



Field Artillery

A Professional Bulletin for Redlegs

June 1995



The FA Leader



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Front Cover: With Port-au-Prince, Haiti, during Operation Uphold Democracy in the background, a Redleg leads others—skills relevant in today's operations other than war (OOTW) or tomorrow's all-out war.

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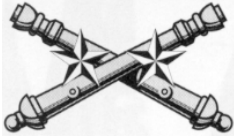
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On the Threshold

There are a handful of moments in history when the pressure of technological progress is so powerful that it transforms the way nations fight. Today, we are paused at one of those great historical moments, facing the demanding challenge of harnessing new technology. In my last "On the Move" column as the Chief of America's Field Artillery, I focus on mastering this challenge and crossing the threshold into the 21st century.

In the last two years, I've had the privilege of working with America's finest soldiers, sailors, airmen and Marines, building a foundation for future joint warfighting. Several moments in my tour stand out as particularly unforgettable—significant for what they can teach us about preparing for the next century. Together, they define the "right stuff" for the Field Artillery.

An Enduring Tradition. On 6 June 1994, I participated in Fort Sill's commemoration of the 50th anniversary of the D-Day invasion in Normandy. The event was a compelling reminder of Field Artillery's tradition of dedicated, selfless service, a tradition that's not only an important part of our past, but also key to our future.

During the D-Day ceremony, I told a story about the soldiers of the 7th Field Artillery Battalion. No story says more about what the Field Artillery's tradition really means.

World War II was an unexpected call to arms for the 7th FA. For two decades, it had trained with World War I-era horse-drawn howitzers; then suddenly, it was deluged with new, modern weapons and whisked off to battle.

By 6 June 1944, the Redlegs of the 7th had the lean, worn features of combat veterans. After having fought in North Africa and Sicily, they hit the beaches of Normandy in the first wave of the invasion. The men of the 7th landed on a miserable sunless, wind-swept day. Half the battalion's howitzers sank when their landing craft floundered. Casualties mounted quickly.

Despite these overwhelming obstacles, at a little after 1600 hours on that fateful day, the howitzers of the 7th roared 20 times.

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They were the first American guns to strike out from the beachhead—a great example of the Field Artillery tradition.

The story of the heroic 7th, while dramatic, is by no means unique. Shortly before the D-Day ceremony, I visited the men of today's 7th, part of the 10th Mountain Division Artillery at Fort Drum, New York. I was struck by how little had changed in a half century. Today's 7th FA is making its own contribution to artillery tradition—from disaster relief after Florida's Hurricane Andrew to supporting humanitarian assistance in Somalia.

The lesson these Redlegs of the past and present have to teach us is clear. We have a standard—a tradition of outstanding, selfless service to our nation—that we must carry forward into the next century.

A Changing Focus. On another occasion, a special evening in December 1993, I joined artillery men of the Berlin Brigade as they celebrated their last Saint Barbara's Day Ball before inactivation. It was a night that carried an important message: it's time to put the Cold War behind us.

As the last of the Berlin Brigade prepared to redeploy to the United States, Redlegs celebrated a mission accomplished. From the Berlin Airlift in the 1950s to the fall of the Wall in the 1980s, America's

gunners have stood proudly beside Berliners at the edge of freedom.

While we concluded the evening saluting the past, we recognized it was time to turn firmly toward the future and new challenges ahead, for all glory is fleeting and no victory guarantees another. The end of the Cold War meant we could no longer focus on one quantifiable threat as the basis for projecting the future force or how to fight tomorrow's foes. Rather, we must prepare to face multiple threats that span the possibilities of warfare. We need agile, versatile leaders and forces prepared to deal with an unpredictable world—focused on future warfighting challenges.

A Powerful New Vision. Last fall at the Senior Fire Support Conference at Fort Sill, we unveiled the Field Artillery's guide for future warfighting—FA Vision 2020. Our vision describes a panorama of the future, not one linked to a specific threat, but based on a thoughtful, rational assessment of capabilities in futuristic technology we can harness. It's a vision that's synchronized with Force XXI, the Army's effort to develop the premiere land force of the 21st century.

FA Vision 2020 depicts revolutionary changes in future organization, doctrine, leader and soldier skills, training and materiel. The 2020 artillery force will be a mission-adaptive force—universally configurable to support the full range of military operations. We'll redefine the function and organization of fire support. Artillery tactical missions and their inherent responsibilities will drastically change. Leaders and soldiers will have unprecedented access to information and autonomy in decision-making. We'll see a quantum leap ahead in our ability to train, capitalizing on the advantages of the Combat Training Centers (CTCs) and integrating simulations to create realistic "combat without death," the ultimate training environment. Finally, Vision 2020 includes conceptual systems, "think pieces," that define the materiel capabilities we'll need in the 21st century.

Vision 2020 establishes the goals that will give us a more versatile, lethal and deployable Field Artillery to deal with the unforeseen challenges of combat in the next century.



An Enduring Tradition—Outstanding, Selfless Service to Our Nation

Creating a New Force. In the spring of 1994 at the National Training Center (NTC), Fort Irwin, California, I had the opportunity to see Redlegs in action in the Army's first advanced warfighting experiment (AWE)—Operation Desert Hammer. AWEs match soldiers and units with new technology and concepts in combat scenarios, informing the decisions that will build Force XXI. These AWEs, starting with Desert Hammer, will play an essential part of turning the FA's Vision 2020 into concrete combat power for the future.

During Operation Desert Hammer, Redlegs from the 4th Battalion, 41st Field Artillery, Fort Benning, Georgia, and the 2d Battalion, 17th Field Artillery, Fort Sill, fought as part of an experimental force, employing an array of new equipment and advanced digital communications systems. Some of our latest systems participated in Desert Hammer, including the initial fire support automation system (IFSAS), Paladin (M109A6) howitzer and Bradley fire support vehicle (BFIST).

All our future systems will be represented in the AWEs. The advanced Field Artillery tactical data system (AFATDS) will provide joint fire support command and control. Crusader, formerly known as advanced Field Artillery system (AFAS) with its armored resupply vehicle (FARV), will demonstrate the capability of the world's most advanced cannon system. Sense and

FORCE

XXI

“...as the quality of the soldier goes, so goes the Army.”

destroy armor (SADARM) will be the Army's first smart munition. New light cannon and rocket systems will provide unprecedented mobility. With our family of future rocket and missile munitions, commanders will dominate battle-space with fires. Together, the firepower these systems bring to the battlefield will help the 21st century force win—and win early and decisively.

A Legacy of Soldiers. Perhaps the most significant reminder for the FA of the future occurred recently when I served as the guest speaker for a recruiting command awards banquet. It was an informal affair, one in which we focused on the most important factor leading to the success of America's Field Artillery—the soldier. I praised the recruiters for their success in bringing the highest quality of soldier into our force that any Army has ever known. I encouraged them to continue in their all-important mission for, as the quality of the soldier goes, so goes the Army.

For every story of an outstanding leader, there's a beginning, a time when a recruiter,

drill sergeant and chain of command saw a spark of ability and trained and developed him. The soldiers of today will be the sergeants major of Force XXI, will take commissions and become its battalion and brigade commanders.

They will inherit the results of our efforts. They will be the ones to continue our tradition of selfless service and excellence, keep the Army focus on target with vision and bring to bear the power of our future force. We must mentor and encourage these outstanding young Americans because they will lead the charge across the technological threshold in the new century. They are the future.



Major General John A. Dubia, America's Chief of Field Artillery, will give up his post as Commanding General of the Field Artillery Center and Fort Sill, Oklahoma, this month, a post he has held since June 1993. He will assume duties in Washington, DC.



TIPS for Leaders

by Command Sergeant Major Daniel E. Wright, 4th Infantry Division (Mechanized)

"Take care of soldiers and families"—how many times have you heard that? My guess is, a lot. We say this every chance we get, but what does it *really* mean? I want to share what I think it means: TIPS.

TIPS is a mnemonic to remind leaders to T-talk, I-inform, P-(be) predictable and S-(be) sensitive. There's nothing new in the philosophy the mnemonic stands for. Good leaders incorporate the philosophy behind TIPS and poor ones don't.

T is for Talk. You must talk to your soldiers. Now, I don't mean just in formation or groups, but one-on-one. Take time (at least 15 to 30 minutes a day) to really talk to a soldier, one soldier a day. It isn't easy to set aside the time for this part of TIPS, especially as you move further up the chain of command away from the "front line" of soldiers. But the benefits of each talk will be multiple. When one soldier leaves after talking with you, he'll tell the rest. So, by talking to one soldier, you talk to the unit.

Getting the soldier to open up will be difficult at first. You can start by talking about something he's familiar with, such as family, hobbies, etc. Before long, he'll talk openly about all kinds of things. Always remember the key to talking to soldiers is to do more listening than talking.

You also must ensure the session is not done in a threatening manner. Nothing will destroy communications faster than if the soldier thinks there will be negative consequences to that conversation.

I is for Inform. Put very simply, this means keeping soldiers informed of what's going on in the unit. You do this by answering the questions you know he has: When am I going to the field? What events are coming up that might affect me or my family? When is the next family support meeting? When am I going to the range? Am I going to shoot night fire? This is by no means a complete list of questions, but you get the idea. Think like the soldier to keep him informed.

The next question is, how do you put out this information? Some would say the best way is to put it on the bulletin board. Still others might say the best way is to tell soldiers in formation. Bulletin boards are

only for the soldiers who read them. And formations...think back to when you were standing in formation; what were you thinking about? Most likely "When is that guy in front going to shut-up so I can get out of this formation!" The only time you paid attention was when your name was called. So, what makes you think today's soldiers are any different?

The best way to keep soldiers informed is through their section chiefs. The soldiers then record the information in their notebooks (every soldier should carry a notebook and something to write with). No leader or soldier I know can remember everything he's told without writing it down.

P is for (Be) Predictable. Leaders must be predictable. We must be able to tell a soldier when he's going to work late and when he's going on field trips or long deployments. And the soldier, like everyone else, needs notice for such events. (Granted, the nature of our business can preclude that, but only rarely.) How many times have soldiers had to cancel a birthday or anniversary because some leader decided to clean weapons or sweep the motor pool at the last minute? The number one complaint I get from soldiers is the push to accomplish last-minute tasks after they've been sitting around all day with nothing to do.

Why can't soldiers expect to get off when the training schedule says they're to get off? The answer is poor planning. Too often we, as leaders, activate our fall-back plan when we don't do the job in the time allotted, and that plan is to work soldiers late. That's unfair and punishes soldiers for our inability to plan.

Another part of predictability is the policy on leave. A soldier should know well in advance (up to six months in my unit) that his leave is approved, and after it's approved, it should take a lieutenant colonel or higher level commander to disapprove it. Even then, leave should only be disapproved in case of war. Soldiers should be able to buy travel tickets on sale well in advance and expect to use them.

Another example—duty rosters should be published as far in advance as possible and Hey-You

rosters eliminated. Hey-You rosters are, again, the result of leaders failing to plan properly.

S is for (Be) Sensitive. In the past, some thought that a leader who was sensitive was not a good leader. People associated sensitivity with weakness. We've come a long way in recognizing that nothing could be further from the truth.

Leaders must be sensitive to the needs of soldiers and their families. There's a saying used in relation to safety problems that applies here: "Someone knew." Someone knew the soldier was having problems paying his rent or buying food. Someone knew that if the soldier had to work late, he'd miss his child's first birthday. Someone knew the soldier would have to cancel his leave because of the last-minute field problem. By recognizing potential problems and the impact of poor planning on soldiers, you can eliminate a source of their dissatisfaction: insensitivity.

I'll be the first to tell you that applying the TIPS philosophy isn't easy. In fact, it just might be the hardest thing you'll ever do. The reason it's so hard is that leading—at least effectively—is hard. Good leadership takes a lot of energy, dedication and selfless service. In the end, the effort is worth it.

The US Army has the right leaders in place to model for and develop leaders for the next century. We have the best educated, best trained, best equipped NCO corps that this or any other nation has ever had. Remembering the TIPS in this article will help keep us focused on why we're here—to take care of soldiers and their families, America's greatest resource.



Sergeant Major Daniel E. Wright is the Command Sergeant Major (CSM) of the 4th Infantry Division (Mechanized) at Fort Carson, Colorado. He also served as CSM of the 4th Infantry Division Artillery and 1st Armored Division Artillery in Germany. The author credits the Commanding General of the 4th Infantry Division, Major General Thomas A. Schwartz, with the development of TIPS.

General William W. Hartzog, Commanding General of the
Training and Doctrine Command

Leadership and TRADOC XXI

by Patrecia Slayden Hollis, Editor

Q *What skills and abilities must a leader in Force XXI have?*

A That's a tough question. The issue is that the world has changed and some leader tasks and the emphasis on certain abilities have changed with it. It goes like this: for years and years, a general needed to know "this much" to do his job, a colonel "that much," a captain "that much," a sergeant "this much" and a private "that much." Therefore, over time, the system sequentially educated the private to know "this much," the sergeant "that much," the captain "that much," etc.

What has changed is that, using information technologies, almost everyone on the battlefield will know the same information at the same time. Data screens, virtual terrain, overlays of positions, global positioning and other systems will tell you where you, other friendly forces and the enemy are precisely at all times—will put that info on television screens. It will be available to privates, sergeants, captains and generals simultaneously.

Such capabilities present challenges. We must have a concept of how to use information and how to develop people to be ready to use that information at each level of their careers.

Rapid, precise information will squeeze the time frames on decision making and could put a sergeant or a captain in a position to make a decision previously made by a colonel or general. There's the potential for error or misuse of power; we're still a hierarchical organization. Perhaps we don't want everyone dealing with the totality of the information at the same time, all the time, because they'll fall all over each other trying to act on it.

At the same time, lower ranking personnel will be more qualified to perform some tasks previously done by more senior personnel—given the amount and accuracy of the information available to



them. That has great implications for our educational system and for the leader development process.

Do we teach a captain how to deal with the President? The captain will have the ability to talk to the President. Do we teach a sergeant how to develop an operations order for a theater? He could find himself responsible for moving 40 or 50 tons of equipment around that theater. Do we need to teach privates more in basic training—a course with a curriculum we've honed carefully for many years? These are all issues we need to sort out.

Q *What skills and abilities do our future battle commanders need?*

A We're in the process of developing a new body of thought about how we'll fight. Surely we'll start by dominating information on the battlefield. We then may use indirect fires to shape the battlefield to be followed by decisive battle, if necessary. We're doing a lot of testing this year on what kinds of forces we need and what kind of equipment will make them hum.

Changes in doctrine, force structure, materiel and training will change our leader requirements. So, what skills and abilities do our future battle commanders need? I'll give you some thoughts.

First, we might need to modify our staff organizations. For my 32 years in the Army and probably as many years before, staffs have been organized by functions: personnelists, intelligence, operations, logistics—S1, S2, S3, etc.

Instead, we may need near-term planners, long-term planners and information officers—I don't know. If the staff organization changes, then the interface between the staff and the commander probably will be different.

Next, we know future commanders are going to have to be at ease with technology—be empowered, not encumbered by it. He or she will have to be far more...I'm going to use a trite phrase...computer literate. But we don't want a generation of cyber-warriors who are only comfortable punching buttons.

“Rapid, precise information will squeeze the time frames on decision making and could put a sergeant or a captain in a position to make a decision previously made by a colonel or general.”



But some things won't change. Like today's leader, the future leader must be able to make the decision and have the courage to go forward at that terribly precise moment defining victory on the battlefield.

Now, the way to develop young leaders into experienced leaders is by repetitively putting them in tough, realistic decision-making positions during training, such as that at the NTC [National Training Center, Fort Irwin, California]. That kind of training is here to stay.

Q *Are there special demands on future Field Artillerymen?*

A Yes. Redlegs are going to have to be more at home with machines and hone their ability to make the most of information. Future artillery pieces are going to have a lot more buttons (and capabilities) on their dashes than there are today—no lanyards anywhere.

Next, all leaders will have to understand more about planning and logic than in the past. This is particularly true of artillery leaders who must be prepared to mass fires from increasingly dispersed locations to hit targets at increasingly longer ranges. That takes leaders who understand and implement training, logic and planning.

Also, if the concept is that a critical part of the way we fight is to acquire targets and deal with them early in a campaign, then ATACMS [Army tactical missile system] and other long-range artillery increase in importance.

Q *In your vision for TRADOC XXI, one goal is to re-engineer TRADOC to meet the needs of the 21st century Army through hub and spoke organizations aligned with the emerging battlefield dynamics and functions performed. Please explain the hub and spoke concept and the basis of the alignment.*

A The concept is to realign TRADOC to reflect the way the Army fights on the battlefield and, at the same time, be fiscally responsible in the near and far terms. TRADOC must move toward "hubs and spokes" with each hub a centerpiece of a battlefield dynamic (or set of functions) and other schools or installations as its spokes. Today's technology can link spokes to each hub school through distributive education, video conferencing

and other means so the robustness of instruction and services are available to all.

But before we can group the parts of TRADOC into hubs and spokes, we must determine the dynamics of the future battlefield—ensure our relevance to that battlefield—and then prioritize our resources. We're at the formulation stage; it will take several months to come up with a re-engineering design that has been tested, staffed and looked at by a lot of people. And it will require some tough decisions.

For 50 years or more, the Army's developmental and education institutions have been organized by branches. We've had a Field Artillery School and Center [Fort Sill, Oklahoma], an Armor School and Center [Fort Knox, Kentucky], an Infantry School and Center [Fort Benning, Georgia] and others. The organization fit the needs of the times.

When we look at "battle" at the most simplistic levels, we see *systems* working—maneuver, fires and intelligence and other systems working—called battlefield operating systems [BOS]. At various times, there have been efforts to group some schools, some branches, by the way they fight in support of these systems—for instance, Field Artillery and Air Defense Artillery. Another grouping is intelligence and signal for information management. Infantry, Armor and Aviation are our maneuver elements. Perhaps we need to align the hubs by BOS with spokes.

Q *Do you foresee Fort Sill being the hub for fires?*

A We haven't gotten that far, yet. But Fort Sill is central to the Army and a robust installation. I would guess it'll be one of the more important hubs.

In the near term, we'll start with some realignments already begun. For instance, the Logistics Officer Advanced Course at Fort Lee [Virginia] has been consolidated for Transportation, Quartermaster, Ordnance and other CSS [combat service support] officers for several years. These officers go back to their branch posts for a small part of the course—five weeks. In a few years, we'll be able to pipe instruction to and from the hubs and spokes or others, as necessary. Students won't have to move around from post to post while getting the same or better quality instruction.

Fort Leonard Wood [Missouri] is an example of a slightly different hub-and-spoke arrangement with the plans to close Fort McClellan [Alabama] and move the Military Police and Chemical Schools to Leonard Wood. So, including the Engineer School already there, Fort Leonard Wood will have three schools.

Obviously, the post won't need a separate staff section and support elements for each of the three schools—there could be a hub of capabilities and services shared by the three school or NCO academy spokes. This is an example of re-engineering by



On the right, General Hartzog talks with General John M. Shalikashvili, Chairman of the Joint Chiefs of Staff.

INTERVIEW

I view Fort Monroe [Virginia] as TRADOC's hub and all others as clusters or spokes to it. The machine behind me that looks like a television set is my phone. That's the way I talk to and see my deputies. A year ago, it would have taken four meetings to gain the same level of interface and accomplish the same amount of work. No longer. TRADOC can take advantage of such technology to connect hubs to spokes and give students good instruction and educational experiences and save money doing it.

Q *What is TRADOC doing to implement Classroom XXI?*

A We're using instructional technologies to improve our institutions. For instance, I was at Fort Knox not long ago in a classroom full of Armor captains where the subject was the interface between the maneuver company commander and his fire support officer. An artillery major at Fort Sill was teaching the class via television—TNET [teletraining network]. These classes can tap into, say, the NTC at Fort Irwin to get the latest videos, tapes and graphics on company-level fire support to enrich instruction. That's far better than 12 Armor students sitting in a classroom at Fort Knox listening to an Armor officer telling them about fire support. Classroom XXI can tap multiple locations and have an interactive audience via the microchip. That's top-notch instruction that saves time, travel and money.

I entered this age of distributive education as a died-in-the-wool skeptic. Having been raised an infantryman, things like physically fixing the bayonet seemed terribly important. But one of the most difficult things I've ever had do was to teach some parts of map reading from a flat map. On my best day, I couldn't describe the difference between a saddle and a draw so someone who has never seen them could understand—they look so much alike on a map. But, if the map's contour lines can be turned up on their sides graphically in a computer, the difference is immediately clear with no explanation. We just have to be courageous about seeking technology to apply to subjects or tasks.

We just finished teleconferencing a complete primary leadership development course [PLDC] and a basic NCO course [BNCOC] from the Sergeant Major's

Academy [Fort Bliss, Texas] to a battalion in the Sinai. My sensing and feedback from soldiers in the course indicate the instruction was high quality. This is the way of future education—students will learn by riding micro-chips and cathode rays. At the same time, professional development still will involve all three pillars of institutional training, self development and unit training; it's just that the balance among the three may be different.

We have a plan for new training that mixes together virtual realities (Super Nintendo, if you will), constructive realities (computer graphics) and live realities (troops on the ground). For example, we can shoot a missile live from White Sands [Proving Ground, New Mexico] and "fly" it in a virtual environment to Germany to "kill" a tank driven by someone at the Armor School in a simulator. All three parties involved will be able to train realistically together at separate locations.

Q *In your vision for TRADOC XXI, one goal is to "aggressively assist joint agencies in the development of joint doctrine." Specifically, how do you see TRADOC contributing to the development of joint doctrine?*

A To begin with, the Joint Chiefs' new Joint Warfighting Center, an organization responsible for developing joint doctrine, recently was established here at Fort Monroe with an Air Force major general in charge. The center also helps plan, execute and assess joint exercises. It includes the Joint Doctrine Center in Norfolk [Virginia] and moves the Joint Chiefs' warfare center at the Air Force's Hurlburt Field [near Fort Walton Beach] in Florida to Fort Monroe.

Joint doctrine must be a consensus of the services. Doctrine may be written in a book, but it isn't doctrine until everyone understands and applies it. So, we have to conduct joint training ventures. We have to have repeated experiences together—one of the purposes of the United States Atlantic Command [Norfolk], designated as the joint services integrator.

Our Battle Command Training Program [BCTP] based at Fort Leavenworth [Kansas] is underwriting and helping to support the Atlantic Command in major exercises, such as the recent United Endeavor at Fort Hood, Texas. The III Corps commander acted as the commander of a joint task force that included Army, Air Force,

Marines and Navy personnel. Our BCTP teams served as observer/controllers and mentors for that exercise.

In great part, each of the services have developed capabilities in a stovepipe manner, but the more joint we are, the better off we'll be. And that applies to more than doctrine—our new digitized systems need to interface with each other in real time.

We need to continue open dialog and the type of constructive cooperation among the services that results in innovative joint operations. For example last year, portions of the Army's 10th Mountain Division with helicopters deployed to Haiti in Operation Uphold Democracy on board an aircraft carrier. So jointness, in all the sense of the word, is proceeding.

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

A As a troop commander, one of my favorite "sidearms" always was an artillery piece—I'd have traded my pistol for it any day. As Force XXI evolves, future commanders will feel that way about Field Artillery, only more so.

