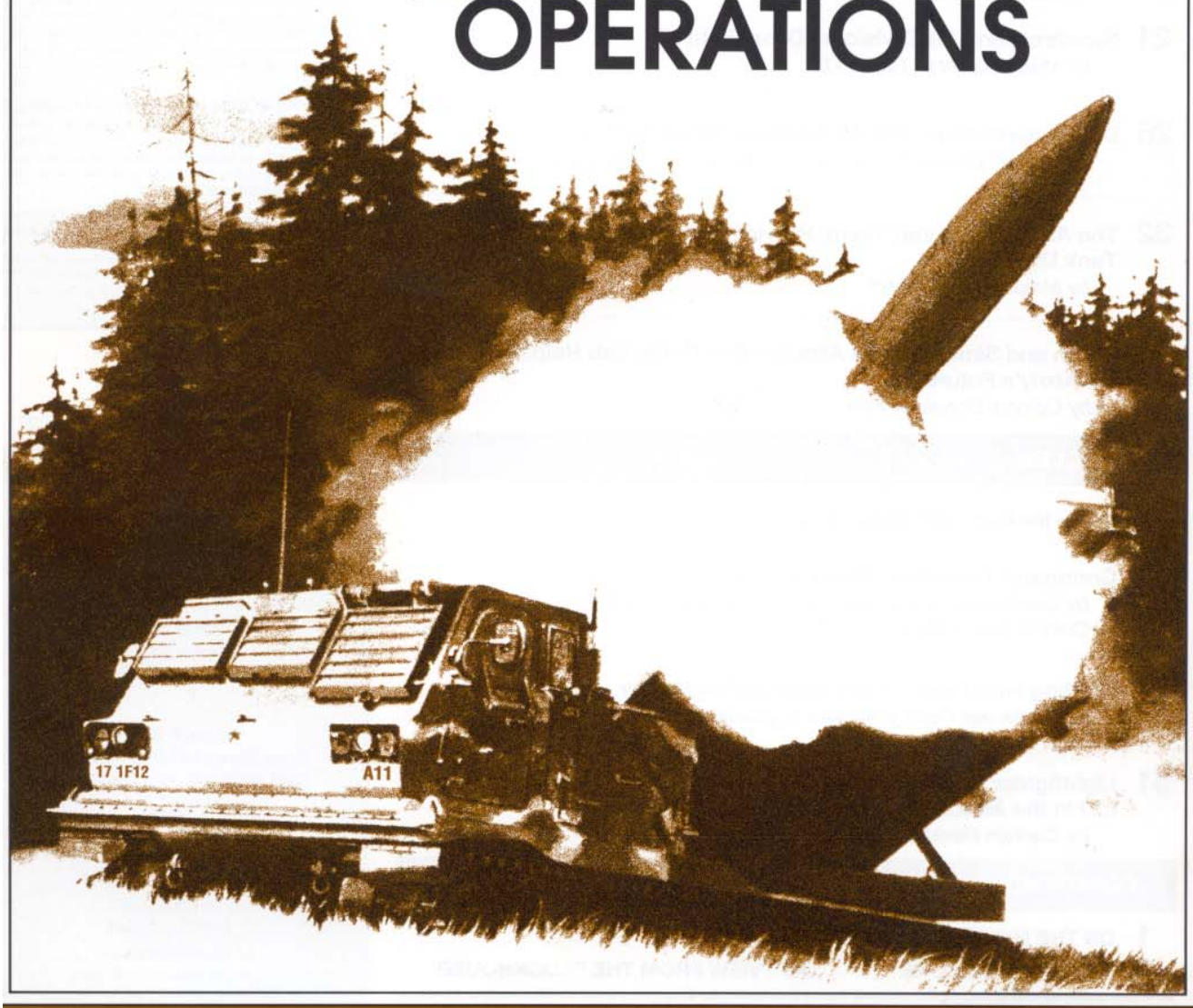
Field Artillery

A Professional Bulletin for Redlegs

April 1993

DEEP OPERATIONS



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INTERVIEW

FEATURE ARTICLES: Deep Operations

ARTICLES

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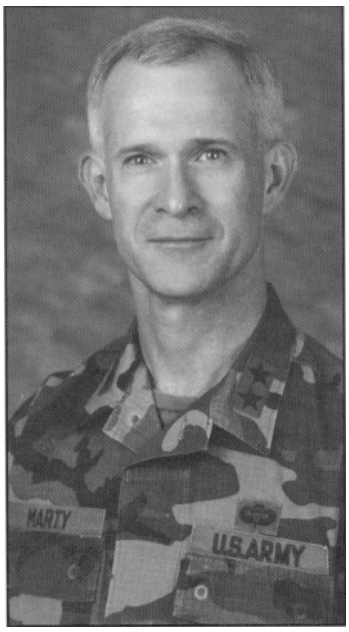
Deep Operations



Our vision of deep operations has changed and evolved significantly in the past decade. The advent of AirLand Battle doctrine clearly established the tenets to expand our warfighting horizons beyond the realm of the close fight. This doctrine, combined with rapidly advancing technologies, revolutionized our concept of fighting deep. We now possess the ability to see, hit and kill on the battlefield to depths and precision never before imagined. Today, our Army weapons provide the joint task force (JTF) commander a multi-dimensional ability for fighting with fires throughout the battlefield at the time and place of his choosing.

Our capability to execute deep attack operations greatly enhances a commander's ability to meet his combat imperatives—mission accomplishment and force protection. Deep operations facilitate accomplishing operational and tactical objectives. They shape and develop the battlefield by setting the conditions for operational maneuver and help dictate the terms for the close fight. Attacking throughout the depth of the operational area holds enemy forces and functions at risk. This pressure extends the battlefield in time and space, giving us the opportunity to expose or attack these essential objectives. Fighting deep allows us to control the tempo of operations, providing us the opportunity to seize and retain the initiative, thus hastening the defeat of the enemy.

Deep attack operations help protect our force by minimizing friendly losses and neutralizing the enemy's attack and acquisition assets. By striking enemy troop concentrations deep, we reduce enemy forces throughout the battlefield long before any direct fire engagement. Attrition of the enemy deep in selected areas also allows us to create favorable force ratios at decision points of our choosing. Well-planned and executed counterfire directed against the total enemy fire support and air defense systems reduces the enemy's will to employ these assets. It also gives us the ability to destroy them quickly if he does.

New Paradigm

To fully understand how the Army fights deep, we must accept a new paradigm for viewing the battlefield. Today's battlefield is truly joint with the synchronized application of all combat assets. It extends in three dimensions with air and ground forces—fires and maneuver intermingled in time and space. This new paradigm affords the JTF commander the simultaneous employment of combat power throughout its depth.

> ***"Today's battlefield is truly joint with the synchronized application of all combat assets. It extends in three dimensions with air and ground forces—fires and maneuver intermingled in time and space."***

Overwhelming application of firepower must happen both simultaneously and throughout the battlefield, holding all enemy functions at risk. It hastens the enemy's defeat by accelerating his disorganization, disintegration and destruction. The enemy commander must face the dilemma of multiple threats and attacks that overwhelm his ability to cope and respond. Through our control of the battle tempo, we create a condition where he has no place to hide and no time to rest.

Executing attacks both simultaneously and at depth requires detailed coordination of assets. It requires near real-time command, control, communications and intelligence (C^3I) systems with joint interoperability. This includes access to national and theater reconnaissance, surveillance and target acquisition assets. Attack systems must be networked with sensor platforms to provide responsive 24-hour, long-range precision strike capabilities.

The traditional view of ground combat focuses on the close fight. Our organic precision strike capabilities now join air assets in extending the land component commander's (LCC's) options for decisive victory. The ability of cannon, rocket and missile systems to attack targets at ranges and with lethality and synchronization never before realized makes fires a critical factor in the combat power equation.

Air and naval systems along with attack helicopters, cannons, rockets and missiles provide the joint force commander a range of complementary systems for fighting with fires. The combined use of these systems provides operational fires throughout the battlefield against the full array of enemy targets. The joint force commander now possesses the ability to execute operational counterfire, interdiction and the precision attack of enemy C^3 and air defenses.

Operational Counterfire. Today, the force can execute counterfire against all enemy fire support systems, to include tactical missiles. This takes two forms: proactive and reactive. Proactive counterfire requires the concentration of acquisition

sensors on probable weapons and support locations. Reactive counterfire demands the detection of an enemy launch or firing. In both cases, once the site or firing is detected, fire orders must be channeled responsively to various attack assets. These two techniques in combination can act to degrade significantly the enemy's ability to provide effective fire support.

Interdiction Fires. These fires afford the commander the ability to overcome an enemy maneuver force before the close fight even happens. Once we acquire an enemy formation or assembly area, we can bring the full weight of our systems to bear on it. This capability to attack the enemy anywhere, anytime on the battlefield significantly reduces his ability to generate and sustain combat power.

Precision Attack of Air Defenses and C^3 Nodes. Attacking hostile air defenses and C^3 nodes follows the same principles. The use of attack assets against these targets greatly hampers the enemy's abilities to command and control and protect his forces. The synchronized use of air assets and land-based fires for destruction of integrated air defenses (DIADs) is most effective. We use long-range precision fires to destroy an air defense site's protective air defense umbrella, so aircraft can simultaneously attack it and other targets.

FA Deep Strike Operations

The Field Artillery is a major player in the aforementioned deep strike operations. Our weapon systems provide a responsive, all-weather, 24-hour capability, with both reach and lethality. An Army tactical missile system (Army TACMS) launcher can deliver the renown "steel rain" accurately on a target more than 100 kilometers away. We are seeking actively to increase both the lethality and range of our systems. The sense and destroy armor (SADARM) and the brilliant anti-tank (BAT) munitions programs will enhance both our precision and lethality. Work also progresses on developing an extended-range multiple-launch rocket system (MLRS) rocket. Modifications will increase the rocket's range by roughly 50 percent.

Our fire support elements (FSEs) also provide a superb base architecture for planning, coordinating and controlling deep strike operations. These organizations, at all echelons, are the focal point for planning and executing fires for the commander. Augmentation by representatives of other branches and services help provide effective and timely communications, targeting, coordination and execution.

Depth and Simultaneous Attack Battle Lab

We are pushing ahead to further refine and expand our deep attack capabilities. The focus of these efforts is the Depth and Simultaneous Attack Battle Lab at Fort Sill. (See the article in this edition "Depth and Simultaneous Attack—One Battle Lab Helping to Forge the Army's Future" by Colonel Donald L.W. Kerr.) The D&SA Lab concentrates its efforts on the full suite of deep battle issues. It seeks to develop, refine and test doctrine, training and materiel in support of deep operations. Supporting labs at Forts Bliss (Air Defense), Rucker (Aviation), Huachuca (Intelligence and Electronic Warfare) and Bragg (Special Operations) contribute immensely to this coordinated effort. The lab also solicits input from industry, academia and other Army agencies and commands. The Army Space Command, Army research laboratories, III Corps Artillery and various contractors all provide support and expertise for the D&SA Lab's endeavors.

> ***"Emerging technology now enables us to see more of the battlefield and to attack the enemy simultaneously throughout its depth."***

Attacking deep on today's battlefield truly demands the joint coordination and application of firepower. Participation in the D&SA Battle Lab by other services serves to refine procedures and enhance our attempts at maximizing the deep strike potential for the entire force. The Marine Corps and Air Force participated in some of our earlier battle lab experiments, and the Air Force's Air Combat Command is an essential partner in the additional Joint Precision Strike (JPS) demonstrations this fall. The Navy also has expressed an interest in collaborating on these important joint issues.

The D&SA Battle Lab is pursuing several important projects this fiscal year. One key initiative focuses on developing a deep operations coordination cell (DOCC) for the corps and echelons-above-corps levels. The DOCC provides a centralized location for planning and executing deep operations. Other significant projects include attempts to compress sensor-to-shooter time lines and the enhancement of Joint Precision Strike capabilities.

Our battle lab accomplishes much of its research and development by using simulations and demonstrations. The D&SA Lab and supporting labs effectively leverage off Lance and Army TACMS missile firings and other exercises to study target acquisition, cueing and other JPS issues. The compression of sensor-to-shooter time lines presents a good example.

We recreated an event, termed Jayhawk Thunder, from Operation Desert Storm. The lab used an Army TACMS live-fire demonstration at White Sands Missile Range, New Mexico, to replicate the actions from target identification to missiles fired. The analysis of this demonstration now guides our efforts on how to improve the associated doctrine, training, and materiel. Work is underway to build an interactive simulation based on this demonstration for use in developing and training a full spectrum of deep attack tactics, techniques and procedures (TTPs).

Emerging technology now enables us to see more of the battlefield and to attack the enemy simultaneously throughout its depth. The leverage deep fires affords a joint force commander becomes a critical factor in the combat power equation. We possess the doctrine, command and control and weapons to provide the commander an extremely lethal ability to fight with fires. We actively seek to improve these capabilities so the Field Artillery can remain—***On Time, On Target!***

Junior Leader Development—Setting the Conditions for Success

by Command Sergeant Major Walter Devoe, 101st Airborne Division (Air Assault) Artillery, Fort Campbell, Kentucky

As our Army downsizes, it's becoming more important for our junior leaders to be competent, aggressive and confident in their ability to take charge. Early in their careers, they must understand that technical and tactical competence are essential to leading in today's Army. However, this development will severely falter unless we *set the conditions* that ensure success.

Senior NCOs must initiate and sustain the leader development process of their junior leaders. To "let the horses run," the command sergeants major, first sergeants and principal staff NCOs must share the critical task of setting conditions where responsibility, authority and accountability rest in the hands of junior NCOs. This can be accomplished in many ways. In the 101st Division Artillery (Div Arty), we use physical training (PT), Sergeant's Time, the fielding of the M119 howitzer and safety as the vehicles for beginning the leader development process of our junior NCOs.

PT. Soldiers must be physically and mentally tough to successfully meet the many demanding physical challenges of serving with the 101st Div Arty. Our junior leaders are responsible for the physical development of their enlisted soldiers. They ensure their soldiers can excel at PT, successfully complete the Army physical fitness test (APFT) and earn their wings at the rigorous Air Assault School. Every PT session is essentially a leadership clinic. Junior NCOs have the authority to execute hands-on leadership to motivate, encourage and correct soldiers.

Sergeant's Time. Another area where junior leaders are given significant responsibility is training. Each Thursday during Sergeant's Time, junior NCOs have a block of time dedicated to train their soldiers on team, crew or section tasks. Junior NCOs plan, conduct and assess their training. This team, crew or section training is the critical link between individual and collective training and is the junior NCO's primary responsibility.

> ***"At a time when our Army is experiencing significant changes, we must grow great leaders at the lowest possible level."***

Team building and leader development are maximized during these valuable training sessions. The junior leader can effectively coach and mentor his soldiers to attain and sustain proficiency on battle drills and supporting tasks.

Fielding the M119 Howitzer. The fielding of the M119 has been an outstanding vehicle for developing our junior leaders. What began as a feeling of uncertainty and skepticism quickly turned into a positive leader development experience. During the course of a five-week period, our junior NCOs were responsible for learning, teaching, firing and certifying a new howitzer.

The fielding process began at Fort Sill, Oklahoma, where Field Artillery School cadre trained our senior 13Bs (Cannon Crewmembers) on the technical aspects of the new howitzer. During the second and third weeks of the training process, our senior NCOs trained their section chiefs and junior NCOs on standardization and crew drill. One of the important goals of the fielding was to have all 54 howitzers in the Div Arty standardized.

Howitzer sections conducted their first live-fire exercise during the fourth week of training with senior NCOs administering a series of evaluations to each section to determine their proficiency. Sections that passed these evaluations proceeded to the last phase of training—a live-fire certification conducted by our senior NCOs. Sections that didn't pass received retraining until they, too, completed the live-fire certification. The result of this valuable training process has been competent and confident junior NCOs who understand the importance of their role in training and mentoring soldiers.

Safety. A cornerstone of all leader development programs is safety. Junior leaders must understand all facets of safety—ours is a dangerous business. Whether it be conducting live-fire, an air assault operation or moving by convoy, safety must be second nature. Our senior NCOs and officers provide valuable risk assessment instruction to our junior leaders so they can make safe decisions and execute their tasks with reduced risk.

At a time when our Army is experiencing significant changes, we must grow great leaders at the lowest possible level. The 101st Div Arty is investing in the next generation of leaders—*setting the conditions* to ensure success in junior leader development will result in unit excellence and a combat ready force able to meet any challenge.

Command Sergeant Major (CSM) Walter Devoe is the CSM of the 101st Airborne Division (Air Assault) Artillery at Fort Campbell, Kentucky. He has had seven years of experience as a CSM and six years as a first sergeant and served in three combat assignments in Vietnam. His previous assignments include CSM of the 1st Battalion, 320th Field Artillery, also in the 101st Airborne Division; CSM of the 4th Battalion, 18th Field Artillery, 41st Field Artillery Brigade, Germany; and CSM of the 6th Battalion, 8th Field Artillery, 7th Infantry Division (Light) at Fort Ord, California.

Top-Down Fire Planning Revisited

I read with interest the excellent articles by Lieutenant Colonel Albert F. Turner, Jr. ("The DS Artillery's Staff Planning Process") and Major W. E. "Casey" Crowder ("Fire Support and FA Issues at the Maneuver CTCs") that appeared in the October 1992 edition of *Field Artillery.* Both articles highlighted significant problems units face everyday at the combat training centers [CTCs].

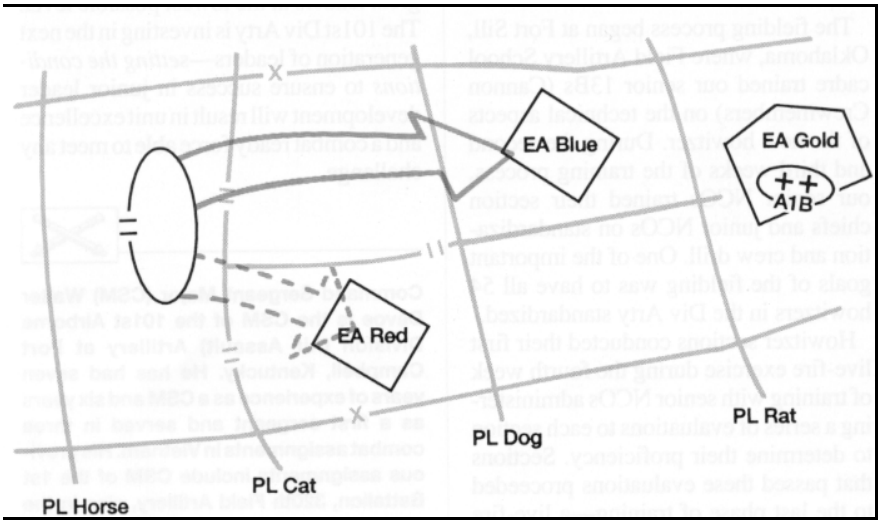
The purpose of this letter is to attempt to articulate what I see as a major pitfall in the top-down fire planning process, one that units need to avoid. The problem occurs when the brigade fire support officer (FSO) or the fire support coordinator (FSCOORD) fail to fire plan throughout the brigade sector or zone, specifically in the area within the task force (TF) boundaries.

In the figure, the brigade FSO has not planned any targets in the TF sector, planning only in support of an engagement area [EA] to be used by attack helicopters forward of the forward line of own troops (FLOT). In this scenario, each TF FSO plans fires in his own TF's area of operations. Each TF FSO participates as part of the battle staff in the wargaming process and, in turn, comes up with excellent fire plans. These are then forwarded to the direct support (DS) battalion tactical operations center (TOC) or fire direction center (FDC) and to the brigade FSO. Duplicate targets are culled, and the scheme of fires is fleshed out in the fire support rehearsal. This approach to fire planning may sound good, but it guarantees two things: the plan will not be synchronized with the other battlefield operating systems and the DS battalion will have to scramble to make the plan work.

Brigade FSOs have a tendency to use a "hands off" approach when it comes to targeting in the TF area of operations. The attitude that it's "the TF's fight" is the norm. When this happens, a large gap is left in the planned sequence of the battle.

This approach to fighting the maneuver fight might be acceptable if all the brigade is concerned with is when and where the brigade reserve gets committed. But, if you buy into the statement that the brigade commander is truly a combined arms commander who orchestrates all the battlefield operating systems, then it becomes obvious how flawed this approach to top-down fire planning really is.

Fire support is a battlefield operating system that transcends TF boundaries with a single radio transmission. It is a finite, scarce resource that must be integrated into the brigade plan and allocated at the brigade level. As fire supporters, we pay a premium to enjoy the benefits of an integrated, synchronized fire plan, and that premium is detailed planning by the brigade FSO.



Top-down fire planning mandates that the brigade FSO plan fires for the TF's area of operation.

The brigade FSO must be an aggressive member of the battle staff who wargames the fight from the line of departure to consolidation on the objective. The result of good wargaming is a fire plan that could be executed (if need be) without refinement from the TF FSOs. This means every resource available to the brigade FSO is either used or allocated. This required level of detail means the brigade battle staff must plan brigade EAs and obstacles and determine where the decisive point on the battlefield will be.

As Lieutenant Colonel Turner's article points out, this approach allows the DS battalion to do everything it needs to do concurrently with the brigade. Failure to do so puts the DS battalion at a needless time disadvantage that is hard to overcome. Additionally, synchronization of fire support at the brigade level becomes an "If I could change one thing..." comment at the next after-action review.

Part and parcel of developing a workable top-down fire plan is linking the specific targets with specific shooters. Major Crowder's article addresses the use of the fire support observation plan to accomplish this. In a nutshell, the fire support observation plan makes optimum use of another scarce resource—dedicated sets of eyes on the battlefield.

While this is a viable technique, it should be recognized that the genesis of the "observation plan" comes from the continued failure of combined arms commanders to accept responsibility for executing assigned targets. At the company/team level, commanders must accept that engaging targets with indirect fires (and the effort needed to make the engagement successful) is a critical task inherent in every combat operation. The "Fighting with Fires" philosophy recognizes this and states the maneuver commander needs to do more than "watch his own lane."

In his August 1991 article, "Improving the Effectiveness of Artillery at the NTC," Colonel Bruce B. G. Clark, Armor, said it best: "In units where artillery fire is effective, company commanders position their FISTs [fire support teams] on the battlefield to call for fires that support their schemes of maneuver....This includes

positioning them to execute the battalion or brigade commander's assigned targets."

Using an observation plan implicitly is a shift away from placing the responsibility for integrating fires and maneuver where it belongs—squarely on the shoulders of the combined arms commander. The technique of allocating scarce observation resources is a good one, but in my opinion, it's the easy wrong instead of the hard right.

MAJ Boyd D. Gaines, FA
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Fire Support and Combined Arms
Operations Department
Field Artillery School, Fort Sill, OK

Response to "The Myth of the Well-Rounded Artilleryman"

In a time of force reduction, the heretofore intellectual and political debates concerning roles and missions and appropriate active and Reserve Component force mix have taken on a new and threatening dimension. As more and more unit colors are permanently "cased," many of the old "turf" issues have resurfaced. In his letter, "The Myth of the Well-Rounded Artillerymen" [February 1993] Captain Robert P. Smith, Jr., accurately recalls some of the old debates internal to the Army of "armor versus cavalry" and "missile versus cannon." Although I agree with his premise that we should respect the challenge associated with any artillery leadership position, I am concerned with his approach to this topic.

My disagreement begins with the author's comparison of today's cannon and multiple-launch rocket system (MLRS) leaders' relationship with yesterday's cannon and Lance/Pershing. The tactics, techniques and procedures (TTPs) of yesterday's systems unfortunately, but logically, segregated these groups into distinct camps.

In the past, only cannon units worked closely with maneuver forces, busily integrating fires into the close fight. In the view of our maneuver counterparts, the cannon truly represented the "King of Battle." The Lance, on the other hand, was a "corps" asset that artillerymen worried about and generals fired to influence the deep battle. The Pershing was even more remote. It was seen as a strategic weapon for which only an anointed few would ever understand its capabilities and employment.

The Field Artillery School [Fort Sill, Oklahoma] has gone to great lengths to define the similarities that exist between cannon and MLRS units. First and foremost, both sets of leaders are challenged to lead the highest quality soldiers in our force. Our recent increase in the accession score of MOS 13B certainly underscores this quality. Promotion boards do not differentiate between the groups as both sets of officers are being promoted at an equal rate. Both must fight the battle in the direct combat zone. Desert Storm vignettes are replete with examples of MLRS launchers and cannons side by side, accompanying and supporting front-line units.

The Paladin howitzer, being fielded this spring, increases the similarities of the systems. Both will employ "shoot and scoot" tactics and possess the capability to strike deep, and both must be included in the development of the commander's attack options.

Herein lies the flaw of Captain Smith's theme... we *do* need well-rounded artillerymen. The reason we exist as a branch is to allow the combined arms commander to fight with fires. This means we must merge our artillery systems into multiple attack options for the commander to execute. We can only do this right if we have an undeniable appreciation of the technical capabilities and limitations of our weapons melded with an indisputable understanding of the intricacies of fire support at all levels.

Pure cannon or pure rocket artillerymen do not fit this mold. One can argue that you can appreciate the difficulty of employing a weapon system without ever firing it. But that argument denies the essence of our branch. We cannot "Fight with Fires" if we do not understand "Fire Support."

Fire support, with all its difficulties, is the common thread of our branch. Without fire support, we are incapable of translating the technological capabilities of our systems into defeat mechanisms for our commanders. Unlike ranges, rates of fire or logistical constraints, one does not learn fire support without experiencing its frustration, its demands and its beauty. Only with this firsthand knowledge does the cannoneer or rocketeer become an artilleryman.

Today's Field Artillery feels so strongly about this common thread that we have taken definitive steps to ensure our force is "well-rounded." Beginning with the publication of the new *DA Pam 600-3 Commissioned Officer Development and Utilization*, artillery captains will not be considered branch qualified until they have completed 12 months of fire support or targeting officer experience. Artillery majors will be qualified after serving as a brigade fire support officer, executive officer or S3.

Exceptionally qualified lieutenant colonels will have division or corps fire support experience as well as successful command. These initiatives represent deliberate decisions to round out our force.

I applaud the Captain's call for artillerymen to appreciate equally the complexity of our different units. But I ask the force to dispel the myth that we do not need "well-rounded artillerymen." We do.

LTC(P) William A. Jones, FA
Director, Office of the Chief of FA
Field Artillery School, Fort Sill, OK

Response to "Thor: A Case Study in Multi-Service Coordination"

I read with both interest and dismay Lieutenant Colonel Faris R. Kirkland's article on Operation Thor [February]. My interest stemmed from the procedures the planners of Operation Thor introduced that allowed them to conduct this joint operation. They recognized the basic human need for information, trust and continued reassurance. The cause for my dismay is that the lessons learned from Operation Thor were forgotten and had to be learned again in Operation Desert Storm.

The air campaign against targets in Operation Desert Storm was planned very secretively and selectively. Very few

personnel outside the Air Force planning staff had any information about the intent, focus and effectiveness of the air campaign.

The result of this highly exclusive procedure can be seen in many of the comments from members of the other services. Complaints abound from ground commanders who felt (incorrectly) that the air campaign totally ignored their requirements; consequently, they believed they could not trust the Air Force to provide the support they required. Continuous proclamations that the war could be won by the Air Force alone only confirmed and reinforced these feelings. While these perceptions are incorrect and undeserved, the fact that these perceptions were generated and proliferated is undeniable.

Lieutenant Colonel Kirkland correctly points out that we cannot impose trust. We also cannot develop trust among the services and the members of the services by writing and publishing joint doctrinal manuals. We need to conduct more joint operations and involve more than the upper-echelon staffs in coordination with the other services. During these joint operations, we should try to involve our officers and NCOs in planning conferences and after-action reviews with their counterparts in the other services. Through these meetings and discussions, we might eliminate unfair stereotypes and mistrust of the other services.

Also, we should remember that next to the other services, the soldier trusts his own highest headquarters the least.

Vincent R. Bielinski, FA Specialist
Fire Support and Combined Arms
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The Outermost Point—A Farewell to the 559th USAAG

The following speech was given by a lieutenant in the 12th Artillery Detachment that was part of the now inactivated 559th US Army Artillery Group, Southern European Task Force (SETAF). The detachment and others like it had soldiers who maintained and secured nuclear weapons rounds for years—in case the US or her NATO allies ever needed them.

Lieutenant Colonel David E. Ott, Deputy G3 of SETAF, thought the Lieutenant did an excellent job of capturing what those Redlegs were all about, and with a sense of humor, and sent it to Field Artillery for publication. We agree.

On Friday 29 May 1992, the 559th USAAG held a formal dinner ceremony in Vicenza, Italy, to inactivate the group. A parade was not allowed because the inactivation had not yet been announced publicly. Colonel Frederick S. Berry, the last group commander, invited a lieutenant who had served in one of the group's subordinate units to make a short speech presenting a lieutenant's point of view of the inactivation. First Lieutenant Peter Janhunen gave this speech as part of that ceremony. As a point of clarification, all the detachments were remote sites to the east of the group headquarters—hence the term in the speech "out east."

Once upon a time, in a land far away, there was a very cold and forbidding outpost somewhere between the good guys and the very bad. Although it went by many names, to the majority behind the lines, the outpost was known simply as "Out East." No other name quite fit.

This outpost has stood as the forward-most point on the front lines of a historic struggle between ideologies; it formed a small but key link in the defense of our way of life. Many brave and faithful souls marched to this lonely detachment over the breadth of 30 years to sit and watch—the silent guarantors of peace in our time.

For the most part, these hardy watchmen sat unmolested in their concrete guardhouses with only infrequent visits by the nomadic nuclear surety inspectors and, even less frequent, the high potentates from headquarters to disturb their tranquil duty. Overseen by their captain, the watchmen played a silent waiting game while the events of the world swept by and left them and their charges covered in a thick layer of dust.

Life for them on the isolated plains was simple and harkened back to a time long before modern conveniences, such as post exchanges and dry cleaning services. Their days were filled by honest pursuits: running together among the fields in the early morning, perfecting the tasks of their trade under the hot sun and, finally, settling down for a peaceful slumber at the end of the day. The local denizens compensated for the inability of many of the watchmen to speak the local tongue by their amazing ability to convey exactly how much coin of the realm various services required. But all in all, it was a good life—full of the camaraderie and spirit that the circumstances engendered.

And then one day, news arrived from afar that the patient watchmen had served their purpose and could return to their native land. Preparation was intense and proceeded with great haste under the narrowed gaze of their wizened supervisors. Soon the metal objects that had so preoccupied them were hauled away to the homeland. Those people left behind quietly gathered their belongings and shuffled back to the safe places from whence they had come—free to read in books about the important role they had played in a drama that every day appears farther and farther away.

The buildings in which they had lived so long now sit vacant; the flag has been lowered and cased. The local citizens are slowly forgetting the foreign presence as all signs of benevolent occupation have disappeared. History barely has noted the passing as the watchmen's duties were secretive and never discussed. And so it was that the outpost's demise was little noticed and barely mentioned.

But tonight, we all raise our glasses to the memory of those who marched into that empty land. They were on the outermost point in our defense, and it was their small sacrifice of comfort and time that made tonight possible. Their patience and professionalism were as important as those of the more storied and celebrated legions among us. They were overlooked then but, thankfully, not tonight.

So as we bid adieu to one small piece of history, let us give one moment of thought to those countless underlings who sat and watched...and watched...and waited—not here, but out there in the distance.

