and capable. The remainder tended to be young men from the "boondocks," men with little or no education who signed their payroll voucher with "Xs." Both types of men would, in a very few years, serve as the backbone of our Army as it expanded for World War II.

The soldiers often groused that they got less respect and care than the colonel's dog, and in today's light, they were right. Uncle Sam himself led the way with his miserly funds. Toilet paper was issued on the basis of 16 and two-thirds sheets per man per day. No one bothered to ask what happened if the unit experienced, as it sometimes did, the diarrhetic results of tainted mess hall food.

On a personal note, venereal diseases were a problem then (before antibiotics), even as now, but the Army's approach was much more direct than present-day society would permit. On payday, every soldier went through a formation in which, as his turn came, he lowered his pants and stepped forward and exposed himself to the professional glare of a doctor. One



soldier, angry at the process, used his payday money to have the words "Hello, Doc" tattooed on his tummy.

It was a tough life for the men. They lived in open squad rooms, sleeping to the tune of 50 or more snoring men. Because few soldiers owned cars, it was difficult to get away from the barracks environment. Entertainment was available in the form of the day room pool table, boxing matches, baseball and bowling, when the soldier had the price of admission. Discipline was rigid; soldiers who toed the line had little difficulty, but recalcitrant men received stiff court-martial sentences or, if they were lucky, took their punishment quickly and quietly from the fists of noncommissioned officers.

With the depression in full swing, it was a sad enough time in America, but in the Southwest, the raging dust storms added to the misery, turning farmlands into dust bowls and sending red dust filtering in and around the windows and doors of our quarters. At times, dust hung in the air for days; occasionally it was difficult to see across the street.

Fort Sill had been the location of the Indian Agency, and scarcely 60 years before had finally quelled the aggressive Comanches, Kiowas and Kiowa-Apaches. On Saturdays, it was common to see Indian families drive into Lawton, park their jalopies in the middle of "C" Street and unload from both sides—little Indian children, women in red shawls and men with their black top hats and hair in long braids tied with red ribbon. Lawton was a small town then, scarcely 30 years old. Both the town and the fort had their beginnings in the isolation of Indian territory and, growing up side-by-side, developed a strong bond of friendship and mutual respect.

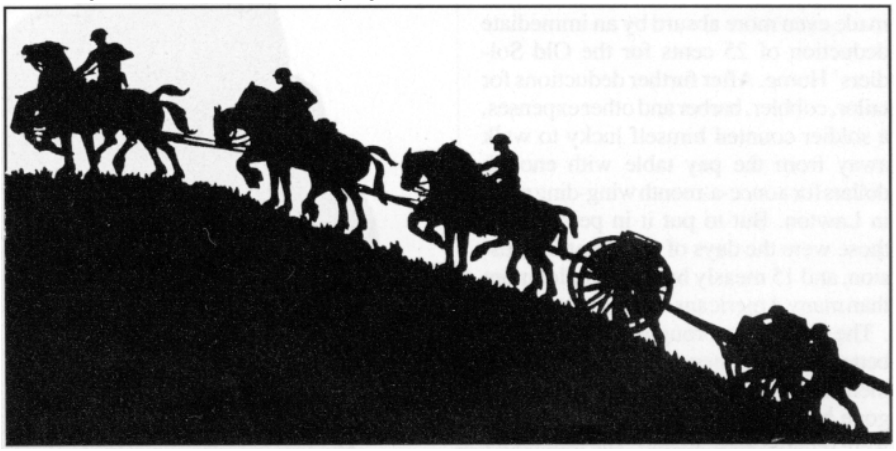
In the 30s, the artillery was torn by a great debate. Should the artillery remain horse-drawn or should motorized artillery take over? At parties and over the bar in the Officers' Club, arguments went both ways. The horse proponents' argument generally ended with the claim (questionable) that horse-drawn artillery sections had made it to the top of Signal Mountain but assuredly *no truck* would ever do so. Westy and I, as lieutenants in the 18th Artillery Regiment (horse-drawn), loved the vigorous life offered by horse artillery, but secretly we knew the horse was on the way out.

We rode a horse every day of the week. Even on days when we had administrative duties such as inventorying the Post Exchange, we still rode at least an hour. At other times when accompanying students on a field exercise, we might be in the saddle 14 hours. We returned home at day's end physically tired but happy. We never needed to jog, pump iron or walk on treadmills. And throughout the week when we could escape from battery duties, we would practice on the polo field or in the horse show ring, training our horses to jump. Service with horses was indeed a happy way of life.

And then there were the Sunday fox hunts, a *must* for anyone associated with the horse artillery, whether husband or wife. Often 100 or more riders would participate, meeting at some appointed place and setting out for one range or the other: east across Peach Tree Crossing and on toward Dodge Hill; west beyond Medicine Bluff Four and on to the crossing near Heyl's Hole; or north across White Wolf Crossing to Hand Hill and the Punch Bowl. These were serious hunts by dedicated people, following a pack of hounds and controlled by huntsmen in red coats, tooting their hunting horns. Optimistically, we hoped to run down a fox but, in fact, were fabulously lucky to round up a measly coyote. The latter was wary prey who dodged the hunt by running into artillery impact areas or prairie dog villages where shell fragments or holes would threaten our horses. The coyotes seemed to know our limits and would sit on their haunches and laugh at us. For all that, we had some exhilarating rides.

Following the hunt, we all met at the old Polo Club (long since burned down) for liberal libations of whiskey bootlegged from Texas (Oklahoma was a dry state then) and a breakfast of scrambled eggs followed by a song fest. At first we started with traditional drinking songs such as "John Peel" and "Drink, Puppy, Drink." Those were followed with artillery songs: "The Caisson Song" (before it was pirated to become the Army song), "Mountain Battery," "The Red Guidon," and "Zamboango." Finally, as drinks turned us a bit maudlin, "Gentlemen Rankers,"