But as Force XXI evolves, we all must remember that if the doctrine, organizations, materiel or training and development programs we design don't work for the soldier, they don't work. The Army is people.



General William W. Hartzog is the Commanding General of the Training and Doctrine Command with its headquarters at Fort Monroe, Virginia. His previous assignment was as Deputy Commander-in-Chief and Chief of Staff of the US Atlantic Command, Norfolk, Virginia. He commanded the 1st Infantry Division (Mechanized) at Fort Riley, Kansas, and the US Army South, after having served as J3 for the US Southern Command during Operation Just Cause, both in Panama. General Hartzog served as the Assistant Commandant of the Infantry School at Fort Benning, Georgia, and commanded the 197th Infantry Brigade at Fort Benning. He served two tours in Vietnam and taught Psychology at the US Military Academy at West Point.

Vision and Willpower: The Essence of Leadership

...first, [the combat leader must have] an intellect, that even in the darkest hour, retains some glimmerings of the inner light that leads to the truth; and second, the courage to follow this faint light wherever it may lead.

*General Karl von Clausewitz, 18th Century Prussian
Author of On War*

The combat arms leader will be challenged by an increasing array of requirements for future operations. In addition to mastering proven techniques, he'll need to be attuned to the latest developments in information-age warfare. Most importantly, he'll need to make the transition between the two—not only for himself, but also for those he leads.

The effective leader must continue to rely on that which has worked for ages: his vision and will. The hallmark of a good leader is the combination of his vision and willpower. First, he has the vision to identify and focus on the essentials for unit success. Inherent is his ability to separate essential information from the large amount available. Second, the good leader has the willpower and commitment to ensure that all efforts and resources are expended to execute the mission successfully.

Vision and Willpower

A leader must maintain an accurate assessment of his organization's capabilities and limitations, have a clear picture in his mind's eye on where the unit can and should go and be able to chart a prudent course to get there. While simple in theory, this three-step process is challenging.

First, the leader must assimilate diverse input (inspection data, reports, training results, etc.) into a candid,

unbiased picture of the unit. As the individual responsible for the unit's performance, the leader's assessment is both unique and critical.

Next, he determines his desired endstate, one that's achievable and supports the higher headquarter's mission. He must know what's possible and recognize when he can push himself and his unit beyond that previously thought unachievable.

When plotting a route from the present to the future, the last step in the process, a leader should try to maximize efficiency while ensuring effectiveness. This means keeping his soldiers focused on the right thing while being as efficient as practicable. This principle becomes increasingly important as the Army moves toward Force XXI and information warfare. Faced with potential information overload, *it's critical that the leader and his soldiers be able to rapidly distinguish between relevant and irrelevant information.*

The leader turns ideas into action through his words, deeds and energy—his willpower. He's not dissuaded by obstacles he faces; instead, he has the drive and courage of his convictions to persist in doing what's right, always maintaining the standard.

Unit Synergy

A leader marshals the skills and energy of his soldiers to achieve

synergy, thereby enabling the unit to achieve that which is beyond the sum of the individual contributions. This results from the soldiers' desire to follow and live up to their leader's expectations and standards. *When soldiers clearly know what their leader expects of them and are motivated by his vision and will, their actions inevitably advance the unit toward the leader's desired endstate.*

A clearly articulated and well-communicated vision helps a leader develop a shared sense of purpose with his subordinates and contributes to unity of effort. Frequent use of images, metaphors and models conveyed via a variety of means (orientations, formations, bulletin boards, counseling sessions, etc.) helps subordinates understand the "commander's intent." Soldiers who share the leader's vision know *what* the unit is aspiring to, *why* they have a mission and *how* they will help accomplish it.

A leader's vision defines excellence; his willpower demonstrates his commitment to excellence. He can show that commitment consistently in everything the unit does: accomplishing all assigned missions, competing in sporting events, supporting families, rewarding soldiers with awards and decorations and more. *Repetitive enforcement of standards is key.*

A leader's vision gives him a sense of when the time is right to make a decision and the "raw material" with which to make it; his will gives him the moral and professional courage to not only make the decision, but also to see it through to successful execution.

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21st Century Coup d'Oeil: Developing Commanders for Force XXI

by Captains Keith R. Yoder and Robert J. Rice

The traditional attributes of leadership will not change; we'll always need leaders who can command soldiers in battle, not simply manage machines. But we also must train leaders to exploit the capabilities of the powerful technologies we'll provide them. Future artillery leaders will require intuitive, tactical judgement to a greater degree than ever before.



Brigadier General Leo J. Baxter
Assistant Commandant, Field Artillery School
"Field Artillery Vision 2020," December 1994

In his article, Brigadier General Baxter describes the concept of Vision 2020, the Field Artillery of Force XXI, that the Chief of Field Artillery unveiled at the Senior Fire Support Conference in the fall.¹ As General Baxter's quote shows, Vision 2020 clearly defines the need to change leader development as technology advances.

Force XXI will provide fire supporters unprecedented capabilities and mental challenges. Every soldier and system on the battlefield will be a sensor with near real-time transmission directly to commanders. The digitized force will greatly expand the battlefield in tempo and space while compressing the decision cycle.

The leaders of Force XXI will need to rapidly scan huge amounts of information, identify what's important and make good decisions quickly. As General Baxter described in his article, computer "filters" will help sift the information. Still, leaders must have *coup d'oeil* (French)—the ability "to see" the battlefield and make sound tactical decisions, a skill that remains in the realm of the human mind. In fact, the most vulnerable link in the system will be the recipient of the information and his ability to use it.²

Does this mean, then, that future commanders must be intellectual geniuses? No, but they must develop some specific mental skills to make the Army of the

future more survivable and lethal—they must know "how to think" rather than "what to do." It takes years of studying the art of military operations for a leader to become an expert decision maker. Therefore, it will take years to mold an officer with the requisite skills to lead in Force XXI

This article focuses on what today's commanders can do to prepare junior officers to command tomorrow's Army. Specifically, we discuss growing future leaders in unit training and professional self-development programs.

Modeling the Experts

The commander can begin building his leader development program by examining experts in military art. In the book, *The Warrior's Edge*, John Alexander and his co-authors describe a process to develop intuitive decision-making skills based on the neuro-linguistic programming theory. Neuro-linguistic programming uses an advanced modeling process to build a training program designed to produce experts.

A trainer studies an expert in a given field closely, trying to model his habits, his mental strategies and the training techniques he used to become an expert. Then, the trainer builds a training plan based on the model.³ (See the figure.)

Neuro-linguistic programming modeling is a way to break a complex task into manageable parts—identifying how the experts mastered the task—and build a training plan to copy their strategies. The first five steps listed in the figure are the basis for the training plan. In the last three steps, the trainer applies the model and revises it based on experience. For a detailed discussion of each of the steps in the process, read Chapter 4 of *The Warrior's Edge*.

The first step in neuro-linguistic programming modeling is examining the common habits and training techniques of the experts. For this article, we examined the careers of Alexander of Macedonia (Alexander the Great, 356 to 323 BC), General Stonewall (Thomas J.) Jackson of the Civil War and German Marshal Erwin Rommel of World War II as examples of masters of military art. They come from dissimilar periods, societies and social backgrounds. The two common traits most relevant to our discussion were their study of warfare (either as a student or participant) and training of the mind to analyze complex problems and make decisions.

1. Elicit the beliefs of the expert.
2. Model the pertinent physiology.
3. Determine the limits of physiology.
4. Model the mental strategy.
5. Form a tentative generalization regarding the beliefs, physiology and mental strategy of the experts.
6. Mold someone (possibly yourself) to fit the model.
7. Review, test and refine the training model.
8. Implement refinements and install the final model.

Neuro-Linguistic Programming and Advanced Modeling Technique. Use these steps to model experts of the military art and design a leader training program based on the model. (Taken from Chapter 4 of the *The Warrior's Edge* by John Alexander et al.)

The first step in neuro-linguistic modeling is to elicit the beliefs of the experts. Alexander, Jackson and Rommel all developed a positive attitude about themselves, their units and military art early in life. Alexander, coming from a warrior society, began his preparation for martial leadership during his preteens. Jackson and Rommel each attended his nation's premiere military academy during his late teens. In all three cases, peers and mentors reinforced the future leaders' immersion in military skills.

The next step is to model the habits and mental strategies of the experts. Alexander, Jackson and Rommel spent years religiously studying military art. All three learned the capabilities and shortcomings of contemporary equipment, weapons and men early in their careers through training and experience.

Each continued to study the military art throughout his lifetime. Each reflected on his experiences in various fashions and, through continuous study, developed *coup d'oeil*. By developing their intuitive ability to see the components of mission, enemy, terrain, troops and time available (METT-T) and the interrelations among them, these great captains were able to determine which principles of war to apply in a particular situation.

These leaders also mastered the ability to detach themselves from the moment to analyze the problem. Alexander retired to his tent before a major engagement to consider the coming battle. Jackson separated himself from his subordinates when formulating tactics. In more modern

times, Rommel regularly performed personal reconnaissance of the battlefield, isolating himself from his staff and subordinate commanders to formulate his battle plan. Each used his own method to clear his mind for thinking, and each perfected his method through practice and experience.

These three experts had the ability to effectively communicate their decisions to subordinate commanders. They issued mission-type orders clearly and concisely, whether by voice, written dispatch or radio. These communication skills—often exercised in the heat of battle—were key to their success in combat.

The commander's ability to see the battlefield, make decisions and communicate missions and intent is the foundation of the art of battle command. Observer/controllers (O/Cs) at the Joint Readiness Training Center (JRTC), Fort Polk, Louisiana, see leaders with these skills as combat multipliers for their units in rotation after rotation.

After examining the experts and forming a tentative generalization of their physiology and mental strategies, commanders can begin to build their leader development training programs.

Create a Positive Learning Environment

One characteristic commonly found in good leaders is they master military art through constant study and review. For young officers to become masters of military art, they must be enthusiastic about the subject.

Commanders can jump-start the learning process by creating a positive environment in their units. Commanders



Commanders can teach young leaders to recognize patterns in tactical information.

can let young officers know they're expected to be students of military art and allocate time each day for study. They also can make leader training a central, highly visible part of the unit training program.

Majors Mark Rocke and Thomas Hayden offer a six-step framework for officer counseling in their article "Officer Development: A Doctrinal Imperative" that appeared in the January 1993 edition of *Military Review*. The six steps encompass a typical one-year rating period and cover communicating expectations, officer evaluation report (OER) support form counseling, periodic mid-term counseling and end-of-rating period counseling. The program is designed to motivate officers to achieve short- and long-range goals.⁴ Combining this counseling program with quality leader training will create the type of positive environment needed to maximize learning.

Pattern Recognition

The key to good decision making in the information age is a leader's ability to quickly identify patterns in thousands of pieces of tactical information. General (Retired) Frederick R. Franks, former commander of the Training and Doctrine Command (TRADOC), described battle command as an art that encompasses the ability to see ones self, see the enemy, see the terrain and visualize the relationships among them.⁵ The result of this vision is a sound decision and the leadership to carry it out.

The challenge for trainers is to develop these intuitive decision-making skills in the first six years of an officer's career. Then, through continued self-development and study, the officer can become a world-class expert by the time he reaches field grade rank.

The Army Research Institute commissioned a study called "Battlemaster" in the late 1980s. The basis of "Battle-master" was research conducted at Carnegie-Mellon University by Dr. Herbert A. Simon, who compared chess grandmasters to novice players.

Dr. Simon ran two trials in which he presented the subjects with a chessboard with about 25 pieces on it. In one trial, the pieces were positioned from an actual, but unfamiliar chess game. In the second, the pieces were randomly placed on the board. The subject looked at the board for five to 10 seconds before it was removed. Then, the subject was asked to reproduce the setup.

For the game setup, the grandmaster was able to correctly place 23 to 24 of the pieces while the novice could only place six pieces. For the random setup, both the grandmaster and novice could only correctly place six pieces. Why the difference?

In the first setup, the game displayed a pattern that the grandmaster recognized. A grandmaster spends many years studying chess on a daily basis and learning to identify patterns. He doesn't see a board with 25 pieces; rather, he sees a situation.⁶ His study and expertise allows him to recognize a pattern.

For an officer to become an expert at pattern recognition, he needs to solve tactical problems every day for several years. War-gaming is a great way to teach officers pattern recognition. The commander can form teams in the battalion and have competitions among them. There are many board games and computer simulations available to help the commander teach his officers how to recognize patterns.

Having officers analyze battles from history is another great training technique. They can either read about the battle and write a short battle analysis or conduct staff rides to battlefields. Commanders can have staff duty officers summarize a battle or produce a plan during their duty. The Infantry, Armor and Field Artillery Schools have many scenarios and practical exercises that commanders could use for leader training.

Intuitive Decision Making

Officers need to learn to process information and make decisions. Commanders must teach young leaders to



Commanders must communicate clearly with junior leaders and teach them to communicate.

detach mentally and let their minds work. Although each person is different, some techniques to consider are those that help successful people to think and make decisions. The first of these is learning to relax.

Historically, most great ideas come during a period of relaxation following intense study of the problem.⁷ In his after-action report from operations in the Ia Drang Valley, Lieutenant Colonel Hal Moore of the 1st Battalion, 7th Cavalry, talks about the need for the commander to detach himself mentally. He says, "Periodically, throughout a battle, the commander must mentally detach himself from the action and objectively think—what is not being done which should be done to influence the situation, and what is being done which should not."⁸

Meditation is a process that successful commanders have used for centuries to inspire intuition. In Foch's *The Principles of War*, the author quotes Napoleon: "There is no genius who tells me suddenly and in secret what I must say or do in any circumstance unexpected by others; it is reflection, meditation."⁹ Napoleon is only one of many great military leaders who have preached the value of relaxing the mind when making decisions. General Robert E. Lee often contemplated and made decisions while slowly riding his horse Traveler.

Commanders can teach young officers to mentally isolate themselves and think about the situation after studying it. In a tactical environment, this can be difficult; but it's essential if leaders are to think clearly and make sound decisions.

Some successful leaders in the military and business recommend the martial arts or yoga as a way to relax and meditate. Each person, though, must determine the best relaxation means for himself. If a person can model his physiology and mental strategy for relaxing and thinking, he can develop a skill that will last a lifetime.

Another way to tap intuition is to capture creative ideas as they occur. Commanders can teach officers to write down their ideas as soon as they think of them. Innovative thinkers carry a notebook and use it religiously to record

ideas. Great ideas come at unexpected times and places and leave just as quickly. If the young leader captures those ideas in a journal, faithfully writing in it every day or so, his great ideas won't be lost.

Challenge Officers with Difficult Decisions

Commanders need to challenge young officers to make decisions and take responsibility for the outcome. If done in a positive way, junior leaders quickly gain confidence and learn.

Commanders can take advantage of every tactical training exercise to force leaders to make choices. If training sets up a situation where the choice or decision for the young leader is obvious or too easy, the leader doesn't learn anything.

Colonel Larry D. Gottardi, Commander of the 82d Airborne Division Artillery, explained his approach to training leaders during a recent visit to the JRTC. He said, "I always give the battery commander an impossible situation during his DART [Division Artillery Readiness Test]. For instance, one time I gave a battery commander the mission to conduct an air assault and then sent two aircraft less than I told him in the order. At that point, I wasn't observing unit performance. Rather, I was observing the battery commander's decision-making skills." Colonel Gottardi's technique forces the leader to think through a difficult problem, make a decision and take responsibility for his decision.¹⁰

Commanders can create situations in garrison that exercise officers' decision-making skills. For example, the commander can give a lieutenant two deadlines he can't possibly meet without missing his platoon's movement time to the field. The lieutenant learns and the exercise builds trust as the lieutenant makes priority decisions and back briefs his commander.

It's important to challenge young officers often, but also to challenge them in a learning, constructive environment. Commanders must be patient with their junior leaders. During the learning process, junior leaders naturally will make some bad decisions. A positive after-action review following each event or exercise is a great way to reinforce lessons. The young officer must understand the challenging situation as a positive, though sometimes painful, learning exercise that allows him to develop his leadership skills.



All Force XXI leaders need to be computer literate.

Teach Leaders to Communicate

No matter how great the idea is, it's worthless if the leader can't communicate it to others. Commanders should constantly emphasize written and oral communications skills as well as computer literacy while training and counseling young leaders.

To hone his writing skills, an officer needs to write every day. Commanders must enforce Army writing and briefing standards and teach officers to communicate their ideas clearly. This process will be painful for some, but it's essential. Writing for professional journals is a great way to develop writing skills.

All officers in Force XXI need to be computer literate. *Coup d'oeil* in the 21st century will largely consist of seeing the battlefield through a computer representation of it. A leader must understand how the system that's presenting the combat information works so his interpretation is accurate. Field Artillery commanders can promote Redlegs'

computer literacy by requiring all officers to become experts on the advanced Field Artillery tactical data system (AFATDS) and other digital systems as they're fielded.

Tomorrow's Leaders—An Investment Today

The most important aspect of any leader development program is regular study of military art. Research has shown that approximately 10 years of daily study or practice is required to produce a world-class competitor in any field.¹¹ To have the mental skills to lead in Force XXI, an officer must immerse himself in the study of military art from the beginning of his career. As with physical training, regular study is more effective than "overloading" at irregular intervals.

For the commander, a quantifiable goal for leader development is two to three hours a day. Obviously, allocating this much time exclusively to leader development is difficult, but commanders can use various techniques to integrate

leader training with daily tasks. The astute commander can hone communication and intuitive decision-making skills of his officers informally in various unit activities in addition to the more formal exercises. Teaching military pattern recognition may require more structured training—battle simulations and battle analyses are fundamental to growing effective combat leaders.

Commanders must take the time to make leader development a top priority. Only by starting now will the Field Artillery community succeed in developing the kind of leader the Army needs for Force XXI. In view of the 10-year rule, the Army can't afford *not* to invest the time.

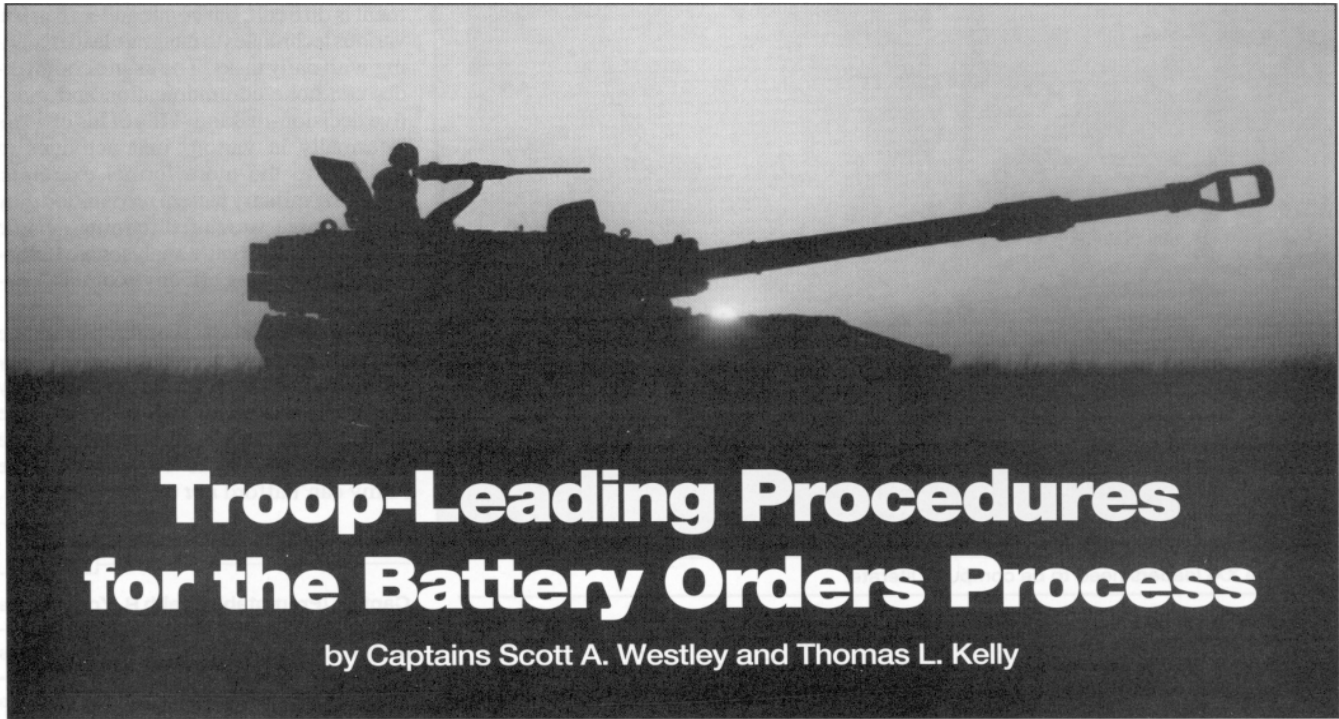
Captain (Promotable) Keith R. Yoder is the Senior Fire Support Controller for the Operations Group of the Joint Readiness Training Center (JRTC), Fort Polk, Louisiana. Also at the JRTC, he served as a Fire Support Analyst and Battalion Fire Direction Center Observer/Controller. Among other assignments, Captain Yoder commanded two batteries: A Battery, 3d Battalion, 35th Field Artillery, initially with the 72d Field Artillery Brigade and then transitioned to direct support with the 3d Infantry Division (Mechanized), both in Germany, and A Battery, 25th Field Artillery (Target Acquisition), also with the 3d Infantry Division.

Captain Robert J. Rice is a Senior Firing Battery Observer/Controller for the Fire Support Division of the JRTC. Also at the JRTC, he served as the Aviation Fire Support Observer/Controller for 18 months. For 21 months, Captain Rice commanded C Battery, 2d Battalion, 29th Field Artillery in the 1st Armored Division, Germany. He's a graduate of the Infantry Officer Advanced Course, Fort Benning, Georgia, and Combined Arms and Services Staff School, Fort Leavenworth, Kansas, and is working on his master's degree in military history at Louisiana State University.

Notes:

1. Brigadier General Leo J. Baxter, "Field Artillery Vision 2020," *Field Artillery* (December 1994), 10-14.
2. Herbert A. Simon, PhD, Carnegie-Mellon University, related to Captain Yoder in a telephone interview 28 February 1995 that researchers have found the weakest link in a management information system is the receiver of the information and his ability to use it.
3. Colonel (Ret) John Alexander, Major Richard Groller and Janet Morris. *The Warrior's Edge* (New York, New York: William Morrow and Company, 1990), 87-101.
4. Majors Mark D. Roche and Thomas W. Hayden, "Officer Development: A Doctrinal Imperative." *Military Review* (January 1993), 27-37.
5. White Paper by the Combat Training Center Group, US Army War College, "Some Ideas on How to Best Use Observer-Controller (OCs)/Trainers During and After Assignment at the Combat Training Centers (CTCs)," DS 44, unpublished (Carlisle Barracks, PA: 12 December 1994), 2.