1LT Peter Janhunen, FA
Formerly of the 12th Artillery Det.
559th US Army Artillery Group, Italy

Lieutenant General Jerry R. Rutherford, Commanding General, V Corps, Germany

Shaping the Battlefield— Deep Operations in V Corps

Interview by Lieutenant Colonel Jerry C. Hill, Editor

"By going deep, I can separate the enemy's echelons, influence where and when the close battle will take place and what forces he'll bring to that battle—shape it for the divisions."

V Corps has developed extensive procedures and devoted considerable assets to deep operations. How has the emphasis on deep operations impacted on the V Corps battlefield?

Deep operations are extremely critical to the success of the close fight. Although the deep, close and rear battles are often fought simultaneously, ultimately we must win the close fight. By shaping the battlefield with deep operations, I can turn over the fight to the divisions in a way that's to their advantage.

The definition of "deep" for V Corps is the delineation of the corps' area of operations in relation to our higher headquarters, CENTAG [Central Army Group]—a delineation that's distinct but flexible enough to accommodate the tactical situation. CENTAG uses a reconnaissance and interdiction planning line [RIPL] to define the "boundary" between the two areas. CENTAG has responsibility for the area beyond the RIPL. The corps is responsible for the area between the FSCL and the RIPL and, including the divisions' area, extends approximately 100 kilometers from the FLOT [forward line of own troops].

To be successful in the deep battle between the FSCL and RIPL, I must get inside the enemy's optempo [operations tempo]. By going deep, I can separate the enemy's echelons, influence where and when the close battle will take place and what forces he'll bring to that battle—shape it for the divisions.

What is V Corps' "deep division commander" and what role does he play in fighting the corps fight? How do you delineate the deep battle responsibilities between you and your division commanders?

To integrate and synchronize the deep fight, I assigned responsibility to one person—the V Corps Artillery Commander. This ensures unity of command. In effect, he's my deep division commander.

He's responsible for coordinating, controlling and synchronizing all corps' deep assets, including attack helicopters and Army TACMS [Army tactical missile system] and integrating BAI [battlefield air interdiction]. Given his experience, he's the logical person to most effectively synchronize those fires.

The corps artillery commander's assets include a fire support cell and, within that cell, a deep operations cell. [See the article "The Corps Artillery Commander and Deep Operations" by Major Grady B. Garrett, Page 15.] The deep operations cell has representatives from all the elements key to conducting the deep fight, including Army airspace command and control [A^2C^2], air defense, ALOs [air liaison officer], the corps aviation brigade, G2, EW [electronic warfare] personnel, SOCCE [special operations command and control element] personnel and G3 air. This cell, under the control of the corps artillery commander, plans, coordinates and executes deep operations for the corps.

To delineate the deep battle responsibilities between my commanders and me, I refer you back to the description of the corps' deep battle area—from the FSCL to the RIPL. The division commanders are responsible for deep operations in the area between the FLOT and the FSCL. However, they can nominate targets beyond the FSCL, but their area of control extends to the FSCL.

Is there any particular "tool" or procedure your corps artillery uses to make deep battle operations successful?

Although no *single* tool or procedure makes our deep operations successful, there are several in V Corps I would

highlight as key elements to our success in managing and fighting the deep battle.

First, we developed a deep attack planning sequence that systematically directs the battle planning process and also helps ensure deep operations are coordinated and synchronized. This planning sequence is based on a time line. For example, four hours prior to a TOT [time-on-target] for a deep attack mission, the corps artillery commander conducts a "stand-to" meeting with all key deep operations players. This meeting formally initiates the deep operation planning and execution sequence with the corps artillery commander issuing initial mission guidance.

For the next several hours, the deep operations cell works through a series of "Go/No Go" decision briefings for planning and execution, ultimately determining if and when the mission should be conducted and, at the same time, answering several key questions. Is the target maturing as we expected? Did the sensors and acquisition systems focusing on our NAI [named area of interest] confirm the enemy is flowing along this avenue into the engagement area? Will the weather support the operation? The sequence systemizes our planning process and ensures we make the right decisions at the right time to integrate all systems to do the most damage to the enemy.

Another initiative in V Corps is our deep operations configuration. I collocate my corps aviation brigade commander and his TOC [tactical operations center] with the corps' fire support cell, so the commanders work side-by-side in coordinating deep operations.

Finally, we setup an electronic TV system to link communications among my van, the G3 plans cell, G3 operations cell and deep operations cell. This link allows me to very quickly coordinate deep operations and all other planning in the command post. It improves the timeliness of the decision-making process and allows continuous coordination among the other key elements.

With the Army's increasing capability to fight deep, do you see a need for centralized control of fires at the corps level?

No, I don't see a need for centralized *control* of fires, but rather centralized *coordination.* To fight the deep fight successfully, the corps' actions must be very time-sensitive. The information needed to make accurate decisions for deep battle operations is always time-sensitive and must be developed and passed quickly to decision makers.

That's why the V Corps deep operations cell includes the ALO, G3 air, G2, air defense elements, SOCCE and liaison officers from higher, lower and adjacent units. All these people, plus the collocated aviation brigade TOC, work very closely in this nucleus under one coordinator to provide the timely information I need to make final decisions for a successful deep attack operation.

Therefore, I feel centralized coordination of fires is key, but centralized control isn't necessary.

"I use all deep assets to complement each other; I really don't look at each asset as a single option."

How can we improve the collection and processing of data for critical time-sensitive targets, and what is V Corps doing to compress sensor-to-shooter time lines?

First, to improve collecting and processing data for targeting, the Army needs more reliable collection assets. Our collection assets must be all-weather capable and should not rely on other sources or data links. We need to focus on obtaining single-source collection platforms for not only timely, but also reliable information. Other than human intelligence [HUMINT], we really don't have a collection asset with those capabilities now.

As an addendum, those collection assets must provide information selected and formatted so it doesn't require a great deal of analysis during combat—the "analysis" should be built into the asset's design. This capability would greatly speed decision making as we could respond immediately to the situation, based on an asset's input.

In terms of what V Corps is doing to compress the sensor-to-shooter time lines, the corps military intelligence brigade has created its own synchronization cell. This cell focuses the brigade on the deep operations priority intelligence requirements [PIRs], on having all its assets answer PIR questions.

We also established an automatic data link from the corps G2 to the targeting cell, so they get information simultaneously. I'm also looking at physically joining my all-source intelligence production section with my fire support cell to reduce duplication of effort and speed up the information flow.

The Depth and Simultaneous Attack Battle Lab at Fort Sill is pursuing a number of initiatives to improve our execution of deep fires. If you were to pick one area you'd like it to explore, what would that be and why?

We need to improve our ability to acquire deep targets. The timeliness and reliability of our current intelligence architecture doesn't facilitate immediately engaging targets key to shaping the corps fight. As a corp commander, I need a UAV [unmanned aerial vehicle]—an organic intelligence asset that can see deep and provide real-time feedback on enemy locations. Also, I could use the UAV to determine accurate battle damage assessment [BDA].

How do you envision using Army TACMS? Does the division commander need it at his level or under his control?

I envision using Army TACMS in concert with other deep assets, each complementing the other. For example in V Corps, we use Army TACMS and EW to suppress or destroy enemy air defenses while attack helicopters go deep and attack high-payoff targets, such as artillery or maneuver forces. Once the attack helicopters are finished and the enemy artillery is set, that artillery is a soft target for Army TACMS. I use BAI to take out bridges, which stalls the enemy and allows me to use Army TACMS to attack the stalled formation.

I use all deep assets to complement each other; I really don't look at each asset as a single option.

The division commanders don't need Army TACMS at their level. They nominate appropriate targets for Army TACMS engagement, and I integrate their nominations into my overall prioritization. They have their organic and attached MLRS [multiple-launch rocket system] that are very effective between the FLOT and the FSCL. Considering the limited number of Army TACMS missiles available and

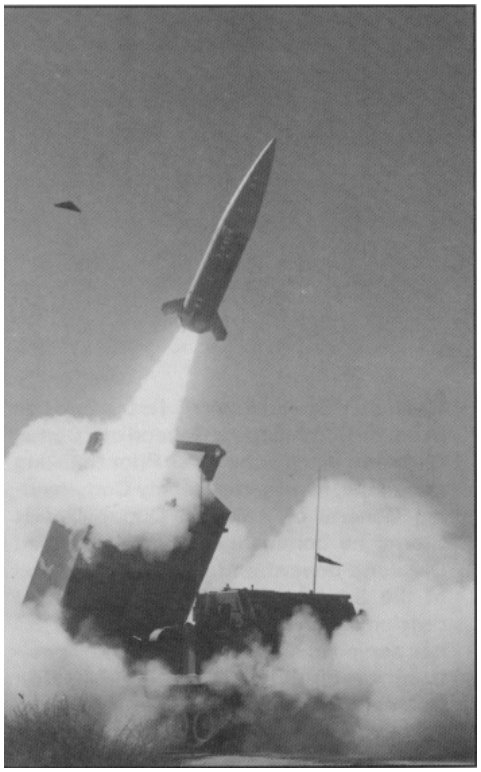
their 100-plus kilometer range, I use them in conjunction with attack helicopters and BAI to strike deep.

The bottom line—Army TACMS is a corps asset.

Considering the complex nature of deep battle planning and execution, how does V Corps train and sustain deep battle proficiency?

We have a formal, comprehensive deep battle training program in V Corps. The program focuses on individual proficiency and staff integration using a building block approach, beginning with individual training. For example, on a weekly basis, V Corps Artillery conducts individual training on the target intelligence and related activities [TIARA] data-processing computer. The training focuses on operators being able to access the targeting information developed by the corps G2 and produce graphical decision aids.

On a monthly basis, the corps artillery conducts a targeting staff training exercise that involves all members of the deep operations cell. As a side note, V Corps Artillery recently published a comprehensive program of instruction for this training that includes testing and certification procedures for all newly assigned



V Corps uses Army TACMS in concert with EW, attack helicopters and BAI to strike deep at high-payoff targets.

"You can't fight the corps deep battle successfully without massing deep assets. Employing single systems just isn't as effective."

targeting cell personnel. That allows us to bring new personnel up-to-speed on targeting cell operations quickly.

On a quarterly basis, we conduct corps-level CPXs [command post exercises]. These CPXs give us the opportunity to actually plan and conduct deep operations and integrate all the deep operations TTPs [tactics, techniques and procedures]. They also help refine skills to keep our people trained and ready to do their critical jobs in the deep operations cell.

With the combined arms commander responsible for synchronizing fires, what are the elements of his guidance and intent that are essential for his staff and subordinate commanders to plan fires for the deep attack?

The essential elements of the commander's guidance and intent for the deep battle generally are no different than those for any other operation. As a corps commander, I must address the purpose of the deep battle operation, whether it's to delay, defeat, disrupt or destroy a specific target or an enemy. Next, I clearly state attack priorities. If there's more than one course of action I want considered, I also must state any limitations I desire on the operation, such as keeping one attack helicopter battalion in reserve. Finally, I must define the terms of success—the end state and future orientation of the corps for the next battle.

As you can see, the elements of my guidance and intent for deep operations are really no different than those I provide in my commander's guidance and intent for the entire corps' operations—deep, close and rear. But I must concentrate on describing the deep operation. My guidance and intent must be absolutely clear so all deep operations players understand them.

How do you use your SOCCE in the context of deep battle operations?

Attached to the corps, the SOCCE plays an integral part of our deep operations. Acting primarily as the command and control structure for the special operations teams operating in the corps area of operations, it's greatest advantage is that it provides access to real-time, human-developed information. That's essential. The SOCCE has access to the special operations and intelligence network that helps me gather my priority intelligence requirements.

For the corps deep battle, the SOCCE can tell us the enemy's intentions in critical NAIs. As we establish NAIs and put special operations forces in those areas, they can quickly provide accurate information that confirms or denies the avenue the enemy is using as he moves toward our proposed deep battle engagement areas. The SOCCE also can provide highly reliable BDA on specific targets we have designated for attack.

What are some of the lessons you learned or confirmed in conducting the deep fight during your recent Warfighter [Battle Command Training Program, or BCTP] exercise?

The corps' most recent Warfighter was in October 1992, and there were several lessons we confirmed. The first was that it's imperative to maintain unity of command. So I have one individual, my corps artillery commander, running my deep operations. It worked during that exercise—proved very effective.

Secondly, deep operations are complex and require extensive planning to be successful. That's why we developed our deep battle planning sequence, and that's why it's absolutely essential all key players are in the deep operations cell. They must "bring all the pieces to the table" for sound and timely Go or No Go decisions on deep target strikes, ensuring success.

Another lesson is that we rely heavily on echelons-above-corps [EAC] to provide some support assets. This sometimes limits our flexibility in conducting deep operations. EAC provides assets, such as EW for lethal or non-lethal joint SEADs [suppression of enemy air defenses], that may not be available at the time we need them.

Finally, fighting with fires in the corps deep fight can set the conditions for decisive victory if you do it right. At times, I have taken all the attack helicopters in the corps and massed them on a particular high-payoff target, working SEAD in support of that mission with Air Force, Army TACMS and EW assets. You can't fight the corps deep battle successfully without massing deep assets. Employing single systems just isn't as effective.

Many of our readers may no longer understand the changing NATO command structure. Please explain the new command structure and where V Corps fits into it?

NATO recently announced a reorganization of its command and control structure. The Allied Forces Central Command [AFCENT] will go from the current five principal subordinate commands to two subordinate commands. The five principal commands in the European Central Region under AFCENT are NORTHAG [Northern Army Group], CENTAG and three Air Force headquarters. The new organization will include two elements—the Land Forces Central Command, or LANDCENT, and Air Forces Central Command, or AIRCENT. In June, when CENTAG becomes LANDCENT, V Corps will be subordinate to LANDCENT as one of its corps in the Central Region.

Additionally, this spring, V Corps will become a multi-national corps for contingencies in the Central Region. I'll give II [German] Corps one of my divisions, and the Germans will give me one of their divisions, leaving V Corps with one US and one German division.

What do you see as the major challenges in executing deep fires as part of a multinational corps?

Differences in doctrine and capabilities. Our doctrine, which determines how we fight, is different from that of our allied corps, and our doctrines drive our individual capabilities.

For example, our corps has the capability to go deep, beyond 100 kilometers. In most cases, our allies don't have that capability.

In our Warfighter exercise last October, it was much easier to change a boundary so I could use my attack assets deep in front of another corps than it was to give the allied corps those attack assets and have it control that fight. The allied corps are not used to employing those tactics.

> ***"As a corps commander, if I fight the deep fight successfully, I'll win the close fight."***

However, this can be overcome by training more in joint and combined exercises.

Given the increased emphasis on your corps as a regional contingency force, what fire support assets would you need to provide lethality and force protection to early deployers?

The fire support assets needed, of course, would be based on METT-T [mission, enemy, terrain, troops and time available]. The most important of these are the mission and enemy—the threat we're expected to face. In a crisis situation where hostilities are imminent, the first troops to go will probably initially rely heavily on air support because it's self-deployed and can get there very quickly.

I'd certainly deploy my forces with their direct support 155-mm battalions. But, I'd also want to deploy MLRS and a target acquisition battery [TAB] very early on to provide a deep capability. The target acquisition radars are critical because you need to find deep systems early and then use MLRS to take them out. It's a sequential build-up from air initially, then direct support artillery, MLRS and the TAB—all front-loaded as much as possible.

From your perspective as the corps commander, how can Field Artillery improve to support you best?

The recent experiences in the Gulf War and our computer simulation exercises have demonstrated that MLRS is a great system. But we must continue to improve and exploit the capabilities of this weapon system—longer ranges and more lethal rounds. We also need to improve our 155-mm munitions. Both systems are invaluable assets for the maneuver commander. A corps commander needs a mix of MLRS and 155-mm battalions to provide the flexibility he requires to organize forces for combat.

Next, the Field Artillery community needs to continue to press for the lead in deep operations. The deep operations cell that I've described is the right way to go at the corps level. Having the corps artillery commander serve as the commander of the deep operation ensures unity of command of all the assets required for a synchronized, effective deep battle. As a corps commander, if I fight the deep fight successfully, I'll win the close fight.

Finally, the Field Artillery School needs to continue to emphasize Field Artillerymen being *more* than fire supporters. They must be proactively involved with maneuver commanders and "think maneuver" on the battlefield.

What message would you like to send to Redlegs worldwide?

The massive destruction provided by Field Artillery during Desert Storm contributed significantly to our victory. And it was trained artillerymen who made—and will continue to make—the difference.

Technology, though also important, is being given too much credit for our success. The quality of artillerymen and the quality of their training were really the keys to the artillery firepower success we had in Desert Storm.

So my message to you is train hard, train realistically and "think maneuver." Your Field Artillery and fire support skills are critical to our combat success—not only for the deep battle, but for the entire battle.

Lieutenant General Jerry R. Rutherford has been the Commanding General of V Corps, Germany, since June 1992. Prior to taking command, he was the Deputy Commanding General of V Corps. During Desert Storm, he commanded the 2d Armored Division (Forward) and assumed command of the 3d Armored Division before the division's redeployment to Germany. He has served in a number of other key positions, including Assistant Division Commander of the 1st Infantry Division, Fort Riley, Kansas; G3 of V Corps; Commander of the 3d Brigade, 3d Armored Division; G3 of the 2d Armored Division, Fort Hood, Texas; and Commander of the 3d Squadron, 3d Armored Cavalry Regiment, Fort Bliss, Texas.

Fighting Maneuver and Fires in the Third Dimension

by Major General J. David Robinson and Colonel Charles M. Burke

"Generally, in battle, use the normal force to engage; use the extraordinary to win."

Sun Tzu, *The Art of War*

US Army commanders today have an unprecedented capability to fight in all three dimensions of the battlefield. The prowess of the M-1 Abrams tank and the effectiveness of the M-2/3 Bradley fighting vehicle are unquestioned in their ability to dominate the ground battle. The accuracy and range of modern artillery and other precision strike systems, improvements of near-real-time intelligence systems and the advent of data-burst communications give the US commander a decided edge against most perceived adversaries. Never before have US ground commanders had a greater ability to fight maneuver options in the third dimension—to synchronize air and ground schemes of maneuver through the full depth, breadth and height of their battlespace.

The purpose of this article is to describe air maneuver and the contributions it brings to the combined arms fight, focusing on deep operations. The article addresses historical and doctrinal perspectives as well as the requirements for planning deep operations. The capabilities described are essential to force projection and resident today in every US division and corps.

Rationale for Air Maneuver

To appreciate the potential of maneuver in the third dimension, history suggests superior mobility alone often determines the outcome of battles and campaigns. At the outbreak of World War II, warfare was primarily a static operation with maneuver restricted to limited movements of truck-mobile infantry forces or horse-mounted cavalry. Large-scale maneuver was conducted at the pace of the foot soldier.

During World War II, the German Army took advantage of emerging tank technology. It employed composite tank divisions at blitzkrieg speeds to outmaneuver less mobile foes. Using large, highly mobile tank units to thrust deep into enemy territory and set the pace of battle, the Germans essentially added a new dimension to warfare, referred to as the "second tier of mobility." Indeed, it proved to be decisive for the Germans until the Allies learned the art of maneuver warfare in this second tier.

Force mobility has increased since World War II; however, it appears technology may be reaching a limit in the mobility of systems that don't break friction with the earth's surface. Restrictions imposed by terrain and manmade obstacles are a significant challenge to ground fighting vehicles that, theoretically, are capable of considerable speed.

For the combined arms team to increase mobility, we must break friction with the earth and augment ground forces by moving into the third dimension. At the same time, we must stay in close proximity to the earth's surface, in the ground regime, for survivability and linkage with the ground combat environment. Such is the operating domain of today's Army helicopter forces.

Unencumbered by terrain and fixed obstacles on the earth's surface, the speed of the helicopter elevates the combined arms team to this third dimension in maneuver warfare. This advantage in speed and agility is so pronounced that General von Senger und Etterlin and other respected military strategists have long declared that warfare is moving into a "third tier of mobility"—indeed, the third dimension ("Air Maneuver: A Competitive Strategy Now for the Operational Level Fight," by Colonels Charles M. Burke and J. Michael Pulliam, US Army War College Military Program Studies Paper, Carlisle Barracks, Pennsylvania, 1988).

Three things have changed in recent times to bring about a true maneuver capability in the third dimension. First, helicopters can fly and fight at night in the ground regime. Second, the artillery can move independently, shoot from dispersed locations and achieve the effects of mass at long ranges. Finally, intelligence systems now provide near-real-time, "actionable" information on high-payoff, short-dwell targets.

Under the control of the land force commander, these capabilities favorably influence battle calculus. They bring to the division and corps commander an unprecedented ability to shape the battlefield deep and allow them to accept greater risks close and increase the tempo of ground operations.

The events of Operation Desert Storm provide a powerful historical perspective for maneuver in the third dimension. Fundamentally, every senior commander employed air maneuver supported by long-range artillery fires.

For example, attack helicopters from the 1st Infantry Division (Mechanized) were the first Army forces to cut Highway 8 leading out of Kuwait City. The 24th Infantry Division (Mechanized) control of the Euphrates River causeway was accomplished by attack helicopters. The XVIII Airborne Corps used attack helicopters to cut off fleeing forces north of Basra on the last night of the conflict. The 3d Armored Division commander used attack helicopters to secure the right flank of the division as it made the end run around Iraqi entrenchments.

In Operation Desert Shield, the 101st Airborne Division (Air Assault) used attack helicopters in a covering force role to provide protection for the build-up of coalition forces in Saudi Arabia.

In each instance, the commanders expanded their control over the battlefield using combined arms air maneuver. In every case, they increased the tempo of ground maneuver, dramatically shifting the calculus of battle in their favor.

An AH64A Apache fires a laser-guided Hellfire anti-tank missile.

Air Maneuver Doctrinal Perspective

The role of the US Army's Aviation force and what the force brings to the fight currently is being refined in our doctrinal publications. The rewrite of *FM 100-5 Operations* will define air maneuver as the ability to "...place the enemy in a position of disadvantage through the flexible application of combat power in the third dimension." The concept of maneuver by air, first noted in the 1986 version of FM 100-5, has matured over the years through the introduction of aviation brigades in every corps and division. With the advent of a brigade-level headquarters, aviation can plan operations at the corps and division levels and synchronize the air and ground schemes of maneuver.

All the battlefield operating systems (BOSs) are represented in the aviation brigade tactical operations center (TOC), much the same as in the ground maneuver TOC. Further, the Field Artillery (FA) School, Fort Sill, Oklahoma, has expanded the size of the fire support element (FSE) in each divisional aviation brigade to equal that of the ground maneuver brigade's FSE, thus enhancing the ability of the FA to plan and execute fires in support of air maneuver.

As aviation continues to be recognized for its maneuver capability, doctrinal expressions of aviation must be reflected throughout all branches. The US Army is the only ground force in the world capable of planning, synchronizing and executing air maneuver operations.

Aviation is not close air support (CAS) or fire support. Air maneuver operations are conducted within the same context as ground maneuver operations, supported by the full complement of BOS; as such, these operations encompass more than CAS or fire support. Aviation forces uniquely engage the enemy using fire and movement in the third dimension, giving ground commanders advantages, such as the ability to fight from the swamp, the tops of the forest or the sides of mountains.

While it can deliver an impressive array of air-to-ground fires similar to the aerial rocket artillery (ARA) of the late 1960s, aviation isn't fire support. Aviation differs in that its systems are manned, operate as units, are employed as combined arms and use the terrain in the same fashion as ground units. Aviation is subjected to the same dynamics of the battlefield and physics of land warfare as ground maneuver. It can be engaged with all the same weapons systems as ground maneuver and then some (air defense weapons). Air maneuver operations require detailed planning and coordination among the BOSs to support the ground force commander's overall battle plan.

Planning Deep Air Maneuver Operations

Aviation provides the commander the flexibility to fight in all three dimensions of the battlefield. In most circumstances, it can participate in close, deep and rear operations simultaneously.

With aviation brigades, multiple-launch rocket systems (MLRS) and Army tactical missile systems (Army TACMS) in every corps and division, the commander now can influence enemy capabilities throughout his area of interest. In other words, his area of operations (AO) has expanded to equal his area of interest.

Operational influence is achieved through the synchronization of air maneuver, using all BOSs, focused throughout the depth of the AO. Because the aviation brigade can influence the full spectrum of its commander's battle-space, the aviation brigade commander also must see and fight the battlefield from the same perspective as the higher commander.

Aviation brigades today are commanded by warfighters—officers who, by their professional development and experience, fully understand combined arms operations. The junior officers are products of the warfighting focus being taught throughout the Training and Doctrine Command (TRADOC) school system, and they understand ground warfare. In all, they are, as General William DePuy said, among the "...generation of officers now in command...[who] have maneuver in their bones" ("FM 100-5 Revisited," *Army*, November 1980).

Synchronizing a deep air maneuver combined arms operation is the challenge. But, it's a challenge that many commanders accept as they recognize the important roles aviation and FA play on the battlefield. Many commanders already conduct

synchronized air maneuver combined arms operations very successfully.

Because the aviation brigade commander's area of interest is the same as his corps or division commander's, he must see and fight at that level. Planning for deep air maneuver operations must begin at the corps or division level.

To facilitate parallel planning, typically the aviation brigade commander collocates his tactical command post (TAC) and TOC near the higher headquarters. This enables key brigade staff to participate in the higher headquarters staff planning process and provide input from the aviation planning perspective. This also ensures the aviation brigade commander sees the battle from the same perspective as the higher commander.

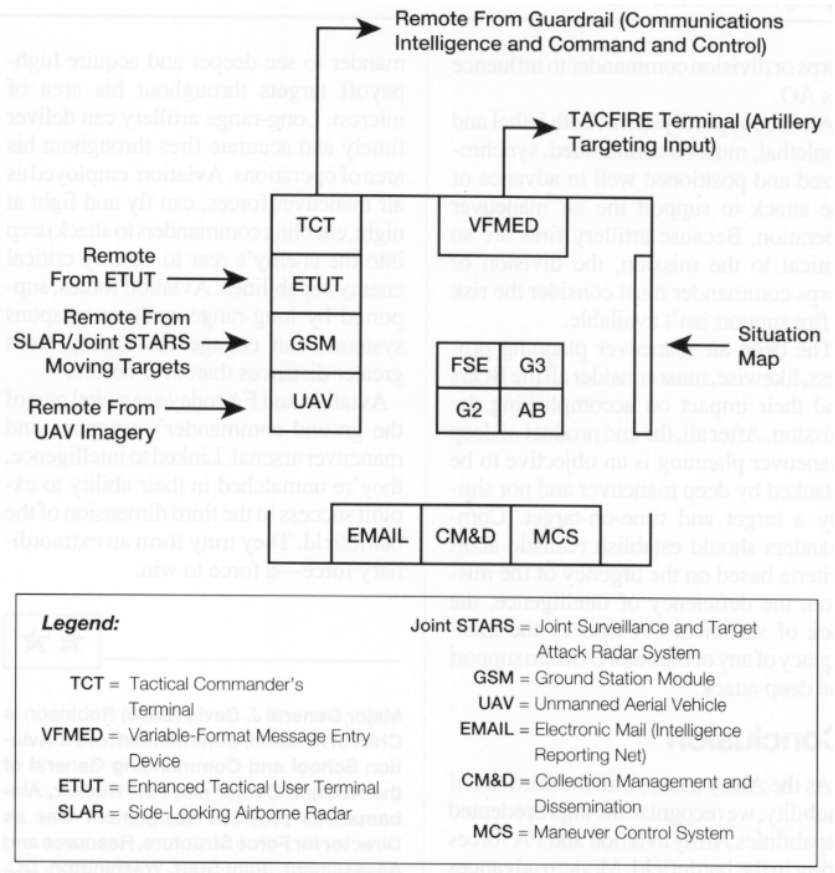
Accurate intelligence is the key to air maneuver operations. The corps or division intelligence planners usually understand their commander's intent and easily can integrate the aviation brigade commander's critical information requirements (CCIR) into their intelligence planning. This ensures the intelligence preparation of the battlefield (IPB) serves the air and ground schemes of maneuver and supports the requirements for deep air maneuver operations.

During the IPB process, named areas of interest (NAIs) are established to confirm or deny enemy actions and target areas of interest (TAIs) are designated. These TAIs may eventually become the engagement areas.

Intelligence collection and analysis efforts also must be synchronized to support the IPB and the timing of deep maneuver. As intelligence data is developed, it must be quickly analyzed and disseminated to the aviation brigade or to a specific location within the corps or division main command post, the focal point for planning deep operations.

To improve synchronization in planning and execution, many units use variations of a deep battle cell to manage intelligence data relevant to deep operations. For example, a five-ton expandable van (see the figure) can serve well as a deep battle cell. The cell funnels specific intelligence taskings through intelligence down links and has secure communications and quick access to a tactical fire direction system (TACFIRE) terminal.

Secure voice communication to the unit attacking deep is accomplished through the remote down link with Guard Rail/Common Sensor, called the improved



Five-Ton Expandable Van as a Deep Battle Cell. The deep battle cell funnels specific intelligence taskings through intelligence down links and has secure communications and quick access to a tactical fire direction system (TACFIRE) terminal. The aviation brigade (AB) representatives working in the cell are the brigade commander or his executive officer, FSO, S3 and S2.

tactical control terminal (ITCT), or through radio relay with Quick Fix. These links allow the most current information to pass to the unit throughout its operation.

The deep battle cell in the van is manned by an intelligence analyst, a fire support element (FSE) representative, the G2, G3 and commander or deputy commander of the aviation brigade. This innovative setup enhances the commander's control of the deep battle and allows him to integrate third dimensional operations into his overall scheme of maneuver.

Fire support planning and coordination are also essential to the success of the deep air maneuver operations. All fire support means available—cannon, rocket and missile fires, CAS and nonlethal fire support means—must be planned and coordinated. Detailed targeting is accomplished by the targeting cell using the decide, detect and deliver methodology.

The product of this targeting process is a list of high-payoff targets. This list becomes the basis for the aviation brigade fire support officer (Bde FSO) to develop the fire support plan in coordination with the G2 and corps or division FSE. The plan includes the suppression of enemy air defense (SEAD) plan, using the top-down fire planning process.

Also, fire support coordination ensures that fires are available to support air maneuver operations. The Bde FSO synchronizes the fire support plan with the air forward line of own troops (FLOT) crossing time or time of attack. He also conducts a fire support rehearsal to synchronize fires that support all phases of the air maneuver operation. Further, the Bde FSO ensures the attack battalion commanders conducting the mission completely understand the fire support plan.

Timing is extremely important. A few seconds off schedule could result in air maneuver assets running into a "wall of steel" along the air routes, jeopardizing the aircraft, crews and the ability of the

corps or division commander to influence his AO.

All fire support systems, both lethal and nonlethal, must be coordinated, synchronized and positioned well in advance of the attack to support the air maneuver operation. Because artillery fires are so critical to the mission, the division or corps commander must consider the risk if fire support isn't available.

The deep air maneuver planning process, likewise, must consider all the BOSs and their impact on accomplishing the mission. After all, the end product of deep maneuver planning is an objective to be attacked by deep maneuver and not simply a target and time-on-target. Commanders should establish realistic abort criteria based on the urgency of the mission, the deficiency of intelligence, the lack of sufficient FA fires or the inadequacy of any of the other BOSs to support the deep attack.