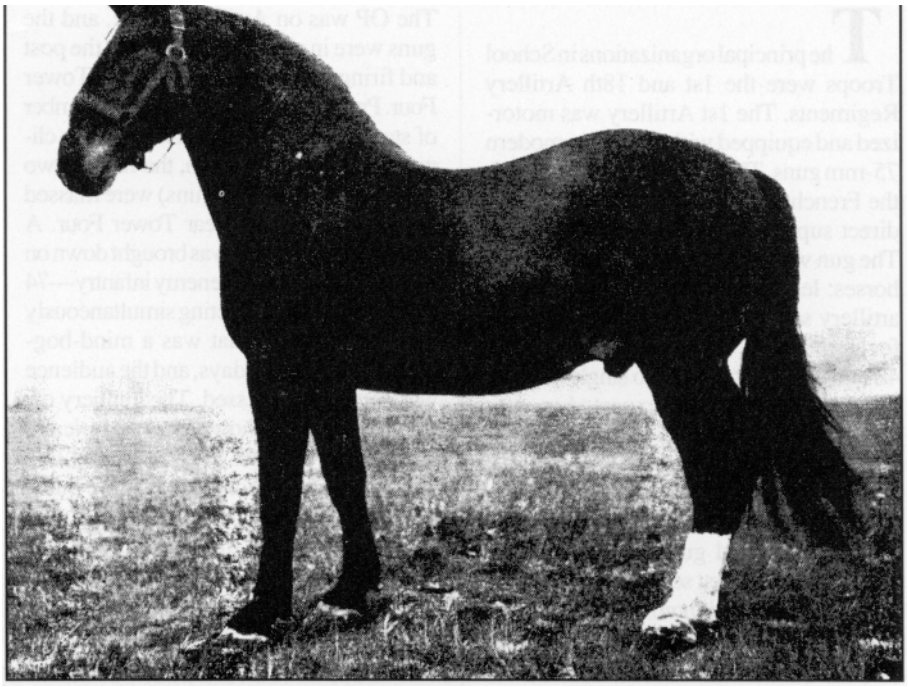
Battery D, 18th Artillery Regiment (horse-drawn) on a field exercise. Then-Lieutenant Bob Partridge is seated without a campaign hat.



A horse-drawn artillery section consisted of a gun and a caisson for ammunition. The gun was drawn by three pairs of draft horses: lead, swing and wheel pairs.

sung with deep empathy for the little black sheep who, like us, had gone astray.

Parties at the Polo Club were often turbulent affairs. At the appropriate time, some wag or other would break out laundry bags full of practice polo balls and dump them under the feet of couples bold enough to dance. And as the party reached a crescendo, happy revellers would "fire the battery," the battery being four heavy doors leading to closets or side rooms. At the command of a self-designated battery executive officer, others would slam their assigned door—simulating a four-gun battery. Doors were slammed in sequence if the command were "battery right" or all at once if "battery one round."



The IC'ed and retired Jumbo--the mascot of Battery D, 18th Artillery Regiment.

When a new shavetail was assigned to a horse outfit, he could be sure to face one rite of passage: to ride the meanest, orneriest single mount in the battery. I remember my first horse, a beautiful chestnut mare named Blindfold. I thought I noticed the men in the battery watching with great interest as I first mounted Blindfold. I soon came to understand why and realized I was doomed to be the source of humor for the cannoneers for a painfully long time. Because no one wanted to ride her, Blindfold had become antsy in the extreme and shied from every object along the road, even a candy wrapper. And for good measure, she threw me, ran away with me, bit me and, in an extra burst of exuberance, kicked me in the stomach. After a month of work, however, Blindfold shaped up, and horse and rider arrived at a delicate truce.

Every horse-drawn battery had its memorable stories about the horse. My outfit, Battery D of the 18th, had an ancient draft horse named Jumbo. Jumbo, a huge animal with a lot of Percheron in him, had been a draft horse in France in World War I. His record book showed him to be 32 years of age. But he was then too old to be useful and so was "IC'ed" (inspected and condemned). Unwilling to let Jumbo suffer such indignity, the battery bought him for a dollar and paid for his oats out of the battery fund. Thus retired, Jumbo was permitted to roam free around the stables, a building that now is the garden shop of the Fort Sill Post Exchange.

The entire post knew Jumbo and, despite his enormous size, made something of a mascot of him. Jumbo had a fondness for grazing on flowers and so was tempted to cross the parade ground of New Post and commit mayhem on the gardens of senior officers. The one phone in the orderly room was often busy with housewives asking the battery to retrieve Jumbo from Major This or Colonel That's petunia garden.

The 18th took on a new commanding officer, one Totty George, who was obsessed with the urge to bring the horse back into favor. He took steps to have his young officers become more active in horse shows, hunt meets and steeple chases. He also conceived the idea of the officers of the 18th paying a mounted courtesy call on the post commander on New Year's Day. We were dressed for the first time in our newly approved blue uniform blouse and met at the School Troops headquarters building where we formed in columns of twos and set out across the New Post parade ground for the commander's quarters in Old Post. A problem quickly developed when our single mounts, unused to having sabers banging against their right flanks, became skittish, and New Post was treated to a shameful spectacle—a three-ring circus in which 30 officers struggled to control their mounts. Notwithstanding, the call turned out to be an impressive affair as we finally stopped in front of the Sherman House, turned our mounts over to horse holders and joined the post commander for glasses of sherry.

Sunday fox hunts were a must for anyone associated with the horse artillery. Hunts were followed by turbulent affairs at the old Polo Club.

The principal organizations in School Troops were the 1st and 18th Artillery Regiments. The 1st Artillery was motorized and equipped with relatively modern 75-mm guns. The 18th was equipped with the French 75-mm gun, model 1897, the direct support weapon of World War I. The gun was drawn by three pairs of draft horses: lead, swing and wheel pairs. An artillery section had a gun and a caisson for ammunition. Thus, a 4-gun battery had 48 draft horses and 20 or so single mounts.

Because the garrison expected us new lieutenants to fail, I was nervous the first time I was trusted to take the battery out to fire for the school. Our position was on Kiowa Hill where we arrived in plenty of time and dropped guns and caissons in good order. The first sergeant lined up the limbers and started them moving back to a rear position over the next ridge. As he gave the command, one of the draft horses slipped and, in the process, made a sharp, startling, indecent noise. In an instant, all 48 horses panicked and ran away, dragging their limbers helter-skelter.

I raced after the stampeding herd and finally reached the crest of the hill. There, in the swale below, was a pile of horses writhing two deep. In their panic, the lead horses had stumbled when they hit the muddy bottom of the swale and the following horses had stumbled on top. It took us half an hour to cut the horses free from their harnesses. Meanwhile, the Gunnery Department officers at the observation post (OP) were asking, in sarcastic tones, what was the delay, what was the problem? They already knew, of course; one of those new unreliable lieutenants had goofed *again*.

Fire direction was very basic in those days. The batteries went into position and fired independently under the control of the battery commander who directed fire from a convenient hilltop. He computed his commands using procedures that depended on the number of mils he was offset from the gun-target line, three methods referred to as axial, little T and big T.