6. Army Research Laboratory "Battlemaster" study compiled by LB&M Associates, Lawton, OK, 1987; Dr. Simon's research was the basis for the study.
7. Alexander, 117.
8. Lieutenant Colonel Harold G. Moore, "After Action Report, IA DRANG Valley Operations, 1st Battalion, 7th Cavalry, 14-16 November 1995," 9 December 1965, unpublished.
9. Peter G. Tsouras, *Warriors' Words: A Quotation Book* (London, England: Cassell Arms Armour, 1992), 190.
10. This technique was related to the authors by Colonel Larry D. Gottardi, Commander of the 82d Airborne Division Artillery, while visiting the Joint Readiness Training Center, Fort Polk, Louisiana, in 1994.
11. In his telephone conversation with Captain Yoder 28 February 1995, Dr. Simon related how research validates the 10-year rule, even when applied to children with exceptional intelligence.



Troop-Leading Procedures for the Battery Orders Process

by Captains Scott A. Westley and Thomas L. Kelly

The attack had failed. His battery had failed. The battery commander (BC) fought back tears as he surveyed the blackened hulks and broken bodies that had been his firing battery.

The frantic calls for smoke from the breaching element fire support team (FIST) still echoed in his mind. The team died trying to breach the enemy obstacles. He would always feel the searing heat of his howitzers exploding as his soldiers desperately tried to repel the enemy counterattack force as it swept through the battery on its way to the rear. What had happened? Why had he and his men failed despite Herculean efforts by the entire battery?

Observer/controllers (O/Cs) at the National Training Center (NTC), Fort Irwin, California, routinely see battles end this way—only substituting simulated battle damage and casualties for "blackened hulks and broken bodies." There are many answers to this commander's question; however, most rotational BCs focus on battalion or fire supporters when asked to explain why things went wrong. This article focuses on the battery—problems a BC can solve.

A Battery Problem

Most BCs don't have the tools to effectively and efficiently translate the battalion FA support plan (FASP) for their subordinates. Like our maneuver brethren, they need an orders process.

Unfortunately, FA battery doctrine as outlined in *FM 6-50 Tactics, Techniques and Procedures [TTP] for the Cannon Battery* doesn't address battery orders; it focuses solely on a battery movement order. While helpful, the movement order alone fails to provide battery leaders the TTP to get the right information to the right people at the right time.

As a result, batteries make poor use of limited time and BCs issue unfocused "one-over-the-world" orders or read the battalion order verbatim. Sections wait for hours doing little and then rush to prepare after the commander issues the battery order. Critical battery missions fail because key rehearsals and inspections

are rushed or not conducted.

To understand the problem from the BC's perspective, let's review his actions in the scenario in the hours leading up to the catastrophic battle. At 1500 hours yesterday, the BC received the battalion FASP briefing. Earlier that morning, he had received a warning order (WARNO) describing the FA battalion mission to support a deliberate attack. Other than mentioning to his platoon leaders that a new mission was coming, he had taken no other action.

As he left the FASP briefing at 1630 to participate in the battalion rehearsal, he carefully stored his copy of the order and graphics in his high-mobility multipurpose wheeled vehicle (HMMWV) to ensure he didn't lose them. After returning to the battery area at 1830, he ate a quick dinner and sat down to prepare his order.

The BC briefed his order off his HMMWV at 2000, reading almost verbatim from the battalion order; his leaders struggled to follow along on their maps in the waning light. The platoon leaders kept their section chiefs for another 30 minutes, giving detailed movement orders.

The BC left with the advance party at 2130. He felt confident that his leaders knew how to get to the initial position and that they could recite the battalion's mission and critical fire support tasks (see Figure 1).

Mission: 1-1 FA (155 SP) provides direct support fires to 3-3 IN (Mech) attack in zone NLT 210500 Mar 95 to penetrate enemy main defensive positions.

Critical Fire Support Tasks:

- Destroy the enemy's CSOPs with CPHD prior to LD.
- Provide smoke to screen breaching operations.
- Provide SEAD missions for CAS and attack AV against enemy company strongpoints.
- Locate and neutralize enemy RAG.

Legend:

- SP = Self-Propelled
- CSOPs = Combat Security Outposts
- CPHD = Copperhead
- LD = Line of Departure
- SEAD = Suppression of Enemy Air Defenses
- CAS = Close Air Support
- AV = Aviation
- RAG = Regimental Artillery Group

Figure 1: Battalion's Mission Statement and Critical Fire Support Tasks

The battery occupied its initial position at 2230 and rapidly achieved firing capability. Each section established sectors of fire for direct fire and crew-served weapons and dug survivability positions. There had not been time to rehearse the reaction force and casualty evacuation plan or integrate the battery defense.

Not until midnight, five hours before crossing the line of departure (LD), did the BC begin to realize his battery was running out of time. Everything seemed to unravel as leaders tried to get ready for the mission. His fire direction officer (FDO) discovered the observer tasked to designate for the Copperhead mission was outside the 800-mil gun-target fan that supports engagement. The FDO also voiced a concern that there were not enough smoke rounds to support breaching operations.

The gun line tried frantically to redistribute ammunition and front-load the smoke rounds while fighting over the Copperhead trainer. The first sergeant had been out of position for more than an hour searching for the ammunition trucks with additional smoke rounds and fuel tankers to top off the battery vehicles before the 14-kilometer jump to the battery's subsequent position.

Despite all this effort by battery leaders and soldiers, the unit still failed in its mission to support the infantry—soldiers "died" unnecessarily. What could the BC have done to improve his battery's chances for success?

A Solution—Troop-Leading Procedures (TLP)

We can borrow the TLP outlined in *FM 71-123 Tactics and Techniques for Combined Arms Heavy Forces: Armored Brigade, Battalion/Task Force and Company/Team* (Page 1-11) and use it for battery TLP. The maneuver TLPs provide a framework to organize the BC's orders process.

The eight steps in the battery orders process listed in this article aren't necessarily performed sequentially; some occur simultaneously or can be executed out of order (see Figure 2). But the actions associated with each step can improve the BC's use of his time and the chances of his battery accomplishing its mission.

1. Receive the mission. The BC receives the mission via battalion order or a detailed WARNO.

- Conduct mission analysis. The BC identifies the essential tasks—also called critical fire support tasks—his battery must execute. A useful framework to define each critical fire support task is to identify the task, purpose, method and endstate for each task.

The result of mission analysis is a restated battery mission, the BC's intent and the tasks the battery must execute to accomplish the mission.

- Prioritize pre-combat checks (PCCs) and pre-combat inspections (PCIs). As the BC identifies the battery critical fire support tasks, he identifies PCCs and PCIs the battery must conduct to verify his unit is ready. A good unit standing operating procedure (SOP) will have PCCs and battle drills for each battery missionessential task list (METL) task and the collective tasks that support the unit's METL. Then, from this "menu" of drills or checks, the commander can prioritize those he wants done in a given situation.

The following are some examples of PCCs that might be included in the battery SOP: family of scatterable mines (FASCAM), Copperhead, smoke, deploy, artillery raid, mass fires, communications, fire direction center (FDC) and others. Threat-based PCCs could include air threat to position, air threat to movement,

mounted threat, etc.

- Make a tentative time line. Time analysis is another important part of receiving the mission. The BC must determine the time available and establish a time for key events, such as issuing the battery operations order (OPORD), movement and rehearsals.

2. Issue the WARNO. The BC can issue his detailed WARNO in any format. The classic five-paragraph format in the

1. Receive the mission.

- Conduct mission analysis—critical fire support tasks; task, purpose, method and endstate.
- Prioritize PCCs and PCIs.
- Make a time line.

2. Issue the warning order.

- Include the—
 - Battery mission with critical fire support tasks.
 - PCC and PCI priorities.
 - Time line.

3. Make a tentative plan.

- Include the—
 - Battery IPB.
 - METT-T considerations.
 - Critical logistics requirements.
 - Rehearsal plans.

4. Initiate movement.

- Perform PCCs and PCIs.
- Rehearse.
- Issue movement order.

5. Conduct reconnaissance.

- Establish/verify survey control.
- Conduct advance party operations.
- Continue to conduct PCIs, PCCs and rehearsals.

6. Complete the plan.

- Prepare the verbal order by—
 - Organizing, briefing and rehearsing the OPORD.
 - Using visuals (terrain board, sketch, overlays, etc.).

7. Issue the order.

- Focus on section chiefs.
- Be concise.
- Require back briefs.

8. Supervise.

- Perform final PCIs.
- Conduct battery rehearsals.
- Execute.

Legend:

- PCCs = Pre-Combat Checks
- PCIs = Pre-Combat Inspections
- IPB = Intelligence Preparation of the Battlefield
- METT-T = Mission, Enemy, Terrain, Troops and Time Available
- OPORD = Operations Order

Figure 2: Troop-Leading Procedures for the Battery Orders Process

OPORD works well. Also, you can easily modify the format in Appendix A of *FM 71-1 Tank and Infantry Combat Team* for artillery-specific considerations. But the format isn't as important as the information in it—the information must be clear and concise. Based on the scenario, an example of a battery WARNO in the five-paragraph format is shown in Figure 3.

If the BC in the scenario had sent his copy of the battalion order and graphics along with a WARNO back to the battery with his driver while he attended the battalion rehearsal, his unit could have used the time to begin preparing. With standard PCCs and battle drills in the unit SOP, a BC can communicate more efficiently what he wants the battery to accomplish. Likewise, his soldiers have the knowledge and confidence necessary to take action in his absence.

3. Make a tentative plan. While the battery uses the BC's WARNO and the

SOP to begin mission preparation, the BC must make a tentative plan. He should focus on detailing the method of accomplishing the critical fire support tasks he identified in mission analysis.

In the scenario, the BC identified the critical task to fire smoke to screen the breach. However, he didn't define the method sufficiently enough to accomplish the task. He failed to answer several specific questions: Where is the breach site? When (event) in the fight will the infantry breach the obstacle? Where does the battery need to be at this time (event)? How large an area needs to be screened and for how long? Which sections will fire the mission? As a result, the BC didn't calculate the number of smoke rounds needed and failed to distribute them in the battery in a timely manner. As the BC makes his plan, he must translate the battalion FASP requirements into battery tasks. He takes from the battalion order the essential information

the battery leaders and soldiers need to accomplish the battery's critical fire support tasks.

From the S2, the BC must demand "battery-level" intelligence preparation of the battlefield (IPB) information. He needs specific terrain analysis of proposed position areas and information about the enemy useful at the battery level. Similarly, BCs must get specific information from the S3 during the battalion FASP briefing.

There are many questions a BC must have answers to before he can plan a battery mission. If he leaves the battalion orders briefing without the answers, he can only blame himself. One technique to help a BC focus his information gathering is to develop specific checklists. For example, Figure 4 lists the questions the S2 can help answer and Figure 5 lists the questions the S3 can help answer.

4. Initiate movement. For the artillery battery, initiating movement may mean physically moving the battery or simply beginning combat preparations from the soldier to battery levels. For a physical movement, a unit can use the reconnaissance, selection and occupation of position (RSOP) procedures outlined in Chapter 2 of FM 6-50 to get the battery from point A to point B.

SOPs, PCCs, PCIs, battle drills and rehearsals allow the battery to "initiate movement" toward mission success, even before the final plan is decided or briefed. These tools facilitate simultaneous action by individuals, sections and leaders while the battery plan is being finalized.

The more the BC can focus and prioritize the section and battery efforts in his WARNO, the better the battery can initiate movement. At the section level, for example, just knowing the battalion will support a deliberate attack can key the section chief to begin movement PCCs, rehearse the occupation battle drill (hasty), the hipshoot battle drill and the section crew drill. The gunnery sergeant can begin advance party PCCs and rehearse hasty survey techniques.

The unit must anticipate and rehearse battery-level tasks before the plan is final. Based on the threat and time available, the battery can rehearse its casualty evacuation drill, reaction force drill and nuclear, biological and chemical (NBC) reaction team drill. Not using the WARNO, PCCs, PCIs and rehearsals often causes units to be overwhelmed as execution time approaches and to fail to accomplish their missions.

1. Situation:	
a. Enemy: 21st MRB defends vicinity of Leak Lake passes (grid 123456) in three company strongpoints. A CSOP is suspected vicinity of 120451. Primary threat to battery is air attack by Hind-D helicopters.	
b. Friendly: 1-1 FA provides direct support fires to 3-3 IN (Mech) attacks in zone NLT 210500 Mar 94 to penetrate enemy defensive positions.	
2. Mission: Battery B, 1-1 FA provides fires to support 3-3 IN (Mech) attack in zone NLT 210500 Mar 94 to penetrate enemy defensive positions.	
3. Execution:	
a. Battery critical fire support tasks:	
<ul style="list-style-type: none"> • Fire CPHD to destroy CSOP. • Provide back-up smoke (45 min) to Battery A. • Mass with the battalion on point of penetration. • Fire counterfire missions with the battalion. 	
b. Subunit Missions: 1st Sec and 5th Sec are priority CPHD shooters. 2d Plt is priority smoke shooter for the battery.	
c. Coordinating Instructions: (1) Air Threat PCC, (2) Hasty Occupation PCC, (3) CPHD PCC-FDC, Guns 1 & 5, (4) Smoke PCC and (5) Casualty Evacuation PCC.	
d. Time Line:	
<ul style="list-style-type: none"> • Battery PCCs - Now to 201930 • Advance Party/Recon - 201800 • Battery Order - 201915 • Main Body at Start Point - NET 202030 NLT 202130 • In position ready to fire in PA 2 - NLT 202300 • FA Tech Rehearsal - 202300 (FM FD4) • Brigade Fire Support Rehearsal - 202300 (FM CF1) • CPHD Observer-Gun Rehearsal - 210130 (FM FD1) • CPHD BCS Bump - 210200 	
4. Service Support: R ³ P en route to PA 2.	
5. Command and Signal: I will be at battalion rehearsal until 1800.	
Legend:	
MRB = Motorized Rifle Battalion	FD4 = Fire Direction Net 4
NET = Not Earlier Than	CF1 = Command Fire Net 1
PA 2 = Position Area 2	BCS = Battery Computer System
	R ³ P = Rearm, Refuel and Resupply Point

Figure 3: Example of a Battery Warning Order

5. Conduct reconnaissance. Depending on mission, enemy, terrain, troops and time available (METT-T), reconnaissance can be a simple map analysis combined with the battery IPB information gathered from the S2. Ideally, it consists of reconnoitering the ground, establishing and verifying survey control, preparing the position to receive the battery and developing the battery defensive plan. Coordination for survey, engineer support, route

security and targets and with initial adjacent units can be completed.

A detailed sketch of the reconnoitered position is very useful to brief the movement order and the occupation plan to the section chiefs. The sketch also helps the BC plan the defensive priorities with the first sergeant.

Accomplishing these tasks requires a well-trained advance party executing a well-rehearsed drill. Detailed PCCs for

each advance party position also can minimize problems caused by missing or inoperable equipment.

6. Complete the plan. As the maneuver brigade and the fire supporters rehearse and modify their plans, the BC may have to adjust his initial plan. In most cases, battery critical fire support tasks won't change, but the timing and location of the execution of those tasks might.

The BC incorporates these changes as well as those required as a result of his reconnaissance and completes his battery plan. An essential part of completing the plan is organizing the battery order and using as many visuals as possible to convey the information during the briefing.

•Organize the battery OPORD. The battery OPORD is the BC's tool to explain his plan to the battery. Because he issues a verbal order, the BC must organize the information and strip the order down to the essentials.

The five-paragraph order is a time-tested format that works. The BC should focus on the battery-level IPB, brief only essential battery tasks and address only non-SOP requirements. He can use the task-purpose-method-endstate as a format to brief the battery's critical fire support tasks.

•Use as many visuals as possible—for example, the actual position, a terrain board, sketch, overlay and map (listed in priority). Ideally, the BC would overlook the battlefield and brief the actual terrain. A terrain board or cartoon sketch is the next best tool. Because the battery OPORD is verbal, the BC should use visual aids to help convey the plan.

The BC can minimize the time required to prepare these tools if the battery operations center (BOC) or fire direction center (FDC) constructs them by SOP while he's still making his plan. If the BC (or his BOC) can't provide overlays and maps to each section chief, he might substitute sketch maps.

•Rehearse the briefing. The final requirement in completing the plan is to rehearse the briefing.

7. Issue the order. The BC should present the plan, focusing on section chiefs. He should be concise and not wander from his prepared notes. Finally, he must require all leaders to back brief him to ensure they understand his plan. If the chiefs don't understand the plan, the BC should rebrief the unclear issues.

8. Supervise. The BC or his representative supervises activities at all stages, but the following are several final activities.

Position Area Terrain and Weather Considerations

- Where are intervisibility lines?
- What is the slope, soil conditions and trafficability?
- Where can I best position observations posts?
- Are there site-to-crest or intervening crest problems?
- What is the percent of illumination and time of moon rise/set and the night-vision goggles (NVG) window?
- What is the precipitation, wind and temperature?

Enemy Considerations

- What is the primary enemy threat to the battery?
- If ground attack:
 - What type of ground forces?
 - What are the number and type of vehicles and weapons?
 - How will they find me/what are the avenues of approach?
 - What is their mission/how will they react to me?
 - When and where can I expect to see this threat?
- If air attack:
 - What are the type/number/capabilities of the aircraft?
 - Where are the likely air routes?
 - How will they find me?
 - What is their mission/how will they react to me?
- If counterbattery:
 - How will the enemy find the battery (direction finding, radar or observation)?
 - When in the battle will I be his priority target?
- Additional Questions:
 - When and where will the enemy use chemicals?
 - What type might he use with what effects?
 - What is my best defense against the chemicals?

Figure 4: From the S2—Battery FASP Questions Checklist

- What battalion critical fire support tasks are my responsibility (in priority)?
- Who is my backup/who do I back up?
- How much ammunition of what type/lot do I need to achieve effects?
- When and how will I get the ammunition?
- What are my observers' call signs and frequencies and ground/vehicular laser designator code (G/VLLDCO), observer locations and other information for special missions (OBCO) and backup observers?
- When will the task be executed/triggered/what is the frequency over which I'll be notified?
- Where are the positions I must fire from? Are they cleared?
- What units will be around me/what are their call signs, frequencies and actions?
- What is my movement priority/approved routes?
- What event triggers my movement?

Figure 5: From the S3-Battery FASP Questions Checklist

- Perform final PCIs. A BC or designated leader conducts a PCI to determine the unit's readiness to execute its tactical mission. The PCI serves several purposes. It allows the BC to check (personally or through his subordinates) that section actions are in accordance with his decisions or tactical SOPs.

The inspection also gives the BC a chance to exercise personal leadership. A commander should not underestimate the importance of talking with soldiers—demonstrating sincere concern for and reinforcing his confidence in them.

To be most effective and efficient, PCIs must be planned. Solid PCC checklists in a unit SOP provide a starting point—the BC only needs to decide who will check when and where. Regardless, a commander should never delay or artificially sequence combat preparations to meet PCIs. A BC must inspect as thoroughly as time allows and correct any deficiencies on the spot. (This information was adapted from FM 71-123, Pages 2-33 to 2-35.)

- Conduct battery rehearsals. Like PCIs, effective rehearsals set the conditions for the battery to accomplish its mission. METT-T dictates the type of rehearsal

conducted, but the closer the battery can replicate actual mission requirements, the better the results.

However, if the FDC doesn't have all the actual data from the position from which the battery will fire, rehearsing with an educated guess as to the deflection and range shifts is better than failing to rehearse. Just by setting off this best-guess data, Redlegs on the guns can anticipate needing alternate aiming reference points or the possibility that camouflage nets will interfere with the mission.

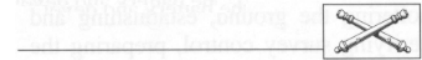
- Execute the mission. During execution, the BC must update his plan as the tactical situation changes. The battery can more easily handle changes to a base plan it understands well.

Troop leading procedures continue during execution as the mission changes or as the battery receives a new mission.

Conclusion

In battle after battle at the NTC, the opposing force (OPFOR) defeats blue force (BLUFOR) units. While there are many causes for BLUFOR losses, the BC can do his part to help the BLUFOR win by using the maneuver TLP adapted for the

battery orders process. These TTP don't guarantee victory for the BLUFOR, but they do provide the BC the tools to improve his battery's performance and its chances of success.



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Choosing the Hard Right Over the Easy Wrong

Welcome to the battalion, Lieutenant. Sit down. I want to explain my basic philosophy for making decisions. It will help you understand the way I think about things and keep you on the right track.

In most cases when you make a decision, you'll have two choices: an easy one and a hard one. The first choice will be easy to make and easy to get your subordinates to go along with. However, it usually will involve turning your back on something you shouldn't. The second choice will be harder. Sometimes people won't appreciate your decision because it may take them more time and effort to meet your standard and cause them some discomfort. But in the long run, the hard choice will be better for everyone.

The easy choice is rarely the right choice. One of the toughest decisions leaders have to make is where to set standards. We need to set high standards that force people to work hard

and push themselves. Too often, we think that "taking care of soldiers" means taking it easy on soldiers—that's not the case.

Let me give you an example. You're looking at your platoon's position and you see a soldier has spent a lot of time digging a foxhole. The hole is armpit deep and big enough for two people. It looks good and the soldier is getting ready to have an MRE [meals-ready-to-eat]. When you examine his field of fire, you realize he can't see most of his sector because he has dug the position in a bad place—10 yard behind where it should be. The tired, muddy soldier explains the section chief told him to dig the position there. The section chief tells you the gunnery sergeant said the position looked good a few minutes ago.

The easy choice is to keep on walking. Nobody else has noticed the problem, and if the gunnery sergeant approved the position, he may know something you don't. Besides, the soldier is worn out from digging the first

position, and the section chief and the gunnery sergeant will resent your making changes. After all, the position is only for training—no one is *really* going to attack. There seems to be little to gain and plenty to lose by making the soldier dig a new foxhole.

I want you to make the hard, right choice every time. It won't be easy, but I'm counting on you. If you don't make that soldier dig another fighting position, you have told him, the section chief, the gunnery sergeant and anyone else who comes by that you don't know a good position from a bad one—that you don't know how to take care of soldiers in combat. Or worse, you've told them you don't care whether your positions are good or bad.

You need to enforce high standards from your first day and choose the hard right over the easy wrong. It's what good leaders do.

Okay, Lieutenant—good luck and stay *Battle Ready!*

Selected FAOAC Leadership Vignette
CPT Brendan H. O'Malley, FA
Fire Control Officer
XVIII FA Brigade (Abn), Fort Bragg, NC

The Making of a Leader

Leaders aren't born, they're made. There are two ways to learn how to be a leader: through personal experience and from others.

Personal experience often means learning from your mistakes—a painful process. It's easier (and less embarrassing) to learn from someone else's mistakes. I've served with several outstanding officers and NCOs whose tales helped educate me on how to handle problems I could face as a leader. Here are nine maxims distilled from those experiences.

1. Train for combat, not just to standard. Several Vietnam veteran NCOs made this point and explained it like this. Sometimes we become so wrapped up in the process (training to standard) that we forget the end result of training. As leaders, we need to constantly remind ourselves of the burden of military leadership—that what we do or fail to do may result in the unnecessary death of one or more of our soldiers. Remembering the *why* of training makes it easier to focus on the *how* to train. Don't simply train to standard—train for combat.

2. Remember: you only have as much power over a soldier as he gives you. When a battery commander (BC) told me this, at first I thought he was crazy. He explained that there's a difference between authority and power. Authority comes from a society or institution (i.e., Congress granting commissions) and gives a person the ability to reward and punish others. Power, on the other hand, can only be granted by the individual. The authority figure can use punishment (Article 15s, Uniform Code of Military Justice, etc.) in an attempt to usurp power, forcing the individual to accept his authority.