Conclusion

As the Army moves into the third tier of mobility, we recognize the unprecedented capabilities Army aviation and FA forces bring to the battlefield. Modern advances in intelligence capabilities enable the commander to see deeper and acquire high-payoff targets throughout his area of interest. Long-range artillery can deliver timely and accurate fires throughout his area of operations. Aviation, employed as air maneuver forces, can fly and fight at night, enabling commanders to attack deep into the enemy's rear to destroy critical enemy capabilities. Aviation forces, supported by long-range artillery weapons systems, can engage the enemy from greater distances than ever before.

Aviation and FA today are a vital part of the ground commander's weapons and maneuver arsenal. Linked to intelligence, they're unmatched in their ability to exploit success in the third dimension of the battlefield. They truly form an extraordinary force—a force to win.

Major General J. David (Dave) Robinson is Chief of Aviation, Commandant of the Aviation School and Commanding General of the Aviation Center and Fort Rucker, Alabama. His previous assignment was as Director for Force Structure, Resource and Assessment, Joint Staff, Washington, DC. He also was Commanding General of the Training and Doctrine Analysis Command, Training and Doctrine Command, Fort Leavenworth, Kansas, and Commander of 9th Cavalry Brigade (Air Attack), 9th Infantry Division (Motorized), Fort Lewis, Washington; 2d Squadron, 10th Air Cavalry, 7th Infantry Division (Light), Fort Ord, California; and A Troop, 7th Squadron, 17th Cavalry, 6th Cavalry Brigade, Fort Hood, Texas. Major General Robinson served two tours in Vietnam and holds a Master of Business Administration in Operations Research from the University of Alabama.

Colonel Charles M. Burke is Director of the Directorate of Training and Doctrine at the Aviation School, Fort Rucker. His previous assignment was as Commander of the 4th Brigade, 1st Armored Division, Germany, that was redesignated from the Combat Aviation Brigade, 3d Armored Division, which Colonel Burke commanded in Southwest Asia during Operation Desert Storm. Other commands include the 228th Attack Helicopter Battalion, 1st Cavalry Division, Fort Hood; C Company, 503d Aviation Battalion, 3d Armored Division, Germany; A Troop, 1st Squadron, 9th Cavalry, also in the 1st Cavalry Division; and an Advanced Individual Training company, Fort Knox, Kentucky. He's a graduate of the Army War College, Carlisle Barracks, Pennsylvania.

Fort Sill Monument to Honor Redlegs

US FA Association Monument Contest

The United States Field Artillery Association is developing plans to build a monument to honor the achievements of all US Field Artillerymen, past and present. While the Field Artillery has a living monument, the Fort Sill Half-Section, it does not have a permanent monument to honor all artillerymen.

The Contest. The US FA Association Monument Committee is sponsoring a monument design contest with awards of $1,000 for first place, $500 for second and $300 for third place designs. A contestant doesn't have to be a member of the US FA Association to compete.

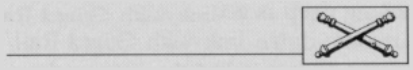
Initial plans call for the monument to be built in Dan T. Moore Park on Randolph Road across the street from McNair Hall, Fort Sill, Oklahoma. The monument would be in the center of the park with commemorative plaques for each artillery regiment located along the walkways leading to the monument. Dan T. Moore Park is a rectangle of approximately 220 feet wide by 350 feet long and covers approximately 1.7 acres.

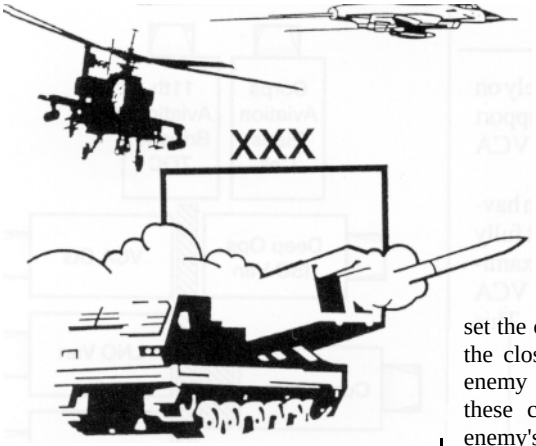
Submission Criteria. The designs must meet the following criteria. Ideas submitted must—

- Honor all US Artillerymen (Army, Marine, Army National Guard and Army and Marine Reserve) past and present.
- Be designed to be built of material that is low-maintenance and suitable for an outdoor environment.
- Be drawn to scale, indicating the monument's life-sized depth, height and width, and specify the material to be used for construction. The drawing can be in any artist medium but must show clearly the depth and contours of the design.

To be considered, designs must be received by the US Field Artillery Association by the close of business, 1600 hours, 30 July 1993. All designs become the property of the association. The association reserves the right to cancel the contest if insufficient entries are received, in which case all entries will be returned to the contestants.

Designs should be mailed to the US Field Artillery Association, P.O. Box 33027, Fort Sill Oklahoma 73503-0027. If contestants have questions, they can call the association at (405) 355-4677 or 8745.





The Corps Artillery Commander and Deep Operations

by Major Grady B. Garrett

Current operational doctrine indicates that we must fight the rear, close and deep battles simultaneously. Although the battles in these three areas will be linked and interdependent, all will be meaningless if the close battle is lost. Therefore, the objective of the deep battle is to isolate the enemy and set the conditions necessary for success in the close battle. Deep operations against enemy forces not yet in contact establish these conditions by stripping away the enemy's ability to concentrate combat power, attack in depth and mass artillery. At the same time, deep operations influence when and where the close battle will occur and force the enemy to commit one echelon at a time.

In V Corps, US Army Europe (USAREUR), the linkage between the rear, close and deep battles is referred to as the "One Corps Fight" (see Figure 1). Specifically, the corps deep area of operations extends from approximately the fire support coordination line (FSCL) to the reconnaissance interdiction and planning line (RIPL). The RIPL is a NATO term and primarily is used by an army group to differentiate between the area appropriate for corps battlefield air interdiction (BAI) missions and the area to be engaged by army group and allied tactical air forces for air interdiction

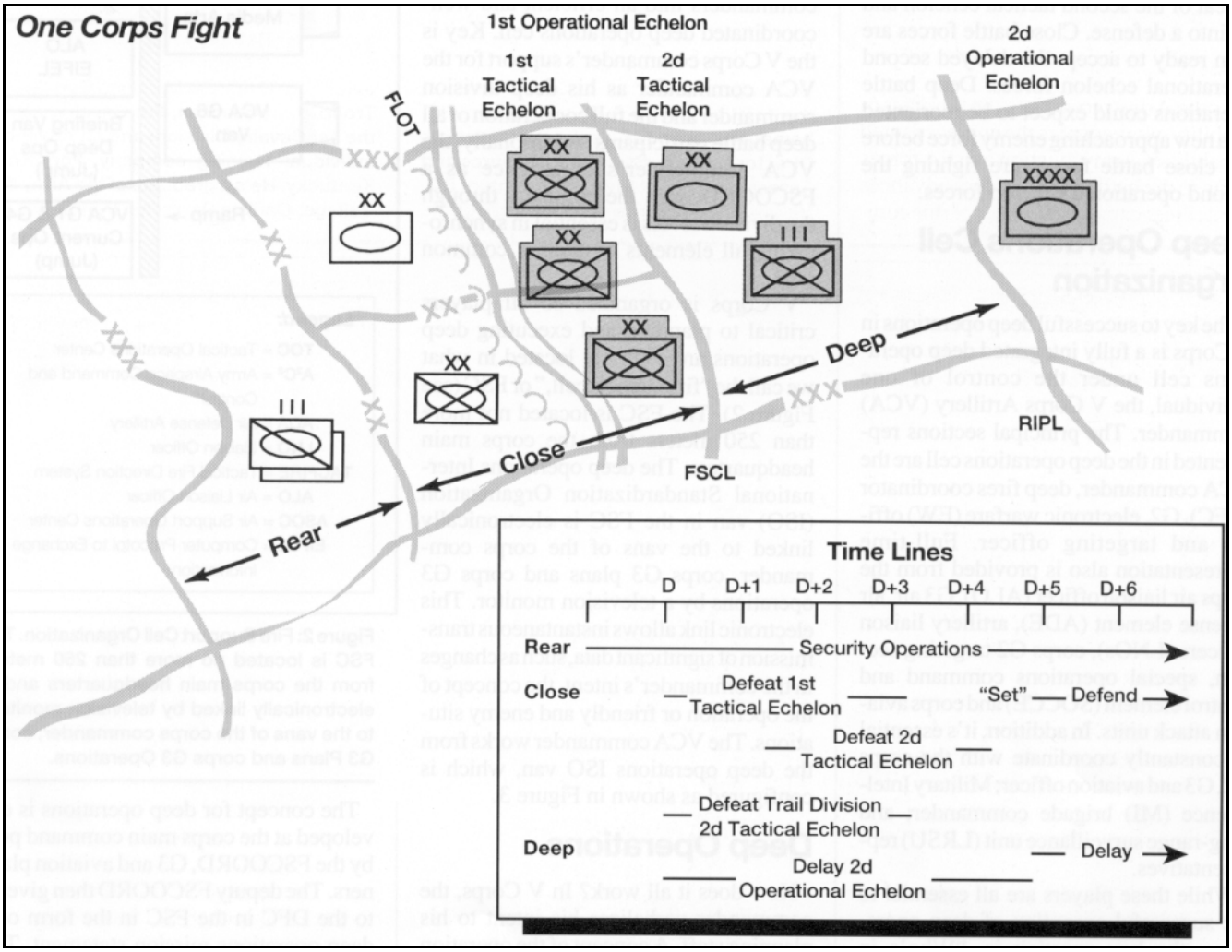


Figure 1: Deep Operations. In V Corps, the linkage between the rear, close and deep fight is referred to as the One Corps Fight. The corps simultaneously engages enemy echelons on different parts of the battlefield.

(AI) missions. The corps close battle is defined as the area from the FSCL to an area just forward of the divisions' rear boundaries, while the corps rear battle extends from the divisions' rear boundaries to the corps' rear boundary.

As one can see from the time lines in Figure 1, different enemy echelons are engaged simultaneously on different parts of the battlefield. In this example, while the close battle focuses on defeating the enemy's first tactical echelon, deep operations are simultaneously defeating the trail division of the second tactical echelon and delaying the second operational echelon. The remaining independent motorized rifle regiment (IMRR) of the second tactical echelon is then passed to the close battle.

The delay of the second operational echelon by deep operations "buys time" for close battle forces to "set" after the defeat of the second tactical echelon and go into a defense. Close battle forces are then ready to accept the delayed second operational echelon forces. Deep battle operations could expect to be reoriented on a new approaching enemy force before the close battle forces are fighting the second operational echelon forces.

Deep Operations Cell Organization

The key to successful deep operations in V Corps is a fully integrated deep operations cell under the control of one individual, the V Corps Artillery (VCA) commander. The principal sections represented in the deep operations cell are the VCA commander, deep fires coordinator (DFC), G2, electronic warfare (EW) officer and targeting officer. Full-time representation also is provided from the corps air liaison officer (ALO), G3 air, air defense element (ADE), artillery liaison officers (LNOs), corps G2 targeting section, special operations command and control element (SOCCE) and corps aviation attack units. In addition, it's essential to constantly coordinate with the corps G2, G3 and aviation officer; Military Intelligence (MI) brigade commander; and long-range surveillance unit (LRSU) representatives.

While these players are all essential to the successful execution of deep operations, the key question is, "Who's in charge?" In V Corps, the responsibility for synchronizing all these elements as the V Corps commander's "deep division commander" has been placed squarely on the shoulders of the corps fire support coordinator (FSCOORD)—the VCA commander.

Initially, the idea of an artilleryman having this critical responsibility wasn't fully accepted. However, upon careful examination of roles and missions, the VCA commander was a logical choice. This choice has been validated on many exercises, to include a recently completed corps Battle Command Training Program (BCTP) evaluation conducted in conjunction with return of forces to Germany (REFORGER) 92.

The VCA commander only "commands" his own assets, but he executes deep battle operations through his special staff position as the V Corps commander's FSCOORD. His rank and command presence allow him to integrate the many diverse and dynamic entities under other commanders into an efficient and well-coordinated deep operations cell. Key is the V Corps commander's support for the VCA commander as his deep division commander and the full cooperation of all deep battle participants. Additionally, the VCA commander's experience as a FSCOORD from the company through the division levels is essential in synchronizing all elements to attain a common goal.

V Corps is organized so all players critical to planning and executing deep operations are centrally located in what we call the "fire support cell," or FSC (see Figure 2). The FSC is located not more than 250 meters from the corps main headquarters. The deep operations International Standardization Organization (ISO) van in the FSC is electronically linked to the vans of the corps commander, corps G3 plans and corps G3 operations by a television monitor. This electronic link allows instantaneous transmission of significant data, such as changes in the commander's intent, the concept of the operation or friendly and enemy situations. The VCA commander works from the deep operations ISO van, which is configured as shown in Figure 3.

Deep Operations

How does it all work? In V Corps, the commander verbalizes his intent to his planning staff. A concept of the operation evolves from this intent and is the basis for plans that address the rear, close and deep areas of the battlefield.

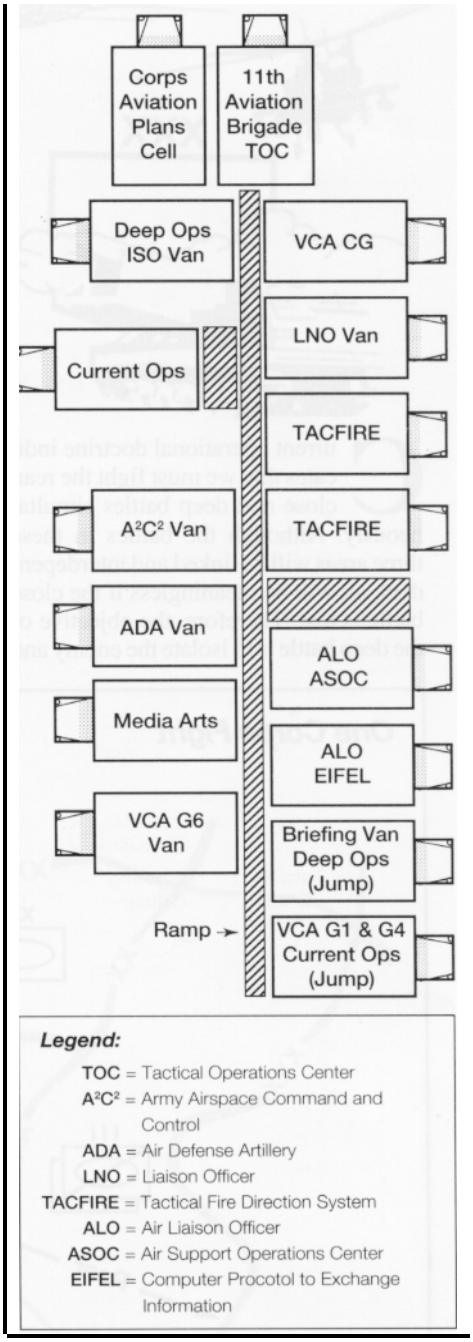


Figure 2: Fire Support Cell Organization. The FSC is located no more than 250 meters from the corps main headquarters and is electronically linked by television monitors to the vans of the corps commander, corps G3 Plans and corps G3 Operations.

The concept for deep operations is developed at the corps main command post by the FSCOORD, G3 and aviation planners. The deputy FSCOORD then gives it to the DFC in the FSC in the form of a deep operations mission statement. The DFC uses this mission statement to begin detailed planning for various deep operations contingencies.

Armed with the commander's concept and deep operations mission statement, the DFC causes a number of events to occur simultaneously. In general, the aviation units, in conjunction with the corps G2, begin terrain analysis, route planning, battle position selection and determination of engagement areas (EAs). EW and BAI requests are submitted to support the deep concept, and the Army airspace command and control (A^2C^2) and ADE begin deconfliction of air routes and determination of the air defense weapons control status. Additionally, lethal suppression of enemy air defenses (SEADs) are planned, and the corps deep lethal attack guidance is developed. The DFC is responsible for synchronizing and coordinating all these pieces and ensuring the deep operations team is prepared to execute any of the contingencies as required.

In the FSC van, the battle map and the deep battle status board serve as the hub for deep battle decision making. A 5x7 card replica of the deep battle status board is maintained by the VCA commander as a ready reference for ongoing deep operations, and copies are provided to the V Corps commander and corps G3.

The VCA G2 maintains the battle map, which depicts the enemy situation down to the regimental level, avenues of approach, the forward line of own troops (FLOT), key fire support coordinating measures (FSCM) and Army aviation EAs. All maps and overlays in the FSC are standardized, so any data needed by the VCA commander can be displayed quickly.

Typical overlays used in deep operations decision making include the decision support template (DST), Army aviation routes, targeting (depicting VCA multiple-launch rocket system, or MLRS, Version 6 locations and range fans, planned SEAD programs and planned preparations), ADA coverage, A^2C^2 low-level transit routes, BAI planned targets and current operations (depicting all friendly artillery locations).

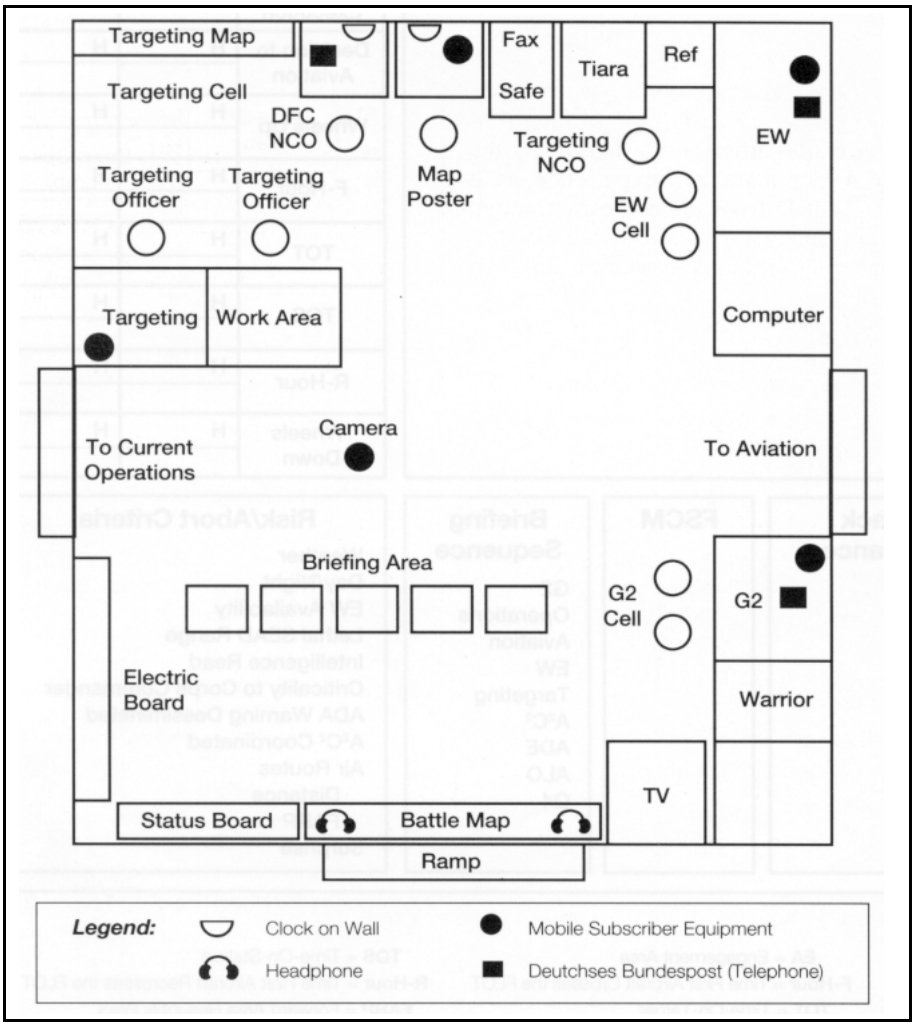


Figure 3: The ISO Van Configuration for the Deep Fires Cell (DFC). This van is positioned within the fire support cell (FSC) as shown in Figure 2.

Deep Battle Status Board

The DFC is primarily responsible for maintaining the deep battle status board (see Figure 4, Page 18). The "Detect Assets" block is maintained by the VCA G2 and tracks both the collection assets available and the coverage of critical named areas of interest (NAIs). The "Weather" block also is maintained by the VCA G2 and tracks those items critical to deep operations, such as early evening nautical twilight (EENT), before morning nautical twilight (BMNT), the percent of illumination and cloud ceiling.

The "Deliver Assets" block addresses critical information provided by several of the agencies from the FSC. In the "Aviation" section, the aviation brigade representatives list the strength of each aviation battalion by type of aircraft as well as the availability status and recycle time for each aviation battalion. The recycle time is the number of hours each battalion requires after an attack to rearm, refuel and conduct final preparations for a subsequent attack.

The "SEAD" section is broken down into both "Non-lethal (EW)" and "Lethal" means. The EW officer makes the non-lethal entries and lists the assets (such as C-130 Compass Call or EF-IIIA Raven) and the hours each asset is available, based on the daily air tasking order (ATO). Either the EW officer or the targeting officer record the lethal entries, which may include the F-4G Wild Weasel or artillery units involved in planned SEAD programs.

The "MLRS (Version 6)" section entries are made by the targeting officer and reflect the number of launchers available by battalion plus any restrictions or priorities affecting the employment of these units.

The "BAI/AI" entries are made by the ALO representatives and depict the concept for support and the number of sorties available by time window from the ATO.

The DFC maintains the "Concept Sketch" block of the deep battle status board. He writes the deep operations

mission statement at the top of the block and then draws a sketch or "cartoon" to portray the deep operation being planned. The sketch includes major cities, rivers, corps and division boundaries, the FSCL and RIPL in effect, aviation EAs, the routes to be used by aviation, the enemy avenues of approach and expected enemy maneuver units down to the regimental level.

The DFC also is responsible for the "Attack Guidance" block of the deep battle status board, which includes information from the corps deep lethal attack guidance (Figure 5). In V Corps, the corps deep lethal attack guidance is a composite of the three documents recommended by *FM 6-20-10 Tactics, Techniques, and Procedures for the Targeting Process*: the high-payoff matrix, the attack guidance matrix and the target selection standards matrix. Once approved by the VCA and V Corps commanders, the corps deep lethal attack guidance is placed in the "Attack Guidance" block (Figure 4).

The DFC is responsible for the "FSCM" block of the deep battle status board. This block lists all measures in effect by phase line or graphical explanation as well as any special coordination required with higher, adjacent or subordinate units.

The time entries made in the various blanks of the "Deep Battle Matrix" block are the responsibility of the DFC in conjunction with the aviation brigade representatives. This matrix lists the critical

Date-Time-Group

Assets

Detect Assets

	NAI	NAI	NAI
SOF			
LRSU			
ASARS			
Guardrail			
SLAR			
Other			

Weather

Deliver Assets

Aviation

SEAD

Non-Lethal (EW)

Lethal

MLRS (Version 6)

BAI/AI

Concept Sketch

Mission:

Deep Battle Matrix

H-Hour	EA Unit	EA Unit
Stand To	H	H
Go/No Go for Planning	H	H
Go/No Go for Execution	H	H
Decision to Aviation	H	H
Wheels Up	H	H
F-Hour	H	H
TOT	H	H
TOS	H	H
R-Hour	H	H
Wheels Down	H	H

Attack Guidance

FSCM

Briefing Sequence

G2
Operations
Aviation
EW
Targeting
A^2C^2
ADE
ALO
G4

Risk/Abort Criteria

Weather
Day/Night
EW Availability
Lethal SEAD Range
Intelligence Read
Criticality to Corps Commander
ADA Warning Dessiminated
A^2C^2 Coordinated
Air Routes
  Distance
  FARP
Surprise

Legend:

SOF = Special Operations Forces
EA = Engagement Area
TOS = Time-On-Station
ASARS = Advanced Synthetic Aperture Radar System
F-Hour = Time First Aircraft Crosses the FLOT
R-Hour = Time First Aircraft Recrosses the FLOT
SLAR = Side-Looking Airborne Radar
TOT = Time-On-Target
FARP = Forward Area Resupply Point

Figure 4: Deep Battle Status Board. This board and the battle map, located in the Deep Fires Cell ISO van (Figure 3), serve as the hub of deep battle decision making.

Corps Deep Lethal Attack Guidance
Effective: 27 2200Z Sep 92

Independent Divisions and 56th Guards Tank Army (GTA)	Attack Guidance	Remarks	Target Criteria: Time	Target Criteria: ATACMS Target Location Error
Specific Units 1. 56th GTA				
Category & Specific Target in Priority				
1. Fire Support				
a. Army Artillery Group: BM-21, BM-22, 2S5, 2A36, 2S7	I/D	EW Target FDCs with Deep Attack	6 Hrs	.5
b. Army Guards Rocket Artillery: BM-21, BM-22	I/D		6 Hrs	.5
c. Regimental Artillery Groups, Divisional Artillery Groups: BM-21, BM-22, 2S3, 2S5, 2A36, D-30, 2S1	I/D		1 Hr	.5
d. Surface-to-Surface Missiles: SS-21, SS-1	I/D	EW Integrate Jamming with Lethal SEAD	6 Hrs	.5
e. Multiple Rocket Launcher Battalions, Brigades	I/D		1 Hr	.5
f. Division/Regimental Artillery Command Posts (CPs)	I/D		1 Hr	.5
2. Air Defense Artillery				
a. SA-4, 6, 8, 9, 11, 12, 13, 10	I/N	Include Template that could Effect Deep Attack; P for SEAD	SA-6/8 3 Hrs SA-4/12 12 Hrs SA-11 6 Hrs	.5
b. EW/Target Acquisition (TA) Sites	I/S			
3. Command, Control and Communications				
a. Regimental/Divisional Forward Main CPs	A/N	EW Jam as Acquired	SA-9/13 3 Hrs EW/TA 12 Hrs	
4. Maneuver				
a. Attack Helicopter FARPs and Tactical Assembly Areas	A/N	N with ATACMS	24 Hrs	.5
b. Battalion and Larger Assembly Areas	A/N	P for BAI, AI	2 Hrs	.5
c. Tactical March Columns	A/D	JAAT to Destroy; P Columns for JAATs	1 Hr	.5
5. Lines of Communications				
a. Bridges and Choke Points Leading into EAs Eagle, Osprey, Falcon and Buzzard	P/D	P for BAI, AI ATACMS G2 Request Battle Damage Assessment	4 Hrs	.5
6. Nuclear/Chemical				
a. Transport Battalions	I/D		1 Hr Static	.5
b. Depots	I/D			.5

Legend: **I** = Immediate, **A** = As acquired, **P** = Planned, **D** = Destroy, **N** = Neutralize, **S** = Suppress

Figure 5: Example of Corps Deep Attack Guidance. This document is a composite of the three recommended in FM 6-20-10: high-payoff matrix, attack guidance matrix and target selection standards matrix. Once the corps deep attack guidance is approved by the VCA and V Corps commanders, it's placed in the "Attack Guidance" block of the Deep Battle Status Board shown in Figure 4.

times used by the VCA commander to synchronize all the elements involved in planning and executing a deep operation.

Deep Battle Matrix

To help synchronize deep battle operations, the VCA commander developed the deep attack planning sequence (Figure 6, Page 20). The major entries in this planning sequence are depicted in the "Deep Battle Matrix" block of the deep battle status board (Figure 4). Three possible sequences have been developed for executing a deep attack operation. The first column in Figure 6 depicts the "Standard" or most frequently occurring sequence.

The "Dedicated EW" column reflects the impact EW can have on planning and execution. When V Corps has dedicated EW assets flying solely to support a deep operation, but those EW assets have to fly a greater distance than normal to arrive in time to support execution, a separate "Go/No Go Decision Briefing for Planning" is conducted. During this briefing, it's determined if EW assets will arrive as projected during the initial planning. Based on the criticality of EW to the success of the mission, a Go or No Go decision is made. If the decision is a Go for execution of dedicated EW assets, then another "Go/No Go Decision Briefing for Execution" for the aviation unit is required to synchronize the arrival of attack and support assets.

The "No-Notice" column in Figure 6 addresses the deep attack sequence used when the FSC has a deep operations mission to plan and execute that wasn't originally identified by the corps planners in the concept for deep operations. This notification commonly occurs after what normally would have been the time for Stand-To and necessitates the merging of the "Stand-To" block with the "Go/No Go Decision for Planning" block. Instead of the standard "TOT" block, "Wheels Up" becomes the base event used by the DFC to determine the times for the various entries in the deep battle matrix. However, other than merging the "Stand-To" with the "Go/No Go Decision for Planning" blocks, the time intervals between events for the remainder of the No-Notice sequence remains the same as those used under the Standard column deep attack sequence.

In the deep battle matrix of Figure 4, it's critical that all FSC players understand the meaning of the entries. The "H-Hour"

entry is determined by the V Corps G3 while the aviation battalion(s) to be used per EA are filled in the blanks next to the "EA and Unit" blocks.

Attack Sequence

The *Stand-To* meeting is directed by the FSCOORD. Stand-To requires the presence of the corps G2, aviation brigade commander and LRSU battalion commander (if applicable) in the deep operations ISO van. The MI brigade commander also contacts the VCA commander from his brigade tactical operations center (TOC) via mobile subscriber equipment (MSE) or Deutsches Bundespost (DBP) telephone at Stand-To.

Stand-To is a formal meeting to initiate a deep attack operation planning and execution sequence for a specific contingency.