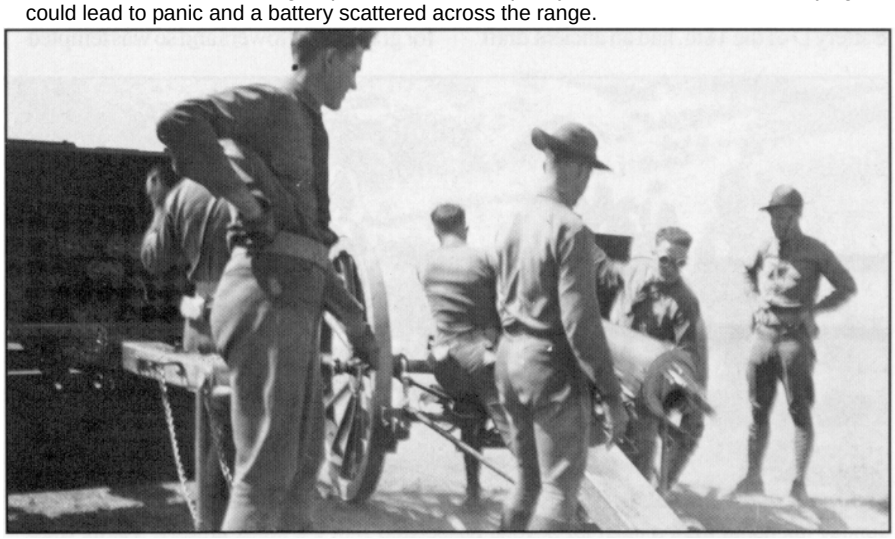
Massing of fires of separate batteries was done crudely, if at all. Massing the fires of battalions was hit or miss, mostly miss. It was during this period that communications improved enough to permit the adoption of the standard fire direction system that proved so effective during World War II.

I recall a Gunnery Department effort to demonstrate the new fire direction center (FDC) technique then being developed. The OP was on Artillery Ridge, and the guns were in position just west of the post and firing toward the flats beyond Tower Four. Present at the OP were a large number of students and other observers. At the climax of the demonstration, the fires of two battalions (24 75-mm guns) were massed on a cluster of trees near Tower Four. A volley of three rounds was brought down on a theoretical platoon of enemy infantry—74 rounds of 75-mm impacting simultaneously on a single area. That was a mind-boggling event in those days, and the audience was suitably impressed. The gunnery officer, proud of the show, asked rhetorically whether we thought anything could live through such a deadly barrage; the question was answered immediately as a deer bounded out of the midst of the dust and smoke, paused for a moment to catch its breath and then raced off toward Mount Hinds, apparently unharmed.

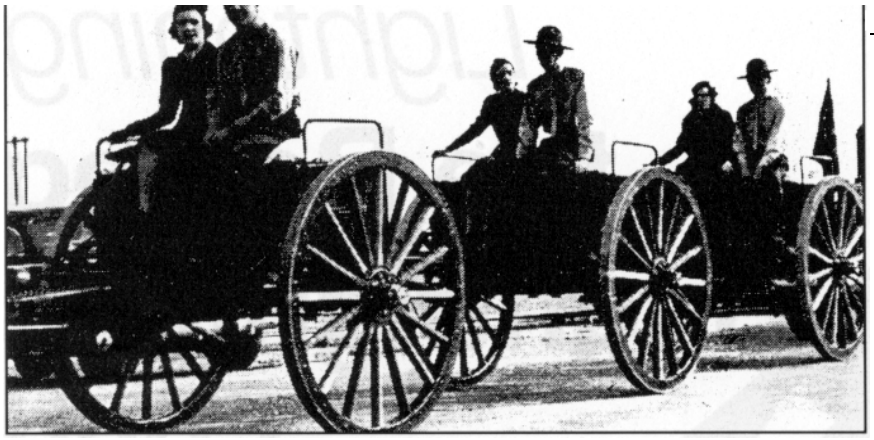
That was also the occasion when a 240-mm howitzer was fired for the first time in years. The demonstration would have gone well except for a minor misunderstanding over white bag and green bag powder charges. When the piece was fired, we at the OP waited with bated breath for the expected enormous explosion, but none came. After a long, long pause, we knew only that somewhere out in western Oklahoma in some farmer's field or in the Wildlife Refuge was an errant 240-mm projectile. We did not know in those days about man-made objects orbiting the earth, or we might have suspected the projectile had left its earthly bounds.

The social life of young officers was extraordinary, certainly by today's standards. Courtesy calls were strictly required. On joining a new outfit, we were

Maneuvers--limbered, at a gallop. In the hands of poorly-trained drivers, such carrying-ons could lead to panic and a battery scattered across the range.



Firing the famous 75-mm gun, model 1897, in support of the school.



A caisson ride was the traditional welcome for brides joining the horse artillery, a gala event in which husbands and wives were paraded around much of the post.

expected to call on our senior officers, and they were duty-bound to return our calls. The visits were strictly limited to 20 minutes and tended to be stiff, cold affairs. Until all calls had been made and returned, we had to be appropriately dressed during calling hours, 7:30 until 9:00 p.m. on weekdays.

When we appeared publicly at indoor gatherings, we were required to wear uniforms or tuxedoes, and that included attendance at boxing matches, basketball games and post movies. We had few radios to listen to—no TVs. On a summer's evening with all our various duties done for the day and when there was no prospect of courtesy calls from senior officers, we would sit out on the front steps to relax, catch the evening breezes and drink a mint julep. More likely than not, some neighbors would wander by, and soon a party would develop.

None of us new lieutenants were married, and in fact, the Army frowned on such for second lieutenants. When I reported for duty to Colonel DeArmond, then commanding officer of the 18th, his first question was, in a harsh voice, "Are you married?" Now I had plans to get married in two months, Thanksgiving to be exact, and I was shaken by the question. When I replied in the negative, he roared at me, "Good thing. I know of no more useless appendage to an Army officer than a wife!"

The old curmudgeon finally relented and gave me a few days leave to get married. Thus, I eventually arrived at Fort Sill with my new bride in tow. At the main gate we were diverted to Peach Tree Crossing of Highway 277 where, to our surprise, we were met by some 100 or more officers and wives on their single mounts. We were in for a caisson ride, the traditional welcome for brides joining the horse artillery.