Leadership is the process of convincing individuals to release some of their power and voluntarily acknowledge your authority. We call this "gaining soldiers' respect" or "loyalty." A good leader is successful in this process and acknowledges the individual's support with rewards (promotion, awards, etc.).

3. Rank is given, respect is earned. A prior-service cadet in my National

Guard unit was talking about what he intended to do after he was commissioned. Apparently, the sergeant major at his last post had chewed him out, and he wanted to return to the post, point to his "butter bars" and lock the sergeant major's heels.

At this point, his section chief asked him, "Yeah, but will he respect you?" The cadet nodded, "Sure. I'll be an officer!" The sergeant, who believes it's a NCO's responsibility to train junior officers, shook his head—"Respect has nothing to do with the rank on your collar. If you want his respect, you'll have to earn it. And from what I've just heard, you'll have to earn mine too."

4. The worst thing a soldier can do to you is follow your orders to the letter. A good leader should develop initiative in his subordinates and allow them to act independently, based on his guidance. He must show confidence in their abilities.

I remember a micromanaging commander on his way to staff call who made the mistake of giving his battery operations center this order: "Don't do anything until I get back." Needless to say, they didn't.

5. A request carries the same weight as an order. I learned this as a cadet. My section chief and I were discussing a second lieutenant who had little control over his section; the only time he gained results was when he gave a direct order.

The chief explained that there's a breaking-in period when the troops test the new officer's leadership ability. He explained the worst thing I could do was get into a "head-butting contest" where I had to make everything a direct order. It seems that human nature is such that you get greater results from a request than from a demand.

6. You'll fight the way you train. Even though I'd been told this, I didn't truly understand it until my unit landed in Dhahran, Saudi Arabia, in the middle of a Scud missile attack during the Gulf War. Someone yelled, "Gas!!"

and we did what we'd been trained to do—we evaluated our soldiers' masking procedures along with half the chain of command. Finally, it dawned on us that this was for real—then we masked up. Luckily it was a false alarm. Take it from experience, you *will* fight the way you train.

7. You're responsible for what your men do or fail to do. Too many leaders seem to forget their authority carries responsibilities as well. When a problem arises, a good leader says something like, "Sir, it's my fault. I didn't ensure that Private Smedlap was trained properly." The "chewing" may begin, but the leader will maintain the respect of his subordinates and superiors.

After all, if you don't accept responsibility for your failures, how can you expect your subordinate to accept responsibility for his?

8. Be receptive to "Let's go get a cup of coffee." This is a polite way for a subordinate to pull a leader to the side to save him from an embarrassing situation. I've never seen a leader lose respect as fast as when I watched an executive officer (XO) repeatedly ignore his fire direction center chief's suggestion to talk in private. (The executive officer had reversed the minimum quadrant elevation, or QE, and the chief was trying to correct it quietly.)

Instead, the XO refused to "get a cup of coffee" and then responded to the suggestion that his QE was reversed as if it were a threat to his authority. Because he wasn't receptive, the XO publicly demonstrated his poor technical knowledge and lack of leadership, resulting in his losing the respect of his soldiers. Eventually, he was removed from the position.

9. Don't let your boss have to say to you, "Show me—don't tell me." If the commander says this, you're definitely "behind the power curve." You should have been proactive instead of reactive.

Selected FAOAC Leadership Vignette
ILT Brian B. Smart, FA
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General (Retired) Glenn K. Otis, Former Commander of NATO's Central Army Group and Commander-in-Chief of US Army Europe

Ascendancy of Fires

The Evolution of the Combined Arms Team

Q In "Field Artillery Vision 2020" [by Brigadier General Leo J. Baxter, December 1994], we explore possibilities for maneuver and fires, both direct and indirect. As the Army develops *Crusader*, extended-range rockets and missiles, precision munitions along with the *Comanche* helicopter and *Tank 1080*, how do you see the combined arms team changing?

A I believe we're at the threshold of major change for the combined arms team—the ascendancy of fires. What that means is that we, as a nation, will fight conventional battles using firepower of all kinds from longer ranges, much of it indirect—not eyeball-to-eyeball using direct fire. We'll use long-range fires as the spearhead of the attack to the extent that the ground maneuver forces may only need to mop up after the fires. That's a totally different concept of operations. This concept aims at achieving decisive results while minimizing the usual high casualties of the direct fire battle.

As I see it, there are two reasons for this ascendancy of fires. One is that we have superior capability to locate the enemy forces with precision. The second is that we have now and are further developing artillery, precision munitions and associated systems to such an extent that we can devote more of our battlefield efforts to raining accurate—highly accurate—volumes of fire on the enemy. As another element of this capability, we have attack helicopters with great firepower and wonderful accuracy that provide both fires and movement, which are key to success in combat. Add to these fires the capability to integrate fires from fixed-wing aircraft and sea-based platforms, and it is easy to imagine the devastation possible when fires are orchestrated by a knowledgeable battlefield commander.

Q In your more than 35 years in the Army, how have you seen the combined arms team evolve?

A When I came in the Army in 1946, it was an Army of foot soldiers. When we started World War II, the normal employment of tanks in most of our forces (Patton's division was different) was to take a couple of tanks from an armor company and give them to an infantry platoon and so on until each infantry platoon or company had one to three tanks. We focused on the infantry and used tanks to support them—a totally wrong concept of employing armor.

By the end of World War II, we realized the tank was the mobile firing platform of shock action and the hallmark of ground combat capabilities. So it became the centerpiece of the combined arms team and our modern, mechanized Army.

Now, 50 years later, we're evolving into the next stage of combined arms wherein fires become the centerpiece. In this stage, ground movement (tanks and infantry) support fires instead of vice versa.

This concept has great impact on the artillery. The ascendancy of fires will demand highly accurate and timely knowledge of enemy locations through reconnaissance, surveillance and target acquisition and the ability to bring devastating fires to bear day, night or in bad weather or obscurations.

Let me give you an example of the impact of the change on the artillery at the micro-level. For years, the artillery has emphasized the capabilities of the forward observer to bring fires to bear for the frontline troops—and rightfully so. With the ascendancy of fires, if the artillery must emphasize the capabilities of the FO, then we've failed to destroy or neutralize the enemy *before* our ground maneuver forces make contact with him.

The long-range fires used to destroy or neutralize the enemy will come from multiple means: surface-to-surface assets, such as tube and rocket artillery; aircraft, both fixed wing and attack helicopters; UAVs (unmanned aerial vehicles) and other sources. The devastating effects of our precision-guided munitions with sub-munitions



(vehicle and anti-personnel) and mines will keep the enemy from moving.

Under those conditions, an enemy commander will find his options are few. No matter what he does, his forces will be subjected to heavy fires. Then our ground maneuver forces—tanks and infantry and, by the way, artillery and helicopters—can move in and complete the devastation, forcing the enemy to quit. The main objective in battle and the campaign is to make the enemy quit. It doesn't matter if he quits by surrendering, withdrawing or your killing him—just that he quits.

Now, I'm not saying we need to do away with tanks and infantry—far from it. But I am saying the focus of the combined arms team is evolving into another stage of development as it did in World War II.

With our knowledge base increasing, with artillery ascendancy in firepower and precision and with attack helicopter mobility—a third dimension—and great accuracy, we have a new era.

Now that's a quick explanation of what I believe to be the ascendancy of fires on the combined arms team. And the Field Artillery sits right in the middle of it for the next two or three decades.

Q What impact do you see this ascendancy of fires having on the organization and employment of Field Artillery?



A Organizationally, we'll see more artillery per unit of force than we've had in the past. Such recommendations have already started. In the recent past, we've had three direct support battalions in an Army division. Then we've had a corps artillery of so many artillery groups or brigades and so on. In the future, we'll see more artillery in the force at all levels. And we might consider artillery divisions—I suggested that in 1986.

Why have an artillery division? As I see it, we fight artillery and other weapons, essentially, by battalions because the battalion is the largest organization that has a single weapon system. So the question is, if the evolving concept requires more artillery battalions, how do you command and control those battalions? If the increase in artillery turns out to be several brigades that can fall under a corps artillery, then fine. If the increase is considerably more and we need an artillery division for command and control, then we ought to have one. The idea is to create the command and control organization for the number of battalions we need. So we create an artillery division *if* the size of the artillery force calls for it.

We'll employ Field Artillery differently in the primacy of fires concept. The fundamental tenet of the construct is that we *not* expose our forces to enemy fires any more than we have to. The construct says, "I'm going to fight the enemy by fire first and then by movement and fire." So our firers must get within range to hit the enemy while non-firers are out of the enemy's range. The logical conclusion is that artillery will move to where it can bring fires to bear on enemy targets.

You'll notice that when I talk about moving the artillery to range targets, I don't talk about crossing the "FLOT" [forward line of own troops]—nor will I because there won't be a FLOT in Force XXI. The language of FLOT envisions lines. *TRADOC [Training and Doctrine Command] Pam 525-5 Force XXI Operations* says there aren't going to be lines. I agree with that.

The juxtapositioning of artillery and ground maneuver forces is going to be very different in the future. On occasion, our indirect fire forces will be closer to the enemy than our ground maneuver forces will be. (I don't visualize a forward and rear in nonlinear operations.) We'll position artillery so it can fire on the main enemy forces. If those positions are in

“ If you put superior firepower on the enemy and maintain freedom of movement to position your troops advantageously, you win. ”

danger of being attacked by smaller enemy ground elements, then ground maneuver forces will support indirect fires, the centerpiece of the future battlefield.

But when it comes time for the ground maneuver forces to move in, then they become the center of the battle and the artillery and other indirect fire assets support them.

Q *As a unit commander through the division level and a combat veteran, what lessons have you learned that apply in warfare today?*

A In all wars, there are some basic requirements for success—enduring lessons of combat. First you must have knowledge superior to your adversary. You must know more about him—what he's doing when and how—than he knows about you.

Superior knowledge is a tremendous advantage at any level of combat in any war. At the squad level, if you can see the enemy, his positions, and can count him while he can't see or count you, you have superior knowledge.

At each level of command, the specifics of the information needed are different, but the descriptors are the same. You need to know where the enemy is, what he's doing and in what strength, and you need to know that information faster and more accurately than he knows it about you.

Part of having superior knowledge is knowing that same information about your own forces. You might think perhaps that's a trivial statement—knowing where your forces are. But that's not true. Even a squad leader with, say, nine soldiers scattered out in positions can lose track of one and cause a disaster in the squad.

The Army is working to ensure we have superior knowledge. Our leaders understand that digitization, that information flow and the ability to integrate information, is key to any future endeavor. In terms of reconnaissance, surveillance, target acquisition, situational awareness during battles, logistical resupply and command and control, digitization will greatly enhance the Army's capabilities.

The next requirement for success in combat is having superior fire and movement. If you put superior firepower on the enemy and maintain freedom of movement to position your troops advantageously, you win. Your fire prevents the enemy from moving freely while you fire and move on the enemy freely. Of course, the development of these capabilities has led to the ascendancy of fires.

Now, that's a very simple explanation of the key requirements for winning in combat, which, by the way, is very difficult to do.

Q *What message would you like to send Field Artillerymen stationed worldwide?*

A A message I've been sending for the past 30 years—that is, in all of modern warfare, the biggest killer on the battlefield has always been the artillery. I only see the role of artillery ascending.

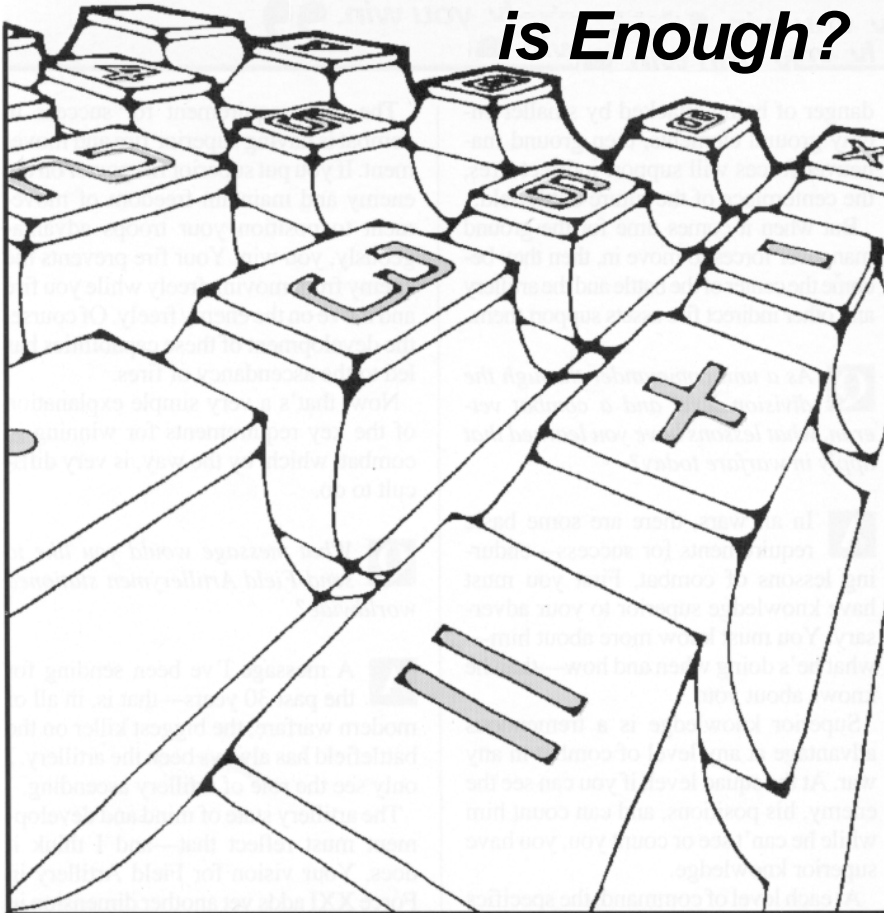
The artillery state of mind and development must reflect that—and I think it does. Your vision for Field Artillery in Force XXI adds yet another dimension in capabilities to ensure you can rain great volumes of long-range, precise fires on the enemy with devastating effects.



General Glenn K. Otis retired from the Army in 1988 after serving as Commanding General (CG) of the NATO Central Army Group and Commander-in-Chief of US Army Europe. He also served as CG of the Training and Doctrine Command (TRADOC) with its headquarters at Fort Monroe, Virginia; Deputy Commander of the Army's Combat Development Activity, Fort Leavenworth, Kansas; Deputy Commander of the Armor Center at Fort Knox, Kentucky; and the Army's Deputy Chief of Staff for Operations and Plans at the Pentagon. General Otis commanded the 1st Armored Division in Germany and the 3d Squadron, 4th Cavalry Regiment of the 25th Infantry Division in Vietnam.

Army Science Board Study:

How Much Field Artillery is Enough?



by John J. Todd and Lieutenant Colonel James M. Holt

How much artillery does the Army need? Have we taken too much out of the force? If we do need more, how will this high-priority force structure be resourced?

During the past year, the Army Science Board has been studying these and other questions relating to Field Artillery (FA) force structure sufficiency. Many of you have provided input through interviews, modeling analysis, briefings and other means during our research of this vital topic.

It's important the fire support community understand the background, premise, study approach and the results of this analytical effort. You then will understand how this study influenced the Army's recent decision to change the force allocation rule from one to two FA brigades per maneuver division in the 10-division force.

What is the Army Science Board and Why the Study?

The Army Science Board is a Federal Advisory Committee organized under the Federal Advisory Committee Act and currently consists of nearly 100 members appointed by the Secretary of the Army.¹ Each member is selected based on unique educational skills or professional experience from industry, academia, non-Department of Defense government agencies and the private sector. The members are volunteers and normally serve on the board for two to six years.

The first step in an Army Science Board study is for a sponsor to prepare a detailed description of the problem, referred to as

the "terms of reference." Based on this document, a panel of members with the appropriate experience or background is commissioned to study the problem. The panel convenes and travels as frequently as necessary to study the problem, develop conclusions and make recommendations to the Army leadership.

On 2 November 1993, the Army Assistant Deputy Chief of Staff for Operations and Plans-Force Development, then Major General Jay M. Garner, sponsored the study on FA force structure.² The need for the study was strongly endorsed by Lieutenant General Ronald H. Griffith, the Army's Inspector General.

As the Commanding General of the 1st Armored Division, during Operation Desert Storm, General Griffith was concerned by the ratio of US versus Iraqi artillery and the potential adverse outcome the ratio could have had on his force and mission. On the basis of his and other senior leaders' concerns, the Army Science Board chartered the ad hoc panel to study FA force structure.

The panel was comprised of nine members who had expertise in operations research and senior management or were retired Army senior leaders.³ Given the number of military and civilian groups interested in the topic, the study sponsor was careful to select highly qualified analysts with no vested interest in the outcome to serve as panel members on a "pro bono" basis. These criteria promoted objectivity and the study's resulting in an achievable outcome.

What was the Study's Objective?

The objective of the study was to determine FA force structure sufficiency for the 10-division force in FY 96. Questions asked in the sponsor's terms of reference for the study provided the bounds for the panel's investigation. The following three questions required answers:

1. Do we have enough artillery to accomplish our National Military Strategy?
2. If we need more artillery, how should it be resourced and what is the correct balance of Active Component (AC) and Reserve Component (RC) artillery?
3. Can we improve our application of artillery based on other armies' experiences (German, French, Russian, Israeli, etc.)?

A key requirement identified early in the study was the importance of investigating artillery issues not only by looking at the number of artillery pieces or artillerymen

available, but also at artillery as a system of systems. Specifically, we wanted to learn as much as possible about target acquisition; command, control communications and intelligence (C³I); logistics; and the weapons systems that make up the entire fire support battlefield operating system (BOS). The emphasis of the study was on the mechanized force.

The FY 96 time frame was selected fully recognizing that future hardware systems—such as Crusader (the advanced Field Artillery system) and improved target acquisition and munitions systems—would produce a fundamentally different outcome. However, providing near-term solutions was considered imperative.

The study was based on following premise:

- The Army has insufficient artillery force structure because of a constrained requirements process (i.e., Army end strength and Total Army Analysis, called the TAA process).

- The Army National Guard (ARNG) has significant maneuver structure not required for the Defense Planning Guidance scenario of two major regional contingencies (MRCs).

- Single-function organizations, such as artillery, are easier to train than the multiple-function maneuver units. Artillery skills are more of a science when compared to the art of maneuver synchronization in combat.

- The ARNG demonstrated its ability to contribute artillery during Operation Desert Storm. With a programmed end strength of 367,000, the ARNG has sufficient structure to support a significant amount of artillery.

- Close air support (CAS) may not be available in the quantities needed in the future, requiring our forces to rely on artillery to service a higher density of targets.

What was the Study Methodology?

The panel spent the first few months receiving detailed briefings on the entire spectrum of the fire support system and conducting interviews with active and retired Army leaders.⁴ This process ensured all members had the most current information on our National Military Strategy and FA structure and systems. Basically, the study included three research methodologies.

Step 1: Conduct interviews. The first segment of the study included data gathering at various military installations

and interviewing experienced senior officers and officials. The interviews were designed to add experience-based, subjective credibility to balance the objectivity of the modeling analysis (Step 3). These discussions also served as a forum to talk about the study premise, learn about new ideas in artillery force structure, validate the study methodology and, finally, inform the Army about the study. The spectrum of experience was wide in the list of 77 interviewees, including all Operation Desert Storm major force commanders.⁵

With the assistance of the Army Personnel Survey Office of the Army Research Institute for Behavioral and Social Sciences of Alexandria, Virginia, we developed a survey on the study issues. In most cases, this survey was used simply as an outline for discussion, but some chose to answer all 27 questions. The questions were divided into core categories: the sufficiency of artillery available (Gulf War and other experiences); doctrinal organization; RC capabilities; foreign artillery capabilities applicability to US force structure; and innovative ideas to make our artillery more effective.

To ensure the interviewees were candid, we maintained a strict policy of non-attribution for all comments, which, based on the responses, was effective.

Step 2: Study other armies. Two members of the panel examined foreign artillery in terms of force structure, doctrine and operations to determine if there were lessons we could learn. They read extensively researched materials on both historical and modern-day artillery and received briefings from the Army's Deputy Chief of Staff for Intelligence and Intelligence Threat Analysis Center, both in Washington, DC, and the Foreign Science and Technology Center of Charlottesville, Virginia. Additional information pertaining to foreign artillery surfaced during some of the interviews.

Step 3: Conduct modeling analysis. This third and final step in the study was the most time-consuming and detailed. The panel agreed to run a series of force structure alternatives through Army-approved combat effectiveness models. These models would objectively compare the alternatives and provide statistical data on the comparisons. The purpose of the analysis was to answer the question. How will additional artillery force structure contribute to the performance of US forces deployed to a major regional contingency?

Three models were selected. First, the Vector-in-Commander (VIC) combat

model was used to evaluate force effectiveness at the corps level by the Training and Doctrine Command (TRADOC) Analysis Center at Fort Leavenworth, Kansas. This model provides a balanced representation of major force elements (down to the battalion level) in a tactical campaign with a US Army corps operating in a theater of operations.

The next model, used by the Field Artillery School's Directorate of Combat Developments at Fort Sill, Oklahoma, was the Target Acquisition and Fire Support Model (TAFSM). This medium-to high-resolution model measures the effectiveness of the fire support system, including target acquisition, command and control and firing unit processes. The maneuver unit movement and formations in the model are based on doctrine, tactics and scenarios provided by the TRADOC Analysis Center.

The third model used to support the panel's analysis was the Force Analysis Simulation of Theater Administrative and Logistic Support (FASTALS). This theater-level model run by the Concepts Analysis Agency, Bethesda, Maryland, provides answers on how much combat support/combat service support (CS/CSS) force structure would be needed as FA force structure alternatives are explored. In the case of this study, FASTALS defined the increased CS/CSS force structure by comparing two FA brigades to one.

The reason for choosing these models in lieu of other military or civilian models was that they are Army- and Office of the Secretary of Defense-approved and used for most force-on-force cost and operational effectiveness analyses.

The TRADOC-approved scenarios used for these model analyses were based on two nearly simultaneous major regional contingencies with a 1996-equipped US force combating a 1996 threat force. Three of the four scenarios involved Northeast Asia (NEA): defensive with a division (-), offensive with a corps attacking and a sensitivity analysis assuming reduced US Air Force support levels. The fourth scenario was based in Southwest Asia (SWA) with a corps involved in decisive offensive operations. Using these scenarios, the operational effectiveness of various force structure alternatives as well as the interactions of CAS, attack helicopter and artillery fire support in the corps battle were evaluated.

For the VIC model, three alternatives were run for each scenario. The alternatives were the Base Case (the division artillery plus one modernized FA brigade),

Alternative 1 (a division artillery only) and Alternative 3 (the division artillery plus two modernized FA brigades). Additionally, TAFSM modeling of alternatives listed in Figure 1 was run using the NEA defensive scenario. The NEA scenario was the most demanding of the scenarios modeled and provided insights into alternatives for constructing force structure at the brigade level and below.

What were the Study Results?

The interviews validated many perceptions long discussed in the Army. There was the obvious finding that more rocket and cannon artillery is needed and provides more favorable battle results. Should the Army get more, the ARNG emerged as the component of choice in which to add more general support (GS) artillery structure.