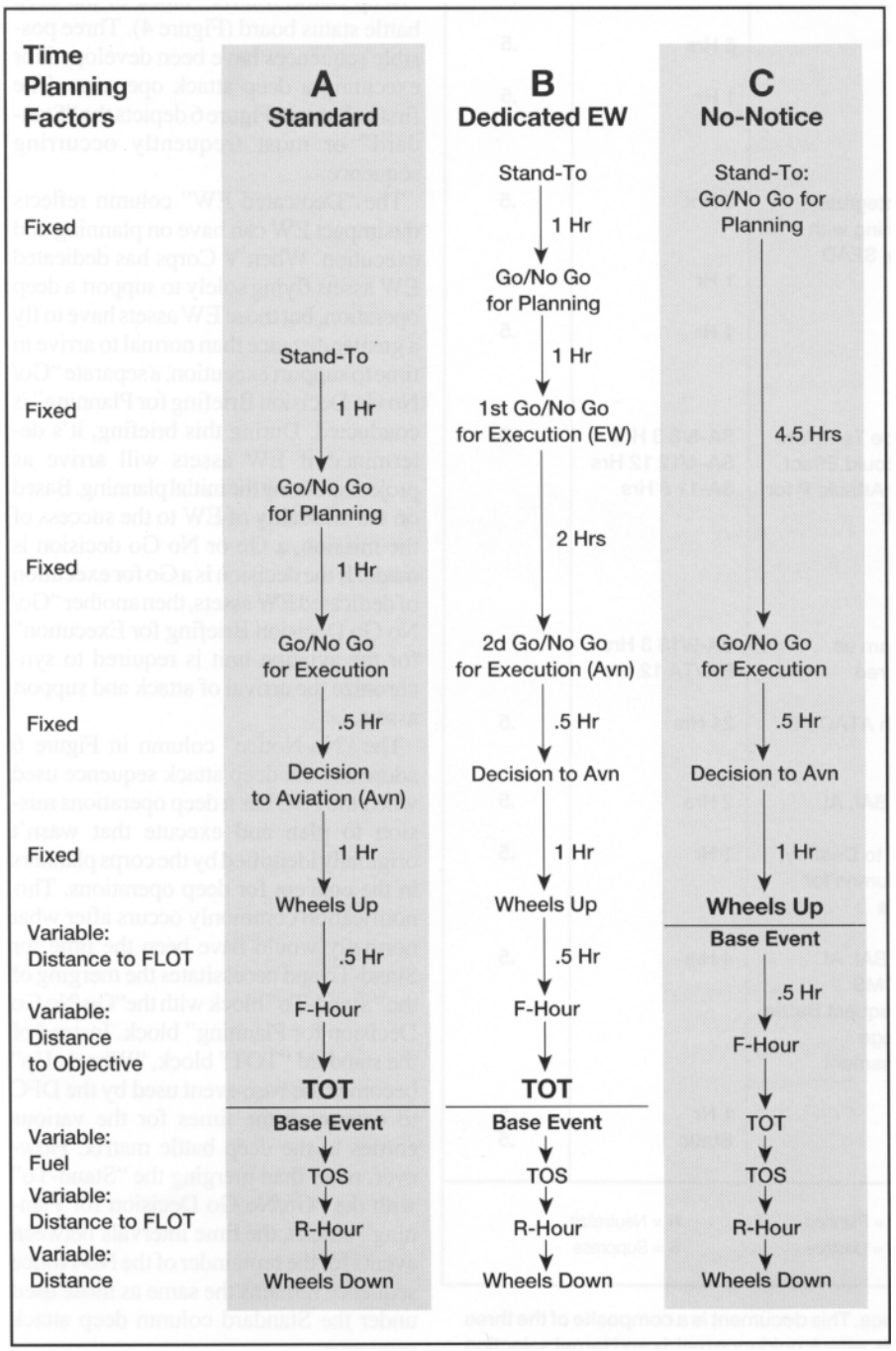


Figure 6: Deep Attack Sequence. The VCA commander developed this attack planning sequence to assist in synchronizing deep battle operations. The major entries in this sequence go in the "Deep Battle Matrix" block of the Deep Battle Status Board in Figure 4.

The VCA commander issues his guidance and announces the time sequence to be used.

The time for Stand-To is determined by the DFC conducting backward planning from the base event. Normally, this base event is TOT—when the enemy is projected to arrive in the EA. Exceptions to determining the time for Stand-To occur when using the Dedicated EW and No-Notice attack sequences.

The *Go/No Go Decision Briefing for Planning* is conducted by the DFC approximately one hour after the Stand-To meeting, except when using the No-Notice sequence. The sequence listed in the "Briefing Sequence" block of the deep battle status board (Figure 4) is followed during this briefing. The same individuals who attended Stand-To are present. The purpose of this briefing is to determine if enough information is available on the enemy to continue planning for a particular contingency.

At the end of the briefing, the VCA commander uses the "Risk/Abort Criteria" entries in the deep battle status board (Figure 4) to elicit a Go or No Go recommendation from each deep operations representative for continued planning. Based on these recommendations, planning will either stop or continue for that contingency.

The *Go/No Go Decision Briefing for Execution* is conducted by the DFC approximately one hour after the Go/No Go Decision Briefing for Planning. The same individuals at the Stand-To attend this briefing, which follows the same sequence. The briefing's purpose is to determine if current enemy indications are sufficient to give a Go for execution. In some cases, the Go/No Go decision may be placed on hold until the NAI trigger points indicate the target definitely is moving toward the planned EA. Again, the VCA commander receives a Go or No Go recommendation from each deep operations representative.

When the decision is a Go, the executing aviation unit is notified within 30 minutes—*Decision to Aviation*. The executing aviation unit then needs approximately one hour to prepare the pilots before *Wheels Up*. During this hour, the pilots finalize their on-board preparations for combat. These preparations include a final mission briefing and time for programming the helicopter computers. The executing aviation unit must be prepared to launch from either its tactical assembly area (TAA) or forward area

refuel point (FARP) approximately 30 minutes before F-Hour.

In V Corps, *F-Hour* is the time the first aircraft crosses the FLOT into enemy territory. Based on range and availability of assets, the aircraft crossing the FLOT may be accompanied by the execution of SEAD—lethal or non-lethal.

The first aircraft arrives in its battle position overlooking the EA at the designated *TOT.* Time-on-Station (*TOS*) is the total time the aircraft stays in its battle position fulfilling its mission.

The first aircraft recrosses the FLOT into friendly territory at *R-Hour.* Based on the complexity of the aviation rotation of units across the FLOT, lethal SEAD may or may not be executed before each returning aviation unit's R-Hour. Ideally, non-lethal SEAD will protect the aviation units from F-Hour to R-Hour.

Once the aviation unit has returned to its FARP or TAA (*Wheels Down*), refueling and rearming begins. One battalion using two FARPs can be refueled and rearmed in approximately one hour and 30 minutes. Add to this the one hour needed for the pilots to conduct final preparations for combat discussed previously, and an aviation battalion can be ready for another deep operation in approximately two hours and 30 minutes.

Conclusion

Success in deep operations is critical to ultimate success in the close battle. V Corps brings the right people together to balance current and future operations.

The difficult task of deep battle synchronization has been successfully demonstrated under the supervision of the VCA commander. The result: the enemy has been isolated and the conditions for success of the close battle set. We recognize this is only one way to conduct deep operations, but during BCTP, it was one successful way. *Victory Corps!*

Major Grady B. Garrett was the Deep Fires Coordinator for V Corps, for 17 months before his current assignment as S3 for 4th Battalion, 27th Field Artillery, 41st Field Artillery Brigade, both in Germany. He also served as a Small Group Instructor for the Field Artillery Officer Advanced Course, Fort Sill, Oklahoma. In the 5th Infantry Division (Mechanized), Fort Polk, Louisiana, Major Garrett was the S3 for the 2d Battalion, 21st Field Artillery; Assistant S3 for the 5th Infantry Division Artillery; and Service Battery Commander for the 3d Battalion, 19th Field Artillery. He's a graduate of the Command and General Staff College, Fort Leavenworth, Kansas, and holds a master's degree in business administration from Oklahoma City University.

Synchronizing the Divisional Deep Fight

by Major Forest D. Haynes III

One of the most significant challenges of mechanized combat is synchronizing combat power throughout the depth and breadth of the battlefield. Conducting operations within the battlefield framework (deep, security, close, rear and reserves), the division must synchronize its efforts both horizontally and vertically and draw upon every resource available to engage and defeat the enemy in all areas of the battlefield sequentially—sometimes simultaneously.

Of particular importance on the battlefield of today and tomorrow is the division commander's ability to plan, execute and win the deep fight. Key to victory here is the synchronization of specific battlefield operating systems (BOSs), and crucial to that synchronization is a standing operating procedure (SOP) for the organization, setup, planning, coordination and execution of the deep attack.

In his August 1992 article, "Fires and Maneuver—One and the Same," Major General William M. Boice, 1st Armored Division Commander, stated, "If I wait until all the targets are within direct-fire range, I'll have too many targets—a sure prescription for death and disaster. Therefore, I decide in advance when and where I want to kill which targets." That's synchronization, and that's key to success or failure.

Deep battle is a precisely planned operation culminating in the destruction of critical elements of the enemy's warfighting capability. Unlike the traditional doctrinal approach of conducting deep attacks against enemy uncommitted forces, the 1st Armored Division attacks targets of the greatest threat to the entire battlefield. Against an artillery-heavy enemy, targets include the long-range fire support systems that, once set to support the battle, outrange our organic divisional fire support systems.

The purpose of the deep operation is to control the battle tempo, deny the enemy the ability to mass forces and maneuver and facilitate friendly operations in the close battle. The 1st Armored Division

fights the deep battle to dictate the terms of the transition to the close battle—shaping it for success.

The commander articulates this intent to the staff to focus planning. "America's Tank Division" does this by following an SOP that "maneuvers" fires deep and ensures the synchronization of all assets at the right time and place to provide the synergistic effect necessary to win.

Organizing to Fight the Deep Battle

For deep operations, the 1st Armored Division forms a deep battle cell (DBC) at the division main command post (DMain). Its purpose is to synchronize the critical battlefield operating systems (BOSs) of maneuver; fire support; command, control and communications (C^3); air defense artillery (ADA); and intelligence.

The individuals that form the DBC (Figure 1) come together specifically to plan and execute the deep fight. The DBC is co-chaired by the division fire support coordinator (FSCOORD) and the aviation brigade commander. The G3 assists with all operational planning and coordination.

The G2 tracks intelligence requirements for the deep attack, specifically named areas of interest (NAIs) and target areas of interest (TAIs). Critical to the operation is his ability to interpret and predict the enemy's location, ADA status and artillery posture. Finally, he coordinates with the corps for non-lethal suppression of enemy air defense (SEAD) support (EF-111 and EC-130).

- Division Artillery Commander (FSCOORD)
- Aviation Brigade Commander/Executive Officer (XO)
- G3 or G3 Representative
- G2 or G2 Representative
- Assistant Division ADA Officer
- Deputy FSCOORD with Division Fire Support Element (FSE)
- Army Airspace Command and Control (A^2C^2) Representative
- Division Air Liaison Officer (ALO)
- Aviation Brigade Representatives: S3, Fire Support Officer (FSO), S2 and ALO

Figure 1: Deep Battle Cell (DBC). The DBC operates within the division main command post (DMain) to synchronize critical BOSs for the deep battle.

The ADA duty officer (ADADO) disseminates weapons control status changes and air corridors and conducts a risk assessment using a weapons control status of "weapons hold" within air corridors while helicopters are operational. The division fire support element (FSE) develops SEAD targets, helps determine appropriate fire support coordinating measures (FSCMs), designates helicopter battle positions as no-fire areas (NFAs), submits close air support (CAS) requests through Army channels and executes the fire plan from the DMain. The air liaison officer (ALO) helps with CAS and battlefield air interdiction (BAI) requests and deconflicts scheduled BAI missions that may affect the deep attack.

Concurrently, the aviation brigade staff develops the deep attack plan, supporting graphics, air corridors, lethal and non-lethal SEAD plans, the DBC execution matrix and the deep attack checklist.

None of these staff sections work in isolation. Rather, for the deep attack to be successful, they must be completely synchronized.

Getting the right organization in place is the first step. We then must have a place where it can function together as a team. In the 1st Armored Division, the DBC meets in the deep operations van located in the DMain (see Figure 2). When the DBC is not meeting, the G3 Air section mans it and G2 Plans maintains its situation maps. This facilitates operations when the DBC is activated.

The position of the deep operations van on the ramp also helps overall operations. The G2, FSE, deep operations and division airspace management element (DAME) vans are interconnected to allow continuous voice and visual coordination.

The 1st Armored Division DMain seen from "under the net" (photograph on Page 21). The DBC is an integral part of the DMain.

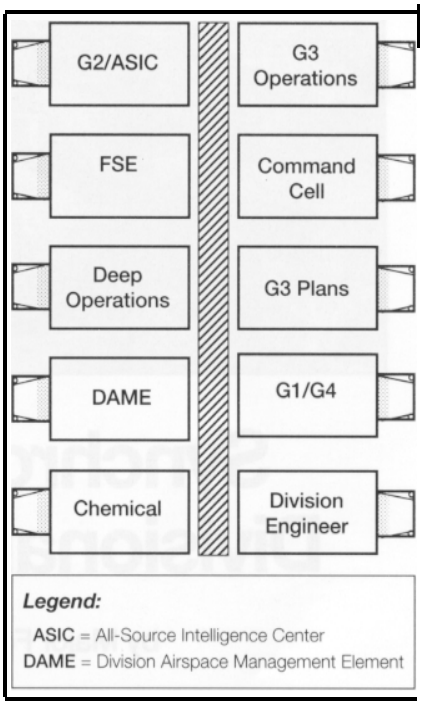


Figure 2: 1st Armored Division DMain Configuration. The DBC meets in the deep operations van. It's activated specifically to plan and conduct deep operations. When the DBC isn't meeting, G3 Air mans the van and G2 Plans maintains the situation map.

Planning the Deep Battle

Significant to most successful operations is how well they are planned; a key factor in planning is how much time is available. An ideal scenario for a deep attack would allow 24 hours to plan the operation, but the time is usually less. The 1st Armored Division uses a 24-hour planning sequence and modifies it when required (see the DBC checklist in Figure 3). Reduced planning time usually precludes the integration of all desired assets, such as electronic warfare (EW), CAS and BAI. Also effected by short planning times are coordination and intelligence collection, analysis and dissemination.

DMain FSE. Located beside the G2, the FSE has immediate access to real-time intelligence focusing on deep high-payoff targets.

The basis for the checklist at Figure 3 is the decide, detect and deliver methodology discussed in *FM 71-100 Division Operations*. The *decide* phase begins at F-24 Hours when the plan begins to be developed. (F-Hour is the time the first aircraft is on station in the battle position, or BP.) To support the plan, high-value and high-payoff targets are developed, followed by specific attack guidance (one of the blocks in the deep battle status board at Figure 4 on Page 24). Also determined during this phase is the risk versus the payoff of the operation. Additionally, mission abort criteria (listed in Figure 5 and one of the blocks in Figure 4) are developed to support the operation. The criteria are monitored throughout the operation to ensure a rational and timely decision can be made to continue or abort the mission.

These decisions provide the framework needed to begin the *detect* phase. Collection assets are focused to ensure priority is given to the deep attack. Information and intelligence received is continuously updated and refined throughout the detect phase.

F-24 Hours

- ❑ G3/G2 recommends deep attack that supports maneuver.
- ❑ Aviation brigade (Avn Bde) G2/G3 conduct mission analysis.
- ❑ FSE coordinates with corps for support.
- ❑ Corps requests non-lethal SEAD.
- ❑ Mission analysis briefed to division commander.
- ❑ Division commander gives a Go.
- ❑ G3 gives mission objectives and abort criteria.
- ❑ Deputy FSCOORD issues attack guidance and allocates assets.
- ❑ G2 adjusts sensor assets and requests dedicated EW support.
- ❑ ALO requests BAI support.

F-16 Hours

- ❑ G2/FSE/Avn Bde identify NAIs, TAIs, engagement areas (EAs) and decision points (DPs).
- ❑ G3/FSE/Avn Bde develop deep plan, graphics, air corridors and deception plan.
- ❑ G2 updates decision support template (DST).
- ❑ FSE develops SEAD plan.

F-8 Hours

- ❑ G2 projects ADA threat and sensor/EW support.
- ❑ Avn Bde/G2/G3/FSE recommend course of action (COA).
- ❑ COA approved.
- ❑ Planning shifts to coordination of execution matrix.
- ❑ G2/FSE/Avn Bde read ADA threat to support routes.

F-4 Hours

- ❑ Avn Bde finalizes air route options.
- ❑ G2 revises NAIs/DPs and updates DST.
- ❑ Detailed dissemination begins.

F-3 Hours

- ❑ DBC forms at DMain.
- ❑ Status of assets is updated.
- ❑ Division commander approves execution.
- ❑ C^2 passes to executing unit.
- ❑ Deputy FSCOORD/Avn Bde finalize forward line of own troops (FLOT), release points (RPs), routes and battle positions (BPs).
- ❑ G2/FSE coordinate final SEAD.
- ❑ ADADO coordinates final air routes.

F-1 Hour

- ❑ Drop-dead time for passing fire plan to tactical fire direction system (TACFIRE).

F-1 Hour to Time-on-Target (TOT)

- ❑ "Time Hack" with unit headquarters, flight and DBC.
- ❑ Aircraft depart.
- ❑ About F-7 to F-1 minutes, ingress SEAD is fired.
- ❑ About F-3 to F-1 minutes, preparations on BPs and EAs are fired.
- ❑ About F-1 to F+4 minutes, non-lethal SEAD is conducted.
- ❑ F-Hour, first aircraft is in BP or TOT target is attacked in EAs.

F+17 to F+23 Minutes

- ❑ About F+17, lethal SEAD is fired.
- ❑ About F+19 to F+23, non-lethal SEAD is conducted.
- ❑ F+20, first aircraft departs BP.
- ❑ F+23, preparations on BPs and EAs are fired; egress SEAD is fired.

Figure 3: Deep Battle Cell Checklist. As reflected in this checklist, the 1st Armored Division uses a 24-hour sequence to plan and conduct the deep battle. Note: F-Hour is the time the first aircraft is on station in the BP. If the target is short of the FLOT, F-Hour may be used as the TOT on the EA.

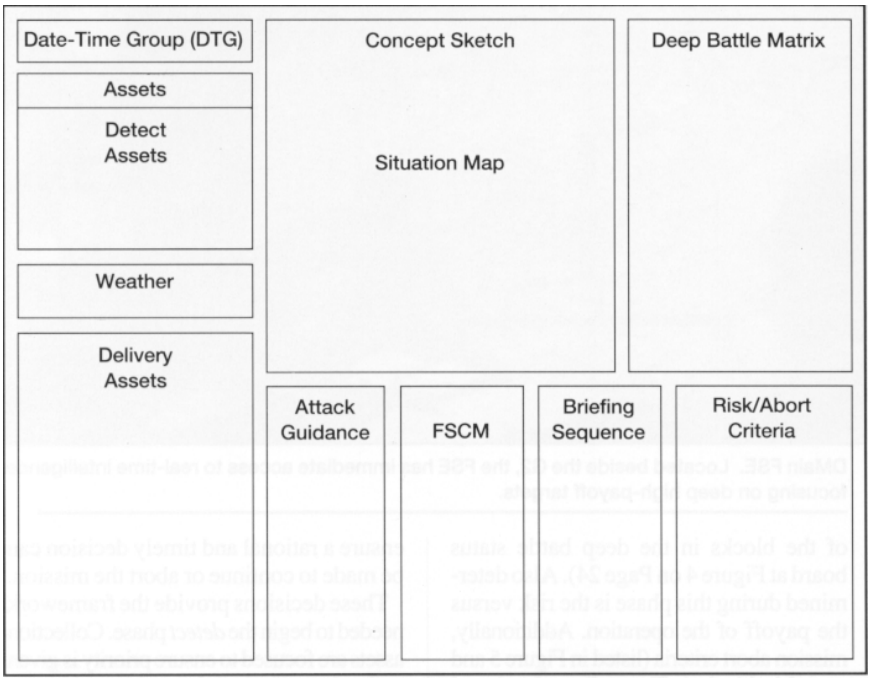
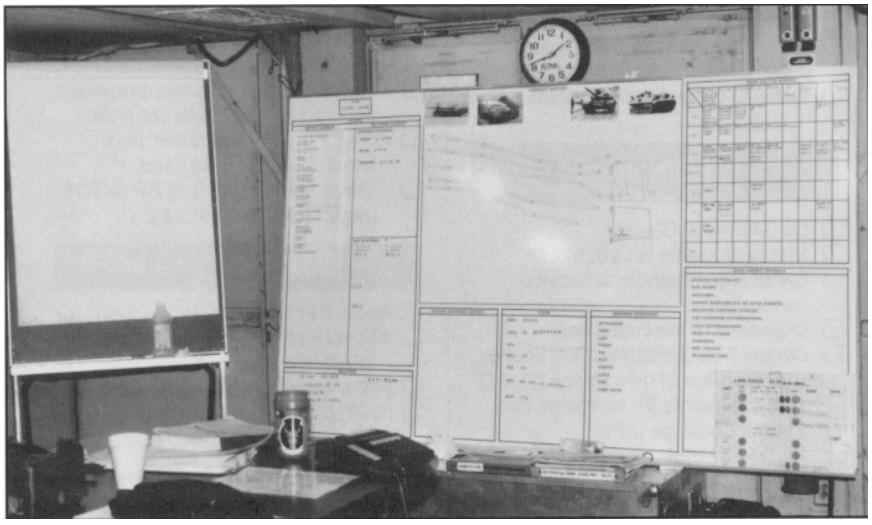


Figure 4: Deep Battle Status Board. The DBC monitors deep battle operations using this status board.

In the *deliver* phase (F-3 Hours), plans are finalized and coordination completed to facilitate execution. The 1st Armored Division is limited in systems that allow it to conduct the deep attack. Consequently, we accept risk by pushing organic assets far forward to acquire and kill the enemy deep in addition to planning for and requesting the use of external sources.

Surface fire support assets must provide SEAD fires from the forward line of own troops (FLOT) to the objective for the operation to be a success. This capability normally depends on the distance to the objective, but in the 1st Armored Division, we maximize the range of surface fire support assets by forming an artillery combat team (ACT). The ACT consists of a multiple-launch rocket system (MLRS) battalion, a 155-mm battalion, a mechanized infantry company, a Stinger or Avenger platoon, Q-36 and Q-37 Firefinder radars, military intelligence EW support measures (ESM) and electronic countermeasures (ECM) assets and a division artillery forward command post.



DBC in Five-Ton Expandable Van. The DBC has a full array of communications equipment and graphics—the deep battle status board shown here.

- Mission Criticality
- Day/Night Considerations
- Weather Considerations
- Range and Availability of SEAD Assets
- Weapons Control Status and Air Corridor Coordination
- A^2C^2 Coordination
- Forward Area Rearm/Refuel Point (FARP) Positions
- Element of Surprise
- Nuclear, Biological and Chemical (NBC) Considerations
- Planning Time

Figure 5: Mission Risk/Abort Criteria. In the decide (F-24 Hour) phase of the targeting methodology, risk versus payoff for the operation is determined. Additionally, mission abort criteria is developed, which is monitored throughout the operation to ensure a timely decision can be made.

The ACT moves beyond the FLOT to engage SEAD and other targets deep. It influences the deep battle by positioning cannon, rocket, target acquisition and military intelligence assets well forward. The accompanying Bradley infantry company and Stinger or Avenger platoon protect the ACT. Its target acquisition and military intelligence assets provide real-time feedback on high-payoff targets, allowing almost instantaneous lethal or non-lethal attack. (For more information on the ACT, see the article "The Artillery Combat Team: Providing Versatility for America's Tank Division" by Major Rex L. Gilbert in this edition.)

Coordinating the Deep Fight

As discussed earlier, the physical setup of the DMain allows continuous coordination among the staff elements. Parallel planning by the division staff is supplemented by targeting meetings held every 12 hours that focus on all areas of the battlefield framework. These meetings update the intelligence picture (TAIs, NAIs and decision points, or DPs), validate current high-value and high-payoff targets, refine attack guidance and synchronize the intelligence collection plan. They identify future intelligence requirements that must be requested from external sources.

The intricacies of a deep attack operation and the criticality of BOS synchronization underscore the vital role played by the DBC. Initially, the DBC receives a warning order at F-8 Hours. The DBC convenes at F-3 Hours in the deep operations van and uses the DBC checklist (Figure 3) to facilitate coordination among the BOSs.

Event / BOS	F-3:00	F-2:00	F-1:00	F-:20	F-:05	F-Hour	F+:20	F+:40	F+1:30
Intelligence	Weather Report SITREP SLAR	SITREP LRSD	SITREP LRSD				SITREP BDA Report		
Maneuver	Occupy FAA REDCON 4	REDCON 3	REDCON 2	Launch		Occupy BPs	Depart BPs		Debrief
Fires			Jam C^2/ADA Nets Fire Plan Complete/Disseminated	Initiate Ingress SEAD	Initiate SEAD of EA	Priority Attack Helicopter	Initiate SEAD of EA/Egress SEAD		
Mobility/Counter-mobility						Execute Obstacle Plans			
ADA				Weapons Hold				Weapons Tight	
C^3	Deploy JTOC		JTOC Enters Command Net	Radio Relay on Station					
Combat Service Support	Deploy JFARP		FARP Operational					Rearm/Refuel	
NAI	8-384	8-322	8-672						

Legend:
SITREP = Situation Report
SLAR = Side-Looking Airborne Radar
FAA = Forward Assembly Area
REDCON = Readiness Condition
JTOC = Joint Tactical Operations Center
JFARP = Joint Forward Area Rearm/Refuel Point
LRSD = Long-Range Surveillance Detachment
BDA = Battle Damage Assessment

Figure 6: Deep Battle Cell Execution Matrix. The DBC uses this matrix to synchronize the execution of the deep battle.

Executing Deep Operations

The litmus test for the utility of a deep attack operation is how well it's executed and its effect on the battle. Execution is synchronized using the DBC execution matrix (see Figure 6; the matrix is also a block of the deep battle status board in Figure 4). The F-Hour sequence used in both the DBC checklist and the DBC execution matrix establishes one time clock for all elements and ensures there's no confusion about what time events are to be executed. The execution of a deep attack should maximize the characteristics of the offensive battle framework, specifically surprise, speed and concentration. The DBC monitors the operation throughout using the deep battle status board (Figure 4).

Once the plan is handed off to the attack battalion for execution, the DBC monitors operations while preparing for future operations. If the distance to the target allows communications, then the DBC closely tracks the operation. If communications with the attack battalion aren't possible, the DBC waits until the mission is complete to receive mission status information.

A crucial element of the mission is the battle damage assessment (BDA) report. BDA is required to provide the commander two pieces of information: the enemy's current posture and an assessment of the success of the mission. Did it shape the battlefield as intended?

The importance of timely BDA cannot be overstated. If the commander is to exploit the success of a deep operation, he must know what that success is and how it will shape the fight at the FLOT. BDA is requested during the initial planning phase and supplied by a number of sources, including signals intelligence reports and video tapes from attack aircraft and tactical air reconnaissance.

The mission is complete when the aircraft return to the launch point. The DBC remains operational until that time in case the situation presents an opportunity to conduct a follow-on mission. When the DBC adjourns, planning and operations are assumed by the G3 Air section until the need arises to convene the DBC again.

A successful divisional deep attack gains control of the battle tempo and allows the brigades to fight a close battle that has been shaped for success. The deep attack destroys the enemy's "long shooters" and delays or disrupts his maneuver forces so the brigades can destroy them piecemeal.

The process described in this article has been institutionalized in the 1st Armored Division field SOP and validated on many division-level exercises. It's a means for synchronizing deep operations in America's Tank Division. *Iron Steel!*

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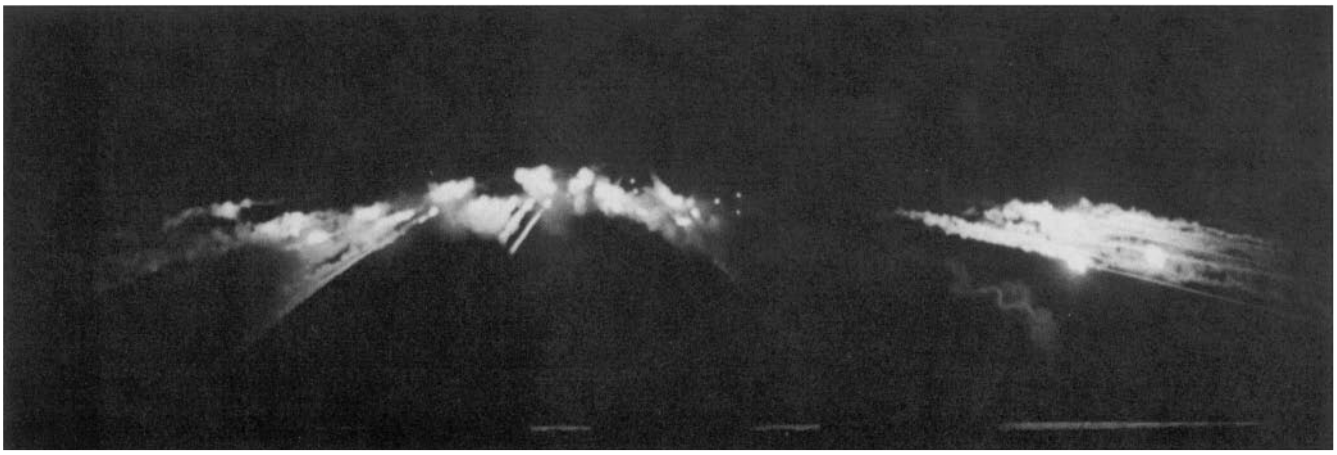


Deep Interdiction—

The MLRS Deep Strike Option

by Colonel Dennis C. Cline and Lieutenant Colonel Joe G. Taylor, Jr.

The quiet, moonlit skies above Fort Bliss, Texas, and nearby White Sands Missile Range, New Mexico, were shattered by the roar and flames of more than 300 rockets during the late evening of 14 and early morning of 15 July 1992. Time-on-target (TOT) missions employing the firepower of a multiple-launch rocket system (MLRS) battalion destroyed high-payoff targets with what would have been a "steel rain" of nearly a quarter of a million dual-purpose improved conventional munition (DPICM) bomblets.

The 6th Battalion, 27th Field Artillery, 6-27 FA, (MLRS), which was operating with elements of the 2d Squadron, 3d Armored Cavalry Regiment (ACR), slipped forward in sector throughout the late afternoon and early evening to position its 27 launchers and key command and control (C^2) systems for the strike. Simultaneously, battery and battalion trains traveled separate routes to eventually link-up with their forward-deployed elements at subsequent operational areas. The missions were the culmination of a year of operational employment analysis, months of deployment planning and three weeks of intensive desert training.

Deep interdiction strike, the term we use for missions such as those conducted with the 3d ACR, is a product of brigade and battalion emphasis on employing MLRS in offensive operations. It's based historically on the artillery raid and, more recently and specifically, on the preparatory raids conducted by MLRS batteries and cannon artillery before the ground assault during Operation Desert Storm.

We took that concept, maximized system capabilities and developed four categories of deep interdiction strike missions: preparatory fires for the deliberate attack, movement-to-contact, ground interdiction strikes and defensive operations. Used appropriately, these missions contribute significantly to the destruction of the enemy, help tie the deep and close battles into a single, synchronized whole and ensure the artillery force can bring its full weight to bear at the critical points in the battle.

We fully understand the deep interdiction strike is not doctrinal. It has evolved from necessities driven by many Battle Command Training Program (BCTP) exercises and has proven to be a high-risk, but decisive, tactic to disrupt the cohesion and momentum of enemy forces. Results have been remarkable. The deep interdiction strike has proven to be the single most decisive action to facilitate transition from the defense to the offense in some cases and the insurance to secure success of offensive operations in others. To avoid "reinventing" this tactic for our exercises, we chose to develop techniques and train for deep strike employment.

This article reviews the four types of deep strike missions and their advantages and conditions for employment. Additionally, it incorporates the battalion's experiences in exercising the deep strike option in a combined arms context during the recent Fort Bliss/White Sands deployment.

Preparation Fires for Deliberate Attack

The most likely use of the MLRS deep interdiction option is as a component of the indirect-fire preparation preceding a deliberate attack. Since the system's fielding,

MLRS fires have been considered a key component of preparatory fires. MLRS rocket fires are effective in striking known targets and in supporting a preparation through reactive counterfires. However, simply including MLRS units in a fire plan doesn't take full advantage of the system's characteristics, particularly in a situation where enemy acquisition capabilities aren't as eroded as they were for the desert offensive in February 1991.

The situation developed for operations at Fort Bliss is shown in Figure 1. The enemy, a combined arms army (CAA), had halted its attack along the Organ Mountains to rearm and refit after successfully crossing the Rio Grande River. Pending the arrival of the enemy's strategic reserves, the CAA can resume the offensive in 12 to 24 hours.

Air parity existed, and the enemy had significant battlefield air defense capabilities. The enemy's overall strength was approximately 80 percent, and his force included an artillery range and tube advantage. He could be expected to vigorously dispute any attempt by our division artilleries to close to effective range to support a counterattack. The 3d ACR was in contact along Phase Line (PL) Scorpion as the corps covering force.