Driving a pair of draft horses takes a bit of training, but my classmates were unfazed. Westy drove the lead pair while Ted Clifton drove the swing pair and Dud Hartman the wheel pair. We proceeded safely enough along the then dirt trail until the procession reached Quinnette Crossing, an unimproved rocky stretch of river bottom. The horses became upset over the clumsy handling by the three neophyte drivers and spooked in the very middle of the stream. We finally came to a halt in a stand of trees on the far bank, soaking wet and hanging on for dear life. Only later did we learn that caisson rides such as ours had been a considerable source of injury over the years. It was a gala event in which my bride and I were paraded around much of the post, including a ride past Battery D barracks where my soldiers hung out windows shouting encouraging advice such as, "Give her hell, Lieutenant!"

Quarters were scarce then, and married second lieutenants were squeezed into a few shacks left over from the World War I mobilization. These were made of wood with cardboard inner walls. The ceilings, too, were made of cardboard, four-foot squares nailed to the joists by thin wooden strips. Over the years, these panels had sagged in the middle, so they trapped water whenever the fragile roof above leaked.

I was assigned to one such, a one-bedroom apartment in a building tacked together from a former hospital ward. It provided quarters for six married junior officers and so was nicknamed the Love Nest. It was located at the foot of Medicine Bluff One near White Wolf Crossing.

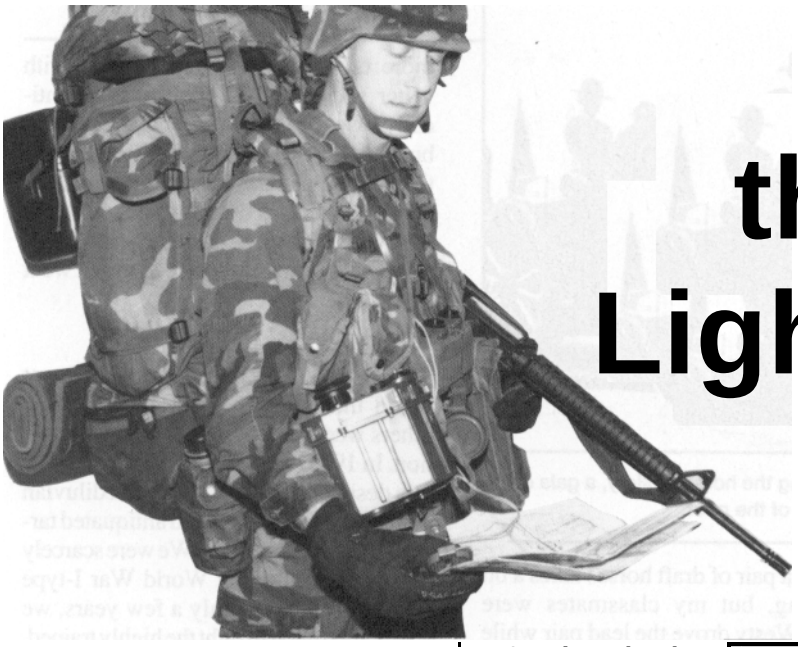
We invited Westy and a date to play bridge one very rainy night. That was the night the distended panel just over our bridge table broke loose, drenching us. As we cleared up the mess, we saw that many more of the panels were bulging with water and ready to burst loose. Frantically, we rounded up pots, pans and buckets and dispersed them under the threatening panels. Then with the elan of a *beau sabreur*, I used my saber (for the first time ever in a utilitarian mode) to punch a hole in each panel. We then went on with our game.

As I said earlier, it was a different world then. Westy and I and so many others went through an enormous transition. In 1939, we were still training with a gun designed in 1897, using antediluvian fire control techniques and antiquated target acquisition methods. We were scarcely capable of fighting a World War I-type enemy. And yet in only a few years, we were called upon to fight the highly trained, magnificently equipped troops of Hitler in Europe and the dedicated warriors of Hirohito in the Pacific.

Later, ultramodern technology burst upon us, bringing complex rocket and guided missile systems to master, highly motorized and mechanized units to maneuver and the greatest dilemma of all—nuclear weapons. From the horse-drawn 75-mm gun to the Pershing missile in a single career—that was a *monumental* leap.

We old-timers take pride in our success over the brief years and in making the quantum leap. And we pride ourselves in having lived up to the old Army adage, "An officer is expected to ride hard, shoot straight and dance well." Yes, with the starch planted in our souls by the Artillery School, we think we did all three—in spades.

Colonel (Retired) Robert B. Partridge is a Field Artilleryman who retired in 1965. His last assignment was as Commanding Officer of the (then existing) Field Artillery Combat Developments Command at Fort Sill, Oklahoma. Prior to that, he served as Chief of Staff of the Southern European Task Force in northern Italy and, in an earlier assignment, was the Commanding Officer of the Special Ammunition Support Command, an organization that stored, controlled and maintained all nuclear weapons assigned in support of non-US NATO ground forces in Europe. He served a tour in Korea and, in World War II, served with an Artillery Group in 1st Army. He joined the 18th Field Artillery Regiment, horse-drawn, at Fort Sill after graduating from West Point in 1936.



Lightening the Redleg Lightfighter's Load

by Lieutenant Colonel Charles R. Rash

It was another hot, humid day at Fort Bragg in August 1978. I had just completed a combined arms live-fire exercise (CALFEX) with the 325th Infantry that included a simulated river crossing across McKiethan Pond and an assault on an objective about one kilometer beyond. It was a well-synchronized exercise with mortars, artillery, close air support and infantry direct-fire systems.

We were marching back from the objective to an assembly area where we would be picked up by trucks for the ride back to garrison, and I was finding it a challenge to keep up. During the assault, I tore a leg muscle trying to get up too fast with 80 to 100 pounds of equipment on my back. There was nothing remarkable about my load, as all the other fire support officers (FSOs) and fire support team (FIST) soldiers carried a similar amount. After this incident, I didn't think much more about the FIST soldier load until 13 years later when I had the opportunity to once again experience the load our FIST soldiers carry.

About a month after assuming battalion command, I began to inquire into the large number of 13F [Fire Support Specialist] soldiers on profile and involved in the Medical Evaluation Board (MEB) process—I had the equivalent of one company FIST on temporary or permanent profile. I asked my command sergeant major (CSM) about the situation, and he assured me the soldiers were good soldiers who were injured in the performance of their duties. Upon investigation, I found that all of the soldiers had been injured while in the field with the infantry and most injuries were damaged knees and backs.