Given the GS mission focus on

supporting or reinforcing fires as opposed to the direct support (DS) mission requiring detailed fire support coordination with the supported force, it's more likely the ARNG can retain an acceptable level of proficiency in 39 days of training per year. The additional units in the ARNG also would become more relevant in contingency operations, based on the fact they'd require shorter train-up following mobilization.

The two ARNG FA brigades in Desert Storm—142d FA Brigade from Arkansas and 196th FA Brigade from Tennessee—proved they could fire with the best. The study found the ARNG's ability to provide GS fires significantly enhances the Army and should be expanded.

Additional findings reinforced the need for modernized fire support vehicles and more Firefinder radars. Specific comments about the ARNG reinforced the need for a distributed learning capability and that Field Artillery units need training alignments with active

divisions or corps.

An interesting proposition that evolved as a spin-off from discussions on forming "Artillery Divisions" is an idea of forming a "division" of FA brigades and other relevant brigade-sized units. This organization would be designed for administrative and peacetime management. It might include artillery, transportation, engineer, aviation and infantry brigade-sized units.

The results of the Army Science Board's effort to learn significant force structure and doctrine lessons from foreign countries was inconclusive. Most often, the panel found other nations embraced US doctrine and were trying to field units with the capabilities of our Army.

We did learn of an effort at Forces Command to explore a reconnaissance-fire complex based on a Soviet-era organization. This ad hoc organization, known as a reconnaissance-strike complex, would be optimized to rapidly win by quickly

Alternatives	Div Arty		Corps FA Bde			
	M109A6 Bn	MLRS Btry	M109A6 Bn	M109A5 Bn	M109A3 Bn	MLRS Bn
Base Case Div Arty + 1 Mod Bde	●●●	●		●		●●
Alternative 1 Div Arty Only	●●●	●				
Alternative 2 Div Arty + 2x9 MLRS Bn (No Corps FA Bde)	●●●	●●				
Alternative 3 Div Arty + 2 Mod Bdes	●●●	●		●●		●●●●
Alternative 4* Div Arty + 1 NF Mod Bde	●●●	●		●	●●	
Alternative 5 Div Arty + 1 Mod Bde + 1 NF Mod Bde	●●●	●		●●	●●	●●
Alternative 6* Div Arty + 2 NF Mod Bdes	●●●	●		●●	●●●●	
Alternative 7* Div Arty + 1 Mod Bde + 2x9 MLRS Bn	●●●	●●		●		●●
Alternative 8* Div Arty + 3x9 MLRS Bn (No Corps FA Bde)	●●●	●●●				
Alternative 9* Div Arty + 1 Mod Bde + 3x9 Bn	●●●	●●●		●		●●
Alternative 10* Div Arty + Paladin Bde	●●●	●	●●●			

Legend:	Mod = Modernized	Bde = Brigade	Btry = Battery
	NF Mod = Not Fully Modernized	MLRS = Multiple-Launch Rocket System	
	Div Arty = Division Artillery	Bn = Battalion	*FA School Excursions

Figure 1: FA Force Structure Alternatives for Divisions. The Army Science Board study modeled combinations of these alternatives in scenarios to evaluate their operational effectiveness and interaction with close air support (CAS), attack helicopters and artillery fire support.

finding and destroying key targets using automated C³I systems that immediately link sensors to shooters.

Additionally, interviewees commented on the Russians' surprise at the small amount of artillery support in the US Army. Interviewees reported that senior Russian military leaders visiting Fort Leavenworth did not realize that the level of artillery support indigenous to our combat units was so low.

So how much artillery is enough? The analysis conducted by the TRADOC Analysis Center and Fort Sill tell us that significant value is added by increasing the allocation rule from one FA brigade to two. The opposite is also true—that is by running the models *without* the FA brigade we're now allocated in our force structure, the division artilleries generally don't have enough firepower to win in either offensive or defensive engagements.

Figure 2 shows VIC model results from three of the four scenarios with several force structure alternatives expressed in terms of normalized loss exchange ratios (LERs) for both troops and systems. LER

is a measure of effectiveness used in evaluating modeling; it is calculated by taking the total number of red force troops/systems (tanks, armored fighting vehicles, artillery pieces and helicopters) lost and dividing them by the total number of blue force troops/systems lost. Therefore, the higher the percentage (bars) in the graphs, the fewer the losses and the better the

alternative fared in the scenario. For security reasons, the actual ratios are normalized with the status quo (Base Case) set at 1 (100 percent) for comparison with the other force structure alternatives.

Figure 3 shows the number of friendly casualties (combat branch soldiers only) that resulted from the three alternatives run in VIC using the three scenarios. Again,

Scenarios	(Div Arty Only) (Alternative 1)	Div Arty + 1 Mod FA Bde (Base Case)	Div Arty + 2 Mod FA Bdes (Alternative 3)
SWA Corps Attack	1,746 More	X	215 Less
NEA Division (-) Defense	1,110 More	X	328 Less
NEA Corps Attack	780 More	X	2,650 Less

Figure 3: Friendly Casualties—Combat Branch Soldiers Only. This figure shows the number of friendly casualties that resulted from the three alternatives modeled in VIC using three scenarios. The chart is normalized with the Base Case set as a constant number ("x") for comparison. The number of friendly casualties increases significantly when you take the FA brigade out of the Base Case and decreases dramatically when you add an FA brigade to the one in the Base Case.

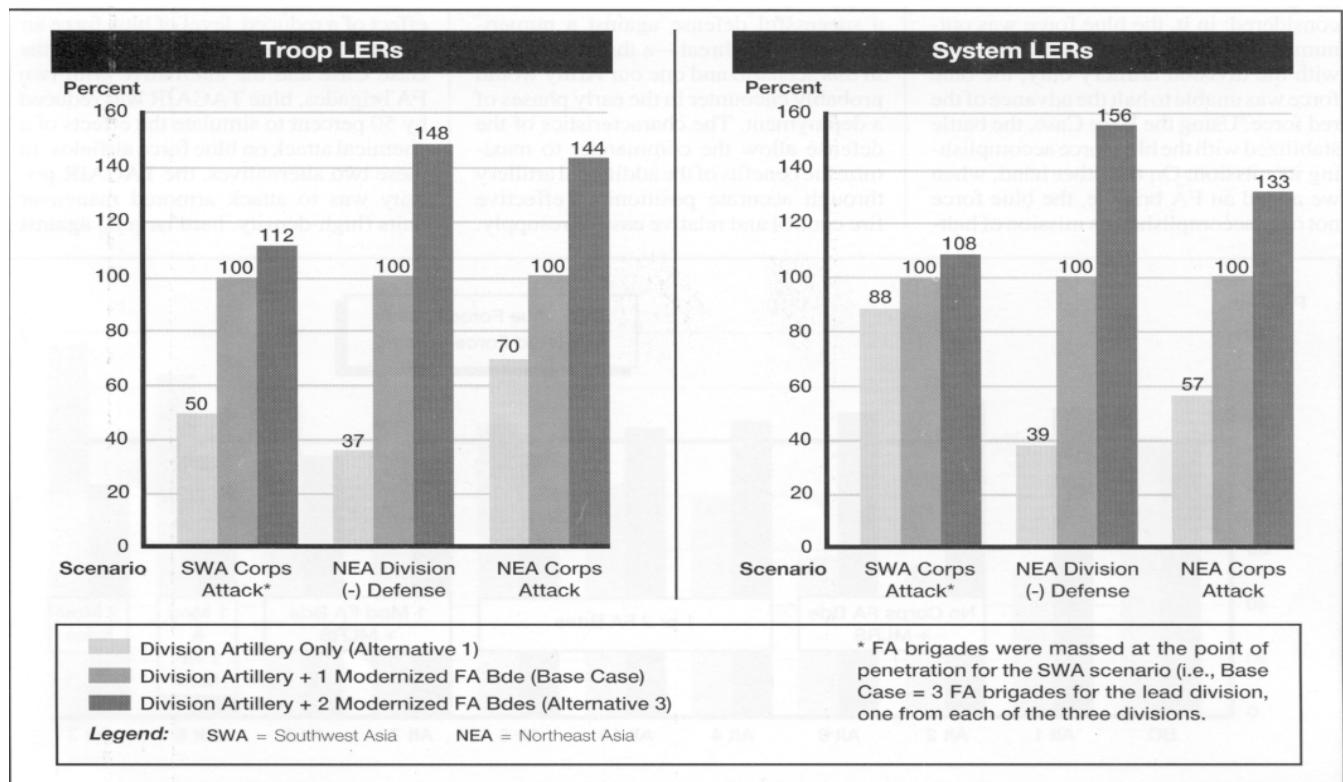


Figure 2: Normalized Loss Exchange Ratios (LERs) for Troops and Systems. The LERs for three of the alternatives modeled in TAFSM using three of the scenarios are shown in the troop and systems bar graphs. The higher the percentages (bars) in the graphs, the fewer the losses and the better the alternative fared in the scenario.

the chart is normalized with the Base Case set at a constant number ("x") for comparison. The number of friendly casualties increases significantly when you take the FA brigade out of the Base Case and decreases dramatically when you add an FA brigade to the one in the Base Case.

SWA Corps Attack. In this scenario of decisive operations, the models validated the need to mass the corps artillery to achieve a breakthrough. (This mirrored the successful 1st Infantry Division operations in Desert Storm.) However, the need to mass the corps artillery at the point of penetration exposed the other maneuver divisions to the risk of increased troop losses.

Fixed-and rotary-winged aircraft helped protect the exposed forces significantly. But aircraft can't fly in all weather conditions, and as we learned in Desert Storm and other wars, you can't control the weather. More importantly, these systems are complementary, not mutually exclusive.

NEA Division (-) Defense. This was by far the most stressful of the scenarios considered; in it, the blue force was outnumbered significantly. In the alternative with the division artillery only, the blue force was unable to halt the advance of the red force. Using the Base Case, the battle stabilized with the blue force accomplishing its mission. On the other hand, when we added an FA brigade, the blue force not only accomplished its mission of halting the

red force, but also had sufficient combat firepower left for follow-on missions and sustained fewer casualties.

In Figure 2, the LERs for the Base Case in the NEA division scenario are 63 percent higher for troops and 61 percent higher for systems than the LERs using a division artillery only. However, when you add a reinforcing FA brigade to the Base Case, the LER for troops improves by 48 percent over the Base Case and by 56 percent for systems.

A review of the TAFSM model findings in Figure 4 indicates that different brigade-level force structures and levels of modernization provide results similar to those shown in Figures 2 and 3. In Figure 4, the data also is normalized with the blue and red forces' losses for the Base Case the point of departure for comparing the 10 alternatives. The TAFSM modeling of the 10 alternatives using the NEA defensive scenario clearly shows the value of adding a reinforcing artillery brigade to the division.

In both the VIC and TAFSM models, the addition of a second reinforcing FA brigade appears to be critical to ensuring a successful defense against a numerically superior threat—a threat portrayed in this scenario and one our Army would probably encounter in the early phases of a deployment. The characteristics of the defense allow the commander to maximize the benefits of the additional artillery through accurate positioning, effective fire control and relative ease of resupply.

NEA Corps Attack. In the offensive scenario, the blue force isn't outnumbered. Using the division artillery only, the blue force was unable to accomplish its mission—in fact, it stalled before it could defeat the red force operational strategic reserve. In the Base case, the blue force accomplished its mission of destroying the red force strategic reserve, but it took high losses from the red force reserve. Using an additional FA brigade in the same scenario, the blue force decisively defeated both the operational and strategic reserve.

The normalized LERs in Figure 2 for the NEA Corps Attack show the significant differences among the three cases. The Base Case LERs are 30 percent higher for troops and 43 percent higher for systems than the alternative without an FA brigade. The alternative with two modernized reinforcing FA brigades has a troop LER 44 percent higher than the Base Case and a system LER 33 percent higher than the Base Case.

Tactical Air (TACAIR) Sensitivity Analysis. This variation to the NEA Corps Attack scenario was used to evaluate the effect of a reduced level of blue force air support on some alternatives. For both the Base Case and the alternative with two FA brigades, blue TACAIR was reduced by 50 percent to simulate the effects of a chemical attack on blue force airfields. In these two alternatives, the TACAIR priority was to attack armored maneuver units (high-density, hard targets) against

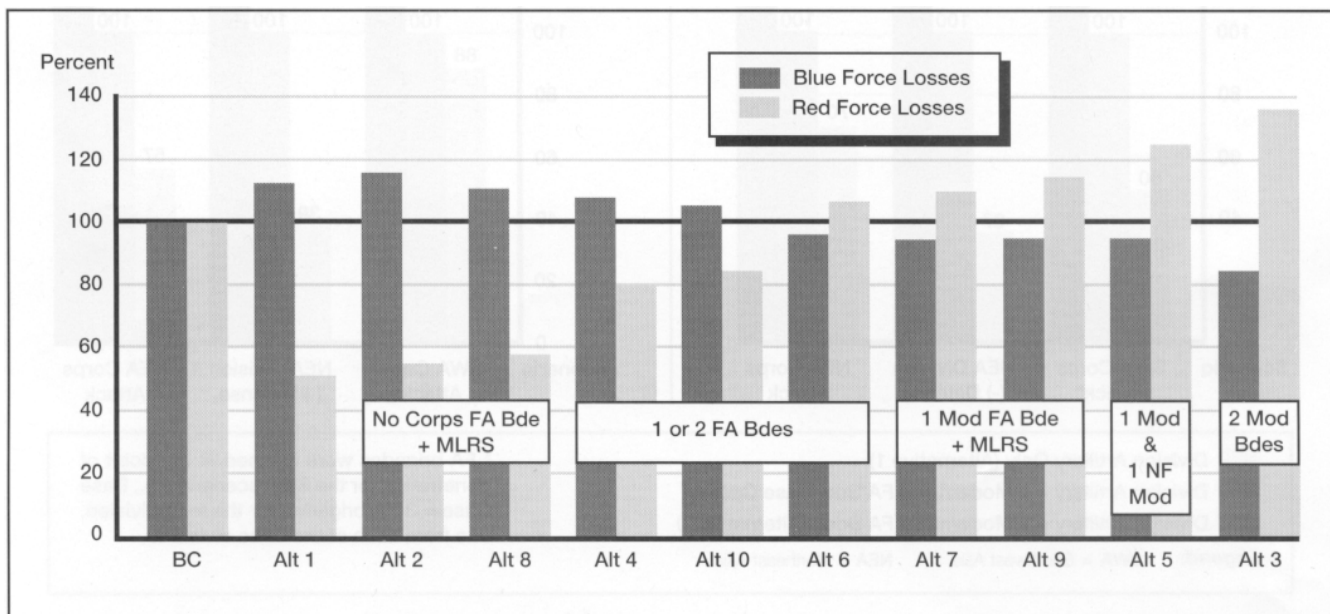


Figure 4: System Losses of All Alternatives in the NEA Division (-) Defense Scenario. This figure compares the blue and red forces' system losses of the 10 FA force structure alternatives modeled in TAFSM. Note the steady rise in red force losses from left to right, moving from Alternative 1 to Alternative 3. Conversely, note the decrease in blue force system losses when moving from the Alternative 1 to Alternative 3.

which fixed-wing assets are very effective. With the TACAIR priority on maneuver units, the 50 percent reduction in sorties primarily affected the ability to kill the red artillery systems.

Total red force losses due to attack air decreased by 27 percent in the Base Case and decreased by 20 percent when using the alternative with a second FA brigade. Red force artillery losses decreased by 40 and 55 percent for the Base Case and the additional FA brigade, respectively. In this TACAIR variation, we learned that regardless of the level of fixed-wing support, operations with a second reinforcing FA brigade are significantly more effective over operations with the Base Case.

Blue TACAIR kills were predominantly armored combat vehicles and long-range artillery. The blue force artillery (circa FY 96) lacked the range and smart munitions suite necessary to engage these targets. Therefore, TACAIR and the FA weren't competing for or trading targets—they attacked different target sets.

CS/CSS Requirements. The Concepts Analysis Agency FASTALS study resulted in a requirement for an increase of 11,262 CS/CSS spaces Army-wide to support 10 additional FA brigades for the 10 divisions. That amounts to about one percent of the Total Army. Predominately, the increase includes additional engineer, maintenance, ordnance, supply and transportation units.

The increase in Field Artillery personnel spaces required for the 10 additional FA brigades is 18,544—less than two percent of the Total Army. With the increase in firepower—a significant combat multiplier—and a decrease in US military casualties, the increase in spaces is a small price to pay.

The additional CS/CSS units primarily would be in the RC (Army Reserve and

National Guard) and, like the additional FA brigades, would require an offsetting decrement in some less critical existing structure.

The Bottom Line

So here is what we learned. The Army must depend on ARNG artillery to fight in major regional contingencies. With roughly half of the Army's artillery in the Guard now (soon to be two-thirds), we'll *have* to use ARNG artillery during the next major regional conflict.

When you add up all the FA brigade requirements for two per division and one for each corps (already an allocation), the Army needs 24 FA brigades. We soon will have only seven in the AC. This means the Army will have to resource about 17 FA brigades in the ARNG. The good news is we have 17 FA brigades in the RC now. More than half of these brigades probably would have inactivated if the study hadn't validated an absolute requirement for them during the Total Army Analysis process. With proper resourcing, these FA brigades can be ready to deploy quickly—probably quicker than the maneuver brigades in the ARNG.

Many senior Army AC and ARNG leaders told us the GS mission is appropriate and realistic, considering the FA skills required for GS versus the more complex fire support synchronization skills required for DS. They also told us we need to train the ARNG side-by-side with their affiliated divisions and corps in a manner similar to the old "round-out" concept.

Finally, we recognize the Army must pay a CS/CSS force structure bill in order to retain the FA force structure to meet the requirement for two FA brigades per division.

It's predictable the Army will need to

study other aspects of its force structure to determine relevance for the future. One could predict studies on both engineer and aviation force structures with, perhaps, results similar to those of the FA Force Structure Study. This process will ensure our force structure—AC and RC—is mission-focused and trained to win on the next battlefield as a leaner, more capable force projection Army.



John J. Todd was Chairman of the Army Science Board Panel to study Field Artillery Force Structure; he's Group Vice President at BDM Federal Group, Inc., responsible for BDM's National Security and Defense Business Group. He's also a former aviator and test pilot and, among other assignments, served in systems analysis positions with the Office of the Secretary of Defense and Army Staff at the Pentagon, retiring from the Army as a colonel in 1981. Before coming to BDM, he was Corporate Vice President for Business Planning and Analysis with Smith Industries and Aerospace Group. Among other awards, Colonel Todd received the Silver Star.

Lieutenant Colonel James M. Holt worked as a Staff Assistant with the Army Science Board Field Artillery Force Structure Study while serving as a Systems Integrator of the Fire Support Division in the Office of the Deputy Chief of Staff for Operations and Plans-Force Development at the Pentagon. Among other assignments, he was the S3 for the 1st Battalion, 5th Field Artillery of the 1st Infantry Division (Mechanized) Division during Operations Desert Shield and Storm. Lieutenant Colonel Holt commanded B Battery, 1st Battalion, 17th Field Artillery, 75th Field Artillery Brigade at Fort Sill, Oklahoma.

Notes:

1. The Director of the Army Science Board is Assistant Secretary of the Army for Research, Development and Acquisition, Mr. Gilbert Decker.
2. The current Assistant Deputy Chief of Staff for Operations and Plans-Force Development and sponsor of the Army Science Board Study on FA force structure is Major General Edward G. Anderson III.
3. The Army Science Board panel members who studied the FA force structure were the Chairman and co-author, John J. Todd; Dr. Joseph V. Braddock, Advisor to the President and Chief Executive Officer and Senior Fellow for Technology and Public Policy, BDM International, Inc., McLean, Virginia; Gary Diaz, Senior Vice President for Worldwide Product Development and Engineering, J.I. Case, Hinsdale, Illinois; Dr. Allen F. Grum, School of Engineering, Mercer University, Macon, Georgia; Dr. William R. Hamel, Senior Technical Advisor and Program Manager for Robotics and Process Systems Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee; Frederick E. Hartman, Executive Vice President, Applied Solutions International, Inc., Vienna, Virginia; Dr. Roger P. Heinisch, Vice President for Engineering, Alliant Techsystems, Hopkins, Minnesota; General Crosbie E. Saint, US Army Retired, President of Saint Enterprises, Alexandria, Virginia; and Dr. Marlin U. Thomas, Professor and Head of the School of Industrial Engineering, Purdue University, West Lafayette, Indiana.

4. The panel's travel itinerary included Headquarters, Forces Command, Fort McPherson, Georgia; Combined Arms Center and the Battle Command Training Program, Fort Leavenworth, Kansas; Field Artillery Center, Fort Sill, Oklahoma; III Corps, Fort Hood, Texas; 4th Infantry Division (Mechanized), Fort Carson, Colorado; Army Information Systems Command, Fort Huachuca, Arizona; Headquarters, Training and Doctrine Command, Fort Monroe, Virginia; Joint Readiness Training Center, Fort Polk, Louisiana; National Training Center, Fort Irwin, California; Army National Guard units in Utah, Wyoming and Virginia; and Concepts Analysis Agency, Bethesda, Maryland.
5. For the study, the panel interviewed active Army leaders, such as the Vice Chief of Staff of the Army and three theater Commanders-in-Chief (CINCs). Interviews also were conducted with all Operation Desert Storm major force commanders, including the commanders of CINC Central Command, both US corps, all maneuver divisions (including the 1st United Kingdom Armoured Division), a corps artillery, maneuver brigade, division artillery and several FA brigades. Additionally, the panel spoke with 16 retired generals ranging from a former Army Chief and Vice Chief of Staff, CINCs and corps and division commanders. Army National Guard leaders' input came from the National Guard Bureau Chief, the National Guard Deputy Director and more than 20 division artillery and FA brigade commanders. Finally, the panel interviewed key leaders at both the National Training Center and Joint Readiness Training Center.



Operation Uphold Democracy: The 10th Mountain Div Arty in Peace Operations

by Colonel Alfred A. Valenzuela and
Lieutenant Colonel Theodore S. Russell, Jr.

Peace operations in Haiti provided many challenges and opportunities for 10th Mountain Division (Light) Artillery (Div Arty) fire supporters from Fort Drum, New York. Like Operations Hurricane Andrew in Florida and Restore Hope in Somalia, Mountain Thunder fire supporters served in many traditional and nontraditional roles.

Success was due to our focus on training mission-essential tasks. Experience in three different operations other than war (OOTW) has validated that units that train to standard in their mission-essential task list (METL) while exposing soldiers and leaders to varying training conditions are fully prepared for OOTW. During annual combined arms training, we vary the conditions under which warfighting tasks are performed. Some examples include operating under restrictive rules of engagement (ROE), directing AC-130 aircraft in close to maneuver units, improving survivability and force protection by employing firebase operations, targeting hostile weapons in the close fight and clearing fires (direct, indirect and nonlethal) in urban areas.

Any changes in standards caused by units' changing training conditions must be clearly documented in their standing operating procedures (SOP). The article

"Marne Thunder: FA in OOTW and the Div Arty METL" by Colonel Keith W. Dayton and Lieutenant Colonel Richard P. Formica (February 1995) provides an excellent discussion on how to change the training conditions to prepare soldiers and units for OOTW contingencies.