In conjuction with elements of the 2d Squadron, 3d ACR, 6-27 FA launchers move forward to conduct deep strike interdiction at Fort Bliss.

The corps commander saw this pause by the enemy as a window of opportunity and intended to attack with two divisions that would accept battle hand-over from the 3d ACR. As part of a synchronized preparatory operation, an MLRS battalion in each division sector was to infiltrate forward into the 3d ACR zone and conduct deep strikes against key enemy C^2 nodes and indirect-fire systems. The corps commander's intent was to use the MLRS strikes as a synchronized component of battle hand-over to proactively strip away much of the enemy's indirect-fire superiority and disrupt his C^2. More importantly, these strikes would allow the remainder of the artillery force to move forward, well within the enemy artillery's range fan, to conduct additional conventional preparations in support of the attack.

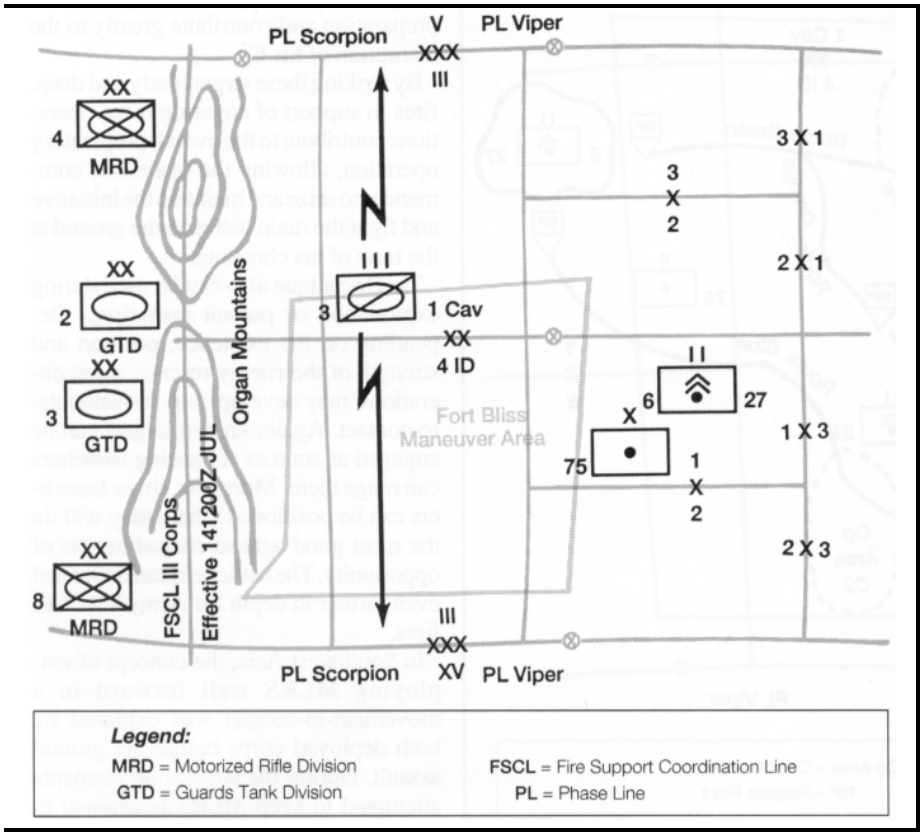


Figure 1: The Deep Strike Scenario. This figure depicts the situation developed for deep strike operations at Fort Bliss that involved 6-27 FA (MLRS) and elements of the 2d Squadron, 3d ACR, operating in the 4th Infantry Division (Mechanized) sector.

In the exercises at Fort Bliss, 6-27 FA played the role of the MLRS battalion in the 4th Infantry Division (Mechanized) sector (see Figure 2 on Page 28). The battalion was part of a reinforcing artillery brigade. After the deep interdiction strike, the battalion elements moved to subsequent operational areas. This movement allowed the unit to contribute both additional preparatory fires and counter-fires as the attack progressed.

Though such strikes can significantly harm the enemy as isolated missions, the key to achieving the greatest effectiveness is to conceive of all fire support operations for the attack as a single, coherent preparatory operation. Synchronizing the deep strikes with battle handover, positioning the division artilleries, firing the "prep" and conducting any other fire support activity (such as employing attack helicopters) create the conditions for success during the coming direct-fire battle. MLRS' speed, relative invulnerability to enemy counterbattery fires and tremendous firepower make it the ideal choice to initiate those operations.

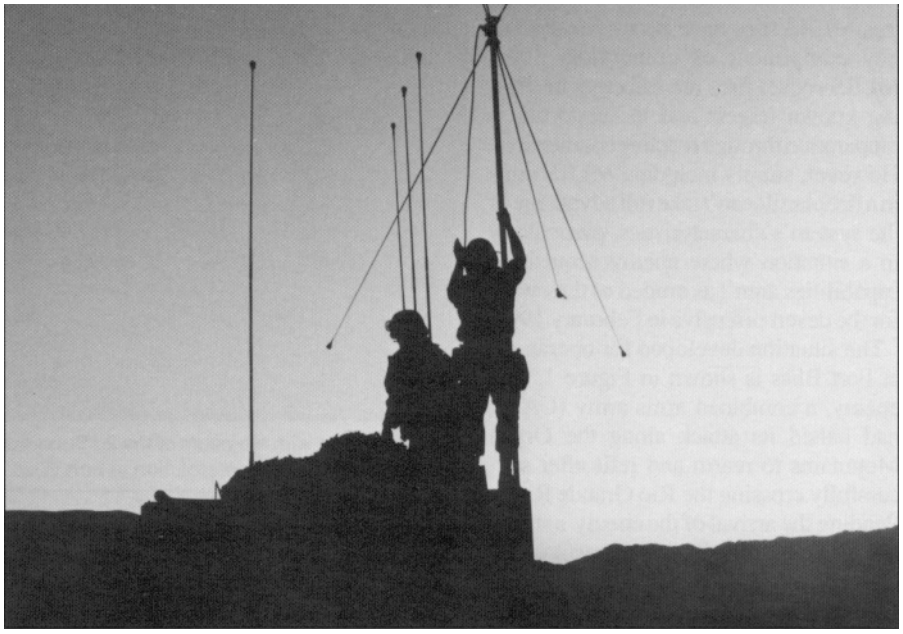
Finally, the Army tactical missile system (Army TACMS) brings an additional potent capability to preparatory operations. In the situation described during the Fort Bliss exercises, the enemy commander was depending on the arrival of his strategic reserve to resume his attack.

Army TACMS fires, in conjunction with Air Force battlefield air interdiction (BAI), could prove decisive in sustaining the corps commander's window of opportunity by disrupting the enemy's employment of those reserve forces.

Though not exercised by the battalion at Fort Bliss due to the range requirements for live-rocket fires, Army TACMS positioned well forward during deep strikes would open the enemy target array further. This deep capability will continue to grow as additional MLRS family of munitions (MFOM) are fielded. Used in such a way, these very deep fires become a synchronized fire support component of the attack.

Movement-to-Contact

A variation of the deep strike techniques used by MLRS during a deliberate attack also are applicable in a movement-to-contact. In this situation, the MLRS battalion accompanies the covering force, whether division or corps, orienting on that element's movement formation.



Communications are key to exercising the deep strike option.

Using all-source intelligence assets, corps and division targeting cells can develop enemy targets and provide updates on high-payoff targets to the artillery force commander. MLRS batteries, accompanying the covering force as it closes, can engage these targets as they come into range. Such missions will proactively strip away enemy fire support, delay his battle preparation and contribute greatly to the disruption of his C^2.

By striking these targets early and deep, fires in support of covering force operations contribute to the overall preparatory operation, allowing the maneuver commander to seize and maintain the initiative and fight the main battle on the ground at the time of his choosing.

This technique also can be used during exploitation or pursuit operations. Depending on the existence, position and strength of the enemy reserve, these operations may develop into movements-to-contact. Again, known targets can be engaged as soon as advancing launchers can range them. Moreover, those launchers can be positioned where they will do the most good against critical targets of opportunity. The battlefield can be opened even farther in depth for Army TACMS fires.

In Southwest Asia, the concept of employing MLRS well forward in a movement-to-contact was explored by both deployed corps before the ground assault. During the attacks, all elements attempted to keep MLRS positioned to fire as deep as possible. The 24th Infantry Division (Mechanized) and 1st Armored Division (United Kingdom) were particularly aggressive in keeping launchers forward with their lead elements so their

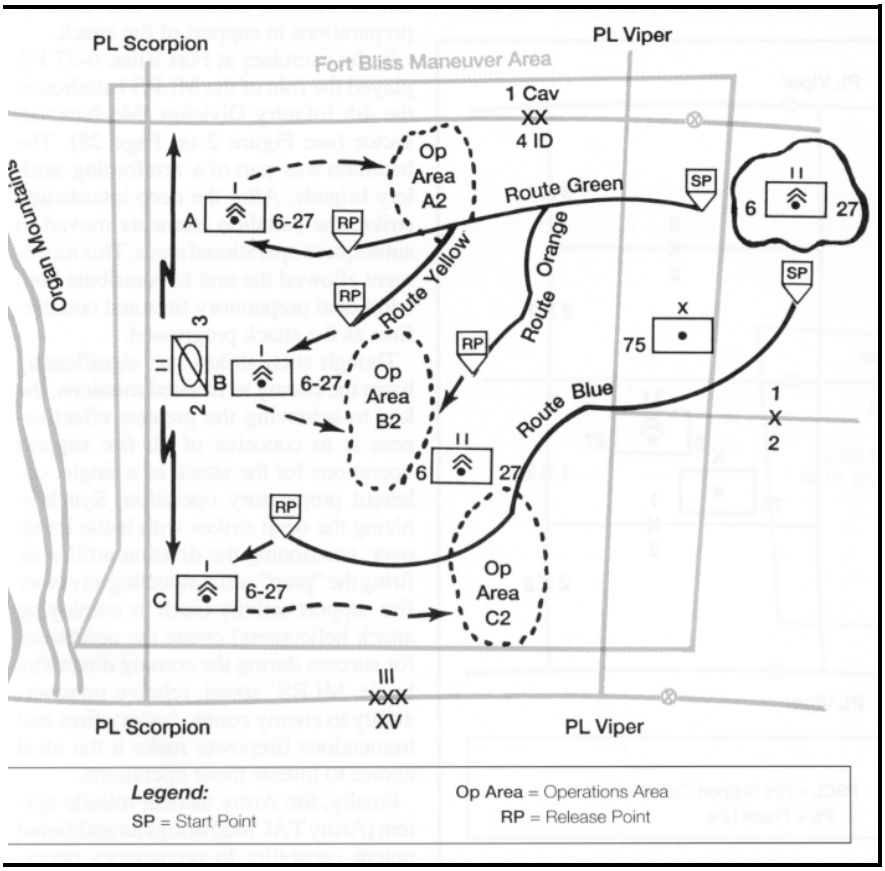


Figure 2: Deep Strike Positioning. During the Fort Bliss exercise, the three 6-27 FA MLRS batteries moved forward along designated routes to deep strike positions. After the strikes, the batteries moved to subsequent operational areas.

firepower could support the developing attacks.

More recently, iterations of BCTP exercises have provided a useful format to validate aggressive, early employment of MLRS. With proper targeting, MLRS can play a decisive role in winning the counterfire battle before main bodies ever come into contact (see "Fighting the 1st Armored Division: Fires and Maneuver—One and the Same" by Major General William M. Boice, August 1992).

Such early use has proven very effective when MLRS is employed in conjunction with deep attack helicopter operations. Suppression of enemy air defenses (SEAD) contributes to the success of the helicopter mission, and the aviation elements can develop or confirm high-payoff targets for attack by rocket or missile fires. By their very nature, such mutually supportive operations help synchronize both the deep battle and the overall operation.

Ground Interdiction Strike

The boldest application of the deep strike option is the use of MLRS in "cross-FLOT" (forward line of own troops) operations. Though, as we shall see, such an operation probably should be called "FLOT extension." Whatever term is chosen, placing artillery within the enemy zone of operations depends on battlefield fluidity and careful risk analysis. This ground interdiction strike is an option for either offensive or defensive operations—as an attack or counterattack by fires—in a combined arms format. Its use is predicated on the existence of targets so critical that their attack is worth taking great risk.

Figure 3 shows what we call an "artillery task force" maneuvering into the enemy security zone to strike deep at a series of high-payoff targets. In this instance, the maneuver brigade commander has the mission to "attack-in-zone" deep enough to secure an operational area 10 kilometers beyond the FLOT and allow the artillery task force commander to strike critical targets that can be ranged only through such positioning.

Mission, enemy, terrain, troops and time available (METT-T) analysis indicates that this mission can be accomplished with a task force built around two mechanized infantry companies, a tank company and two batteries from the MLRS battalion. The direct support (DS) artillery is positioned to provide fires in support of the penetration and help isolate the MLRS operational area. The third MLRS battery and Q-37 Firefinder radars provide reactive counterfires during the mission. Additional force packaging and protection issues must be considered and are discussed later in this article.

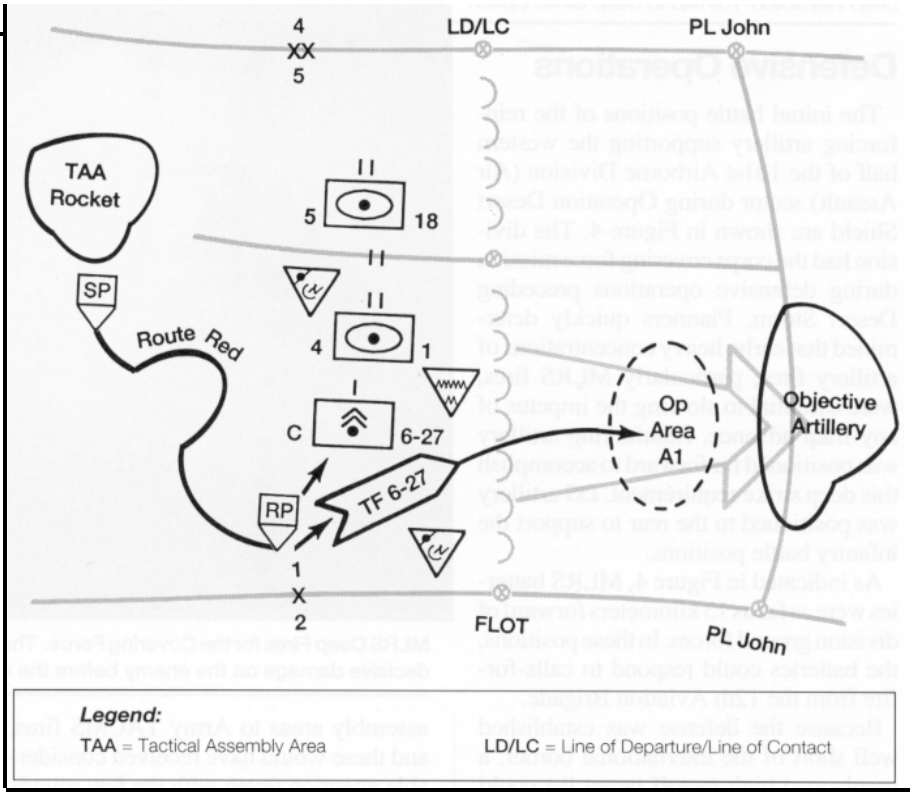


Figure 3: Ground Interdiction Strike. An artillery task force (TF 6-27) maneuvers across the FLOT into the enemy security zone to strike a series of deep, high-payoff targets.

Both C^2 and defining the mission of such an operation are difficult. Traditional concepts built around seizing and holding an objective or providing fires through a particular support relationship don't clearly define the operational objective. Rather, force protection and the attack of high-payoff targets require a blend of maneuver, fire support and command requirements not found in any other operation.

Flexibility is key in any such mission. In a situation where a force must conduct a deliberate attack across a recognizable FLOT, overall mission responsibility must be given to the maneuver commander upon whose ground the attack to secure the operational area will take place.

The artillery task force may be commanded by either an artillery or a maneuver commander. A useful rule-of-thumb is the mission of the maneuver force. If maneuver assets are present primarily for force protection and security, then the task force commander should be an artilleryman. If, on the other hand, the maneuver force must conduct a deliberate attack to secure an operational area, then the task force commander should be maneuver.

In a more fluid operational environment, the ground interdiction strike will prove an even more viable option. In such a campaign, the artillery task force must be prepared to maneuver to any point on the battlefield, defend itself and strike deeply at critical targets. Though a deliberate attack to secure firing positions may be unlikely, meeting engagements with enemy elements are possible—even likely—as the task force maneuvers without a clearly designated FLOT. The artillery task force must be able to defend itself in such a direct-fire fight, survive and deliver fires. The task force's degree of exposure should be based on a very deliberate determination of the potential target array's value.

Aggressively employing MLRS to provide interdictive fires as a synchronized component of the larger battle is a high-risk but also, potentially, a high-payoff option. Innovative packaging of the artillery force tasked with such operations is a key to success.

Defensive Operations

The initial battle positions of the reinforcing artillery supporting the western half of the 101st Airborne Division (Air Assault) sector during Operation Desert Shield are shown in Figure 4. The division had the corps covering force mission during defensive operations preceding Desert Storm. Planners quickly determined that early, heavy concentrations of artillery fires, particularly MLRS fires, were essential to slowing the impetus of any Iraqi advance. Reinforcing artillery was positioned far forward to accomplish this deep strike requirement. DS artillery was positioned to the rear to support the infantry battle positions.

As indicated in Figure 4, MLRS batteries were as far as 15 kilometers forward of division ground forces. In these positions, the batteries could respond to calls-for-fire from the 12th Aviation Brigade.

MLRS Deep Fires for the Covering Force. The early initiation of the fire support battle can inflict decisive damage on the enemy before the main bodies come in contact.

Because the defense was established well short of the international border, a preplanned high-payoff target list could not be prepared. Rather, target groups were established along avenues of approach that the aviation brigade could trigger. Forward positioning opened Iraqi assembly areas to Army TACMS fires, and these would have received considerable attention (even with the few rounds available in the theater at that time) had the attack occurred.

As in a movement-to-contact, the early initiation of the fire support battle was intended to inflict decisive damage on the enemy before the main bodies came in contact. Thus, MLRS deep fires were a critical component of the overall covering force battle.

Obviously, such an operation entails significant risk. Even relatively weak enemy scout forces can cause unacceptable damage in an MLRS operational area. In this particular case, attack helicopter units assumed the added responsibility of MLRS protection. Risk and artillery force protection must be a major consideration in any operation employing the deep strike option.

Early employment of MLRS in a defensive fight will continue to have value. As in the offensive, these operations form an important component of not only the covering force battle, but also the overall synchronized fire support battle. Risk analysis and force protection are important employment considerations.

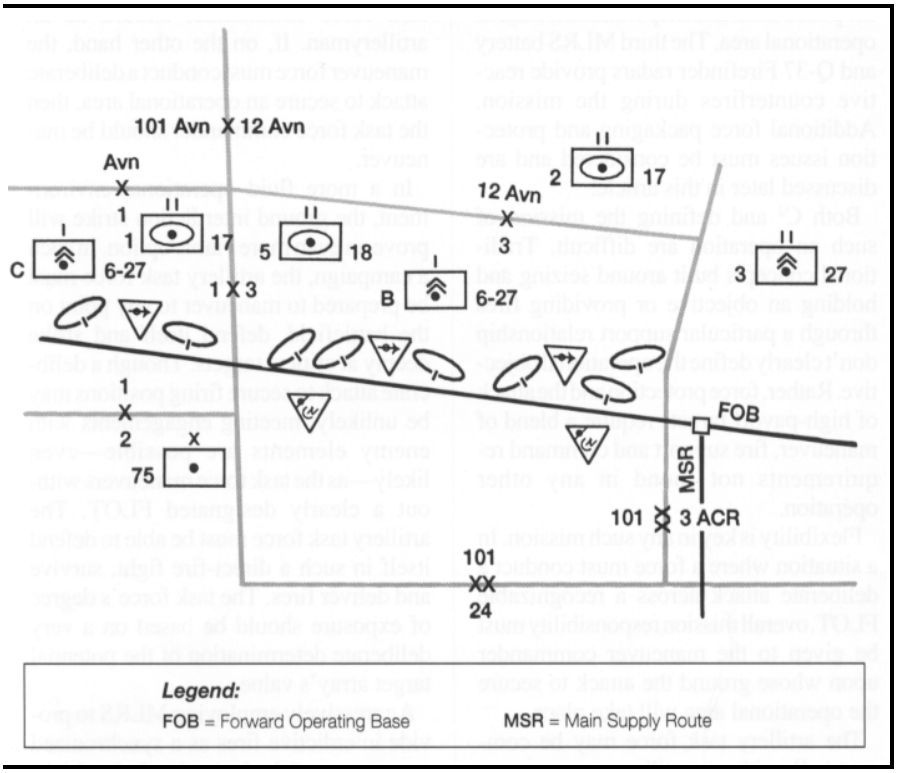
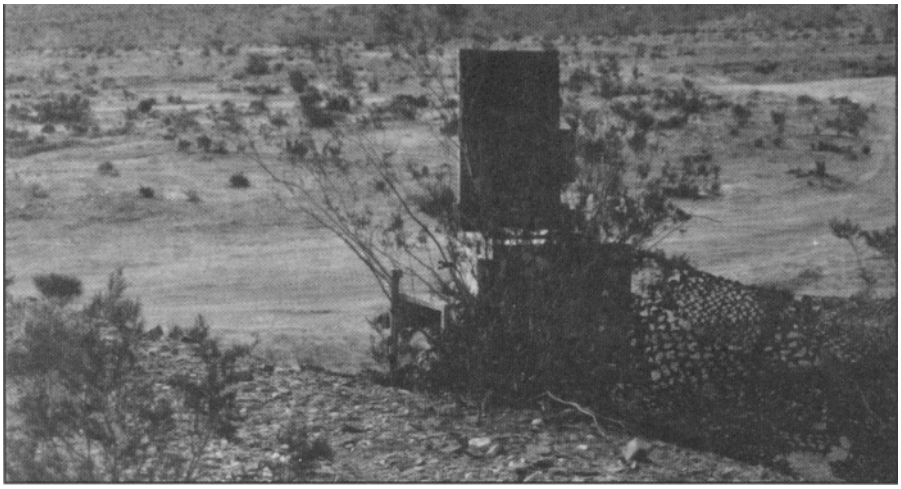


Figure 4: Defensive Operations. These were the initial battle positions of the reinforcing artillery supporting the western half of the 101st Airborne Division (Air Assault) sector during Operation Desert Shield. The reinforcing artillery was positioned far forward to conduct deep strike missions.

Strike Force Packaging

The key to success in employing the MLRS deep interdiction strike option is to organize the artillery task force so it has enough launchers to accomplish its fire support mission and enough supporting forces to survive. That force packaging should use all available organizations and systems.

During the Fort Bliss deployment, 6-27 FA used other supporting artillery. In that exercise, the 2d Squadron Howitzer Battery was positioned to provide counterfires and support disengagement after the TOT.



Q-36 radars positioned near the deep strike operational area increase the effectiveness and responsiveness of countermortar fires.

The battery also was prepared to provide fires if a direct-fire engagement developed en route to the operational area. The howitzer battery was under the operational control of (OPCON) the artillery task force for the duration of the mission.

The operation at Fort Bliss occurred inside the FLOT. As a result, the maneuver commander in whose sector the strike took place was responsible for positioning and force protection. 2d Squadron scouts were to guide and accompany the batteries forward. Though not actually exercised on the ground, other squadron elements were formed as teams that would have been positioned well forward to provide direct fires if an enemy ground attack had materialized. Helicopter assets provided reconnaissance and were prepared to protect the force. In a more fluid setting, maneuver elements could be attached to the artillery task force to provide protection.

A Q-37 Firefinder radar section was positioned to support the MLRS task force with a second section simulated. Though the sections remained organic to the target acquisition battery attached to the artillery brigade, a quick-fire channel to the howitzer battery was established and critical friendly zones were set up around the deep strike operational areas.

In an actual deep strike operation, a portion of any remaining MLRS force would have assumed the primary reactive counterfire mission. A howitzer battery or other cannon units could contribute to this counterfire mission, particularly by attacking enemy mortar positions too close to strike effectively or safely with MLRS. Q-36 radars—also considered in forming the task force—can be positioned in or near the deep strike operational area and greatly increase the effectiveness and responsiveness of any countermortar fires.

Air defense is another major concern in initiating such an operation. MLRS is a high-priority target for any enemy force. Operational areas for strikes on either side of the FLOT will be relatively small to facilitate movement and force protection. This tendency to concentrate in smaller areas facilitates short-range air defense coverage, such as with Stinger, and makes coverage prediction for longer range systems easier.

Finally, electronic warfare (EW) assets are extremely useful in conducting a successful strike. Both airborne jammers and those accompanying the task force can mask the digital signature that precedes a TOT. Other EW assets can provide battle damage assessment by monitoring targets as they're attacked.

The eventual organization and C^2 of the artillery task force will play a tremendous role in the success or failure of any deep strike mission. Its organization must be flexible, contribute to accomplishing the mission and facilitate future employment of all task force assets in the developing battle. If these conditions are met, the artillery force is assured of a pivotal role in both the deep and close support fights and will survive to fight another day.

Final Thoughts

MLRS capabilities exceed basic artillery support doctrine and simple, traditional innovative techniques such as the artillery raid. Additionally, MLRS demands more imaginative force configuration than the basic modification table of organization and equipment (MTOE) organization.

In MLRS, the Field Artillery has a weapon that can be the catalyst to synchronize maneuver and fire support in executing the deep and close battles. A single MLRS unit, properly positioned and protected, can significantly damage an enemy throughout the depth of his forces. Properly synchronized as a component of the overall battle, MLRS fires can shape the battlefield to the maneuver commander's advantage and provide for the full employment of the division artilleries and other supporting arms.

Redlegs—as branch and individual professionals—must proactively develop techniques and doctrine for the innovative and aggressive use of this system and all its munitions. We must offer suggestions and develop principles that contribute to the synchronization of a deep and increasingly complex battlefield. If we don't lead in such an endeavor, we most certainly will follow.

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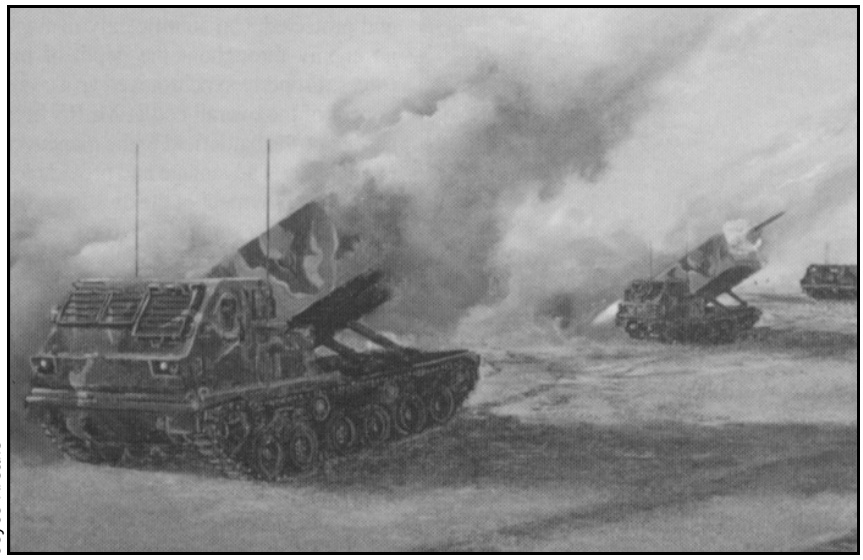
Lieutenant Colonel Joe G. Taylor, Jr., commands the 6th Battalion, 27th Field Artillery (Multiple-Launch Rocket System, or MLRS), 75th Field Artillery Brigade. Before assuming command of the "Proud Rocket Battalion," he was the S3 of the 75th Field Artillery Brigade during its Southwest Asia deployment. Other recent assignments include Executive Officer of the 3d Battalion, 27th Field Artillery (MLRS), XVIII Airborne Corps, and Assistant Fire Support Coordinator, XVIII Airborne Corps Fire Support Element at Fort Bragg, North Carolina. Lieutenant Colonel Taylor also commanded Headquarters and Headquarters Battery, 72d Field Artillery Group, Germany.

The Artillery Combat Team: Providing Versatility for America's Tank Division



Joyce Kreafle

by Major Rex L. Gilbert

Versatility is a significant addition to the four tenets of AirLand Battle doctrine in the preliminary draft of *FM 100-5 Operations.* At the tactical level, the manifestation of this fifth tenet is providing the commander as many instruments as possible with which to defeat the enemy.

In the 1st Armored Division, Germany, one such instrument is the Artillery Combat Team (ACT), an organization embracing all five tenets of AirLand Battle doctrine: agility, initiative, synchronization, depth and versatility. The ACT gives the division commander the versatility to shape the fight to his advantage by standardizing the process by which he surges his artillery forward into battle.

The concept of deploying artillery forward, a predominant characteristic of the ACT, has a long history of success. From Gustavus Adolphus during the 30 Years' War through the War for Independence, the Civil War, World War II, Korea, Vietnam and the Persian Gulf, artillerymen have maneuvered forward of their friendly force's main body to inflict a decisive blow on the enemy.

Deploying artillery forward maximizes the Field Artillery's (FA's) strengths of range, increased lethality and all-weather performance. It provides the capability to maneuver and mass fires for deep operations early in the battle. Finally, thrusting artillery forward is fundamental in establishing conditions for success in the close fight.

The ACT employed by the 1st Armored Division is a force designed to capitalize on these strengths of the "fires" battlefield operating system (BOS). Defined in the simplest of terms, it's a team surged forward on the battlefield to strike targets early and often, achieving the division commander's intent against specified targets in accordance with established effects criteria.

A close examination of the task organization (Figure 1) reveals the ACT includes all seven of the BOSs and has a significant offensive strike capability of up to 30 kilometers. A mechanized infantry company is dedicated to protecting the ACT's long-range weapons systems from ground attack by enemy reconnaissance elements or bypassed platoon or smaller ground forces.

The ACT task organization normally includes air defense artillery (ADA) to protect against air attack; engineer support for mobility, countermobility and survivability; and TRQ-32 intercepter/direction finder, TLQ-17 intercepter/jammer and Q-36 and Q-37 Firefinder radars for proactive electronic target location, electronic warfare (EW) and counterfire. It also includes a command and control headquarters and a communications network with liaison officers (LNOs) from ADA and military intelligence (MI) assets.

The ACT has access to a significant observation capability: an armored cavalry squadron with both ground and air troops trained to locate, identify and initiate calls-for-fire on static or moving enemy targets. Inherent in the screening mission, the cavalry provides early warning as to likely enemy courses of action (COAs). The ACT has a direct communications link with the squadron to use this and other real-time intelligence information. It provides the cavalry squadron close supporting fires from a 155-mm FA battalion.