Armed with that knowledge, I began looking into the amount of weight each soldier carried to see if it could be a contributing factor. I was told the FIST load was a heavy one and, according to my senior 13F NCOs, contributed greatly to the injury rate. Combined with the chronic shortage of 13F personnel, the injury rate was placing an even greater load on the remaining soldiers and was making it difficult to fully support the maneuver battalions.

Before I could finish evaluating the FIST load issue, the battalion tactical operations center (TOC) and FISTs, supporting the 3d Battalion, 14th Infantry, deployed to Germany for REFORGER. While conducting a night infiltration attack, one of my FIST soldiers took a wrong step on the side of a hill and fell, rolling down the hill until he was stopped by some vegetation. As it was later described to me,

Equipment	Weight (Pounds)	Reference
Rucksack Packed IAW FIST Winter Packing List	45	Estimated
Kevlar/LBE/BDU Uniform	15	FM 7-71
Protective Mask	3	FM 7-71
M16A2 Rifle	8	TM 05538C-10/1A
7 Full Magazines (5.56 Ball)	8	FM 7-71
4 Meals Ready to Eat	1	FM 7-71
Total Weight	***80***	

Table A. Common Equipment

Equipment	Weight (Pounds)	Reference
Binoculars	2	Estimated
AN/GVS-5 Laser Rangefinder	4	TM 11-5680-201-10
Lensatic Compass	.25	Estimated
BA 4386 (3) (PRC-77)	3	TM 11-5820-667-12
BA 5590/U (3) (KY-57)	3	TM 11-5810-256-12
BA 5600/U (3) (DCT)	1.75	Estimated
Total Weight	***14***	

Table B. Forward Observer Related Items

Equipment	Weight (Pounds)	Reference
PRC-77 Radio	18.00	TM 11-5820-667-12
KY-57 COMSEC Device	7.25	TM 11-5810-256-12
AN/PSC-2 Digital Communications Terminal	5.75	TM 11-5895-1325-12
Total Weight	***31***	

Table C. Radio-Telephone Operator Related Items

Figure 1. Weight of Soldiers' Equipment

he was so top heavy with equipment, he could not have stopped himself if he had wanted to. Fortunately, his injury was only temporary—but he was out of action for seven days.

Upon returning to Fort Drum, I was determined to investigate in more detail the load my FISTs were required to carry. I asked my brigade FSO to weigh the equipment a forward observer (FO) and radio telephone operator (RTO) carry and also weigh the load carried by the 13F soldiers who did dual-duty, because we were frequently short of personnel. The resultant "weigh-in" is shown in Tables A, B and C (Figure 1). Table A is common to both soldiers, with either Table B or Table C added to reflect the FO or the RTO.

The visual impact of this load is even greater. The first picture (Figure 2) shows the FO's equipment as listed in Tables A and B. The second picture (Figure 3) shows the RTO's equipment listed in Tables A and C. Although these are certainly heavy loads, I was unprepared for the load a 13F carries when he is both the FO and RTO. The combination of tables A, B and C reflect the items carried when one man must do both duties (Figure 4).

Recalling back to my days at Fort Bragg, I found it hard to believe we had actually increased the FIST load over the last 13 years. It has been proven time and again that a man can carry equipment and perform effectively for long periods if the load does not exceed 40 percent of his body weight. Based on that, FIST members should weigh between 235 and 312 pounds to carry the loads currently required.

Armed with this knowledge, we briefed the Div Arty commander. He directed the briefing be presented at the Light Div Arty Commanders Conference. As a result of that briefing, the Field Artillery School is researching a solution to reduce the load our 13F soldiers must carry. Initial ideas look promising and include replacing the M16A2 rifle with the 9-mm pistol and replacing the AN/PRC-77 radio with an off-the-shelf lightweight radio. Another consideration being evaluated at Fort Drum is to eliminate the digital communications terminal (DCT) for offensive operations and only use it during the defense when its added weight is less a burden. The combination of these weight reductions would reduce the FIST soldier's load by 24 pounds.

Another item our FIST soldiers use in the dismounted mode is the ground/vehicle

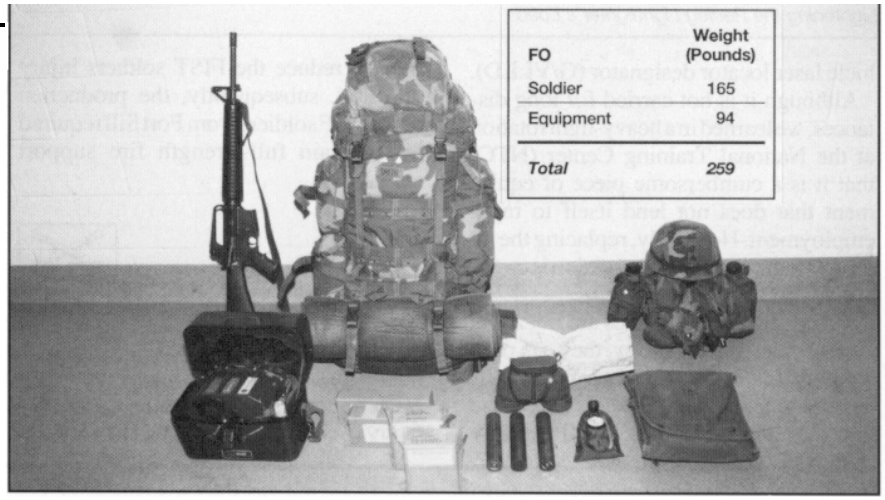


Figure 2. FO Equipment

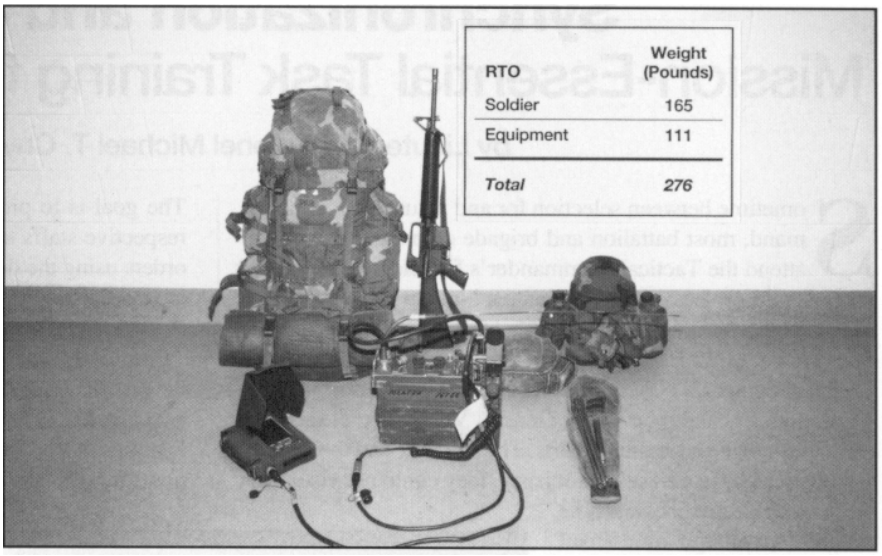


Figure 3. RTO Equipment

Figure 4. FO/RTO Equipment

laser locator designator (G/VLLD).