This article discusses the traditional and nontraditional roles 10th Div Arty fire supporters played in Uphold Democracy and the lessons they learned while in Haiti.

Traditional Lessons

When the time came for initial entry operations in Haiti, our primary mission was to provide a safe and secure environment for Haitian citizens and ease the return of the democratically elected government. Initially, we didn't know if that mission would call for peacemaking, peace enforcement or a combination of both.

In OOTW, the destruction of enemy forces may not be the desired end state. Fire supporters must support the peace objective and, at the same time, protect the force. Due to ROE restricting collateral damage, Field Artillery fires may be prohibited—as was the case in Haiti. The requirement for direct, observed fires affected our choice of weapons. AC-130

gunships, attack helicopters, OH-58 helicopters and ground maneuver forces were employed to acquire high-payoff targets (HPTs). They also provided a show-of-force.

Like any OOTW, peace operations can rapidly deteriorate into combat. Therefore, targeting, counterfire operations and clearing fires in the close fight are all critical tasks fire supporters must be prepared to perform at any time.

Targeting. Most of the targeting in support of initial entry operations was accomplished by the XVIII Airborne Corps Joint Force Fire Coordination Center (JFFCC) before the introduction of ground forces.

Once in country, ground maneuver forces seized or secured most targets without using lethal fires. As operations continued, our joint task force (JTF) headquarters employed a targeting cell rather than a larger joint targeting board.

This targeting cell included representatives responsible for the target information collection and lethal and nonlethal attack of HPTs. The Army, Air Force and Marines were represented.

The *decide-detect-deliver-assess* targeting methodology was used to plan and execute strikes against the greatest threats to maintaining a safe and secure environment. Those threats included weapons and ammunition caches held by hostile or belligerent groups.

While the new *FM 6-20-10 The Targeting Process* describes specific procedures applicable to OOTW, we have several general observations about the targeting process in peace operations such as Uphold Democracy. First, the five targeting objectives described in our doctrine (limit, disrupt, delay, divert and destroy) apply in combat operations, but they may need to be modified for OOTW. Terms such as "locate," "seize," "deny" and "secure" describe appropriate measures of success in peace operations. Further, the attack systems to accomplish these targeting objectives may be selected from a wide range of conventional means, including special operating forces (SOF), psychological operations (PSYOP), infantry, military police (MP) or police monitors and electronic warfare (EW) systems. Fire supporters must be intimately involved in planning, coordinating and clearing fires for both lethal and nonlethal systems.

Second, target tracking is critical in supporting the targeting process. Although that's true in all targeting, in peace operations,

the commander's intent might be to "locate" and then "track" the target.

We used a variety of means to track targets; AC-130 gunships and attack aviation kept "eyes on" targets in areas of interest in which hostile weapons could shoot and quickly disappear. These systems also protected the force during security and convoy operations. The airborne reconnaissance low (ARL) aircraft was a particularly valuable sensor that could track targets in daylight because the threat to air operations was low. We also used counterintelligence (CI) teams to gather information and confirm, deny and track HPTs. Target tracking can become an important means of clearing fires in highly populated areas under restrictive ROE.

Finally, it's critical that all members of the targeting process understand the capabilities of target detection and attack systems. Joint and combined operations have large numbers of assets available, but tasking those assets and collecting target information is a time-consuming process. As HPTs in OOTW shoot and then move, sensors must quickly pass target intelligence horizontally and vertically throughout the force, providing commanders and staffs a relevant common picture.

In OOTW, some nontraditional players were members of the targeting effort, such as MPs, Staff Judge Advocate (SJA) and others. Fire supporters were critical facilitators during these OOTW targeting meetings. To assist in this process, we developed a sensor-to-shooter matrix (Figure 1) that listed all systems available to detect, track and attack targets. Using this matrix, the targeting cell determined the optimum sensor-to-shooter linkages, based on response time lines. But cell members had to understand the capabilities of the systems to use the matrix effectively. For example, some sensors can't track a target for long periods. Others take too much time to process information. By understanding the capabilities of the assets available, the targeting cell can use the matrix to nominate optimum sensors and attack means for each target.

Counterfire. *Joint Publication 1 Joint Warfare of the US Armed Forces* defines counterfire simply as "...fires intended to destroy or neutralize enemy weapons." During OOTW, fire supporters may have to think beyond the traditional counter-battery and countermortar techniques. In OOTW, threat assessments have revealed that hostile, indirect fires will most likely come from mortars that

lack any sophisticated fire control and can move quickly.

As we learned in Somalia, hostile, indirect fire weapons move shortly after delivering harassing fires. Acquiring and tracking these HPTs challenged us to employ the right sensor-to-shooter linkages. Responsive counterfire requires us to "see" and track the target, communicate the target information quickly to the right units and attack the target in accordance with the commander's intent.

An effective counterfire sensor was the AN/TPQ-36 Firefinder weapons locating radar. During Uphold Democracy, the Q-36 was initially positioned to protect base clusters around Port-au-Prince International Airport. Two radars were able to search most of the city. Communications links had to be established with attack aviation and ground maneuver units. The latter included MP and SOF units operating in sectors or at fixed sites.

Communications occurred on a voice counterfire coordination net. This net acted as a quick-fire channel to alert forces to hostile weapons firing and initiate a response by an appropriate attack system, such as Army aviation, AC-130s or maneuver elements operating near the origin

High-Value Target	Sensors										
	EPW Teams	CI Teams	LRSD	ARL	Guardrail	Q-36 Radar	Q-37 Radar	Sweitzer	UAV	Trojan Spirit	TRQ-32V
Weapons Cache	K	A K	A K	A K			K		K		
Ammo Storage	K	A K	A K	A K			K				
FS Weapons		A	A			A	A K				
Command Posts		A	A	A				A	A	A	A
Force Protection						A K	A K			K	
Civil (Crowds)	A	A		A K	A					K	
C ³ I	A K	A K	A K	A K			K	K	K	A	A
Mnvr Units	A	A	A	A K	K	K			K		
	AH-1	OH-58D	AC-130	SOF Teams	PSYOP (ALS)	PSYOP (TPTs)	CAS (5/Day)	EW	Mnvr Units		

Attack Systems		
Legend:	CI = Counterintelligence	Mnvr = Maneuver
A = Acquire	C ³ I = Command, Control, Communications and Intelligence	PSYOP (ALS) = Psychological Operations (Aerial Loud Speaker)
K = Attack	EPW = Enemy Prisoner of War	PSYOP (TPTs) = PSYOP (Tactical PSYOP Teams)
Ammo = Ammunition	EW = Electronic Warfare	SOF = Special Operations Forces
ARL = Airborne Reconnaissance Low (Aircraft)	FS = Fire Support	UAV = Unmanned Aerial Vehicle
CAS = Close Air Support	LRSD = Long-Range Surveillance Detachment	

Figure 1: Sensor/Attack Matrix. This matrix summarizes sensor and attack assets available. The information enables the targeting cell to determine optimum sensor-to-shooter linkages based on operational time lines. This matrix is a variation of the sensor-to-shooter matrix described in FM 6-20-10.

of hostile fires. We had to develop procedures for sensors and shooters to pass target information to each other before the target moved. Once we had eyes on the target, we could attack it with direct, observed fire or capture it with a ground maneuver element.

Our experiences during Operation Restore Hope in Somalia provided valuable insights on counterfire operations in OOTW. Fortunately, there were no recorded incidents of hostile fires by indirect weapons during peace operations in Haiti. Although we never had to execute our counterfire system, it was in place, ready to respond to a potential threat.

Clearing Fires. As our ground forces expanded operations from initial lodgment areas, more of the HPTs encountered were targets of opportunity. In many situations, converging forces increased the likelihood of fratricide to friendly forces or nonbelligerents.

Everyone realized the importance of fire control and clearance of fires. Maneuver forces had to know the location

of all units operating in their battlespace. ROE and the presence of curious noncombatants prohibited the use of area fire weapons. Communications had to be established and rehearsed to facilitate the coordination and positive clearance of fires.

In OOTW, silence is never consent. Observers must be able to distinguish friendly from hostile elements. Clearing fires by using boundaries is unacceptable in peace operations because of the large number of nonbelligerents and fluid nature of the situation.

Nontraditional Tasks

Because of political considerations, Field Artillery weapons systems were not deployed to the Haitian joint operations area (JOA). The Div Arty, however, contributed to Uphold Democracy in important nontraditional ways.

Role as a Maneuver Headquarters. The Div Arty staff played a critical role during Uphold Democracy by establishing and deploying the largest

maneuver headquarters in the Combined Joint Task Force Haiti (see Figure 2). This headquarters provided command and control of initial lodgment operations in Port-au-Prince, secured the sustainment infrastructure and supported the expansion of presence and security operations throughout Port-au-Prince and outlying areas.

A number of decisions shaped the task organization and functions of the Div Arty staff as a legitimate maneuver headquarters. The first and, perhaps, most important was the decision to develop two operation plans (OPLANs). The first involved a forced-entry operation with the XVIII Airborne Corps as the JTF headquarters. The second focused on permissive entry operations with the Headquarters, 10th Mountain Division (Light) as the JTF headquarters on the ground. Under this second OPLAN, the JTF headquarters established an Army Forces (ARFOR) headquarters for planning and support.

Once the second plan was activated and the 10th Mountain Division was designated

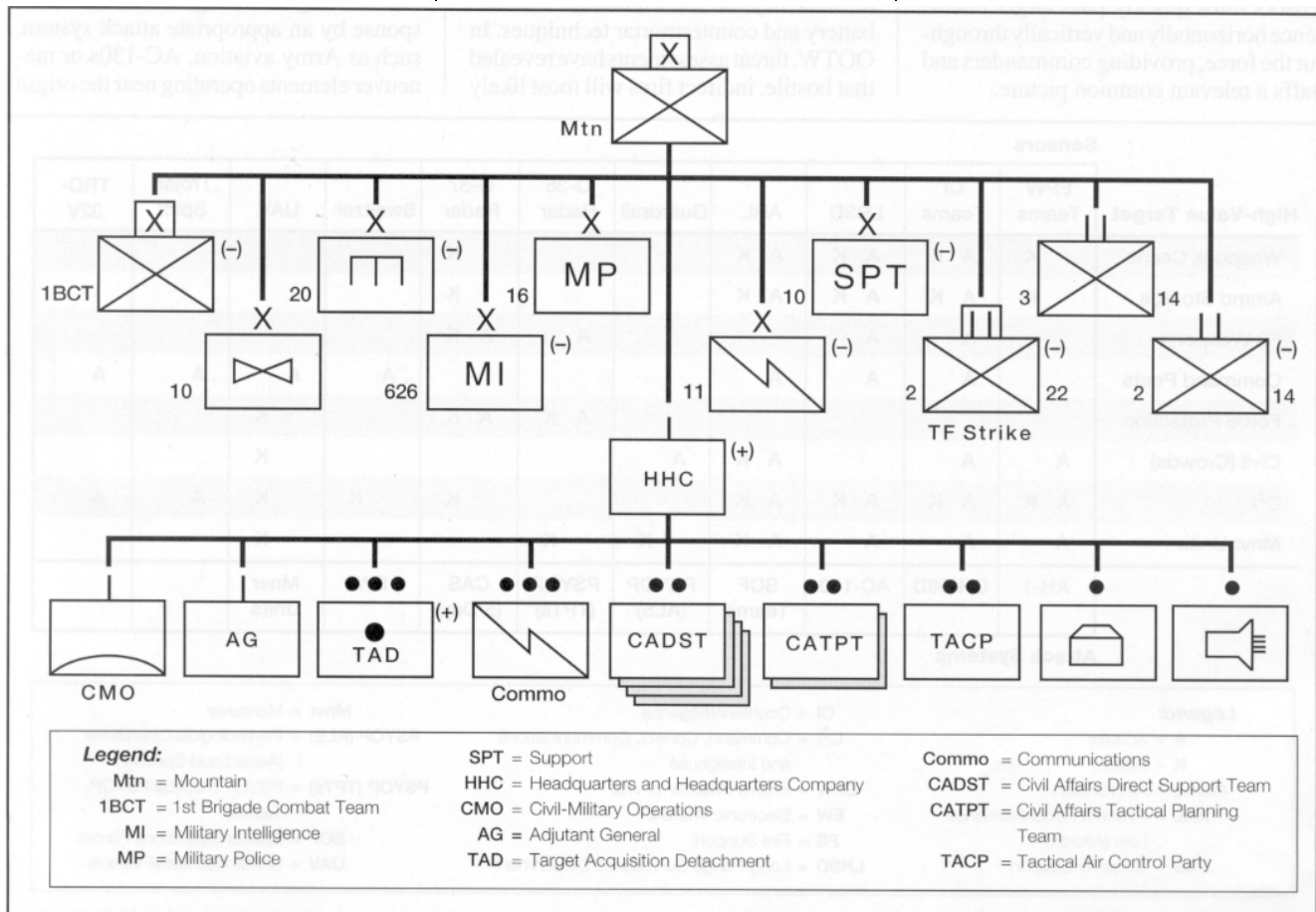


Figure 2: Initial Operations (August - September 1994). The 10th Mountain Division Artillery staff stood up the largest maneuver task force in the joint task force during Operation Uphold Democracy. The organization during initial entry—Task Force Mountain, shown here—changed as the task force established a more secure environment and transitioned to coalition operations (Figures 3 and 4).

as the main effort, it was decided that howitzers would not be deployed into the Haitian JOA. Our maneuver headquarters was called Task Force Mountain.

The Div Arty headquarters was chosen as the nucleus for TF Mountain for several reasons. First, it enabled the JTF commander to capitalize on habitual association and common operational procedures. It also validated the Div Arty's traditional role as the alternate division tactical operations center (DTC). Unity of command was fostered by the roles of the assistant division commander (operations) as deputy JTF commander, ARFOR commander and TF Mountain commander with responsibility for the Port-au-Prince sector and outlying areas.

The Div Arty commander became the TF Mountain deputy commander, whose responsibilities centered on employing the Div Arty headquarters as a maneuver task force headquarters in OOTW as well as serving as a senior coalition advisor to the JTF commander.

Figure 3 shows how the organizational structure of TF Mountain changed as a safe and secure environment was achieved and forces began operating in the outlying areas. After initial entry operations the ARFOR staff was reduced to a four-battalion maneuver brigade, including the seven-nation Caribbean coalition battalion (CARICOM). Under this revised organization, TF

Mountain was responsible for fixed-site security, up to battalion-sized tactical operations, weapons seizures and a weapons buy-back program. Once the coalition International Police Monitors (IPM) arrived in the Haiti JOA, TF Mountain also provided command and control and sustainment. The TF Mountain Headquarters was further reduced to the coalition coordination

element (CCE) as shown in Figure 4. This element was a special staff that supported functions for all coalition forces and United Nations observers who deployed to Haiti.

Those who served on TF Mountain learned that the deliberate planning process is not reserved for maneuver headquarters and staffs. The Div Arty headquarters can function as a command and control

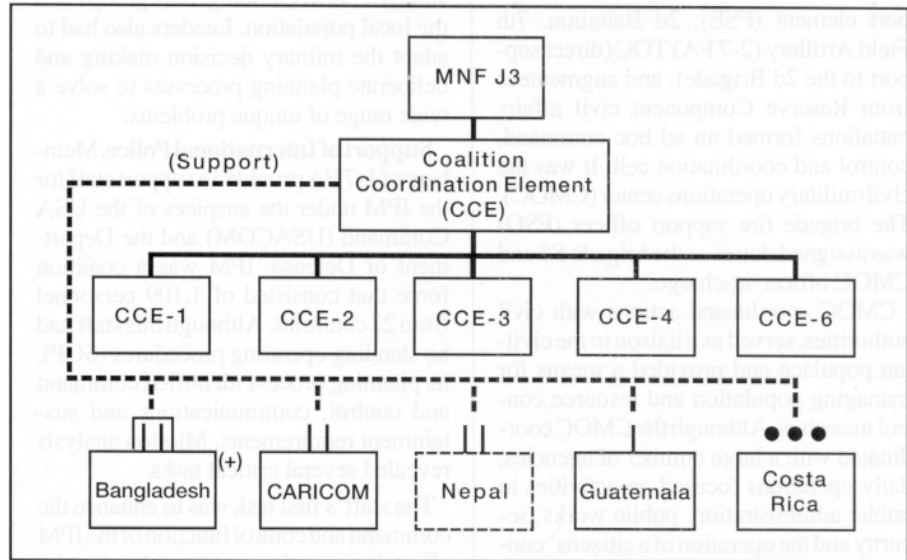


Figure 4: Coalition Support Staff (November 1994 - January 1995). After Task Force Mountain inactivated, this Multinational Force (MNF J3) organization was supported by a special staff comprised of the 10th Mountain Division Artillery.

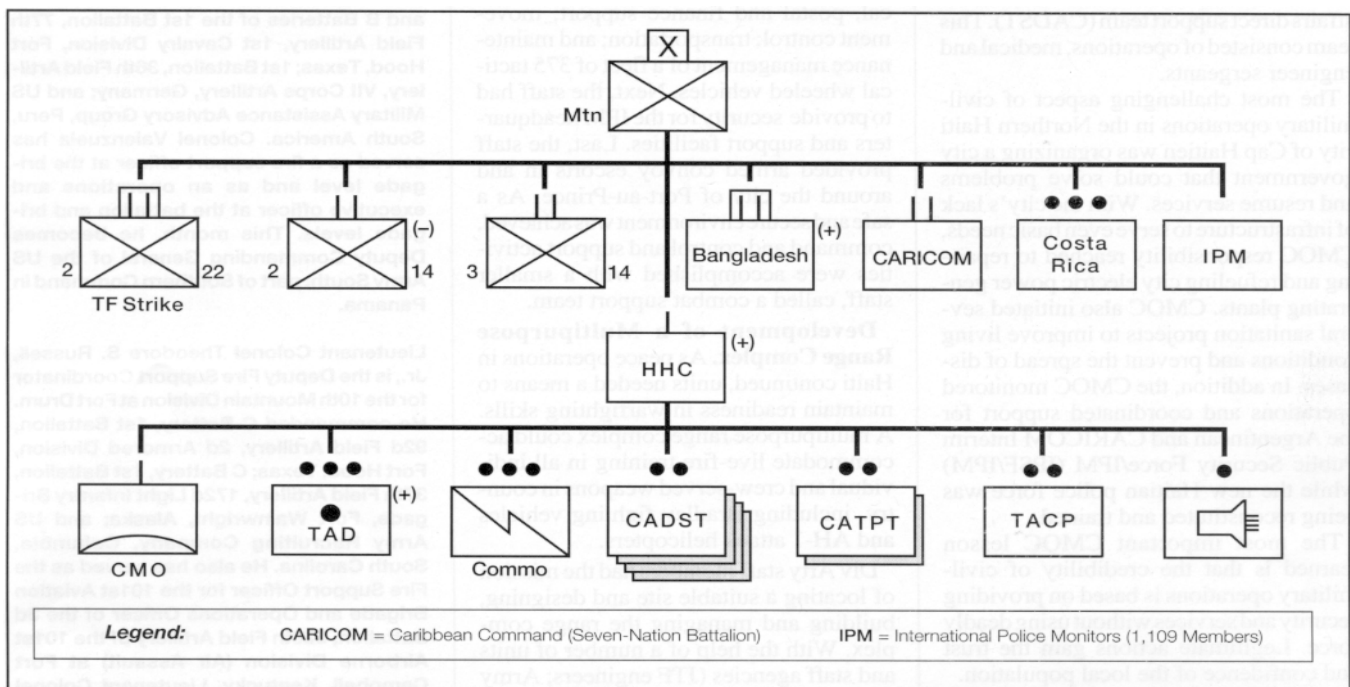


Figure 3: Sustained Peace Operations (October - November 1994). This second, smaller organization primarily focused on peace operations in Port-au-Prince.

center for joint, combined and interagency operations. Fire supporters must maintain their proficiency in the deliberate staff planning process and be able to speak "maneuver" with the best of 'em.

Liaison and Civil-Military Operations. Our soldiers were involved in planning, coordinating and conducting civil-military operations throughout the JOA. In Northern Haiti, members of the 2d Brigade Combat Team (BCT) fire support element (FSE); 2d Battalion, 7th Field Artillery (2-7 FA) TOC (direct support to the 2d Brigade); and augmentees from Reserve Component civil affairs battalions formed an ad hoc command, control and coordination cell. It was the civil-military operations center (CMOC). The brigade fire support officer (FSO) was assigned duties as the brigade S5 and CMOC officer-in-charge.

CMOC coordinated actions with civil authorities, served as a liaison to the civilian populace and provided a means for managing population and resource control measures. Although the CMOC coordinated with a large number of agencies, daily operations focused on activities in public administration, public works, security and the operation of a citizens' concern center for the local populace.

CMOC was tailored to interface with the local governmental structure, based on the initial area assessments of a civil affairs direct support team (CADST). This team consisted of operations, medical and engineer sergeants.

The most challenging aspect of civil-military operations in the Northern Haiti city of Cap Haitien was organizing a city government that could solve problems and resume services. With the city's lack of infrastructure to serve even basic needs, CMOC responsibility reached to repairing and refueling city electric power generating plants. CMOC also initiated several sanitation projects to improve living conditions and prevent the spread of diseases. In addition, the CMOC monitored operations and coordinated support for the Argentinean and CARICOM Interim Public Security Force/IPM (IPSF/IPM) while the new Haitian police force was being reconstituted and trained.

The most important CMOC lesson learned is that the credibility of civil-military operations is based on providing security and services without using deadly force. Legitimate actions gain the trust and confidence of the local population.

Div Arty soldiers assisted individual Haitians in many ways. They helped

Haitians settle claims, dealt with complaints of human rights violations, facilitated meetings with local leaders and groups, conducted patrols, established static security of key sites and interacted with the media.

Soldiers and leaders had to adapt their warfighting skills to fit this unique situation. The most important skills included individual discipline and self-control, particularly during emotional or violent exchanges between belligerent groups and the local population. Leaders also had to adapt the military decision-making and deliberate planning processes to solve a wide range of unique problems.

Support of International Police. Members of 1-7 FA provided a support staff for the IPM under the auspices of the USA Command (USACOM) and the Department of Defense. IPM was a coalition force that consisted of 1,109 personnel from 22 countries. Although this staff had no standing operating procedures (SOP), its planning process identified command and control, communications and sustainment requirements. Mission analysis revealed several critical tasks.

The staff's first task was to enhance the command and control function of the IPM effort. Its second was to provide administrative and logistic support for the IPM organization, including in-processing; billeting management; coordination of medical, postal and finance support; movement control; transportation; and maintenance management of a fleet of 375 tactical wheeled vehicles. Next, the staff had to provide security for the IPM headquarters and support facilities. Last, the staff provided armed convoy escorts in and around the city of Port-au-Prince. As a safe and secure environment was achieved, command and control and support activities were accomplished with a smaller staff, called a combat support team.

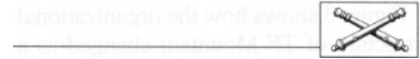
Development of a Multipurpose Range Complex. As peace operations in Haiti continued, units needed a means to maintain readiness in warfighting skills. A multipurpose range complex could accommodate live-fire training in all individual and crew-served weapons in country, including Bradley fighting vehicles and AH-1 attack helicopters.