- 2d Battalion, 29th Field Artillery (155-mm, Self-Propelled) Direct Support to the 1st Squadron, 1st Cavalry
- 6th Battalion, 29th Field Artillery (MLRS) in General Support
  - A Company, 4th Battalion, 12th Infantry
- 1st Platoon, A Company, 5th Battalion, 3d Air Defense Artillery
- 1st Platoon, C Battery, 333d Field Artillery (Target Acquisition--Q-36 Firefinder Radar)
- 4th Platoon, C Battery, 333d Field Artillery (Target Acquisition--Q-37 Firefinder Radar)
- 1st Platoon, A Company, 501st Military Intelligence (TRQ-32 Intercepter and Direction Finder)
- 2d Platoon, A Company, 501st Military Intelligence (TLQ-17 Intercepter and Jammer)
- 1st Platoon, A Company, 23d Engineers

Figure 1: Artillery Combat Team. The ACT has a division artillery assault command post (CP) controlling these elements to support its surge forward to strike targets early and often. Note that the ACT has representatives from all seven battlefield operating systems (BOSs).

Agility in command and control, artillery maneuver and the decision-making process are critical components of the ACT. It's organized quickly to provide fire support for units in contact and respond to a rapidly changing target array. The 1st Armored Division Artillery (Div Arty) shortens the time required to form

the ACT by exercising habitual relationships during training.

The ACT is organized under the Div Arty assault CP in a converted M109 van (see Figure 2). The CP is a force artillery headquarters capable of controlling counterfire, tactical fire direction, positioning for general support (GS) and general support reinforcing (GSR) units and fire planning functions. It also provides a headquarters staffed to receive, analyze and act immediately on targeting information.

ACT Operations

Whether the division has an offensive or defensive mission, the ACT provides offensive combat power to strip the initiative from the enemy. The 1st Armored Division commander gains the initiative by employing the ACT to defeat targets of high value to the opposing force and, thus, of high payoff to the division.

The targets "valued" by the enemy depend on his organization and doctrine. For the purposes of this article, I concentrate on enemy artillery.

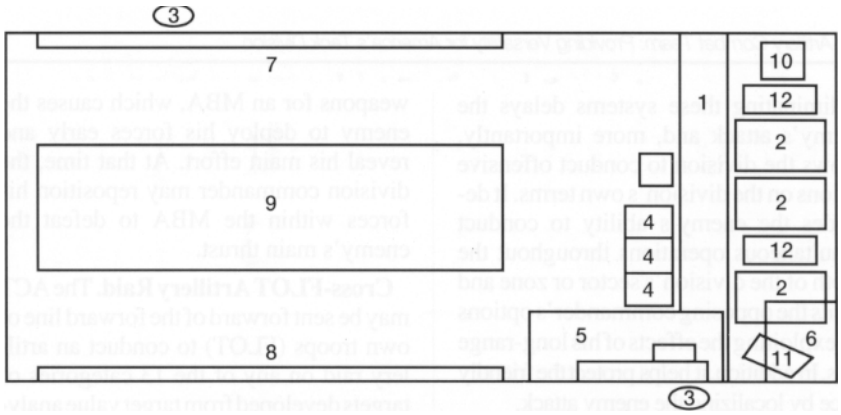
When confronting an artillery-heavy enemy, his long-range artillery is consistently identified as high priority for the division. Defeating these systems early in the fight achieves much more than increased freedom of maneuver for friendly ground forces; it creates an imbalance in the enemy's correlation of forces, leaving him without the combat power he has calculated as necessary for success. It forces the enemy to choose between two options: commit to an inadequately supported attack or delay the attack until additional combat power can be brought forward from follow-on forces. The number and type of artillery the enemy fields for a specific engagement, however, can make its destruction by an ACT operating independently a difficult task. Normally, the ACT fights deep in concert with the division's aviation brigade and Air Force battlefield air interdiction (BAI) assets to destroy the enemy's artillery early in the battle (see Figure 3).

Faced with a high ratio of enemy-to-friendly weapons systems, the division commander may commit additional attack assets to the counterfire fight. The cycle of continuous planning, preparation and execution of the deep operation mission requires a synchronized effort.

Synchronization begins with the formation of a deep battle cell (DBC) in the division main CP (DMain). The DBC consists of the aviation brigade and Div Arty commanders and decision makers on the division staff who plan for and coordinate with the various attack assets involved in the mission. (For more information on the DBC, see the article "Synchronizing the Division Deep Fight" by Major Forest D. Haynes II in this edition.) Close coordination between the Div Arty commander in the DBC and his staff in the Div Arty assault CP is continuous to ensure timely responses to changing events and a thorough understanding of the scheme of battle.

The Div Arty staff provides tactical fire direction for the operation—selects the units to fire suppression of enemy air defense (SEAD) programs and preparations on air battle positions and specific engagement area (EA) targets. This is accomplished while ensuring units are concurrently in position to fire for forward ground forces. Inherent mission tasks, such as conducting forward and rear passages-of-lines, are outlined in the FA support plan issued to members of the ACT.

Successfully eliminating the enemy's artillery increases the depth of the division's battle in terms of time and space. Forward deployment is a necessity driven by the range of enemy artillery systems. These can include the BM-22 multiple rocket launcher (16 tubes, 220-mm) with a range of 40 kilometers and the 2S7 (203-mm, self-propelled) howitzer with a range of 37.5 kilometers and 50 kilometers with rocket assisted projectiles (RAPs).



Legend:

1. Variable-Format Message Entry Device (VFMED)
2. VRC-46 Radio
3. OE-254 Antenna
4. Single-Shelf File Cabinets
5. Field Desk with Digital Non-Secure Voice Terminals (DNVTs)
6. Mobile Subscriber Equipment (MSE) Fax Machine under the Counter Top
7. Counterfire Map Board
8. Operations Map Board
9. Storage Box/Bench Seat
10. Power Supply
11. Two-Band Multiplexer for Antennas
12. KY-57 Secure Device for Radios

Figure 2: 1st Armored Division Artillery Assault CP. The ACT is organized under the Div Arty assault CP located in a converted M109 van as shown. The CP's manning per shift is the officer-in-charge, NCO-in-charge, operations specialist, S2, counterfire officer, 501st MI liaison officer and ADA liaison officer.

	Friendly	Enemy	Ratio
Best Case			
Artillery Tubes	72	456	1:6.3
Multiple Rocket Launchers	27	72	1:2.7
Worst Case			
Artillery Tubes	72	1008	1:14
Multiple Rocket Launchers	27	198	1:7.3

Figure 3: Artillery Threat in the Division Sector. The ACT normally fights deep in concert with the division's aviation brigade and Air Force BAI assets to destroy the enemy's artillery early in the battle.

Eliminating these systems delays the enemy's attack and, more importantly, allows the division to conduct offensive actions on the division's own terms. It degrades the enemy's ability to conduct simultaneous operations throughout the depth of the division's sector or zone and limits the opposing commander's options for exploiting the effects of his long-range fires. In addition, it helps protect the friendly force by localizing the enemy attack.

With the decision to attack the enemy's long-range artillery as a priority target, the Div Arty and the division, aided by corps assets, focus on detecting and tracking the target, based on terrain analysis, intelligence preparation of the battlefield (IPB) products and the collection plan. The FA intelligence officer (FAIO) at the DMain and liaison officers (from the division's MI battalion) in the assault CP enhance the speed with which the ACT receives intelligence obtained at the division level.

Once the target is located, the ACT moves into position to attack the target, engaging it in accordance with the commander's attack guidance for effects, and then prepares to assume a new role as rapidly as possible. The window of opportunity for engaging enemy artillery as the weapons set but before they fire on our forces is small. Positioning the ACT to fire at a critical moment requires anticipation from the Div Arty staff. That anticipation must be based on a thorough knowledge of the enemy's artillery tactics associated with his doctrine for the offense, defense and meeting engagements and the Div Arty staff's proactive contact with the DBC in the DMain.

ACT Missions

The ACT truly embodies the AirLand Battle tenets. Its versatility as an instrument for the division commander is evident in the many missions for which he may employ it on the battlefield.

Covering Force. First, the ACT is task organized to support traditional covering force area operations. It provides close fires for maneuver forces with a 155-mm battalion and counterfire and interdiction capabilities with the multiple-launch rocket system (MLRS) battalion and associated FA and MI assets. These units portray a covering force artillery picture designed to deceive the enemy about the location of the main battle area (MBA). The ACT presents the correct mix of weapons for an MBA, which causes the enemy to deploy his forces early and reveal his main effort. At that time, the division commander may reposition his forces within the MBA to defeat the enemy's main thrust.

Cross-FLOT Artillery Raid. The ACT may be sent forward of the forward line of own troops (FLOT) to conduct an artillery raid on any of the 13 categories of targets developed from target value analysis. As the attack guidance changes (based on our success against the enemy's indirect fire support system), the ACT may be positioned forward to engage newly identified high-priority targets, such as logistics facilities or maneuver assembly areas.

Exploitation or Pursuit. The ACT also may support maneuver ground forces committed to attacking key enemy targets during an exploitation or pursuit. For this mission, the ACT has the long-range assets to deny the enemy the chance to reconstitute his force. Also, the ACT's assault CP provides an additional headquarters to reduce command and control problems caused by the long distances inherent in deep operations.

Out-of-Theater Operations. In support of the Army's only forward-deployed tank division, the 1st Armored Div Arty trains quarterly in deploying firing units forward to draw pre-positioned equipment. Corps and division exercises habitually plan to use the ACT in the area surrounding the port of debarkation to help the division's lead elements deploy outside the theater. The ACT's early appearance in the division's N-Hour (alert notification hour) sequence and transportation deployment schedule indicates the division commander's commitment to achieving a deep fire capability early and the importance of its role in out-of-theater operations.

Conclusion

The ACT is firmly established in the 1st Armored Division's training plan and employed in all corps and division training exercises. The 1st Armored Div Arty trains in local maneuver rights areas (MRAs) to maintain proficiency in synchronizing the BOSs and to verify the artillery maneuver time and distance factors used in simulation exercises.

These MRA exercises have helped prepare the ACT for success in simulation, such as the Battle Command Training Program (BCTP) Warfighter Exercise conducted 26 to 30 January 1992. This was the first exercise in which the 1st Armored Division employed the ACT.

In Warfighter 92, the ACT, deployed 15 to 20 kilometers forward and across the division front, disrupted the time line of the world-class opposing force by 18 hours. This allowed the division time to reconstitute its combat power, where necessary, and simultaneously pursue offensive courses of action to decisively defeat the enemy.

The ACT initially destroyed the enemy's long-range assets in the Army Artillery Group (AAG) through responsive counterfire. The priority intelligence requirements (PIRs) and the ACT's focus then shifted to detecting and engaging air defense targets as soon as they were located. Success in this effort resulted in freedom of maneuver for the division's aviation brigade.

Destroying the enemy artillery early and often and providing SEAD fires for cross-FLOT deep operations are the charter of the ACT. Risk is inherent in cross-FLOT operations, particularly for an indirect-fire weapons system; however, the organization of and emphasis placed on the ACT show the benefits to be gained by employing the ACT in deep operations far outweigh the risks.

The 1st Armored Div Arty's ACT trains for a variety of missions, providing versatility and flexibility for the division commander to engage targets throughout his division sector or zone of operations. It's a key member of the lethal and unique 1st Armored Division team of professionals.

Major Rex L. Gilbert is Assistant S3 of the 1st Armored Division Artillery in Germany. His previous assignment was as S2/S3 and then Fire Support Observer/Controller at the Combat Maneuver Training Center in Hohenfels, Germany. Major Gilbert also served as a Tactics Instructor for the Field Artillery Officer Advanced Course (FAOAC) in the Fire Support and Combined Arms Operations Department (FSCAOD), Field Artillery School, Fort Sill, Oklahoma. Also while in FSCAOD, he was selected as a Small Group Leader for the implementation of FAOAC small group instruction. He commanded Headquarters and Headquarters Battery in the 2d Battalion, 11th Field Artillery, 25th Infantry Division (Light), Schofield Barracks, Hawaii.

Depth and Simultaneous Attack—

One Battle Lab Helping to Forge the Army's Future

by Colonel Donald L. W. Kerr

With the military technological revolution—extraordinary capabilities on the horizon—and increasing limitations on our budget and manpower, the Army is devising new paradigms to take advantage of technology and most efficiently and effectively accomplish its mission and protect the force. Helping to meet that challenge, the Army is experimenting with emerging concepts for doctrine, materiel, organization and operations in laboratories—battle labs. They're identifying potential answers to tough questions, helping to refine and practice concepts for future Army, joint and Joint Precision Strike (JPS) operations. (For more information on JPS, see the article "Joint Precision Strike—The Field Artillery Contribution" by Major Johnnie L. Bone, Jr., February 1993.)

Beginning last summer, the Training and Doctrine Command (TRADOC) established six such labs to examine the major dynamics that will govern tomorrow's battlefield: Early Entry Operations at Fort Monroe, Virginia; Battle Command, Fort Leavenworth, Kansas, and Fort Gordon, Georgia; Mounted Battle Space at Fort Knox, Kentucky; Dismounted Battle Space at Fort Benning, Georgia (the latter two representing the dynamics of close battle operations); Combat Service Support at Fort Lee, Virginia; and the Depth and Simultaneous Attack (D&SA) Battle Lab at Fort Sill, Oklahoma. These labs examine old and devise new operational concepts and then analyze, simulate, experiment with and evaluate them. They also setup hands-on and force-on-force demonstrations and use actual unit exercises to test the concepts. Finally, each lab integrates its findings to develop new or refine old requirements for the Army. Among other advantages, the labs provide the opportunity to experiment with technology early in the research and development phase of the materiel acquisition process.

Experimenting with the findings of the six labs and other concepts and tapping into the worldwide simulation network connecting corps and theater exercises is a senior leader "think tank" initiated by the Chief of Staff of the Army—Louisiana Maneuvers. Where the six battle labs work ideas and issues at the tactical and operational levels, Louisiana Maneuvers works doctrine and concepts at the operational and strategic levels. With its main node at Fort Monroe, Virginia, Louisiana Maneuvers analyzes and tests new ideas for the 21st century Army.

This article focuses on the D&SA Battle Lab, part of the Field Artillery School at Fort Sill. The lab's charter is to go beyond deep to the more complex simultaneous targeting of the deep and close battles—the first setting the conditions for the success of the second.

It's purpose is to provide tomorrow's battlefield with real-time targeting, reducing the sensor-to-shooter time lines of operational and tactical fires. It's also looking at defeating operational and tactical targets through cost-effective and more accurate killer systems. At the same time, the lab is enhancing fighting simultaneously throughout the battlefield by developing better communications for on-the-move, extended ranges and the continuous flow of critical targeting information. Finally, it's seeking ways to improve force protection against theater missile; artillery counterfire; nuclear, biological and chemical (NBC); and direct-fire threats.

In addition to the Field Artillery School, four proponent schools support the D&SA: Aviation, Fort Rucker, Alabama; Air Defense Artillery, Fort Bliss, Texas; Intelligence and Electronic Warfare, Fort Huachuca, Arizona; and the Special Operations School at Fort Bragg, North Carolina. These schools maintain supporting labs with full-time personnel. Contributing to the D&SA on a routine basis are the Chemical School, Fort McClellan, Alabama, and the Engineer School at Fort Leonard Wood, Missouri.

Old versus New

Operation Desert Storm, more than any other recent military expedition, demonstrated the US military's ability to strike deep into enemy territory without risking the lives of ground forces. Imagine what Generals Lee during the Civil War, Pershing during World War I or Eisenhower during World War II could have done if they had had the ability to see and strike enemy forces at the ranges we're capable of today. Yet the technology that supported our forces in Desert Storm is the same that potential enemies will have in a just a matter of years.

The basic tenets of war haven't changed in the past 200—even 1,000—years. Military leaders always have tried to overwhelm the enemy at critical junctures in the battle, denying him the ability to move

his forces freely on the battlefield and creating a tempo that precludes him from hiding or resting.

Until the first half of this century, the battlefield was two-dimensional: depth and width on the ground. With the advent of air power, the battlefield quickly became three-dimensional. Yet, military leaders continued to be hampered in their ability to keep continuous pressure on the enemy—that is until today.

In just over 20 years, we've doubled the ranges of our intelligence sensors and, at the same time, increased their accuracy tenfold. Today, the joint surveillance target attack radar system (Joint STARS) can detect moving formations and other critical targets at ranges in excess of 150 kilometers. Other theater and national sensor systems provide commanders at all echelons near-real-time acquisition and intelligence information at ranges that 50 years ago were inconceivable.

Air platform systems, such as the Apache helicopter, can strike enemy formations and other critical targets at ranges in excess of 150 kilometers. With the introduction of the Army tactical missile system (Army TACMS), the Army now has a ground platform that can attack targets at similar ranges. Finally, with the increased availability of satellite communications, we can link sensors to shooters to engage targets almost instantaneously and defeat the enemy's critical centers of gravity or other targets that devest him of the ability to fight.

When the Apache was first fielded in the early 1980s, there was considerable discussion about how best to employ this long-range killer. After some dialogue and experimentation, the Army recognized that simultaneously applying multiple combat platforms at great depths and in the close battle was the best way of ensuring the platforms' success and survivability—the essence of the depth and simultaneous attack concept.

Today's battle commander has the tools to strike the enemy simultaneously throughout the depth of the battlefield, attacking operational and tactical centers of gravity, key command and control (C^2) nodes and follow-on forces. At the same time, he can attack enemy forces in the close battle, engaging and destroying armored and infantry formations, close C^2 capabilities and logistical trains. The result: he can hasten the enemy's defeat by destroying the enemy's will and capability to fight.

The combat power available to today's commander is more than just fires. It's the combination of all systems orchestrated in such a manner that each complements the others. "All systems" include those of our sister services in joint operations. To achieve the depth in attack and an ability to overwhelm the enemy in the close battle, we must employ the combat systems of the Army, Air Force, Navy and Marine Corps in concert.

The Army has a good "track record" of fighting the close battle, maximizing systems in a joint environment to disrupt and defeat the enemy. Technological breakthroughs dictate that we now apply the same principles to the deep battle in support of tactical and operational, even strategic, objectives simultaneously with their application in the close battle.

A good example of this is the role Army assets will have to play in the theater missile defense for tomorrow's battlefield. With the proliferation of medium-and long-range missiles throughout the world and continued technological advances, it's imperative the Army is able to attack incoming missiles and their launchers simultaneously. To achieve this, a complex C^2 architecture is being developed that will allow the theater commander to engage detected launchers with a variety of killers, including Army TACMS. In the near future, the Firefinder radar may detect and warn of incoming missiles early for engagement by our Patriot missiles while continuing to provide counterfire targeting data crucial to protecting the force.

The Field Artillery will play a major role in supporting the ground component commander (GCC) in both the close and deep fights. History proves that the "King of Battle" is more responsive to ground forces than air platform systems that have missions other than supporting the ground-gaining arms. Yet, we must continue to work with the Air Force, Navy, Marine Corps and Army aviation elements to ensure that we're synchronized in attacking critical targets.

Today, the Field Artillery brings to the deep battle Army TACMS with a range of approximately 150 kilometers. Tomorrow, the extended-range Army TACMS will offer commanders the opportunity to strike critical time-sensitive targets out to 300 kilometers. At the same time, the multiple-launch rocket system (MLRS) offers a small early entry force the ability to strike at targets well beyond the forward line of own troops (FLOT) and, tomorrow, will be able to strike at even longer ranges.

Commanders on tomorrow's battlefield will demand systems that can attack targets at longer ranges and with greater accuracy than previously experienced. The challenge for fire support will be to integrate assets throughout the battlefield in simultaneous support of the close and deep battles.

D&SA Battle Lab

Since its inception last summer, the Depth and Simultaneous Attack Battle Lab has been involved in a number of demonstrations that have validated new technology, found problems that otherwise might not have been identified before formal testing and found cost-effective solutions to existing problems.

One example is the 6 October 1992 precision strike demonstration at White Sands Missile Range, New Mexico, involving Apache helicopters conducting a deep attack against targets out to 150 kilometers. In this demonstration, we used Army TACMS live fire as we conducted a suppression of enemy air defense (SEAD) mission in support of the Apache element.

Results of this demonstration included validating for the first time that the aviation automatic target handoff system (ATHS) prototype, part of the Longbow acquisition system, can link digitally with the tactical fire direction system (TACFIRE) at extended ranges via radio. We also identified that Firefinder can acquire an Army TACMS missile well past the 80-kilometer range. However, Firefinder software doesn't take into account Army TACMS offset capabilities; thus, it's difficult for Firefinder to determine a launch point.

In December, we participated in another demonstration, called Desert Capture, run by the intelligence and electronic warfare (IEW) community at the National Training Center (NTC), Fort Irwin, California. All tactical exploitation of national capabilities program (TENCAP) sensors and a number of others were pulled together to cue on a common target array. During this exercise, we linked the Joint STARS ground station module (GSM) with TACFIRE at Fort Sill and passed targets generated by Warrior, an all-source intelligence processor, to TACFIRE as well.

The demonstration validated the accuracy of several prototype sensor systems and down-link capabilities that will be

Semel et Simul
(Together and at Once)

Tactical
- Counterfire
- Interdiction
- Joint Suppression of Enemy Air Defenses (SEAD)
- Close Air Support (CAS)

Operational
- Theater Missile Defense (Attack Operations)
- Joint Precision Interdiction
- Destruction of Integrated Air Defenses (DIAD)
- Precision Strike

The D&SA Battle Lab is helping to leverage technology to provide the tools to strike the enemy throughout the battlefield. In a synchronized multi-service effort, we must move from the tactical concept of the joint air attack team (JAAT) to a much larger, more complex operational level "JAAT."

fielded soon. At the same time, we identified a number of minor fixes that will enhance the targeting flow now. We found that additional work was needed to facilitate the digital message flow between Warrior and TACFIRE. This work has since been accomplished, and we demonstrated complete connectivity in late January when Warrior was brought to Fort Sill for two weeks of hands-on experiments.

While the focus of the D&SA Battle Lab is on division and higher integration of deep attack assets, it seeks solutions to employing individual systems in the context of the deep battle. The lab is concerned with more than just materiel solutions. Many of the fixes needed to provide a seamless architecture of targeting and attack capabilities are doctrinal or organizational in nature.

A good example of this is the work ongoing with the GSM and TACFIRE. There's a lot of discussion about the best location for the GSM. Regardless of the decision, the ability to down-link Joint STARS data digitally into the interim fire support automation system (IFSAS) and, subsequently, the advanced Field Artillery tactical data system (AFATDS) will require some doctrinal, even organizational, changes. As we experiment with the GSM-IFSAS interface and the targeting flow, we're making observations and gathering data that soon will be turned into recommended tactics, techniques and procedures (TTPs) and force structure changes.

As in the case of the GSM, technological improvements already in place have provided the basis for change. But such improvements, often inserted to support a specific proponent's needs, haven't been exploited to their fullest extent or recognized for their doctrinal implications on all aspects of the battlefield.

Another sensor-to-shooter issue D&SA is working on is reducing the time it takes to clear Army TACMS fires as demonstrated in the missile's combat debut in Operation Desert Storm. During Operation Jayhawk Thunder in the ground war, the 75th Field Artillery Brigade fired an Army TACMS mission in support of the Air Force. The unit had to wait more than one and one-half hours to get clearance for this mission. By studying Jayhawk Thunder and other scenarios, battle lab is working to reduce the time necessary to conduct the coordinated deep attack.

The D&SA is taking the Jayhawk Thunder combat scenario and turning it into an interactive computer model for analysis and experimentation. Some of the initial research for the model was conducted during the 6 October Army TACMS firing at White Sands. The model will give the lab the opportunity to test procedures, tactics and doctrine by changing the scenario parameters—targets, attack options, command and control, etc. The main issue, however, is expediting the sensor-to-shooter time line for Army TACMS.

Another ongoing D&SA project is developing a prototype deep operations coordination cell (DOCC) for the corps and echelons above corps (EAC) levels. The DOCC will give the commander the right personnel, necessary coordination and communications channels and equipment configured most efficiently to plan and execute deep attack operations.

The D&SA is planning a fully operational DOCC mockup, including the people and equipment for communications; targeting; intelligence and sensors; and quick-channel interfaces with the shooters, joint and combined or coalition forces and other decision makers key to deep operations. The lab will construct and experiment with the DOCC mockup and propose an organization and setup for testing in actual theater-level deep operations in the field.

The DOCC organization would support such deep attack operations as theater missile defense and JPS—both the focus of another ongoing D&SA project. The lab is working with the Air Force to resolve related issues in attacking deep targets with ground and air systems.

Theater missile defense calls for precision strikes by joint assets. Ideally, when an enemy missile system is located, it's destroyed before it can fire. But if it's detected after it has fired or while it's firing, then both the missile and launcher must be destroyed. Air defense, Field Artillery, Army aviation and Air Force assets are options for simultaneously attacking the enemy missile system to put it "out of business." D&SA currently is working with the Air Force to plan JPS for theater missile defense demonstrations and experimentations at White Sands Missile Range in the fall.

The D&SA Battle Lab's plan to experiment with many concepts calls for increased reliance on Army component and Warfighting commander-in-chief (CINC) exercises during the next year and a half. This spring, we're supporting the European Command (EUCOM) during Dragon Hammer, a NATO exercise, and Optic Needle, a theater missile defense exercise. In the summer, we'll support the Pacific Command (PACOM) and Eighth Army during Ulchi Focus Lens as the CINC looks at how to better integrate Army capabilities in support of the theater missile defense in Korea. Next year, we'll be involved in four CINC exercises and are working with both III Corps, Fort Hood, Texas, and the XVIII Airborne Corps, Fort Bragg, to support them and conduct experiments during their exercises.

As the Army changes, we all must find ways to ensure our warfighting capabilities don't diminish. As the budget shrinks, so will the Army's ability to field a large number of new systems. Technology insertions aimed at enhancing existing systems will be the norm for the next few years. These insertions won't be cheap and will necessitate the Army's prioritizing the insertions, based on a system's ability to support a particular battlefield dynamic. Doctrine must incorporate these insertions, maximizing their impact on the battlefield and on hastening the enemy's defeat.

Joint is the way the military will fight in the future. The Field Artillery and the rest of the fire support elements have established doctrine and TTPs that support the close battle. But today's challenge is to extend our focus well past the FLOT, even the fire support coordination line (FSCL)—to "think joint." We must develop systems, doctrine and procedures that provide commanders at the division, corps and echelons above corps (EAC)

levels the ability to see and defeat critical targets with a variety of systems while ensuring the close and deep fights have a seamless architecture. TRADOC's battle labs will provide the Army the means to do this and more.

As the D&SA Battle Lab goes about its business, it does so with a focus on soldiers, attempting to integrate units into the experimentation and evaluation of new concepts and technology. The aim is to gain the expert advice and opinions of the Army's soldiers and leaders as early in the research and development and acquisition processes as possible.

Those interested in more information on the D&SA should write the Depth and Simultaneous Attack Battle Lab, US Army Field Artillery School, Fort Sill Oklahoma, 73503-5600 or call DCTN 639-3701/5647 or commercial (405) 351-3701/5647.

Colonel Donald L. W. Kerr is the Director of the Depth and Simultaneous Attack Battle Laboratory, Field Artillery School, Fort Sill, Oklahoma. Among other assignments, he served as Assistant Division G3, Plans for the 1st Cavalry Division and S3 of the 1st Cavalry Division Artillery, Fort Hood, Texas; and Personnel Staff Officer in the Office of the Deputy Chief of Staff for Personnel and Staff Officer in the Office of the Joint Chiefs of Staff, both in Washington, DC. Colonel Kerr commanded the 1st Battalion, 15th Field Artillery, 2d Infantry Division, Korea, and the Howitzer Battery, 2d Armored Cavalry Regiment, Germany. He's a graduate of the Army War College, Carlisle Barracks, Pennsylvania, and holds a Master of Public Administration from Shippensburg University, Pennsylvania.

VIEW FROM THE BLOCKHOUSE

FROM THE SCHOOL

Goodbye, BCS and BUCS--
Hello, LCU

LCU--LC who? The lightweight computer unit (LCU). If you thought we had the most responsive fire support in the world--we just got better. The LCU Version 2 (V2) is scheduled to replace both the battery computer system (BCS) and the backup computer system (BUCS) throughout the Army and Marine Corps. National Guard units will start fielding the LCU V2 in FY 93 with the active duty units coming on line in FY 94.

The LCU is part of the Army tactical command and control system (ATCCS) common hardware suite, and will interface with the advanced Field Artillery tactical data system (AFATDS) when it comes on line in the fourth quarter of FY 95.

The LCU V2 is a ruggedized suite of equipment composed of a portable computer, AC/DC converter, printer, battery packs and a tactical communications interface module (TCIM). The LCU is a lightweight (27.5 pounds), commercial computer that has been adapted to meet the needs of the Army. It's a current technology computer that has an Intel 80486 microprocessor and 32 megabytes of random access memory (RAM). Detachable from the computer is an 82-key keyboard modified with a removable template defining the commands the special function keys perform for the BCS application. The keyboard is capable of performing 101 different functions.

The V2 Lightweight Computer Unit (LCU)

There are three distinct areas on the keyboard: the key section, the trackball/button section and the control panel section. The trackball/button section is not used with the BCS Version 9 emulator now; however, it's scheduled to be used when Version 10 software is fielded.

The LCU has a 120-megabyte removable hard disk drive accessed through the metal door on the left side of the unit. The capability to expand this hard drive up to 500 megabytes is available. The hard disk drive (about the size of a VHS video cartridge) is loaded with the information necessary to run the BCS Version 9 emulator software on the LCU. On the right side of the LCU is a three-and-a-half inch, high-density, 1.44 megabyte floppy disk drive.

Power requirements are provided by both household use (120/240-volt AC) and tactical vehicle/generator use (23-32

volts DC). The AC/DC converter and charger (3.1 pounds) will accept either AC or DC power and convert it to the proper voltage for powering the LCU. This will greatly enhance consolidated training. Because the LCU is lightweight, it can be unmounted from a tactical vehicle and placed in a classroom without special power converters.

The LCU has a built-in battery compartment designed to house either 20 non-rechargeable C-cell alkaline batteries or a rechargeable battery pack. Battery life, whether using C-cells or the battery pack, is approximately two hours at 70 degrees. With the battery pack installed, loss of power by the primary source won't disrupt any operation the operator may be performing.

The LCU V2 printer (10 pounds) is a ruggedized, nine-pin dot matrix printer. The printer can run off either a rechargeable battery pack or 20 non-rechargeable AA-cell batteries. The batteries will supply approximately 45 minutes of operation time or 75 minutes of standby time. Primary power for the printer is supplied by the AC/DC converter that supplies power to the LCU. Built into the LCU is a TCIM. Communications for the LCU are supplied by normal tactical field radios or field wire working through the TCIM. The TCIM supplies two channels of communications, and if more channels are needed, the LCU can have external TCIMs connected.

The Gunnery Department, Field Artillery School, Fort Sill, Oklahoma, currently has 69 LCUs for training National Guard and Reserve Component officers and 13E30 Cannon Fire Direction Specialist enlisted soldiers. The first NCO class began in October 1992. This is a three-week train-the-trainer course and the only formal training offered in conjunction with the fielding of the LCU BCS to Army National Guard Field Artillery batteries. Attendees will train battery fire direction center (FDC) personnel after returning to their home stations.

The LCU can process a fire mission faster than the current BCS and uses the same ballistic solution to determine firing data.

In addition to being more compact and lighter than the current BCS, the LCU can run all off-the-shelf IBM-compatible software. It has the capability to maintain a line editor simultaneously with V9 application with just a stroke of a key. It also can process any type of administrative data by simply rebooting the system.