Although it is not carried for long distances, we learned in a heavy-light rotation at the National Training Center (NTC) that it is a cumbersome piece of equipment that does not lend itself to rapid employment. Hopefully, replacing the G/VLLD with a lightweight version is on the horizon.

Although these initiatives are not at the cutting edge of technology, they can only help our FISTs in the light infantry, airborne and air assault divisions keep pace with the maneuver forces. It will certainly help to reduce the FIST soldiers injury rate and, subsequently, the production rate of 13F soldiers from Fort Sill required to maintain full-strength fire support teams.

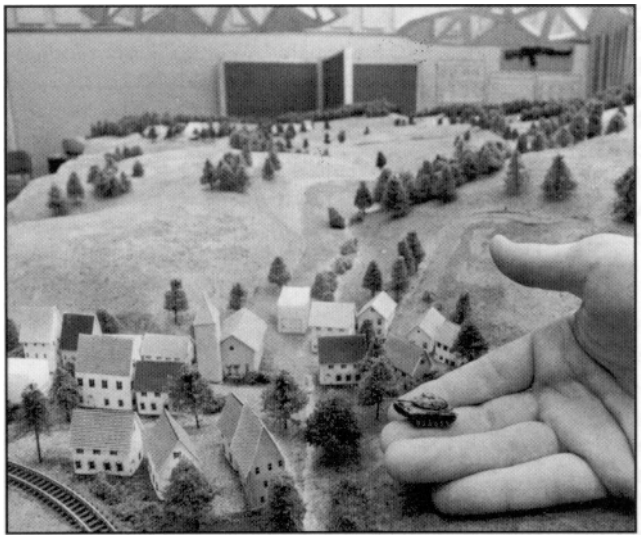
Lieutenant Colonel Charles R. Rash currently commands 2d Battalion, 7th Field Artillery, 10th Mountain Division (Light Infantry), Fort Drum, New York. His previous assignment was as Deployment Plans Officer, United States Transportation Comand. He was Executive Officer of 4th Battalion, 9th Field Artillery (Pershing) and commanded Battery C, 2d Battalion, 9th Field Artillery (Pershing), both in Germany. Lieutenant Colonel Rash served in the 1st Battalion (Airborne), 320th Field Artillery, 82d Airborne Division, Fort Bragg, North Carolina, as commander of Battery A, Battalion S2 and Battalion Fire Direction Officer (FDO). He is a graduate of the Armed Forces Staff College and received a Master of Business Administration from Widener University, Chester, Pennsylvania.

Synchronization and TCDC:
Mission-Essential Task Training for Commanders

by Lieutenant Colonel Michael T. Chychota

Sometime between selection for and assumption of command, most battalion and brigade command-designees attend the Tactical Commander's Development Course (TCDC) at Fort Leavenworth, Kansas. Now in its fourth year, TCDC began as an effort to fill a need that then Army Chief of Staff General Carl E. Vuono noticed while observing National Training Center (NTC) rotations at Fort Irwin, California.

Commanders and their staffs, General Vuono noted, seemed unable to synchronize their efforts. Though they had the necessary tactical and technical proficiency, they could not visualize the battlefield, use space and time to their advantage or control combat systems through subordinates. In addition, communication and understanding suffered greatly because of the lack of a common language: the same words meant different things to different people. Those deficiencies, among others, resulted from a flawed decision-making process. General Vuono directed the establishment of a course to train tactical commanders to synchronize the battlefield operating systems (BOSs).



Consequently, despite its name, the TCDC teaches synchronization rather than tactics. Officers will not be tactical geniuses upon completion of TCDC unless, of course, they were tactical geniuses when they began the course. Instead, the two-week course teaches them how to take the tactics and techniques they already know (or should know) and apply them in time and space to achieve the desired effect. The goal is to prepare the command designees to train their respective staffs to effectively develop and execute plans and orders using the doctrinal decision-making process.

TCDC Conduct

Constantly changing, TCDC is dynamic. The course authors, the instructors, continually change the course based on student critiques and input from Army schools and the Army Research Institute (ARI). ARI evaluates the effectiveness of the instruction through interviews with TCDC graduates who have had time to use the techniques and procedures in their "follow-on" assignments. Nevertheless, the emphasis remains on synchronization.

The Tactics Department of the Command and General Staff College (CGSC) at Fort Leaven-worth uses division and corps scenarios to teach the military decision-making process to CGSC students. But the decision-making process at brigade and below differs from that at division and above in two important respects. Staff officer expertise and experience are significantly less at the brigade or lower levels and so is the time available. Consequently, the commander becomes increasingly important in the process. The lower the echelon, the more important the commander. The less time available, the more the commander must do. For those reasons, TCDC addresses the brigade and battalion decision makers and uses the doctrinal

decision-making process taught in CGSC as a starting point for teaching an abridged process to the prospective battalion and brigade commanders.

TCDC students, although usually only combat and combat support brigade and battalion command-designees, often find soldiers from other branches and fields, even an occasional civilian, among them. On a case-by-case basis, observer/controllers from the combat training centers (CTCs) or executive officers and operations officers from units attend the course.

TCDC instructors, chosen for their expertise, work with small groups—normally no more than eight to 12 students. Acting as moderators, they fill the course days with discussions of the previous evening's assigned readings, video tape recordings of actual unit operations and practical exercises that allow students to develop the planning tools and products needed during the orders process. During the evenings, the students read assignments in doctrinal texts and professional journals that illustrate the teaching points of the next day and prepare to present solutions to various practical exercises in class the following morning.

Instructors normally divide each small group into staffs, appoint "commanders" for specific tasks and take the commanders and staffs through the planning process from mission receipt to mission completion, be it success or failure. Unlike typical military instruction, once the students develop and refine the plan, no simple instructor evaluation takes place. Instead, the group discusses the plan and rehearses and then executes the mission using the Janus computer simulation. In Janus, the students play the roles of commander, staff and subordinate unit commanders.