Div Arty staff members had the mission of locating a suitable site and designing, building and managing the range complex. With the help of a number of units and staff agencies (JTF engineers; Army Training Support Center at Fort Eustis, Virginia; 52d Engineer Battalion from Fort Carson, Colorado; and 41st Engineer

Battalion of the 10th Division), the complex became a reality in weeks.

State-of-the-art, radio-controlled, solar-powered target devices were installed and maintained for units to live-fire their weapons. Ranges also were developed for company-sized combined arms live-fire exercises (CALFEXs). Local Haitians were hired to help with daily range maintenance.

The success story of 10th Mountain Redlegs in Uphold Democracy is a story of a team ready to deploy worldwide on short notice to accomplish any mission from war to OOTW. The key to success is not in training for the next contingency—who knows what that will be—but to train to the METL under varied conditions. Leaders and soldiers then have the confidence and competence to act decisively and use initiative and creativity to solve unique problems and adapt to rapidly changing situations. *Train to fight and train to win—Mountain Thunder!*

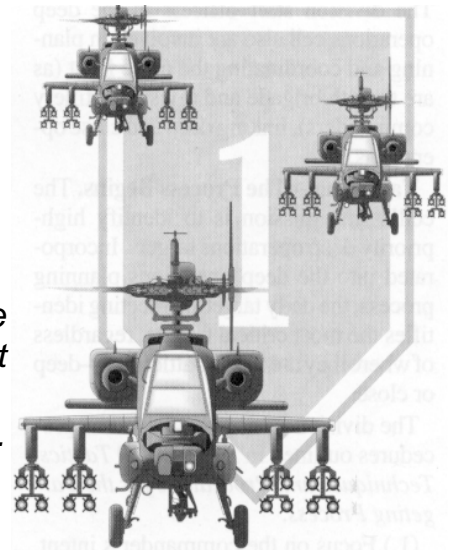


Colonel Alfred A. Valenzuela has commanded the 10th Mountain Division (Light) Artillery at Fort Drum, New York, since June 1993; he participated in Operations Restore Hope in Somalia and Uphold Democracy in Haiti. He also commanded A and B Batteries of the 1st Battalion, 77th Field Artillery, 1st Cavalry Division, Fort Hood, Texas; 1st Battalion, 36th Field Artillery, VII Corps Artillery, Germany; and US Military Assistance Advisory Group, Peru, South America. Colonel Valenzuela has served as a fire support officer at the brigade level and as an operations and executive officer at the battalion and brigade levels. This month, he becomes Deputy Commanding General of the US Army South, part of Southern Command in Panama.

Lieutenant Colonel Theodore S. Russell, Jr., is the Deputy Fire Support Coordinator for the 10th Mountain Division at Fort Drum. He commanded C Battery, 1st Battalion, 92d Field Artillery, 2d Armored Division, Fort Hood, Texas; C Battery, 1st Battalion, 37th Field Artillery, 172d Light Infantry Brigade, Fort Wainwright, Alaska; and US Army Recruiting Company, Columbia, South Carolina. He also has served as the Fire Support Officer for the 101st Aviation Brigade and Operations Officer of the 3d Battalion, 320th Field Artillery of the 101st Airborne Division (Air Assault) at Fort Campbell, Kentucky. Lieutenant Colonel Russell is scheduled to assume command of the 2d Battalion, 7th Field Artillery, 10th Mountain Division this month.

Deep Operations in the Big Red One Winning Early, Winning Deep

by Colonel Henry W. Stratman and
Lieutenant Colonel Jackson L. Flake III



Dragon Six, this is Deadshot Six. We've got 'em! They're right where we thought they'd be. Artillery tubes and rocket launchers everywhere. Engaging now—Over.

This is Dragon Six. Roger. Kill everything you see. Don't bring any missiles home. Out.

That's how it was done repeatedly as the Big Red One's Apache helicopters attacked deep during its June 1994 Battle Command Training Program (BCTP) Warfighter exercise. The 1st Infantry Division (Mechanized) deep operations set the conditions for victory. The Fort Riley, Kansas, units destroyed the opposing force's (OPFOR's) center of gravity—its long-range artillery—attacking it as early and often as possible, allowing the division to execute the close fight more effectively. The result was the stunning defeat of the world-class OPFOR in both the offensive and defensive battles.

This article explains the Big Red One's deep operations planning process, considerations for executing deep operations and how deep operations set the conditions for decisive victory in the close fight.

Deep Operations Planning

Understanding the planning process and how to coordinate and execute deep operations is a challenge. "Mr. Deep Ops" in the 1st Infantry Division is the chief of staff. He runs the staff and controls the division's main command post (DMAIN), which coordinates deep operations.

The division's deep operations cell includes the 4th brigade (aviation) commander and S3 who control the primary deep attack weapon, the attack helicopters; the division artillery commander; key members of the fire support element (FSE) and G2 and G3 sections; and other division staff officers as necessary (see Figure 1). The deputy fire support coordinator (DFSCoord) coordinates the cell's meetings and the planning and execution of deep operations.

The division commander's intent focuses the cell and guides its selection of targets and attack systems. The cell then begins a planning and execution process that includes the tasks listed in Figure 2.

The result is a repetitive cycle in which the cell identifies the highest priority targets, selects the best weapon systems to attack those targets and then plans and coordinates the execution of the attacks.

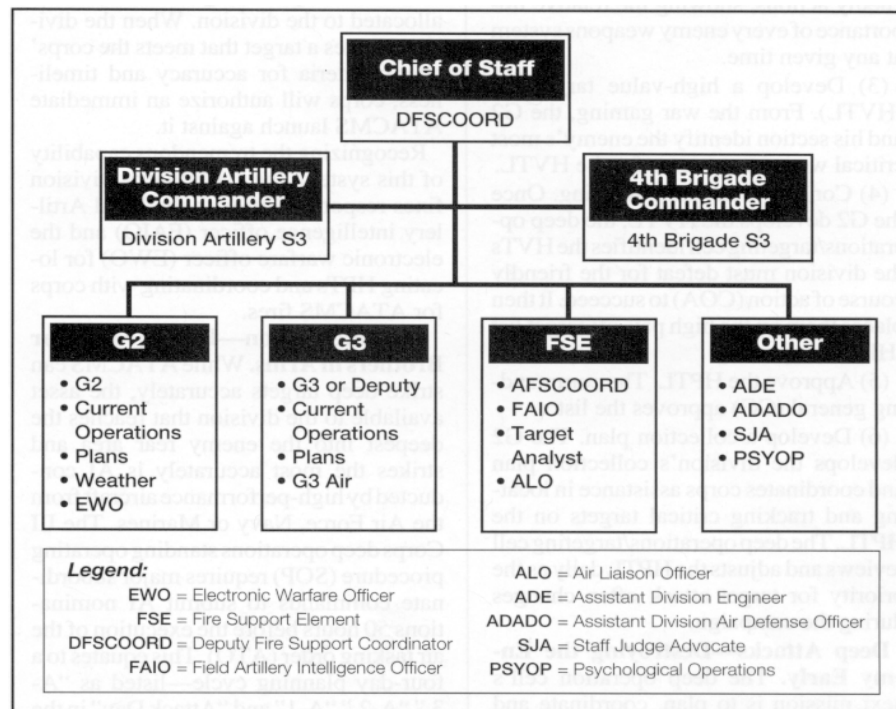


Figure 1: 1st Infantry Division (Mechanized) Deep Operations Cell

- Plan and coordinate the use of systems, such as the Army tactical missile system (ATACMS), MLRS and cannon artillery, that are immediately available to attack targets.
- Nominate and track targets for air interdiction (AI) by other services.
- Plan and execute deep attacks with Army aviation assets under the division's control.
- Work with higher headquarters to coordinate and take advantage of its deep operations in the division zone.

Figure 2: The deep operations cell plans and executes deep attacks with an eye toward the close fight.

The division staff officers in the deep operations cell also are involved in planning and coordinating the close fight (as are the 4th brigade and division artillery commanders), linking deep and close operations.

Targeting—The Process Begins. The cell's first mission is to identify high-priority deep operations targets. Incorporated into the deep operations planning process, the daily targeting meeting identifies the most critical targets, regardless of where they are on the battlefield—deep or close.

The division basically follows the procedures outlined in *FM 6-20-10 Tactics, Techniques and Procedures for the Targeting Process*.

(1) Focus on the commander's intent. Planners focus on what the division must do to accomplish its mission both deep and close.

(2) War-game actions. Deep operations cell planners visualize both friendly and enemy actions, showing the relative importance of every enemy weapons system at any given time.

(3) Develop a high-value target list (HVTL). From the war gaming, the G2 and his section identify the enemy's most critical weapons systems for the HVTL.

(4) Conduct a targeting meeting. Once the G2 develops the HVTL, the deep operations/targeting cell identifies the HVTs the division must defeat for the friendly course of action (COA) to succeed. It then places them on the high pay-off target list (HPTL) in priority.

(5) Approve the HPTL. The commanding general (CG) approves the list.

(6) Develop a collection plan. The G2 develops the division's collection plan and coordinates corps assistance in locating and tracking critical targets on the HPTL. The deep operations/targeting cell reviews and adjusts the HPTL daily as the priority for target attack often changes during the campaign.

Deep Attacks—Destroying the Enemy Early. The deep operation cell's next mission is to plan, coordinate and execute deep attacks. Although the division has many lethal and nonlethal assets available for deep operations, the majority of planning focuses on four lethal systems: the multiple-launch rocket system (MLRS), Army tactical missile system (ATACMS), Apache attack helicopter (AH-64) and air interdiction (AI) sorties flown by other services.

MLRS is a division asset and the weapon of choice to fire the suppression

of enemy air defenses (SEAD) for Army aviation deep attacks in the division zone. The 1st Division uses MLRS early and often to attack as many deep targets as possible before ground maneuver forces engage the enemy in the close fight.

The only problem with employing MLRS is its relatively limited range of 30 kilometers. This often necessitates artillery movement across the forward line of own troops (FLOT) to attack deep targets or fire SEAD. It's risky business sending launchers and supporting ground maneuver forces into enemy territory on a raid, but it's a calculated risk that often produces tremendous effects. The deep operations cell weighs all the risks in such a raid and commits MLRS to attack a deep target only when the potential payoff justifies it.

ATACMS, with a range of more than 100 kilometers and pinpoint accuracy, is ideally suited for light armor, command and control assets and air defense targets. But unfortunately, it is primarily a corps asset with a percentage of its missiles allocated to the division. When the division locates a target that meets the corps' attack criteria for accuracy and timeliness, corps will authorize an immediate ATACMS launch against it.

Recognizing the tremendous capability of this system, the 1st Infantry Division fixes responsibility with the Field Artillery intelligence officer (FAIO) and the electronic warfare officer (EWO) for locating HPTs and coordinating with corps for ATACMS fires.

Air Interdiction—Help From Our Brothers in Arms. While ATACMS can strike deep targets accurately, the asset available to the division that reaches the deepest into the enemy rear area and strikes the most accurately is AI conducted by high-performance aircraft from the Air Force, Navy or Marines. The III Corps deep operations standing operating procedure (SOP) requires major subordinate commands to submit AI nominations 50 hours before the execution of the air tasking order (ATO). This equates to a four-day planning cycle—listed as "A-3," "A-2," "A-1" and "Attack Day" in the time line in Figure 3. (The shaded boxes in Figure 3 show the actions on the time line related to AI.)

Because ATOs begin at 0600 hours, the division deep operations cell must submit its nominations for AI to corps by 0400 hours two days before the division wants the targets attacked. To develop AI nominations, the cell identifies and begins tracking potential targets 72 to 96 hours

before the planned attack of the target.

This process revolves around two deep operations cell meetings that occur each day at 1000 and 1930 hours. AI planning for the ATO that begins at 0600 hours on Attack Day, the day the attack is to occur, begins at the 1000 meeting three days before the Attack Day or on the day labeled A-3. At that meeting, the cell uses the HPTL to focus on the enemy units and weapons systems that will be the biggest threat to the division on the Attack Day. The goal is for the cell to identify the broad target types and units for AI nominations.

After the meeting, the FAIO and the G2 planners analyze the enemy in detail to identify specific targets in the categories of targets and units selected during the meeting. For example, the cell could plan to defeat the 44th Motorized Rifle Division (MRD), the biggest threat in the next 72 to 96 hours, by destroying its division artillery group (DAG), the priority target on the HPTL, as it begins moving in about 80 hours. The G2 planners identify the 440th, 441st and 442d Field Artillery Battalions as the units that make up the 44 MRD DAG.

The FAIO presents these units to the cell at the 1930 meeting as AI nominations. With the chief of staff's approval, the FAIO works up the target nominations' attack times and the detailed rationale for attacking each target and submits the nominations to corps by 0400 hours the next day.

Because of the lead time involved in developing an ATO, it will be as much as 50 to 74 hours before the attacks occur. The targets are likely to move in that time, so the cell tracks them and updates the nominations. These updates begin 36 hours before each attack with the last occurring one hour before the attack.

The cell continues to assess AI targets and their relative value at each meeting. When a target is no longer the greatest threat to the division, the cell changes the nomination to a different target. This ensures the division uses its limited AI sorties as effectively as possible.

It's tough to identify potential targets four days in advance and then track them until attack, but the pay-off is tremendous. During Warfighter, the early attack of the enemy's artillery, his center of gravity, made a significant difference in the conditions the 1st Infantry Division faced in the close fight.

Army Aviation—The Division Commander's Sunday Punch. The most lethal deep attack system in the division is Army aviation. Routinely, the 1st Division

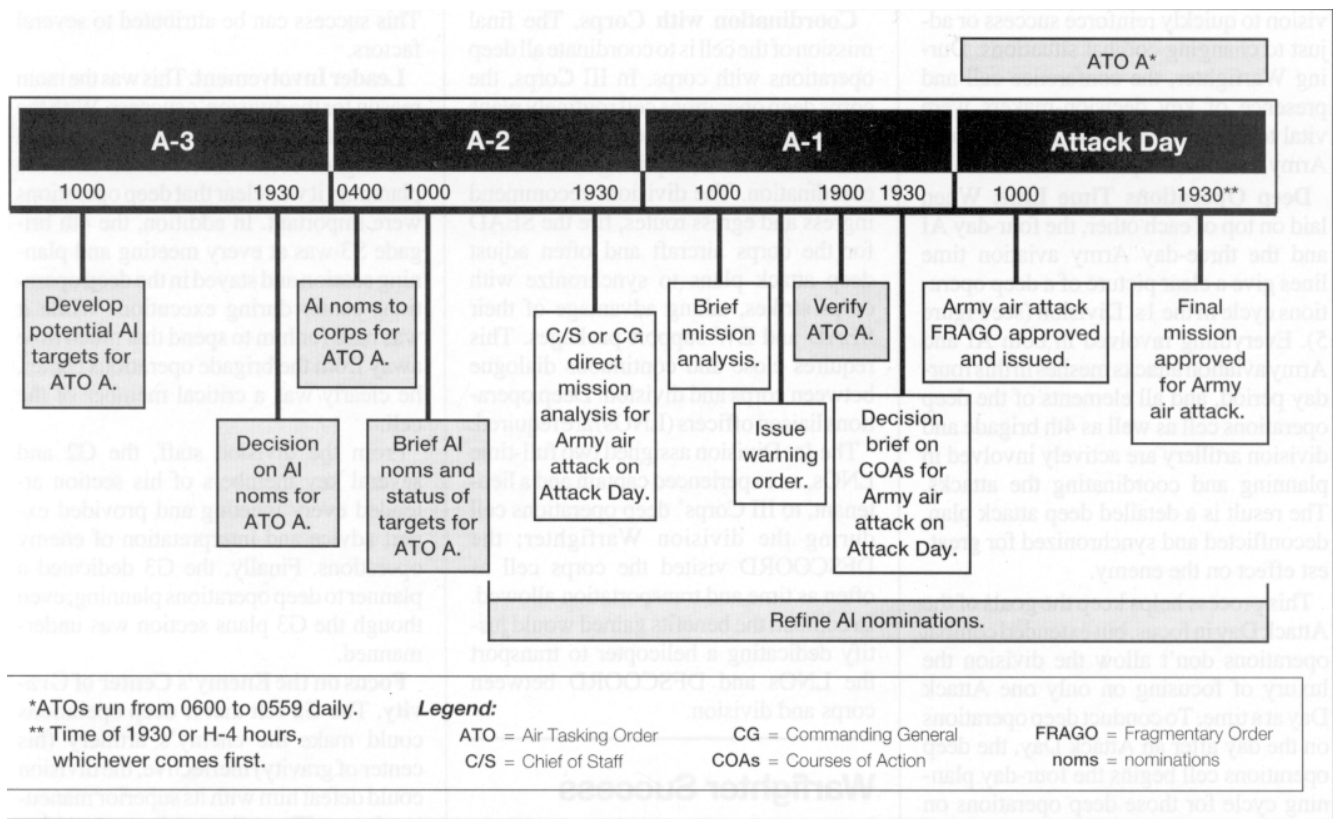


Figure 3: Air Interdiction (AI) and Army Aviation Deep Attack Time Line. This four-day deep attack time line shows the actions for AI in the shaded boxes and the actions for Army aviation in the white boxes.

controls its battalion, the 1st Battalion, 1st Aviation and one other Apache battalion of AH-64s attached from corps. The flexibility of the Apache and its 120-mile combat radius give the division the ability to strike quickly and deeply into the enemy's rear areas.

Normally, the cell begins planning an Army aviation deep attack at the 1930 hours meeting on A-2, or two days before the attack (see the white boxes on the time line of Figure 4). The DFSCoord discusses the deep targets corps is planning to attack with Army aviation and then recommends likely targets for the division assets to attack.

After the chief of staff selects the targets, the deep operations cell, 4th brigade and division artillery simultaneously plan the attack. The cell establishes broad mission attack parameters, the engagement area, attack time and desired end state during planning.

The detailed planning, however, falls primarily to the 4th brigade and division artillery. The staffs of the brigade and aviation battalions involved plan the number of aircraft to send, command and control procedures, the munitions mix, ingress and egress routes, airspace control

procedures and downed pilot recovery procedures, among other things. The division artillery plans SEAD targets, determines ammunition requirements, selects firing unit positions and coordinates artillery raid requirements for cross-FLOT movement and deep SEAD.

Most early attacks are conducted at night, complicating planning and coordination between the 4th brigade and division artillery. The DFSCoord and the S3s from both units work closely to ensure that nothing is overlooked. Meanwhile, the deep operations cell continues to track and evaluate the target to make sure it's still the best target to attack to support the close fight.

From days A-2 to A-1, the cell continuously analyzes the mission and briefs the COA to the chief of staff or the CG for his decision. At the 1930 hours meeting on Attack Day (or four hours before the planned time of the attack, whichever is earlier), the cell briefs the mission status to the CG and chief of staff; they approve or decide to abort or modify the mission, based on mission, enemy, terrain, troops and time available (METT-T) factors. The cell's focus then shifts to executing the mission.

Execution—Steel Rain and Hellfire

On behalf of the chief of staff, the DFSCoord effects final coordination with the 4th brigade and division artillery, the primary attack units. The deep operations cell establishes a deep operations center in the FSE van at the DMAIN to coordinate and monitor the attack. The DFSCoord runs the deep operations center and monitors the execution of the ingress and egress SEADs by the division artillery, the ingress of the helicopters, the actions during the attack and the egress of the helicopters. He does this through a "hot loop" mobile subscriber equipment (MSE) conference call that connects the deep operations center with the division artillery, 4th brigade and others that have a role or critical interest in the attack (see Figure 4 on Page 34.)

The DFSCoord, the G2 and the 4th brigade S3 remain in the deep operations center throughout the operation, and the chief of staff monitors its progress from the command group van. This facilitates rapid decision-making and allows the division

to quickly reinforce success or adjust to changing combat situations. During Warfighter, the conference call and presence of key decision-makers were vital to the success of the 1st Division's Army aviation deep attacks.

Deep Operations Time Line. When laid on top of each other, the four-day AI and the three-day Army aviation time lines give a clear picture of a deep operations cycle in the 1st Division (see Figure 5). Everything involved in both AI and Army aviation attacks meshes in this four-day period, and all elements of the deep operations cell as well as 4th brigade and division artillery are actively involved in planning and coordinating the attacks. The result is a detailed deep attack plan, deconflicted and synchronized for greatest effect on the enemy.

This process helps keep the goals of the Attack Day in focus, but extended combat operations don't allow the division the luxury of focusing on only one Attack Day at a time. To conduct deep operations on the day after an Attack Day, the deep operations cell begins the four-day planning cycle for those deep operations on the day designated as A-2 of the first planning cycle (Figure 5). During continuous operations, the cell plans for four different Attack Days at the same time. This might seem a little confusing at first, but the deep operations cell quickly develops a rhythm that allows it to plan one Attack Day after another.

Coordination with Corps. The final

mission of the cell is to coordinate all deep operations with corps. In III Corps, the corps deep operations cell routinely plans deep attacks through the zones of its subordinate divisions, requiring considerable coordination. The divisions recommend ingress and egress routes, fire the SEAD for the corps aircraft and often adjust deep attack plans to synchronize with corps strikes, taking advantage of their SEAD and EW support packages. This requires close and continuous dialogue between corps and division. Deep operations liaison officers (LNOs) are required.

The 1st Division assigned two full-time LNOs, an experienced captain and a lieutenant, to III Corps' deep operations cell during the division Warfighter; the DFSCoord visited the corps cell as often as time and transportation allowed. In combat, the benefits gained would justify dedicating a helicopter to transport the LNOs and DFSCoord between corps and division.

Warfighter Success

Deep operations during Warfighter helped the division soundly defeat the OPFOR by setting the conditions for a successful close fight. For example, during offensive operations, deep attacks rendered the enemy's artillery combat ineffective and paved the way for the division to crush the enemy during the

close fight. This success can be attributed to several factors.

Leader Involvement. This was the main reason for the division's success. With the chief of staff and the division artillery and 4th brigade commanders involved in the planning, it was clear that deep operations were important. In addition, the 4th brigade S3 was at every meeting and planning session and stayed in the deep operations center during execution. While it was hard for him to spend that much time away from the brigade operations center, he clearly was a critical member of the cell.

From the division staff, the G2 and several key members of his section attended every meeting and provided expert advice and interpretation of enemy operations. Finally, the G3 dedicated a planner to deep operations planning, even though the G3 plans section was undermanned.

Focus on the Enemy's Center of Gravity. The G2 felt that if deep operations could make the enemy's artillery (his center of gravity) ineffective, the division could defeat him with its superior maneuver forces. The cell was often tempted to attack other targets, usually maneuver reserves, but the chief of staff kept bringing the cell's focus back to the enemy's artillery.

Synchronized Deep and Close Operations. The deep operations cell did all planning with an eye toward ongoing and upcoming close operations to ensure deep operations were tied to the close fight.

For example, division deep operations assets attacked the enemy's artillery just before the division's ground maneuver attacked and then continued the deep attacks as the ground maneuver forces engaged enemy units. This prevented the enemy from effectively using his most significant weapons, his long-range artillery, to attack the division maneuver forces moving from their initial attack positions to the enemy's defensive positions. This synchronization disrupted the enemy's operational tempo (OPTEMPO) and forced him into a reaction mode.