This addition to the Army's inventory has great potential as a system that can perform multiple functions. By converting the current BCS and BUCS hardware to the LCU, the Field Artillery Community will be able to support the maneuver commander with a robust redundancy in hardware. At the same time, it will save valuable maintenance turn-around time during combat without serious effects on the unit's overall mission.

If units have questions about the LCU, call Enlisted Instruction Branch, Cannon Division of the Gunnery Department at DCTN 639-6803 or commercial (405) 351-6803

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Automated Range Safety System
Version 4.0

Determining safety data has become increasingly complicated, time-consuming and confusing with the introduction of new projectiles. Additionally, calculating safety has increased in complexity with the requirement to fire different projectiles, angles of fire, fuzes and charges. Hence, a need has arisen to develop a quicker, more efficient system to compute safety data.

The Automated Range Safety System (ARSS) is IBM-compatible software that produces a range safety card and a safety-T. It can be taken to the field in a lap-top computer or, in the future, in the lightweight computer unit (LCU). ARSS allows Field Artillerymen to quickly and accurately determine safety data for a multitude of projectiles, fuzes, charges and angles of fires.

Version 4.0 Versatility. Previous versions of ARSS had to use only standard data in their technical solutions, had no capability to determine high-angle illumination and were only authorized for use with the M198 howitzer. ARSS Version 4.0 is a significant improvement over previous versions. The software and the operator's manual have been written to enhance user friendliness. When determining safety-T data, Version 4.0 can account for non-standard conditions.

The Gunnery Department, Field Artillery School, Fort Sill, Oklahoma, recently completed an extensive evaluation of ARSS. The system proved capable of determining accurate safety data for *all* current weapon systems. Safety data can be determined for the high-explosive (HE) projectile family with all compatible fuzes for both low-angle and high-angle fires and all propellant types. Safety data also can be determined for the M825 and dual-purpose improved conventional munition (DPICM) projectiles.

ARSS Operations. As with any computer system, the operator first establishes a data base. The data base for ARSS consists of a target area for the appropriate impact area. The operator defines the target area by reducing the impact area a specified number of meters for each caliber of weapon system.

For example, to create a target area for a 155-mm cannon system, the operator reduces the outside limits of the impact area by 900 meters. The 900-meter reduction compensates for the eight probable errors in deflection on the flanks of the target area, eight probable errors in range on the far side of the target area and 12 probable errors in range short of the target area in accordance with AR 385-63 Policies and Procedures for Firing Ammunition for Training. Target Practice, and Combat. Local range regulations are the authority for determining the grid coordinates and altitudes for the target areas.

After specifying the target area, the operator can input up to 10 no-fire areas (NFAs). The target areas and NFAs are permanently stored by ARSS. If desired, an overlay of the target area and NFAs can be printed. Meteorological and muzzle velocity data then are entered into the data base.

To generate a range safety card, the operator enters the unit name, center of battery (firing point or specific gun) location,

target area, angle of fire and weapon system. The number of doglegs desired is then specified. The operator also has the option to input the desired azimuths, ranges and vertical intervals. The ARSS then displays a range safety card and a safety box on a scale of 1:50,000.

The unit can stop there and determine safety using other means—manually, backup computer system (BUCS) or battery computer system (BCS)—or use ARSS to its fullest capabilities. To determine a safety-T in ARSS, the operator specifies the projectile type, projectile weight, propellant temperature and up to three charges and three fuzes. Within seconds, the ARSS will generate a safety-T for each charge. It also can print additional safety-Ts.

To provide a "second check," a unit could use manual procedures, BUCS or BCS to verify the ARSS solution. Two other alternatives exist. First, the position commander (or designated safety officer) can verify the data base input, entries on the range card and the safety-T the same way he verifies the BCS data base. Another method is for the platoon or battery fire direction officer (FDO) to use ARSS to determine a safety-T and, using a plain-text message, transmit the safety-T to the battalion fire direction center (FDC). The FDC can calculate the safety-T using its ARSS and verify the platoon or battery's safety.

ARSS Fielding. The fielding of ARSS Version 4.0 is simplifying unit safety procedures and reducing the time needed to compute safety data. In March, all active Army and Marine Corps, Army National Guard and Army and Marine Corps Reserve Field Artillery units began receiving sets of Version 4.0 disks, four per set. Battalions are receiving the sets through their higher headquarters. In addition, separate batteries, battalions and brigades are each receiving a set from the Field Artillery School.

If a unit has questions about ARSS, call the Concepts and Procedures Branch, Gunnery Department at the Field Artillery School at DCTN 639-5523 or 2802 or commercial (405) 351-5523 or 2802.

Capt. James M. Hayes, USMC
Officer Instruction Branch,
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Computing Firing Data for the M109A5 and M109A6

There seems to be some confusion about computing firing data for the M109A5 and M109A6 howitzers. You won't find a tabular firing table (TFT) or graphical firing table (GFT) with either of these weapon systems on their covers. With more and more units being fielded with A5s and A6s, the field needs guidance. Well, here it is.

Firing Table (FT) 155 AM-2 is for cannon tubes M185 (M109A2/A3/A4) and cannon tube M199 for the M198. It's also the TFT you use to compute firing data for the A5 and A6. Change 2, dated June 1991, accounts for the differences in muzzle velocity (MV) between the M185 and the M284 cannon tubes for the high-explosive (HE) projectile family. Just correct for the muzzle velocity variation (MVV), and you're ready to fire the A5s and A6s.

Battery Computer System (BCS). Units equipped with the M109A6 can use BCS Version 9 (V9) to determine firing data. There's no selection for the M109A5 with V9. Units with the A5 should select the A2/A3 or M198--it really doesn't matter. The only thing you have to do is make an additional data base entry. You have to enter the corrected MVs from Change 2 in the BCS;MVV file and store them as historical MVV.

Referring to Change 2 to the AM-2, the standard MV for Charge 5 (M3A1) is 373m/s or a decrease of 3m/s from the standard MV. Before calibrating, the BCS operator need only enter -3.0m/s in the BCS; MVV format as a historical MVV. After calibrating, the operator enters the M90 readout average (determined in accordance with *ST 6-40-16 Operation of the M90 Chronograph and Muzzle Velocity Management*) in the BCS;MVD. The BCS will accurately account for the difference in MVs between the weapon systems in its computation of the MVV.

A5 units should not select the A6 in BCS V9. The firing data is the same; however, this causes too many tactical problems when sending messages to the tactical fire direction system (TACFIRE).

Backup Computer System (BUCS). Revision 1 of the BUCS program has been fielded for the M109A5; it accurately reflects the MVs for the cannon tube M284. If a unit with M109A5 doesn't have the Revision 1 modules, it should order them (NSN 5962-01-299-4171).

Example

TFT AM-2
Charge: 5GB
Range: 5,000 Meters
Table F/Column 10 factor = +14.0 per 1 m/s
Change 1, Charge 5GB has a Decrease of -3.0m/s
3 X +14.0 = +42 Meters
Expressed to +40 Meters

The procedures in this table are also valid for the dual-purpose improved conventional munition (DPICM) and rocket-assisted projectile (RAP) families. When applying the procedures to the projectile families, ensure the appropriate TFT and changes are used to determine the data. The next chart lists the current changes to use.

Projectile Family	TFT--Changes
HE	FT 155 AM-2, C2
DPICM	FT 155 AN-1, C6
RAP	FT 155 AO-0, C2

When V10 is fielded in FY 94, you'll be able to select the M109A5. At the present time, there are no plans to publish a separate TFT for the M109A5.

Example of Manual Procedures for Determining MV Differences for the M109A5

However, it can use Revision 0 modules following the same procedures as for the BCS.

The easiest and most accurate method to account for the differences in MV for the M109A5 is to determine a BCS (BUCS)-derived GFT setting. First, complete the procedures for MV differences as described in the paragraph using the BCS. Next, determine a HE GFT setting from the BCS (BUCS), using the procedures outlined on Page 5-59 in *ST 6-40-2 Field Artillery Battery Computer System Cannon Gunnery.*

Manual Procedures. If the BCS or BUCS is not available, the differences in MVs can still be easily accounted for using manual procedures (see figure). For example, if you're firing Charge 5Green Bag at a range of 5,000 meters, you account for the differences in MV by referring to Table F, Column 10. Column 10 lists the range correction for a decrease in one meter per second in MV. At a range 5,000 meters, the correction factor is a + 14.0 meters for a decrease in one meter per second in MV.

The A5/A6 has a decrease for Charge 5GB of -3.0m/s from the standard. To determine the total range correction, multiply the D3.0m/s by +14, which equals 42 meters, expressing to the nearest 10 meters yields a range correction of +40 meters. Using the Charge 5 GFT, place the manufactures hairline (MHL) over the range of 5,000. Due to a decrease of 3.0m/s for the A5/A6, we need to aim over the target 40 meters to have the rounds impact at 5,000 meters. Since we need to aim at a range of 5,040, place a dot at the elevation corresponding to that range. Now, construct the elevation gage line, using the procedures for a one-plot GFT setting in accordance with *TC 6-40 FA Manual Cannon Gunnery.* Constructing a multi-plot GFT setting will yield greater accuracy. Use the elevation gage line to determine firing data. The elevation gage line should be updated after calibration, registration or updated meteorological data.

If units have questions, call the Concepts and Procedures Branch of the Gunnery Department, Field Artillery School, Fort Sill, Oklahoma, at DCTN 639-5523/2802 or commercial (405) 351-5523/2802.

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"From the Gun Line"

Author's Guide

From the Gun Line (FGL) Column. FGL is a column featured in ***Field Artillery*** written by a command sergeant major (CSM) selected Army-wide. The column is one magazine page and appears in the front of the magazine immediately following the Chief of Field Artillery's "On the Move" column.

A FGL can cover any subject related to soldiers or NCOs and isn't limited to Field Artillery-specific topics. CSMs from all branches and services—not only Field Artillery—may submit a column for consideration.

Since its founding in 1911, ***Field Artillery*** has been a forum for professional discussions. Therefore, your viewpoint, recommendations or procedures don't have to agree with those of the Branch, Army or Department of Defense (DoD). But your column must be logical, accurate, address disadvantages as well as advantages of a proposal, promote only safe techniques or procedures, include no classified information and be of interest to our readership.

Readership. Editions of ***Field Artillery*** are published February, April, June, August, October and December of each year as a professional journal for active duty and Reserve Component Redlegs of the US Army and Marine Corps stationed worldwide. Approximately 40 percent of our readers are company-grade, both officer and enlisted, with the remaining 60 percent more senior Army and Marine personnel, DoD civilians, retirees, members of other branches and services, allies, corporate executives and our political leaders.

Style. Write clearly and concisely, and put your main point (bottom line) up front. The body of your article should systematically contribute to the main point. Be specific about your subordinate points, giving examples when possible.

While writing, always keep in mind your readers, many of whom aren't in the Army or Marines—even the military. Therefore, spell out every acronym the first time you use it and briefly explain a new or rare concept, system or technique—even if it isn't your main point in the paragraph.

Submission. Please send—

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- A comprehensive biography, highlighting your experience, training and education. Include your full name, current job, address and telephone number.
- A graphic, if possible, that illustrates your column. It can be a black and white or color photograph of any size (no Polaroids, please), drawing, slide, graph, unit crest or symbol, map, etc. If the graphic is a picture, please include a caption saying which unit (or who the people are) and what its doing.

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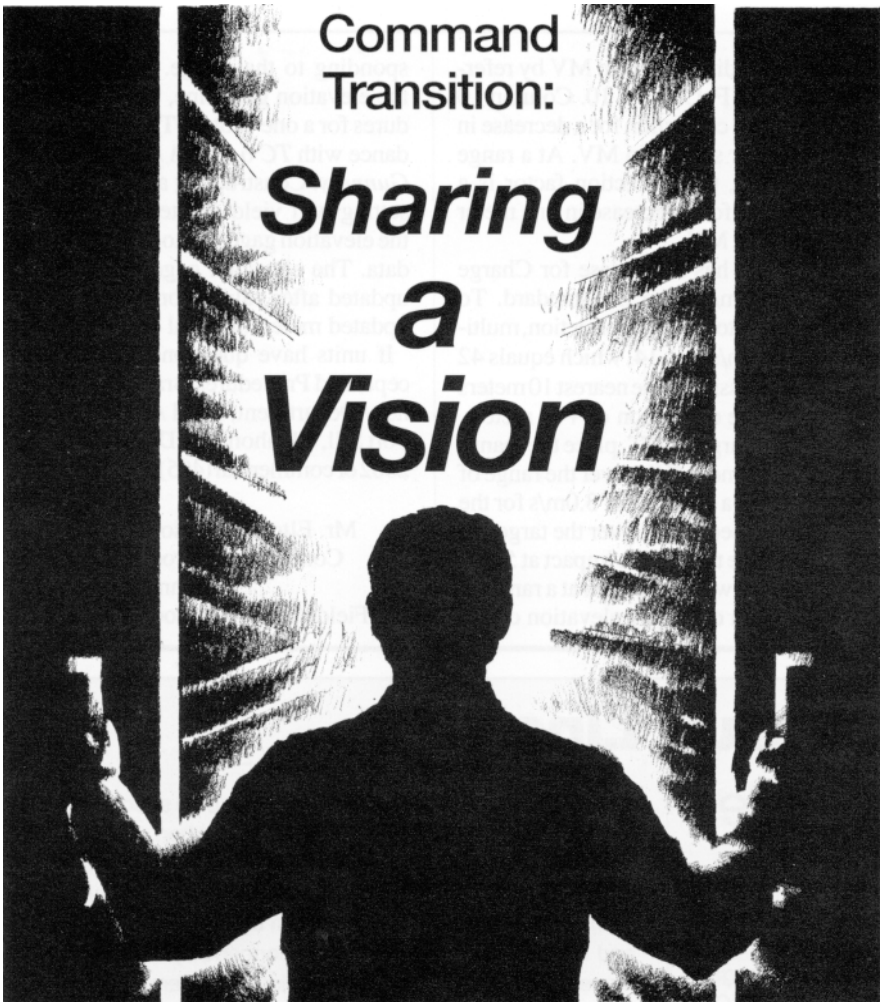
The ***Field Artillery*** staff will edit the column and put it in our style and format. You'll receive a "check copy" for review before publication. If you have questions or want to discuss a topic for your column, call the Editor or Managing Editor at DCTN 639-5121/6806 or commercial (405) 351-5121/6806.



by Lieutenant Colonel Raymond E. Rasmussen II and Colonel Leo J. Baxter

The wizened battalion commander, about to relinquish command later in the day, shared a last pot of coffee with his executive officer (XO) of the past year.

"You've done a hellava job here, Sir," said the XO. "You've been a great commander. The troops will miss you."

"It has been a great couple years—can't believe it's over," the boss replied. "We did it all—REFORGER [return of forces to Germany], the CMTC [Combat Maneuver Training Center, Hohenfels, Germany], Warfighter [Battle Command Training Program], five Grafenwoehr densities. The plate was always jammed full."

The XO responded, "And it's all been done well, too. We accomplished every mission you gave us."

"You're right, of course," said the commander, "but...you know, for some reason I don't feel like I ever quite got it right. We never really jelled into the unit I thought one day we'd be. I came here with an idea about what we ought to look like, what the standard ought to be, what would be important, how we ought to work....but the schedule just wouldn't allow it to happen. I just lost track of what I really wanted to do."

This battalion commander didn't lose track of what he wanted to do, he simply failed to share his vision of the future with his unit, and he failed to translate that vision into concrete, measurable, effective actions. Within the first days of his command, the battalion commander lost the opportunity to place the unit on his azimuth for the future.

This article describes for you, the soon-to-be battalion commander, a command transition process that can assure your vision is shared with your unit in a way that will reap success after success—it's about the sharing of a vision.

Command transitions often have no clearly stated goals or outcomes. The new commander, who arrives with fresh ideas on policies and programs and new ways of doing business, probably won't have a clearly articulated vision or an agenda for change. More than likely his attitude will be, "I'll observe the unit for awhile and make changes as I see the need." The unit will have an agenda of transition activities—briefings, tours and interviews wedged into the training schedule—with no goals except to make the new boss smart and demonstrate how "squared away" the unit is (thereby, heading off any radical changes).

The result is that at the end of the transition period, the new commander and the members of his unit have no shared understanding of what happens next. The transition should be a focused and purposeful period that ends when three conditions exist.

First, you understand the context of your command. Context is the totality of the elements that define the reality in which you'll command. Included are internal elements, such as organizational, political and social systems; unit culture; core missions and roles; and status; and external elements, such as guidance and requirements from higher commanders. The context of command is the foundation upon which you'll base decisions and actions to achieve your vision. (For the genesis of our ideas for command context, see Chapter 1 of Warren Bennis' *On Becoming a Leader;* Addison-Wesley Publishing Company, Inc., Reading, Massachusetts, 1989, Pages 13-37.)

The second condition is unit leaders and soldiers understand the commander's vision, which is a picture of what the unit should look like at the end of two-plus years of command. They should have a clear picture of where you want them to go.

And third—the unit has a plan to achieve the vision. The plan consists of results-oriented actions, both short-and long-term, that will get the unit where you want it to be (Richard Beckhard and Reuben T. Harris, *Organizational Transitions*, Second Edition; Addison-Wesley Publishing Company, Inc., Reading, Massachusetts, 1987, Page 30).

There are any number of ways to go through a transition that produces these conditions. The trick is to complete the transition quickly and effectively. This means expediting the transition so it doesn't become mired in other activities and embedding any needed change in operational plans to ensure that change actually occurs. To meet these conditions, your transition must—

• Be controlled. The idea of managing change is not new but is worth repeating. Without control, your transition is in danger of losing focus. You control the transition by providing direction and structure.

• Be directed by your vision (Beckhard and Harris, Pages 46-47). The assessments you make must tell you where you are in relation to where you want to be. The plans you formulate must achieve the vision. This is a time for identifying and reducing distracters.

• Involve as many people as possible. You can neither achieve your vision alone nor command the vision to materialize. The unit must share your vision and have a say in how the unit gets there.

• Comprehensively identify requirements and assess the programs and policies the organization is responsible for implementing (Beckhard and Harris, Pages 57-58). Doing this retains a mission focus. For each program and policy, you must identify goals and expected standards of performance established by higher commanders as well as the current level of the unit's performance.

• Result in a set of unit goals and expected standards of performance and an action plan to achieve them within the context of your vision (Robert H. Schaffer and Harvey A. Thompson, "Successful Change Programs Begin with Results," *Harvard Business Review*, January-February 1992, Page 89). You derive unit goals and performance standards from those established by higher commanders and your assessment of where the unit needs to go.

• Result in a well-thought-out and integrated schedule of change. The schedule integrates changes to maximize effectiveness and reduce interference and diffusion of effort. The schedule must relentlessly march toward your vision.

To help you in your transition, we propose a model of four stages: preparation and assessment, planning, execution and follow-up. During preparation and assessment, you gather information, construct a vision and assess the policies and programs in the unit. You also enlist the help of key leaders to gather information and make independent assessments. During planning, you conduct a change management conference where unit leaders build an action plan that, potentially, will take the unit from where it is to where you want it to be. During execution, you embed the action plan into unit operations and put in place the management tools to make it work. Finally, during follow-up, you monitor the execution of the plan and make mid-course corrections.

Preparation and Assessment

It takes a lot of effort up-front to make this transition model work. Preparation for the transition begins when you're chosen for command and ends when you complete the change management conference and begin implementing your action plans. During this phase, you formulate your command philosophy and vision, assess the command's programs and policies and gather the references you'll need for the conference. You can and should begin this process as soon as you know what unit you'll command. It's time-consuming but vitally important.

A good place to begin this phase is with formulating your command philosophy—a separate concept from your vision. Your command philosophy is a description of how you'll lead and manage the unit. It can contain a statement or list of what's important to you, such as personal attributes you look for in your subordinates. It also can contain hints on how you like to work, such as those areas where you'll reserve decision authority. We recommend you go through the process of developing a philosophy, even if you don't plan to publish one formally.

At some point in the transition process, you'll find it necessary to talk to your folks about your philosophy. Be ready to tell them how you act and interact with people, how you work and play and what your expectations are. You'll get several handouts in the Pre-Command Course (PCC) at Fort Leavenworth, Kansas, to help you through this process, but you should be nearly complete before you arrive at PCC. One caution: be honest with yourself and the unit; don't "create" a persona that doesn't fit.

Next, build your vision. Your vision is a word picture of what you want the unit to look like at the end of your command. Start by defining the context of your command. You'll need information on the past and current state of the unit and any information about the unit's culture—beliefs, values, norms, customs, history, ceremonies and methods of operation (Terrence E. Deal and Allen A. Kennedy, *Corporate Culture*; Addison Publishing Company, Inc., Reading, Massachusetts, 1982, Pages 13-15). Write the current commander and request copies of standing operating procedures (SOPs), command policies, current command philosophy, training guidance, short- and long-term training calendars, budgets and spending guidance and anything else you think apropos. You'll need this same kind of information from higher commands and other external agencies that affect your unit, such as community and installation activities. Most enlightened commanders will be happy to provide whatever you ask.

It will be difficult to get a clear picture of the unit's culture from pieces of paper. How else can you get it? Seek out former members of the unit. You'll find them in advanced courses, the Combined Armed Services and Staff School (CAS^3) and Command and General Staff College (CGSC), both at Fort Leavenworth, and in follow-on assignments at the same posts where you go for PCC. Query them in detail about the kind of unit you're getting.

Once you have some idea of the context of your command, you're ready to develop a vision. Here again, you'll get some very useful information on developing a vision during PCC. Some other sources are *Leaders, The Strategies for Taking Charge* by Warren Bennis and Burt Nanus; *In Search of Excellence* and *A Passion for Excellence* by Tom Peters; *Organizational Transitions* by Beckhard and Harris; *Teaching the Elephant to Dance* by James A. Belasco; *The Transformational Leader* by Noel M. Tichy and Mary Anne Devanna; and *The Fifth Discipline* by Peter M. Senge. Other good sources are available in local libraries and book stores.

If you're fortunate, you'll have some time on the ground before your change of command. A good use of this time is to

meet the people and tour the workplaces of the organizations external to your command. If the outgoing commander agrees, set up briefings with the unit staff.

After the change of command, you'll conduct a series of tours, interviews and briefings. Focus these activities on gathering information on requirements, programs and policies. Use this information to assess the status of the unit. Also, ask key leaders and staff members to gather references and make independent assessments for use during the change management conference.

Use the time you have during in-processing to plan the change management conference. Because most units have a five- to eight-week lock-in on training schedules, you should ask the outgoing commander to schedule the conference. Give your commanders and staff enough time to do all the up-front work. Allow at least three days for the conference, and fit it into the first month of your command—if at all possible. Put out a letter to all participants telling them what they'll do at the conference and what they must do to prepare for it.

As with most endeavors, the quality of the work you do up front will determine your success. You and your people should bring to the conference a complete picture of requirements, programs and policies that exist (internal and external), an understanding of the standards for each of these programs and policies and an assessment of each measured against the standards. The intent is to develop a comprehensive list of everything the unit is required to do and the standard by which each requirement must be done.

At Figure 1 is one example of a policy or program laydown. You can use this tool to list policies and programs you want addressed during the change management conference. Begin developing your list during PCC and continue to work it throughout the transition. You can ask the XO to develop one in the months or weeks before you arrive. Then you can merge the two and use the laydown to help structure the conference.

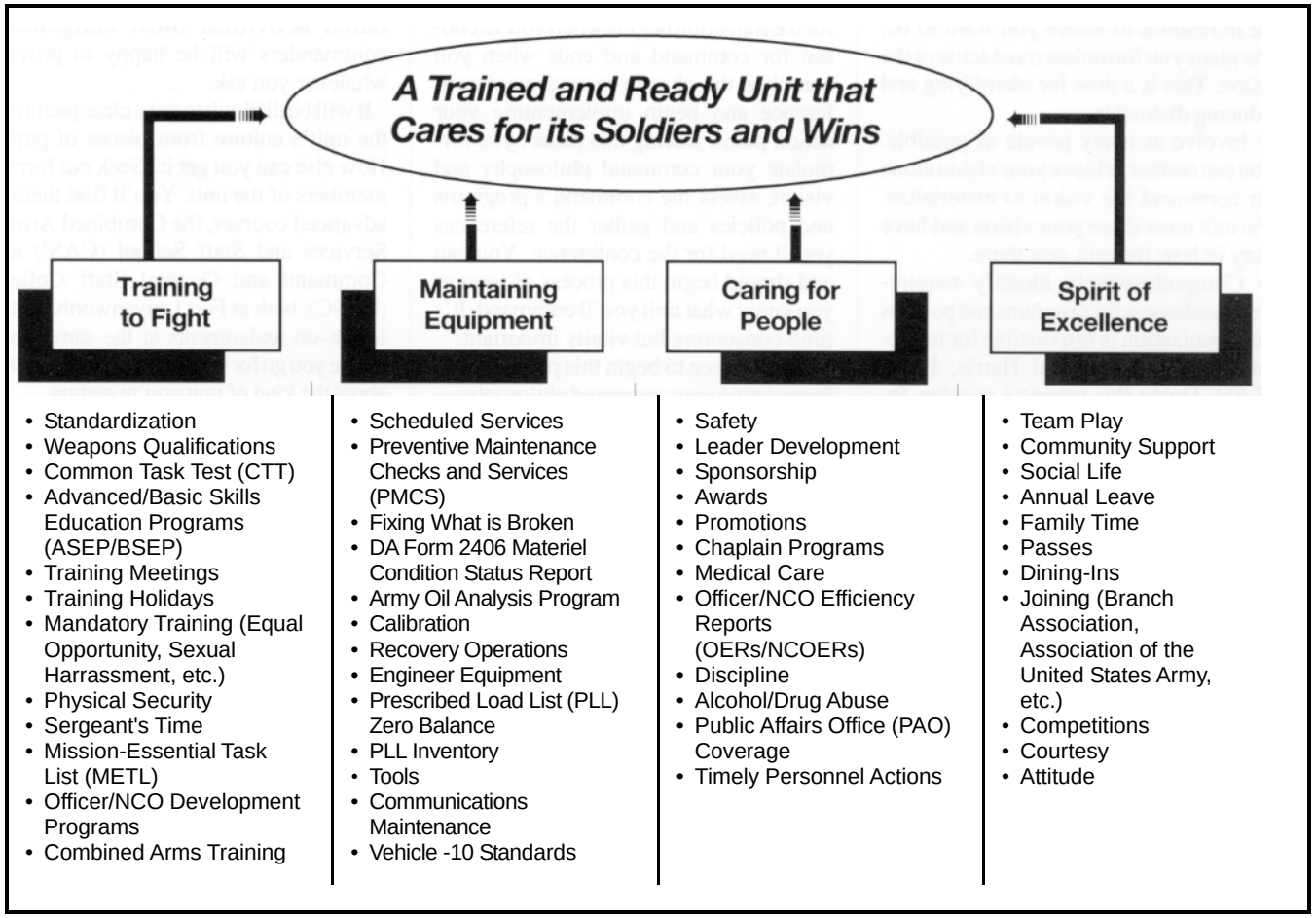


Figure 1: Example of a Policy/Program Laydown. You use this as a tool to list the policies and programs you want to address during your change management conference. This is only one example; set yours up any way it makes sense to you.

Planning

The change management conference is where you and your subordinates will do the most important work in the transition process. You must stay focused on the final product of the conference—the action plan. Successfully executing the action plan will make your vision a reality.

The agenda for the conference must be simple, straightforward and focused—don't allow yourself or your people to become distracted. Don't put unessential activities into the working day, but do plan some team-building activities and allow for recreation and relaxation to keep your folks fresh and upbeat. Here's an approach we recommend.

Begin with an explanation of the process and the expected results. Do this personally so there are no questions about whose program it is. Be explicit about what you expect the action plan to look like. You can include a discussion of your command philosophy, but this may not be the time to do this. You should describe your vision, as this will be the framework for the final product.

Next, break into teams by functional areas, for example maintenance, supply, administration and training. Assign each group a cross section of leaders and functional area experts. Include in each group the same people who will be responsible for implementing the plans the group develops. A good mix of expertise and experience makes the work go faster, and vested interest in the product ensures quality.

Here are two examples of groups by functional areas. The team working on administration could consist of the battalion personnel officer, the Personnel Action Center (PAC) NCO or Personnel Services (PS) NCO, a battery commander, a first sergeant or two, a battery "shadow" clerk, the battalion information management officer, the battalion medical officer, the medical section NCO, etc. The team working on command policies could consist of the command sergeant major (CSM), a battery commander, a first sergeant, a platoon leader or two, a platoon sergeant or two, the battalion equal opportunity NCO, a few junior NCOs and some soldiers. The point here is to have a lot of people involved and a good cross section of the people who have a vested interest in the product.

Each team performs two tasks. It first assesses each program and policy and then determines a fix, if a fix is needed. The assessment is a synthesis of the analyses you asked people to do during your briefings and interviews. It also includes the results of inspections and staff visits, observations in after-action reports and personal observations of the team members. Each assessment must be a clear statement of the standard and a measure of where the unit is in comparison to the standard. Some programs are easier to measure than others. This is because some are simple or have clear, objective measures instead of "soft" subjective ones. For example, the standards for rifle marksmanship are easy to measure while those for military courtesy are not. *Caution*: Be sure the teams assess each policy and program, no matter how complex or subjective. Make them think through each and find a measurable standard.

Once the team members have finished an assessment, they identify the fix. This can take several forms. It can be a recommendation to sustain the current program. It can be a one-time, short-term action, such as publishing a policy letter, rewriting an SOP or conducting a class. But it also can be a long-term, more complicated process, such as implementing a platoon services program or a new rifle marksmanship program.

The key is to ensure "the fix" really does just that—fixes the shortfall. The fix must close the gap between the status of the unit and the expected standard. At Figure 2 is an example of a tool you can use to record assessments and fixes.

Determining the fixes will take a day or more to complete. If you're short of time or patience, then prioritize each team effort or break into smaller teams to speed the work. You may be tempted to sacrifice quality in the rush to get something out—a mistake. If you don't correctly assess the status of the unit, establish the expected standard and identify an effective fix, then you've wasted everyone's time.

When done, have each team brief its products to the other teams. Make changes or adjustments, as needed. Then adjourn the conference while you and a few selected

Functional Area: Training

Policy/Program	Assessment (+/0/-)	Fix
Individual Weapons Qualification	(-) Corps goal = 50% experts Our status = 35% experts > Companies not conducting preliminary marksmanship instruction (PMI) > No one using Weaponeer > No feedback to firer on zero/qualification score	• Conduct train-the-trainer (2Q FY94, CSM) • Conduct PMI to standard (2Q FY94, CSM) • Put all marksmen thru Weaponeer (2Q FY94, CSM) • Conduct range week/achieve goal (Mar 94, CSM)
Training Holidays	(-) Battalion doesn't take scheduled holidays; chain of command reluctant to let leaders and soldiers off, especially before big events Battalion goal = take scheduled training holidays	• Put training holidays on training schedules and lock in (immediate, CO) • Change command policy on who can require soldiers to work on a training holiday (immediate, CO)
Advanced Skills Education Program	(-) Less than 20% of eligible NCOs have attended Corps goal = 100% of eligible NCOs attend	• Arrange with education center for classes (1 Sep 93, S3) • Conduct classes during support cycles (S3) • Achieve 50% by end of 2Q FY94/75% by end of 4Q FY94/100% by end of 2Q FY95 (S3)

Figure 2. Example of an Assessment Matrix. In this example, the matrix is filled out for the functional area of training. Regardless of the functional area, the matrix is a tool your teams can use to record assessments and fixes. The key is to ensure the fixes really do fix each shortfall.

key leaders (e.g., the CSM, XO, S3, battery commanders) take the results and organize them into an action plan.