Civilian contractors, normally retired combat arms officers, many of whom taught tactics, run the simulation so no student need be computer literate. The contractors, or computer "interactors," act as small-unit or even vehicle commanders and assist the primary instructor in demonstrating the desired teaching points. When the battle ends, the instructor conducts an after-action review and the group either alters and re-executes the plan or moves on to the next teaching point.

The instruction isn't tied to time but to standards like those found in documents such as the Army Training and Evaluation Program (ARTEP) Mission Training Plan (MTP) 71-2 The Tank and Mechanized Infantry Task Force. The day's length depends on the expertise of the group. At any rate, the atmosphere resembles a seminar more than it does a typical military block of instruction.

Other features of the TCDC learning experience include detailed discussions of enemy and US doctrine, organization and equipment, even to the extent of laying out on a terrain model a typical enemy motorized rifle regiment attack or a US Army battalion task force assembly area using micro-armor—1:285 scale vehicles.

Discussions also examine the precise definitions of terms like "defeat" and "destroy," or the differences between terms like "reconnaissance-in-force" and "limited attack." One perennial favorite is "clear-in-zone." Discussions invariably heighten the participants' awareness of the danger in sloppiness of terminology, even those terms whose meanings we all take to be commonly understood: "seize" and "secure," for example.

Talking about terms frequently leads to talking about military symbols where the need for precision and accuracy again becomes significant. Such discussions, including the use of training aids like the micro-armor, have far-reaching effects because, after assuming command, former students put into practice similar techniques in their battalions.

Combined Arms Approach

The synchronization instruction is branch independent; the techniques apply to all branches of the Army in all situations. For a variety of reasons, the course uses an armor or infantry brigade or task force as the instructional unit. Any unit will work, but the combined arms team approach seems to reach the most students with the most effect. Depending on the small group composition, the instructor varies the unit, terrain and mission to meet the needs of the majority of the students.

For more information, call Major Kenneth Hackworth, DCTN 552-4484, School for Command Preparation, Fort Leavenworth.

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VIEW FROM THE BLOCKHOUSE

FROM THE SCHOOL

New Equipment Training for Paladin—The Future is Now!

In the rich history and legends of medieval France, Paladin was the name bestowed upon the 12 knights who served as defenders and champions of the emperor Charlemagne's palace court. The Field Artillery, the King of Battle, will soon have an improved howitzer, the M109A6 Paladin, that will serve as the champion and defender of maneuver forces into the future. Like its legendary namesake, the M109A6 Paladin stands on guard, poised to defend with quick and deadly accuracy. Lightning streaking across a darkened sky accurately reflects the vehicle's swift, lethal and far-reaching firepower in response to aggression.

The Field Artillery School, Fort Sill, Oklahoma, is readying itself to begin fielding the M109A6 Paladin. The first unit fielded will be the 2d Battalion, 17th Field Artillery (2-17 FA), 212th FA Brigade, under III Corps Artillery at Fort Sill. The battalion has successfully completed the

follow-on test and evaluation (FOTE) designed to demonstrate the system is prepared for full production. This article introduces the fielding team and the training strategy that will be used to field Paladin.

Paladin Capabilities

The M109A6 Paladin is the most technologically advanced howitzer in the US Army and will bring about a totally new approach to the way we perform some of the tasks required to accomplish the mission of the Field Artillery. The Paladin can operate semi-autonomously within its assigned position area, process technical firing data and shoot with no outside assistance. The automated fire control system (AFCS) and single-channel ground and airborne radio systems (SINCGARS) eliminate the need for surveyed firing points, aiming circles, collimator and wire communications.

Capabilities of the system include the ability to fire 254 rounds per tube per day and conduct 20 survivability moves of 300 to 500 meters and two tactical moves of greater than 7 kilometers in a 24-hour period. Survivability moves will be every five to 12 minutes. There are increases to reliability, availability and maintainability (RAM) over the M109A2/3.

To field the system, the Field Artillery School has developed a strategy and organized a new equipment training team (NETT) to support it.

NETT and the Paladin Training Strategy

The NETT consists of a 52-man team capable of fielding a battalion of 24 howitzers at a time (see Figure 1). It's headed by a lieutenant colonel and arrives at the fielding site as the M109A6s arrive. Once the howitzers have been deprocessed and signed over to the unit, NETT will begin and last for four weeks.

For the training, the team will divide into three battery teams, one maintenance team and one headquarters team. The NETT strategy provides individual training for military occupational specialties (MOSs) 13B Cannon Crewmember, 13E Cannon Fire Direction Specialist, 45D FA Turret Mechanic, 45L Artillery Repairer and 63D FA Systems Mechanic; develops minimum essential collective skills at the battery level; and provides critical knowledge for the battalion level. The goal is to provide each battalion enough skills and knowledge to push the system to its full capabilities in collective training after the departure of the NETT.

The most challenging aspect of Paladin operations for the fielding unit will be tactically employing platoons and batteries. Hands-on training in tactical employment is essential, so the battalion can employ the system to the limits of its technical characteristics and has some degree of operator standardization. To accomplish this, the NETT's four-week (20 training days) multi-echelon approach to operator and tactical training focuses on a building block train-the-trainer concept: individual, section, platoon and battery (Figure 2).

Additionally, using the trainer-the-trainer concept, unit maintenance personnel will be trained through three different classes: unit-level hull (63D) for 40 hours, unit-level cab (45D) for 80 hours and direct support cab (45L) for 80 hours. The maintenance training will occur before the operator/tactical training. Since the deprocessing of the howitzers will take approximately a month, the maintenance training will begin as soon as the first four howitzers have been deprocessed.

The training strategy focuses on the critical individual and collective tasks needed to employ the system. It starts with individual tasks and then brings the MOSs together to collectively train on how to employ the system, concluding with a battery-level live-fire exercise.

The first five days of NET are critical. For example, during that time, the 13B training strategy consists of a howitzer section instructor taking the chief-of-section, gunner and ammunition team chief and training all individual tasks to standard. In the section/platoon/battery field exercises, the instructor will always be present on the gun, but the section chief will train his section.

Team Leadership	
1/13A/LTC	NETT Team Chief
1/13A/MAJ	Battalion DTTP
3/13A/CPT	Battery Team Leaders
1/13C/SFC	Battalion TACFIRE Instructor
1/913A/CW2	Maintenance Training Chief
I/GS/CIV	Chief Training Battery & Below
Operator/Training	
6/13B/SFC	Platoon Headquarters Instructors
6/13E/SSG	Platoon Operations Center Instructors
24/13B/SSG	Howitzer Section Instructors
1/31G/SSG	Radio/Communications Instructor
Unit-Level Maintenance	
4/63D/SSG	Organization Maintenance Instructors
1/31V/SSG	Communications Troubleshooting Instructor
DS/GS Maintenance	
2/45K/SSG	Turret Repairer Instructors

Figure 1. The 52-man Paladin NETT will field a battalion of 24 howitzers at a time and provide four weeks of training designed for the battalion to push its Paladins to their limits in collective training following the NET.

Once NET is complete, the battalion will be able to operate the system and begin developing a collective training plan.

The reference publication for Paladin operations is *ST6-50-60 M109A3E2 Howitzer Improvement Program (HIP) Howitzer.* In preparation for the FOTE, individual training was provided to 2-17 FA, based on ST 6-50-60 and instructor experience with the Paladin. The NET strategy was and will continue to be developed based on lessons learned from individual and collective training, the FOTE and unit experience in operating

	13B	13E	Battery Leaders	Battalion Leaders
Classroom Instruction (in Days)	0	0	3	3
Individual Hands-On Instruction	5	5	2	1
Section Field Training Exercise (FTX)	5	5	5	3
Maintenance In-Progress Review (IPR)	1	1	1	0
Platoon FTX	3	3	3	0
Maintenance IPR	1	1	1	0
Battery Live-Fire Exercise	5	5	5	5

Figure 2. The NET will provide 20 days of multi-echelon operator and tactical training, focusing on building blocks to collective training using the train-the-trainer concept: individual, section, platoon and battery. In addition, the NET will train maintenance personnel and battalion leaders.

the system. The fielding team will take ideas from 2-17 FA, conduct an external analysis of current doctrine and tactics, analyze the results of the FOTE and incorporate this information into a revision of ST 6-50-60, which ultimately will be incorporated into *FM 6-50 Tactics, Techniques and Procedures for the Field Artillery Cannon Battery* and *FM 6-20 Fire Support in the AirLand Battle.* Developing good doctrine, tactics, techniques and procedures (DTTP) is a dynamic process, and each NETT will build on previous experiences to provide the optimum solution to each fielding unit.

To assist the battalion in its long-range training strategy, the fielding team will provide a draft standing operating procedure (SOP) and sustainment plans. The unit also will receive a training packet, consisting of view graphs, slides, lesson plans and student handouts. If the unit needs additional assistance, it can request help from the Field Artillery School's mobile training team.

Paladin training also will be integrated into Fort Sill's Pre-Command Course, Officer Basic Course, Officer Advanced Course and Basic NCO Course. A Paladin Commander's Course also is being developed, scheduled to begin April 1994.

Questions about the Paladin NETT strategy or fielding schedule can be directed to the fielding team (Paladin Branch of the Gunnery Department, Field Artillery School) located in Room 57 of Summerall Hall on Fort Sill. The phone number is DCTN 639-4418/5523 or commercial (405) 351-4418/5523.

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New Distributed Training Programs: FAOAC and 13B ANCOC

The challenge facing today's Army is to be ready to deploy and fight well-equipped enemies around the world in conflicts that span the full spectrum of intensity with little or no warning. To prepare for all the contingencies that may arise, the Army must continue to train to rigorous standards, using the full scope of advanced training technologies. Examples of current state-of-the-art training media include computer-based instruction, video tapes and video teletraining for individual and collective training.

The Army's Distributed Training Program (DTP) will take advantage of these advanced technologies to train soldiers before they attend resident training. DTP promotes training effectiveness by ensuring all students enter the resident portions of their courses with a common base of knowledge learned during pre-resident instruction. This common knowledge will reduce student frustration and the boredom associated with repeating materials already mastered by some students, yet new to others.

The DPT concept proved its versatility for training during Operations Desert Shield and Storm. Soldiers received live, interactive Arabic language refresher courses using video teletraining at their home garrisons from the Defense Language Institute at Fort Ord, California, before deploying to Saudi Arabia.

Another example: Reserve Component (RC) officers completed the unit movement officer course at their home stations using video teletraining and video tapes from the Transportation School and the Training Support Center at Fort Eustis, Virginia. Those RC units received critical movement information that facilitated their deployment to Southwest Asia without sending their transportation officers to the resident course.

DTP is now in the "proof-of-principle" phase. Several proponent school courses were selected to participate in the pilot program. These courses include 12 basic NCO courses (BNCOCs), four advanced NCO courses (ANCOCs) and eight officer advanced courses (OACs).

Initially, pilot courses will consist of course lessons reconfigured for distribution using printed instructional material. Later, pilot classes will include advanced training technologies to modernize, improve and help distribute course materials to the field.

The Field Artillery School at Fort Sill, Oklahoma, will implement two DTP pilot courses in FY 93: the Field Artillery Officer Advanced Course (FAOAC) and the Cannon Crewmember ANCOC (Military Occupational Specialty, or MOS, 13B40).

Beginning with Class 4-93 (reporting 25 July 1993), we'll implement OAC Common Core Series 1 as Phase 1 of FAOAC. Students scheduled to attend this class will receive a pre-resident package of instructional material covering about 32-hours of current OAC common-core instruction. The resident portion of FAOAC, Phase 2, still will be 20 weeks and require the student to be in permanent change of station (PCS) status.

The Cannon Crewmember ANCOC, beginning with Class 4-93 (reporting 11 April 1993), will implement 12 DTP modules as Phase 1, covering 73 hours of instruction. The instruction consists of both common leader training and MOS-specific material. Phase 2, resident training, will remain nine weeks, four days long.

Students should receive the materials approximately 26 weeks before the resident phase begins and must complete the lessons and tests before reporting for the resident phase. Students arriving for the resident courses will have a higher average knowledge level of course materials. More knowledge will enable them to "hit the ground running" and proceed at a rate that stimulates, motivates and challenges. At the same time, pre-resident instruction will enable students to proceed at their own rates to ensure maximum learning.

DTP also will enable soldiers to perform duties more effectively in their units and enhance unit readiness. Industry studies have demonstrated the use of advanced training technologies significantly increases knowledge retention and job performance.

For more information, contact the Reserve Component/Distributed Training Branch, Directorate of Training and Evaluation, Field Artillery School, Fort Sill, Oklahoma, at DCTN 639-3427/3789 or commercial (405) 351-3427/3789.

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