In this working session, you give priorities to the fixes, pick the change agents or "heroes" who will be responsible for leading the effort to make the change and set completion dates. For those changes that are complex or will extend over a long period, you decide how to monitor and report progress.

For example, the corps commander sets a goal of 50 percent experts in rifle marksmanship. The unit has 35 percent experts. Your training team identifies three weaknesses in the marksmanship program: no one is conducting preliminary rifle marksmanship training before going to the range; no one is using the Weaponeer or other training aids to improve the skills of poor marksmen; and no one is providing the soldier feedback on the quality of firing, either during zeroing or qualification.

Your team then identifies a fix or series of fixes for each weakness. One fix to correct the deficiency in preliminary rifle marksmanship training is to form a battalion team to conduct train-the-trainer classes for all section chiefs, platoon sergeants and first sergeants, classes that include a performance evaluation.

At the executive session, you and the other leaders validate the assessment and the fixes. Because you give rifle marksmanship a lower priority than other mission-essential task list (METL)-based training activities, you adjust the timetable to reflect this priority. You identify the CSM as the change agent, and you set the date to achieve the standard as the end of the next range week in a support cycle during the next training year. You plan a series of in-process reviews as the tool to monitor and report progress.

When you're done, provide feedback to the conference. Publicly announce priorities, ratify the fixes and anoint the change agents or heroes. This last is especially important. Not only are you assigning responsibility for implementing the change, you also are publicly empowering the subordinate responsible. And most important, you commit the organization to achieving the goals. Here is the first opportunity you have to show your commitment to "walking your talk."

Execution

Developing the action plan is not the end of the transition. In fact, the real work begins on your return from the conference. The fast pace of activities in most units will tempt leaders to go back to "business as usual" or to procrastinate on plans and promises for action. Those who didn't attend the conference may be ignorant, indifferent or even hostile to plans for change. You must act decisively and quickly to overcome any resistance to the action plan.

Present the product to the unit. Do this to the unit as a whole or to smaller groups. Tailor the information to the audience. For example, talk to the unit as a whole about changes to command policies, such as leave and pass policies, and talk to all maintenance personnel about the new program to begin platoon services. Get around to see as many of your folks as possible, talking to them about your vision, the action plan and their part in it. Do this often. Spread your message with enthusiasm and energy.

Embed the action plan into your management processes, beginning with your short- and long-range plans. Brief your boss on your plan and get his support.

Follow-Up

In this final phase, you find the most effective way to measure results and report progress. You hold your heroes accountable for achieving goals and for providing regular updates on significant milestones. At the same time, you provide feedback to the unit. Celebrate and reward success—visibly and often.

When needed, reconvene teams to assess the status of the program or policy, modify goals and tweak the action plan. You can use these sessions to motivate key leaders and recommit them to the vision. Last, plan for changes in key leaders, particularly change agents, by transferring responsibilities for change to incoming people.

Conclusion

This type of closed-loop process isn't new. It mirrors the training management cycle in *FM 25-100 Training the Force.* It's also a simplified version of the methodology of Total Army Quality (TAQ) management philosophy (*Leadership for Total Army Quality*, Government Printing Office, 25 September 1992). If you're familiar with TAQ, you'll recognize our functional area teams as Process Action Teams, or PATs. The key leader council that validates assessments and fixes equates to the TAQ Executive Steering Committee. The process we presented parallels the awareness, assessment, team-building and action steps required to implement TAQ.

How you conduct your transition presents you with a pay-me-now or pay-me-later dilemma. This approach is resource-intensive and requires much personal effort. However, it has many advantages. It accomplishes the transition comprehensively and quickly, builds on unit strengths and clarifies goals and standards. It emphasizes positive action and involves and empowers people. It rejuvenates and re-energizes the unit, recommits people to missions and values and builds teams. Most important, it puts you and the unit on the road to achieving a shared vision.

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A Warfighting Philosophy

by Lieutenant Colonel William A. Jones

"Throughout the Army, the term 'Fighting with Fires' is becoming synonymous with, and in many cases supplanting, the term 'fire support.'"

In his "On the Move" column in the June 1992 edition, Major General Fred F. Marty, Chief of Field Artillery, provided an update on the progress of the Training and Doctrine Command (TRADOC)-sponsored "Fighting with Fires" study conducted by the Field Artillery School, Fort Sill, Oklahoma. His forecast of a positive response to this initiative from the combined arms community has become a reality.

In September 1992, Major General Marty presented the Fighting with Fires Final Report to General Frederick M. Franks, Jr., Commanding General of TRADOC. General Franks accepted the report and tasked his staff to review the study's findings and work with the TRADOC community to action many of the issues.

Today, Fighting with Fires is more than a fire support study under review at TRADOC headquarters. It has evolved into a warfighting philosophy that creates a new paradigm of how to maximize combat power. Throughout the Army, the term "Fighting with Fires" is becoming synonymous with, and in many cases even supplanting, the term "fire support." The Fighting with Fires philosophy contains all the tenets of fire support but has expanded the parameters of our attack options to include the simultaneous engagement of operational targets while maintaining our support of the close fight.

Background

Fighting with Fires began as a TRADOC study tasked to the Field Artillery School. Its goal was to determine why commanders continued to experience difficulties in synchronizing maneuver and fires while training at the Combat Training Centers (CTCs). Ironically, this well-documented phenomena didn't exist during Operation Desert Storm where our commanders repeatedly massed fires in a timely and accurate manner.

The initiative's objectives were simply stated:

• Enhance the ability of maneuver commanders to fight with maneuver and fires.

• Ensure the TRADOC domains of doctrine, organization, training, materiel, leadership and soldiers (DOTMLS) support the commander with the tools necessary to execute his responsibility for integrating and synchronizing maneuver and fires.

• Develop a greater appreciation of the Fighting with Fires concept throughout the Army.

At the onset of the study, the synchronization problem was described using an analogy of a rifle range. The battlefield operating systems (BOSs) evaluated at the CTCs were depicted as individual firing lanes. Each shooter on the range independently engaged targets within his own lane or BOS.

At the CTCs, the concentration on each BOS had become so intense that seldom did commanders ever climb into the "range tower" to ensure the collective "fires" of all lanes met the commander's intent. (See the article "Fighting with Fires: The Major Issues" by Lieutenant Colonel Sammy L. Coffman, June 1992.) Our mission was to remove the maneuver commander from his individual lane and place him in the combined arms "tower," overseeing all the BOSs in a synchronized fight. It was this mission that guided the study to its completion.

In his article, Lieutenant Colonel Coffman outlined many of the issues surfaced by both maneuver and fires commanders throughout the force. He also described the process the study participants used to identify these issues. This process included many halts to check "GFT settings" (graphical firing table) to ensure the issues being addressed in the study remained important and relevant and were supported by consensus.

Milestones that highlighted the final months of the initiative included a July 1992 in-process review (IPR) with Lieutenant General Wilson A. Shoffner, the Commanding General of the Combined Arms Command, Fort Leavenworth, Kansas, and a two-day session in Washington, DC, with a senior officer review group composed of retired general officers, most of whom had been warfighting commanders-in-chief (CINCs).

The study, now representing hundreds of hours of research, data collection, discussions and seminars, was sent to the TRADOC school commandants for a final check. Given a final "Go" by the school commandants, the study is truly representative of the combined arms community's beliefs concerning fire support.

During the staffing process, it became apparent that the study would result in three distinct categories of fires issues. The first category, called "Combined Arms," consisted of those issues

the fire support community couldn't resolve by itself. The resolution of these issues required analysis and participation by the entire TRADOC community.

The second category was those the study determined the fire support world could resolve. Returning to the analogy of the rifle range, these were named "Our Lane" issues.

"CTC" issues, the final category, were the result of a civilian-contracted study sponsored by the Field Artillery School. This 10-month analysis (December 1991 to September 1992) included visits to all the CTCs, observation of unit rotations and after-action reviews (AARs), discussions with observer/controllers (OCs), interviews with maneuver commanders before and after their training at the CTCs and research into previous studies and reports.

The final report presented to General Franks in September marked the conclusion of the formal study. Throughout the process, Fighting with Fires provided a warfighting "lens" to examine the TRADOC DOTMLS to ensure the focus of these domains remained on supporting the combined arms commander. The report highlighted a number of shortcomings and deficiencies that degraded the ability of commanders to effectively synchronize fires on the battlefield--briefly outlined as follows.

Combined Arms Issues

These issues targeted the synchronization capability and skills of the combined arms commander.

Institutional Training. The training of combined arms commanders was the foremost concern of the study's participants. The consensus was that synchronization training should begin in the officer advanced course and progress logically throughout one's career. Collectively, the field army wants the TRADOC "schoolhouse" to increase its emphasis on this type of training.

Combat Training Centers. The CTCs strive to accurately replicate all the BOSs. It's imperative that our training teach commanders at all levels to fully appreciate the contribution each BOS makes to solving the battlefield equation. Only with this knowledge can the combined arms commander successfully synchronize the fight. This effort is clearly underway at our CTCs today.

Manuals. Our leaders want our tactics, techniques and procedures (TTP) manuals to contain more "how to" examples of synchronizing BOSs. *FM 71-123 Tactics and Techniques for Combined Arms Forces: Armored Brigade, Battalion/Task Force, and Company/Team*, published by the Armor School, Fort Knox, Kentucky, was heralded by the field as an example of success in this area. This manual's approach to describing TTP is an excellent model of a "how to" manual.

Operational Fires. Operational fires, by definition, strike at critical nodes that may decide the outcome of a campaign. Today's technology provides the commander many options for attacking these critical targets.

Army doctrine must recognize its own contribution to the commander's options at the operational level. We must ensure the new *FM 100-5 Operations* includes the Army's intellectual view of its role in operational fires.

Joint Doctrine. Our joint doctrine must identify the requirement for a fires coordination element (FCE) at the joint task force (JTF) level. Desert Storm clearly validated the need for a FCE to support the joint force fires coordinator (JFFC) in the target development process. In today's exercises, we often meet this need by taking personnel from the corps fire support element (FSE) and creating an ad hoc organization. The Field Artillery School is working with TRADOC to ensure this FCE requirement is articulated in future joint doctrine.

Information Management. Technology provides the commander access to multiple, highly sophisticated acquisition systems—access to a wealth of information. Commanders and staffs must be taught to balance the competing demands for situation and target development. We need TTPs that demonstrate the complexity of these tasks and examples of reasonable solutions.

Communications. Our current communications architecture needs to expand. Desert Storm AARs repeatedly documented the need for communications systems that could reliably transmit both secure voice and data over long distances.

Fire Support Mobility. Our fire supporters lack the mobility and survivability to support the heavy maneuver force. What had been a mere inconvenience at the training centers became a harsh reality in war. Fielding planned for the Bradley-variant fire support team vehicle (FISTV) and the M113A3 armored personnel carrier will help resolve this issue at the company, battalion and brigade levels.

Fratricide. The volume of cannon and rocket fires during Desert Storm caused the dud rate of our submunitions to pose a tactical challenge to soft vehicles and light forces. Avoiding fratricide always has been of major concern to our commanders, but the dimension of maneuvering into areas of unexploded friendly munitions is something our commanders must now consider in their planning. We must develop both joint and Army doctrine and TTPs that address employment considerations for improved conventional munitions (ICM) and family of scatterable mines (FASCAM).

Our Lane Issues

The issues in Our Lane are fires issues being resolved at the Field Artillery School. In October, Brigadier General David L. Benton III, the Assistant Commandant, approved Field Artillery School departmental action plans to correct these problems. He conducts a formal review of these plans each quarter with the department directors.

Fire Support Training. The institutional training of fire support officers (FSOs) and fire support NCOs (FSNCOs) has changed. Our basic NCO course (BNCOC) and advanced NCO course (ANCOC) curriculums now include the same fire

support skills as our officer basic course (OBC) and officer advanced course (OAC). Likewise, our officer course curriculums are placing more emphasis on teaching maneuver tactics.

Fires Manuals. The previously mentioned call for more detailed TTPs extends beyond the combined arms arena as fire supporters throughout the force highlighted shortcomings in our manuals. Field Artillery School instructors are regularly communicating with the CTCs in an effort to incorporate field-tested tactics and techniques into our manuals and to identify deficiencies in institutional training.

Liaison Teams. The liaison teams of Desert Storm were invaluable. As Field Artillerymen, we must convince the Army to recognize this need, document it properly and allocate the necessary structure for these critical positions. Fort Sill solutions to this force structure issue will continue to be offered to the Army's senior leadership for consideration.

Fire Support Elements. Our battalion and brigade FSEs lack the robustness necessary for sustained operations. Our combat developers will continue to work through the Total Army Analysis process in an effort to overcome these shortfalls.

Divisional MLRS Battalions. Desert Storm convinced maneuver commanders that a multiple-launch rocket system (MLRS) battalion should be organic to our heavy divisions. The Field Artillery School is working to secure the spaces for a two-battery, 18-launcher battalion per heavy division.

The 3d Armored Division made good use of MLRS fires. Here an MLRS battery fires the division's first rounds into Iraq.

Increased Range and Lethality. We must continue to increase the range of our systems and the lethality of our munitions. Our Paladin howitzer's development has been close to flawless and continues to exceed all expectations for its far-reaching, semiautonomous operations. Initial unit fielding is scheduled for this summer. The development of smart munitions, such as sense and destroy armor (SADARM), will increase the lethality of our force.

Light Force Requirements. Fire support equipment for our light forces must afford them the same mobility as their maneuver

The M109A6 Paladin's development has been close to flawless and continues to exceed all expectations for its far-reaching, semiautonomous operations.

counterparts. At the Light Division Artillery Commanders Conference this past January, commanders offered many suggestions on how to balance the technical fire support requirements of our systems with the reduction of their bulk for increased mobility. Our TRADOC System Managers (TSMs) are reviewing these recommendations to incorporate them into system designs.

FSO Development. For years our officer assignment policies conflicted with our beliefs for successful FSO development. Immediately after successful battery commands, officers were reassigned to branch-immaterial assignments. Today, we are working with our branch managers to allow some of these experienced artillery officers to remain in their divisions to serve as battalion FSOs.

CTC Developments

The most encouraging piece of the Fighting with Fires history has been developments at the CTCs. The CTC leaders didn't wait for a formal report to scrutinize their replication of the fire support system. Their focus on successfully accomplishing the commander's intent (as opposed to counting specific kills), using more realistic artillery battle damage assessment tables, conducting combined maneuver and fire support AARs and emphasizing the capabilities of the fires option to maneuver commanders are just a few examples of positive steps taken by the CTCs. Clearly, these initiatives impact favorably on training the combined arms commander to synchronize maneuver and fires.

The contractor report on the CTCs validated that the CTC initiatives were "on target." Topics addressed in the CTC report included fire support replication, baseline norms for fire support, measurement of fire support effectiveness, fire support feedback systems and interaction between the combined arms commander and his fire support coordinator (FSCOORD).

One only has to refer to the *Field Artillery* interview of Major General William G. Carter III, Commander of the National

"The CTCs' appreciation for the criticality of commanders learning to synchronize the BOSs places the maneuver commander in the combined arms 'tower.'"

Training Center (NTC), Fort Irwin, California, to see the azimuth our training has taken at the CTCs ("Synchronizing Combat Power at the NTC," October 1992). The CTCs' appreciation for the criticality of commanders learning to synchronize the BOSs places the maneuver commander in the combined arms "tower."

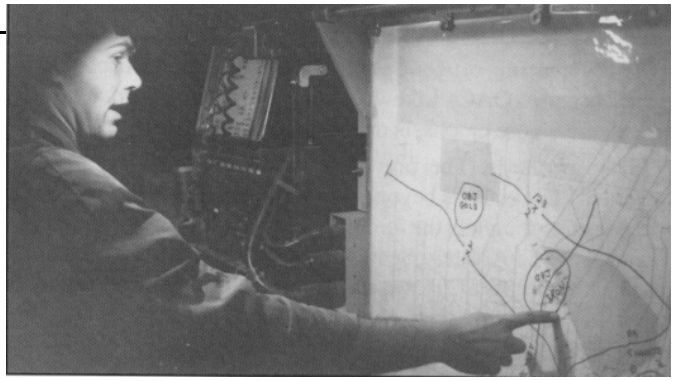
Fighting with Fires—the Future is Now

With the end of the USSR and US superpower "chess match," the strategic environment facing US forces has greatly changed. The battlefield for which we must prepare will be populated by fewer forces with greater lethality engaging each other at longer ranges. US forces on this battlefield normally will include elements of our contingency Army projected into the region, primarily from the continental United States (CONUS).

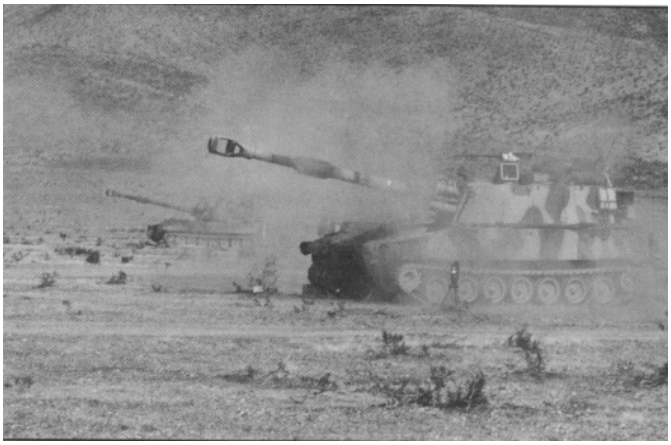
Despite this new warfighting environment, our commander's imperatives remain unchanged—accomplish the mission and protect the force. These imperatives translate into a challenge to maintain a trained and ready force that can rapidly deploy to the fight and win decisively and quickly with minimum casualties.

In an October 1992 interview with *Armed Forces Journal International*, General Franks addressed parameters for success on the battlefield. He held that to be successful a rich choice of options must be available to our commanders at all levels. The commander exercises these options to gain leverage and to overwhelm the enemy's warfighting systems. The Fighting with Fires philosophy embraces this concept by offering Army fires as an option to be used either in conjunction with maneuver forces or as part of joint operational fires. As General Franks said in the interview, "The richness of choice and the wide range of flexibility available to a battlefield or theater commander is enormously important...."

A commander who recognizes the potential fires can offer as an option understands the essence of the Fighting with Fires philosophy. This commander accepts fires as an equal partner to his maneuver option. He no longer envisions the sequential engagement of enemy forces as his only defeat mechanism. Rather, he merges the technological capabilities of enhanced target acquisition, long-range attack systems and lethal precision munitions into numerous attack options to be employed throughout the battlefield simultaneously. Responsive ground attack systems linked to airborne and satellite sensors produce a system of systems that help create this "rich choice of options."



Commanders and staffs must be taught to balance the competing demands for situation and target development, given the wealth of information they have access to.



Making the Most of Fires at the NTC. Howitzers of 1st Battalion, 82d Field Artillery, 1st Cavalry Division fire in a 1992 rotation to the NTC.

The Fighting with Fires philosophy provides no rest for the enemy. It allows the commander to use all his options—maneuver, aviation, fires and air and naval forces—to focus his combat power, the key to winning. The commander extends the battle throughout the theater in time and space. He holds the enemy's center of gravity hostage by seeing the enemy in real time, striking when and where he chooses and killing when he strikes. The commander who achieves this *Fights with Fires*.

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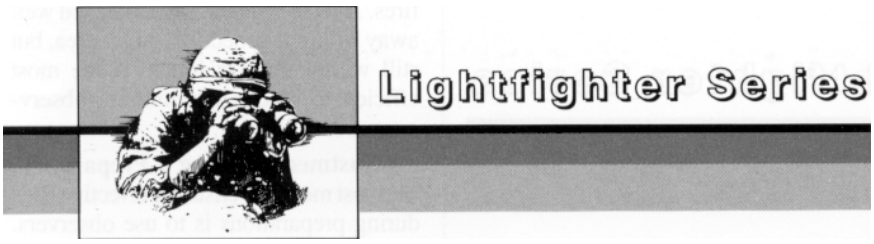


Artillery TTPs for the Danger-Close Fight:

LID in the Attack

by Captain David D. Hollands, USAR

This article is the second in a series of three by Captain Hollands on artillery tactics, techniques and procedures (TTPs) for danger-close combat in the light infantry division (LID). The first article appeared in the February edition and covered TTP for the movement-to-objective and initial contact. The last of the series 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) in the attack. The fire support procedures addressed are generally not found in doctrinal publications. They're 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.

Characteristics of light infantry offensive operations are stealth, small unit movements, surprise and violent close-range destruction of the enemy. Maximizing the few available fire support resources greatly reduces the number of infantrymen required to close with and destroy the enemy. The following discussion presents fire support considerations for observation, preparatory fires, blocking fires and transition to the defense.

Observation

Planning for observation of the objective area is an often neglected fire support task. Maneuver commanders usually try to gain "eyes on the objective" during the reconnaissance phase of the operation. Scouts or elements selected from companies usually make up these observation parties. Some battalions routinely incorporate forward observers (FOs) into these reconnaissance elements, while some opt to rely on well-trained infantry NCOs. Combat observation lasing teams (COLTs) controlled by the brigade fire support element (FSE) are often suitable for this type of mission.

The fire support requirements are the same, regardless of who accomplishes the task. But one missing piece is often a clear briefing to recon leaders of specific, prioritized fire support requirements and the reporting timeliness required. Critical fire support information from observation of the objective area is shown in the figure.

These requirements for information must compete with other tasks developed by the S2 and S3. FSOs at all levels must ensure their concerns (which are really just another set of the commander's concerns) get equal consideration.

- Confirming or denying targeted enemy locations.
- Refining targeted locations, particularly targets included in a preparation or schedule of fires.
- Reporting on terrain conditions and the type of defenses.
- Identifying suitable observation posts (OPs) for FOs during the attack.
- Confirming suitability of selected mortar firing positions.
- Determining wind conditions at the objective that would affect the use of smoke.

Critical Information Gathered from Observation of the Objective Area

At the company level, there are fewer resources, but the same information needs exist. Knowing the battalion plan for recon helps FISTs know what type of additional information to expect about the objective and helps refine company efforts. Company lead elements and the members of the commander's recon element must understand these requirements and routinely pass along gathered information.

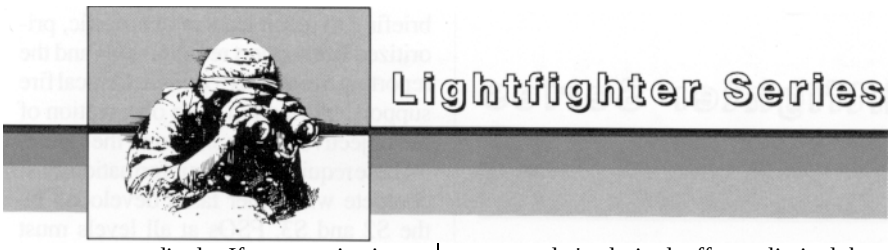
During the actual attack, observation of the entire objective area is critical to coordinating and delivering effective fire support. Before starting an attack, it's routine for scouts and recon elements to pull away from the objective as maneuver units occupy assault positions. Gaps in observation often occur at this point—the most critical phase in the attack. At the company level, positioning FOs before the attack should—

• Provide observation over all preparation targets in the company sector.

• Ensure communications with all firing units.

• Provide redundant observation of critical areas of the unit's objective.

Positioning FOs at greater than arm's length from their platoon leaders may meet with resistance. The FIST chief and company commander must review how best to support the attack and allocate



resources accordingly. If communications with firing units are a concern, locating an FO on a hill overlooking the objective with good communications is a good solution. Careful consideration of the type of fires expected when platoons close with the enemy should determine the utility of FOs accompanying the platoons during the assault. If vantage points that provide observation, communications and the ability to influence the action are available, they shouldn't be abandoned lightly.

Preparatory Fires

Preparatory fires are generally the violent initiation of an attack. They vary in length and intensity, depending on the level of the unit conducting the attack. Normally, battalions are the lowest level that plan preparations. However, companies may plan small preparations during decentralized operations. Key considerations for maximizing the effectiveness of preparations are discussed in the following paragraphs.

Stealth versus Surprise. Light infantry commanders stress stealth during their movement to the objective. However, they often confuse stealth with surprise when conducting their attacks. The decision as to whether to fire a preparation or not hinges on the trade-offs between the surprise of an infantry attack and the forewarning of an attack communicated by extensive fires.

The commander must evaluate the damage inflicted on the enemy and the state of his defenses at the time of the assault, both with and without a preparation. The factors of mission, enemy, terrain, troops and time available (METT-T) will determine whether a preparation is appropriate. To those commanders who fear that using a preparation will deny them the element of surprise, the FSO should ask, "What could be more surprising than 108 105-mm rounds [18 tubes x 6 rounds per minute] and 120 81-mm mortar rounds [4 tubes x 30 rounds per minute] impacting on the objective in one minute?"

Volume and Rate of Fire. FSOs schedule preparations to achieve the commander's desired effects, limited by time and ammunition. The maximum shock effect and highest percentage of casualties will occur during the first minute of a preparation. As troops find their way to fighting positions, craters or any low ground, they become less susceptible to fires. Short preparations, scheduled at the maximum rate of fire for each system, generally provide the best results. If commanders want sustained suppressive effects, fires can shift to sustained rates after the first minute and continue firing as long as needed.

Using two gun platoons or two to three volleys from batteries or mortar platoons will generally not provide significant shock or damage to a prepared enemy. If forced to execute a preparation using only one battery, the most important targets should be selected and scheduled in a series, ensuring a sufficient volume is fired to achieve effects on each target.

Observed versus Unobserved Fires. Incorporating preparation fires into the observation plan is critical to ensure success. Rounds impacting even 100 meters from the target provide significantly reduced results. Targets based on intelligence or templating without verification and fired on by units without adjustment (often without valid registrations) will have desired effects only through luck. There are several steps FSOs can take to improve preparation accuracy:

- Refine targets using all available intelligence means.
- Conduct an offset registration (within transfer limits).
- Observe preparation targets and use check rounds or adjustment techniques if accuracy is in doubt.

As discussed in the observation portion, scouts or observers with recon elements must report refined target data, particularly for scheduled targets. Focusing electronic intelligence resources on the target area also helps refine the target data.

Fire units should conduct registrations if they lack confidence in any of the elements of accurate, predicted fire. This is particularly important for unobserved fires. A radar registration conducted well away from the scheduled target area, but still within transfer limits, is the most efficient technique. It requires no observers and is quick.

Adjustments During a Preparation. The best means of ensuring effective fires during preparations is to use observers. They can conduct check fires offset from the objective and then send corrections to shift fires on the target, maintaining surprise. They can call for adjustments if fires are inaccurate or ineffective. However, adjustment procedures require coordination to prevent lulls in firing. Batteries should continue to fire while processing corrections and shift to the new data by platoons. Even inaccurate fires provide suppressive effects. Shutting off units while computing new data could provide the enemy time to improve his defensive cover.

If the schedule doesn't produce the desired target effects, observers can direct re-engagement or recommend an extension of the preparation. The commander then can decide whether or not to begin the attack based on knowledge of the preparation's success or failure.

Signals. Using signals can enhance both the initiation and termination of preparatory fires. As a backup to FM communications, pyrotechnic signals provide a redundant initiation technique. Flares, if coordinated, can signal mortars, artillery or relays to begin and end fires. White phosphorus (WP) or low-burst illumination rounds to signify the completion of preparations can shorten the gap between the last rounds landing and the first infantryman hitting the objective. With a visual cue, the infantry knows that no more rounds will impact on the ground they're trying to take.

The selection of signaling munitions must consider the effects of illumination on friendly troops and the residual effect of smoke and WP on the objective. The FSO should ensure the schedule includes signaling munitions and that units involved in the preparation actually fire them. (During an external evaluation, an FSO scheduled a mortar unit to fire WP at the end of the artillery preparation. This provided no assurance that the artillery had finished firing, and when the mortars fired ahead of schedule, it *confused* everyone involved.)

Blocking Fires

Blocking fires have become generic catch-alls for any location to which FISTs

shift fires off the objective—to "check the block" on shifting versus lifting fires. FSOs often give little thought to the real impact of blocking fires on enemy forces retreating from an objective. Fires shifted off the objective should meet the following standards. They should—

• Be observed.

• Prevent enemy escape from, or reinforcement of, the objective area.

• Allow friendly forces to maneuver to their limit of advance.

• Have an FO assigned to control them.

Enemy soldiers attempting to pull away from the objective should find their way impeded by a "wall of steel." As friendly units secure the objective, the commander should begin creeping the blocking fires back in, squeezing the enemy between direct and indirect fires. Properly using blocking fires will prevent the enemy from breaking contact and massing for a counterattack, making friendly transition to the defense easier.

Fire units will have adjusted data for key targets to protect the now defending friendly troops. These techniques call for shifting fires no more than 500 meters from the objective. Shifts of any greater distance will severely restrict their effectiveness in supporting the attack.

Transition to the Defense

Shifting from the offense to defense after seizing an objective is not difficult, but units rarely execute it with the aggressiveness and timeliness required. During the targeting process for the attack, FSOs plan fires on, beyond and to the flanks of the objective area. They select targets based on their suitable appearance during map reconnaissance. While suitable at the time, these targets rarely match the company's needs once set in its defense.

The FIST must begin its transition battle drill as soon as the platoons halt. Waiting for final dispositions is unnecessary; the plan can be modified as leaders conduct the inevitable adjustment of lines.

The following should be part of a FIST's standing operating procedure (SOP) for transitioning to the defense. The FIST—

• Has each FO immediately establish targets in the platoon sector, beginning at the limit of visibility, moving toward the line of troops and ending with final protective fires (FPFs).

• Conducts one-round adjustments on these targets with all available weapon systems. To deter counterattacks, priority goes to placing rounds between friendly forces and retreating enemy forces. Time spent adjusting at this point will ensure fires are accurate when needed. FOs must consider their leader's desires and concerns about obscuring enemy units within direct-fire range and the possibility of suppressing friendly forces who may fear that the rounds landing are the enemy's.

The FIST must begin its transition to the defense battle drill as soon as the platoons halt. Waiting for final dispositions is unnecessary.

• Focuses attention at the maximum range of visibility. It must avoid the tendency to think of FPFs as the primary means of defensive fires. The FIST also posts OPs to improve visibility and early warning and assigns priority targets at the maximum visible range.

• Begins creating a terrain sketch using a laser range finder. The FIST also helps crew-served weapons teams prepare weapons range cards by providing laser support.

• Assigns responsibility for all targets. If an FO can't observe a target, the FSO assigns it to a squad leader (SL). He gives the SL a card with the target number, a small sketch showing the target location, a prepared call-for-fire (CFF) and instructions on how to communicate with the fire support system. He also assigns secondary responsibility for each target to ensure that, even with attrition, someone will execute that portion of the fire support plan.

Using these techniques will clarify the priority of work for FOs during the confusing period after an attack. Initiative by platoon FOs can greatly enhance platoon security during consolidation and reorganization and requires little direction from the platoon leadership.

The purpose of this collection of techniques is to trigger thought and experimentation among company FISTs. Adopting, testing and improving these procedures falls to the "men in the arena"—the FOs and FIST headquarters troops that must execute them in combat.

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