Freeing FA for the Close Fight. There was an unanticipated benefit of focused and synchronized deep operations. With the division's destroying the enemy artillery before it could become a factor in the close fight, the division was able to use its long-range, high-volume MLRS to support the close fight instead of dedicating it to counterfire operations. While this was not part of the original plan, it was directly attributable to the unit's deep operations

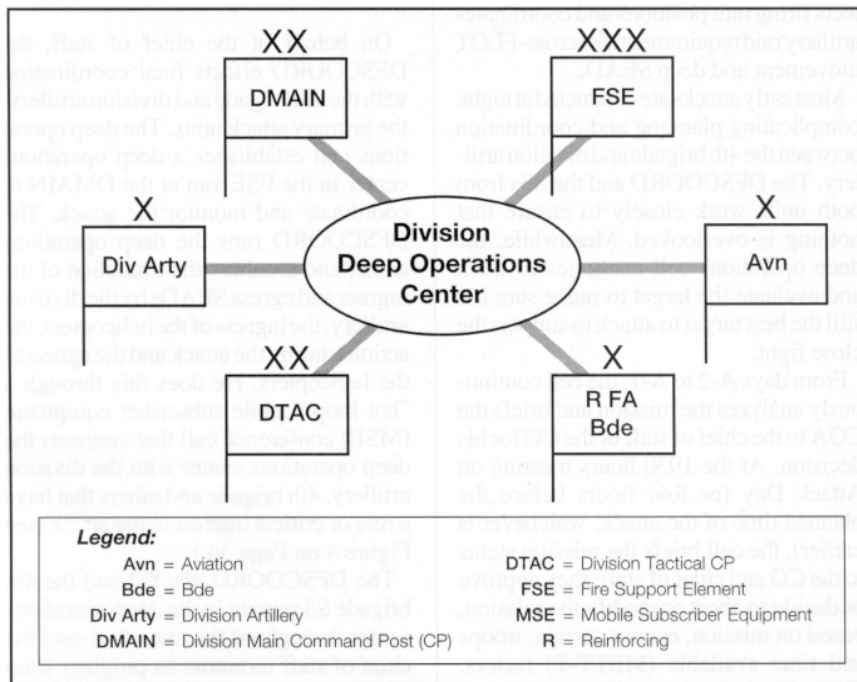


Figure 4: "Hot Loop" MSE Communications for Deep Operations Command and Control

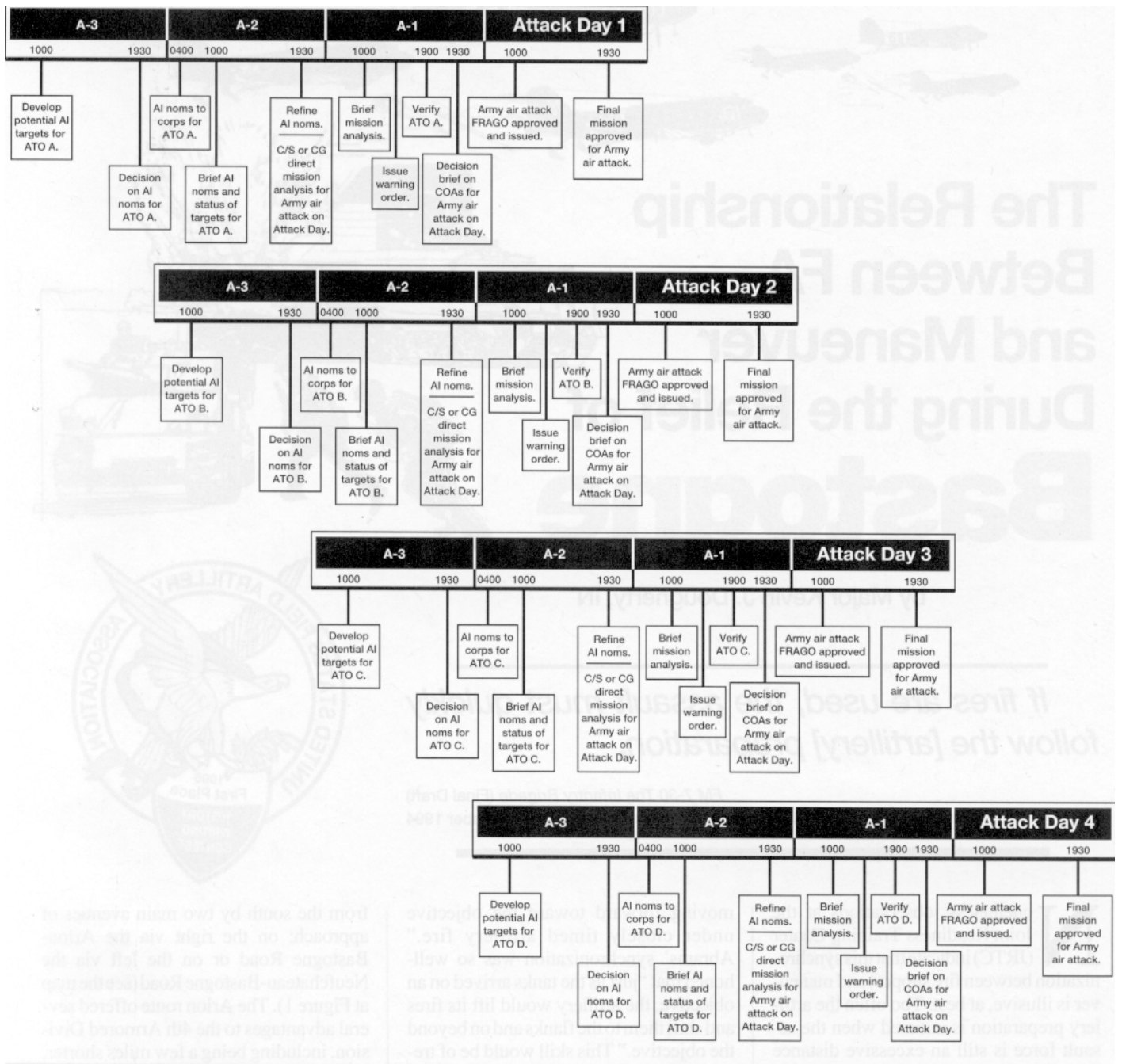


Figure 5: During continuous operations, the deep operations cell plans four different Attack Days at the same time.

success and was clearly a significant contributor to the 1st Infantry Division's victory.

The 1st Infantry Division's deep attacks were focused on the enemy's center of gravity and synchronized with the close fight. As a result, deep operations set the conditions for the Big Red One's stunning combined arms victory over the world-class BCTP OPFOR.



Colonel Henry W. Stratman commands the 1st Infantry Division (Mechanized) Artillery, Fort Riley, Kansas. He commanded the 2d Battalion, 29th FA, 1st Armored Division, Germany, deploying the battalion to Operations Desert Shield and Storm. Among other assignments, he served as S3 of the 8th Infantry Division (Mechanized) Artillery, Germany, and commanded three batteries, one each in Germany, Korea and Fort Sill, Oklahoma.

Lieutenant Colonel Jackson L. Flake III was the Deputy Fire Support Coordinator

(DFSCOORD) for the 1st Infantry Division (Mechanized) during its June 1994 Battle Command Training Program Warfighter Exercise. He's the 1st Infantry Division Artillery Executive Officer and is scheduled to take command of the 1st Battalion, 5th Field Artillery at Fort Riley this month. During Operation Desert Storm, he was the Executive Officer of the 1st Battalion, 320th Field Artillery, 101st Airborne Division (Air Assault). Among other assignments, he commanded a battery in the 56th Field Artillery Brigade, Germany.

The Relationship Between FA and Maneuver During the Relief of Bastogne

by Major Kevin J. Dougherty, IN

If fires are used, the assault must quickly follow the [artillery] preparation.

FM 7-30 The Infantry Brigade (Final Draft)
Headquarters, Department of the Army, November 1994



Nonetheless, observations at the Joint Readiness Training Center (JRTC) indicate that this synchronization between fire support and maneuver is illusive, at best. Too often the artillery preparation is initiated when the assault force is still an excessive distance from the objective. The prep is dutifully fired and then lifted, and the infantry force is still nowhere near being in position to assault. By the time the infantry does begin its assault, the enemy has recovered from the effects of the artillery, and the element of surprise has been lost.¹

One man who was able to surmount this difficulty in synchronizing Field Artillery and maneuver in the attack was Lieutenant Colonel Creighton Abrams. While training his 37th Tank Battalion in England in preparation for the Allied cross-channel invasion in World War II, Abrams stressed combined arms live-fire exercises "with tanks and armored infantry

moving forward toward the objective under closely timed artillery fire." Abrams' synchronization was so well-honed that "just as the tanks arrived on an objective, the artillery would lift its fires and shift them to the flanks and on beyond the objective." This skill would be of tremendous importance later when Abrams led his battalion to relieve the encircled forces at Bastogne.²

Synchronizing fires and maneuver to maximize the effects of fires on the enemy just prior to an attack remains a difficult task today. Field Artillerymen and their maneuver counterparts could learn from Abrams' techniques—with the addition of some control measures to more systematically avoid fratricide.

In the Artillery's Wake. On 21 December 1944, the 4th Armored Division received its mission to advance north from the Leglise-Arlon area and relieve Bastogne.³ Bastogne could be

reached from the south by two main avenues of approach: on the right via the Arlon-Bastogne Road or on the left via the Neufchateau-Bastogne Road (see the map at Figure 1). The Arlon route offered several advantages to the 4th Armored Division, including being a few miles shorter, and thus it was selected.⁴

At 0600 on 22 December, the 4th Armored Division began its attack as part of III Corps. The plan was for Combat Command A (CCA) to attack along the main road while Combat Command B (CCB) would advance on secondary roads to the west.⁵ As was the normal 4th Armored Division practice, the plan did not call for the Combat Command Reserve (CCR) to be employed as an integral tactical unit.⁶

By Christmas Eve, it became obvious that no quick breakthrough could be expected via the Arlon-Bastogne Route.⁷ Instead the 4th Armored Division commander, Major General Hugh Gaffey,

ordered CCR to attack along the Neufchateau-Bastogne route. In addition to Abrams' 37th Tank Battalion, CCR included the 53d Armored Infantry Battalion, the self-propelled 94th Armored Field Artillery Battalion and a battery of 155-mm howitzers from the 177th Field Artillery Battalion.⁸

Throughout the attack, coordination between the artillery and armor was outstanding, but nowhere was the effect more dramatic than at Assenois (see the map at Figure 2). By midafternoon Christmas Day, CCR controlled Clochimont. According to the plan, Sibret would be the next objective. However, the poignant sight of air-dropped supplies descending on Bastogne inspired Abrams to suggest to Lieutenant Colonel George Jaques, commander of the 53d Infantry, "Let's try a dash through Assenois straight into Bastogne." Jaques concurred and, without consulting the CCR commander, the two battalions were off.⁹

It was about 1520 when Abrams radioed Captain William Dwight, his battalion S3, and instructed him to bring C Team forward. Likewise, the artillery liaison officer notified the 94th Field Artillery of the plan. The 94th already was registered to fire on Assenois, but little time and unreliable communications made transmitting data to the division artillery and arranging a fire plan difficult. Despite these handicaps, in 15 minutes coordination was affected so that three artillery battalions from CCB were ready to fire when required.¹⁰

At 1620, the 37th Tank Battalion moved out with Team C in the lead. At 1634, Abrams checked with the 94th Field



Lieutenant Colonel Abrams in 1944 near Bastogne.

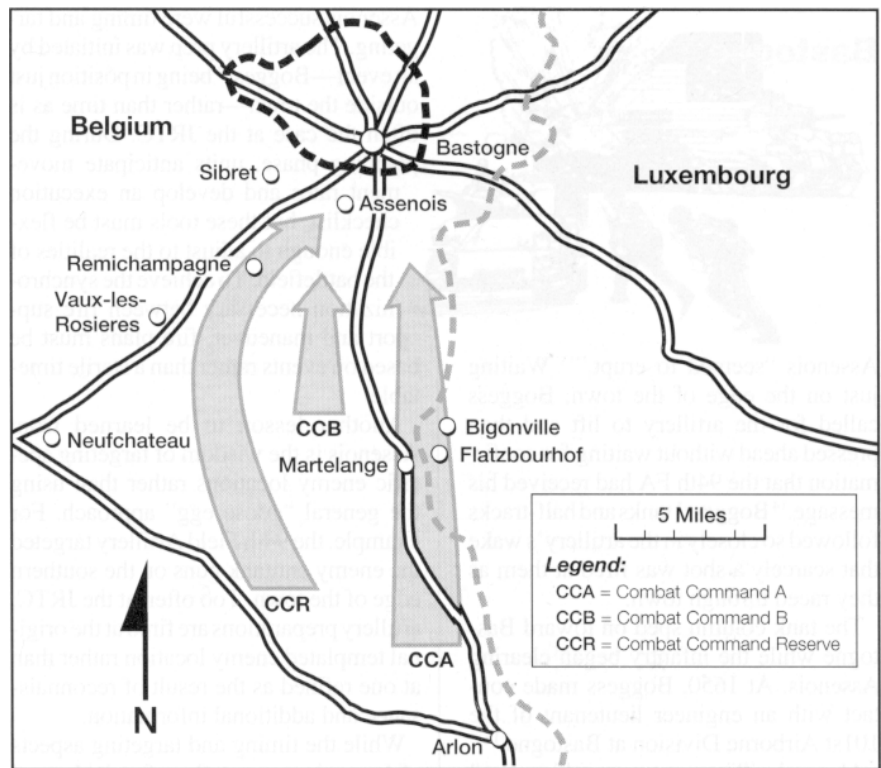


Figure 1: The 4th Armored Division in the Relief of Bastogne

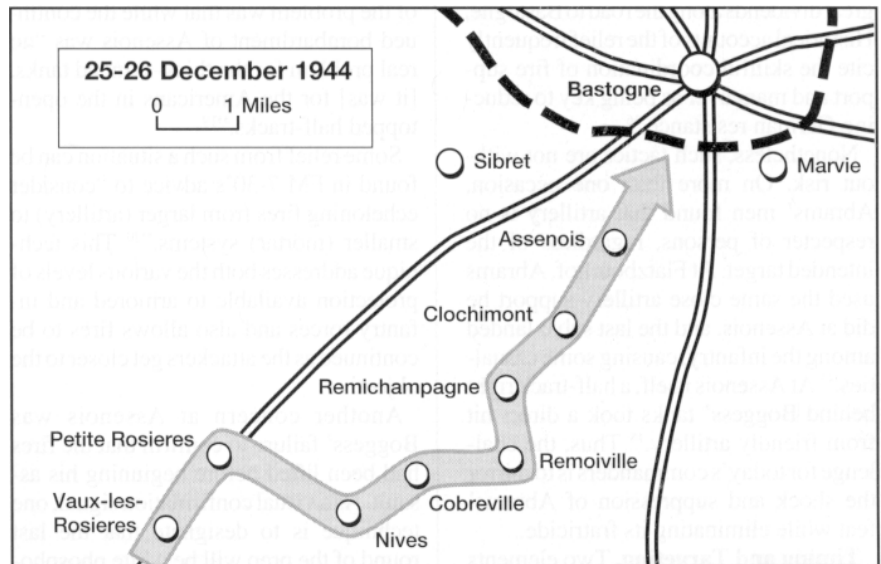


Figure 2: Task Force Abrams' dash through Assenois toward Bastogne—moving through the wake of the artillery.

artillery to see if he could get the Assenois concentration fired at a minute's notice. Exactly one minute later, the call came through from the lead tank. Abrams passed the order to the artillery, "Concentration Number Nine, play it soft and sweet."¹¹

The three artillery battalions from CCB and the battery from the 177th Field Artillery fired 10 volleys each on the center of the town. One battery from

the 94th Field Artillery hit the forward edge, hoping to destroy the enemy antitank guns there. The other two batteries fired on woods flanking each side of the road just beyond the town. In all, it was an intense bombardment of 420 rounds.¹²

First Lieutenant Charles Bogness was at the front of Team C's attack, and he recalled that with the impact of the artillery,



Assenois "seemed to erupt."¹³ Waiting just on the edge of the town, Boggess called for the artillery to lift and then pressed ahead without waiting for confirmation that the 94th FA had received his message.¹⁴ Boggess' tanks and half-tracks followed so closely in the artillery's wake that scarcely a shot was fired at them as they raced through town.

The tank column sped on toward Bastogne while the infantry began clearing Assenois. At 1650, Boggess made contact with an engineer lieutenant of the 101st Airborne Division at Bastogne.¹⁵

Abrams' willingness to mount his ground assault while the enemy was still reeling from the effects of the artillery had paid great dividends along the road to Bastogne. Historical accounts of the relief frequently cite the skillful coordination of fire support and maneuver as being key to reducing German resistance.¹⁶

Nonetheless, such tactics are not without risk. On more than one occasion, Abrams' men found that artillery is no respecter of persons, regardless of the intended target. At Flatzbourhof, Abrams used the same close artillery support he did at Assenois, and the last salvo landed among the infantry, causing some casualties.¹⁷ At Assenois itself, a half-track right behind Boggess' tanks took a direct hit from friendly artillery.¹⁸ Thus, the challenge for today's commanders is to mirror the shock and suppression of Abrams' feat while eliminating its fratricide.

Timing and Targeting. Two elements that made Abrams' use of artillery at Assenois successful were timing and

targeting. The artillery prep was initiated by an event—Boggess' being in position just outside the town—rather than time as is often the case at the JRTC. During the planning phase, units anticipate movement rates and develop an execution checklist, but these tools must be flexible enough to adjust to the realities of the battlefield. To achieve the synchronization necessary between fire support and maneuver, fire plans must be based on events rather than a sterile time-table.

Another lesson to be learned from Assenois is the wisdom of targeting specific enemy locations rather than using the general "goose egg" approach. For example, the 94th Field Artillery targeted the enemy antitank guns on the southern edge of the town. Too often at the JRTC, artillery preparations are fired at the original templated enemy location rather than at one refined as the result of reconnaissance and additional information.

While the timing and targeting aspects of Assenois are exemplary, fratricide must be avoided. In his book *A Time for Trumpets*, Charles MacDonald notes that part of the problem was that while the continued bombardment of Assenois was "no real problem for the thick-skinned tanks, [it was] for the Americans in the open-topped half-tracks."¹⁹

Some relief from such a situation can be found in FM 7-30's advice to "consider echeloning fires from larger (artillery) to smaller (mortar) systems."²⁰ This technique addresses both the various levels of protection available to armored and infantry forces and also allows fires to be continued as the attackers get closer to the objective.

Another concern at Assenois was Boggess' failure to confirm that the fires had been lifted before beginning his assault. As a visual confirmation signal, one technique is to designate that the last round of the prep will be white phosphorus, 200-meter height of burst.²¹ In this way, all members of the assault

force know not only that it's safe to advance, but also the exact time the assault must begin to avoid giving the enemy time to recover from the artillery's effects.

The synchronization of fire support and maneuver displayed by Lieutenant Colonel Abrams in the relief of Bastogne demonstrates both the effectiveness and the dangers of this technique. His success was largely the result of his rigorous combined arms training before the battle was ever joined.

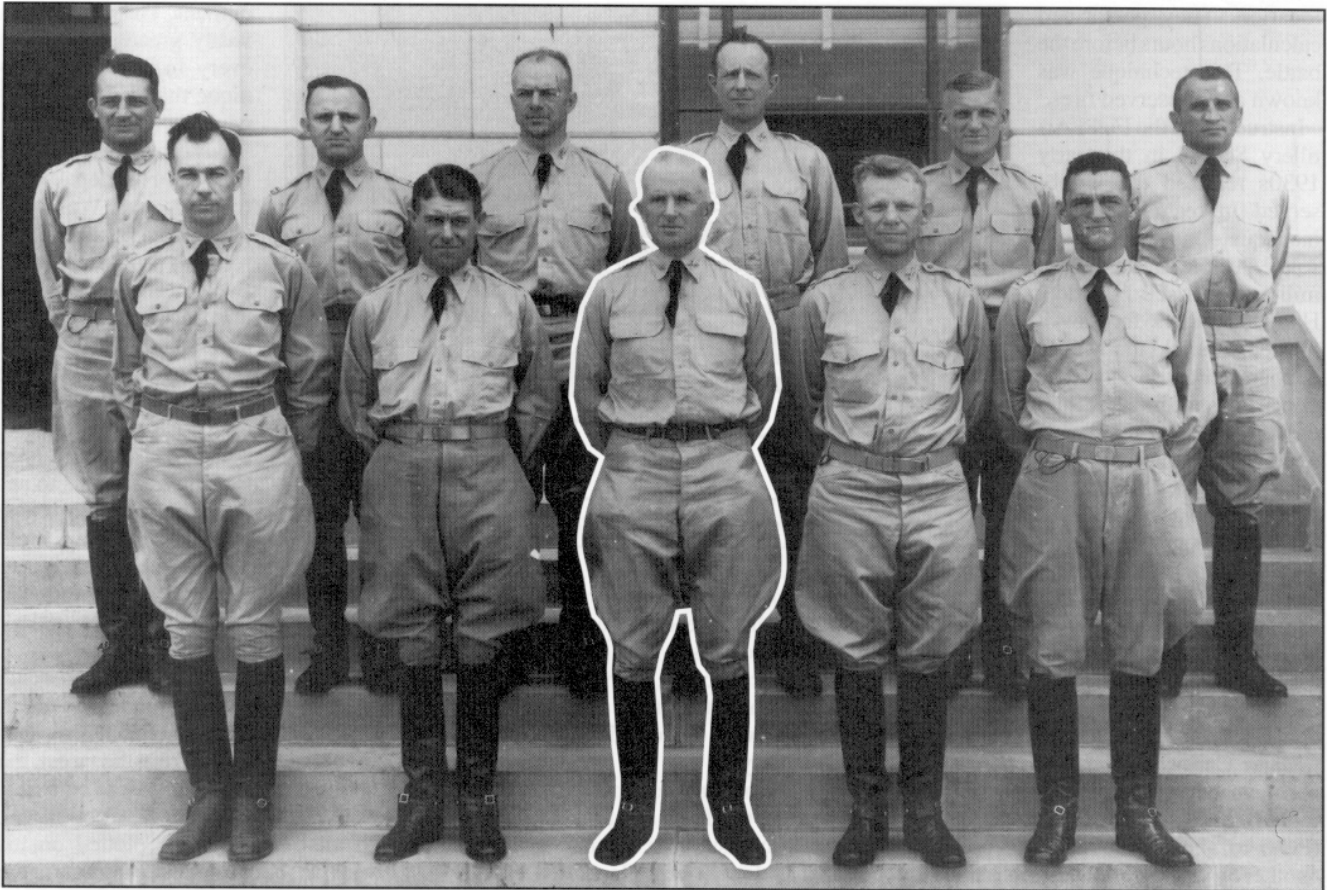
Today's commanders should follow Abrams' example in terms of training, timing and targeting, but they should build in mechanisms to avoid fratricide. Two such mechanisms are echeloning fires and providing a visual signal to confirm fires have been shifted. The combination of Abrams' daring and these additional control measures will allow commanders to safely and effectively optimize the shock and suppression of an artillery prep prior to a ground assault.



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Notes:

1. All references to the JRTC are based on the personal observations of the author while serving as an Observer/Controller at the JRTC from 1990 to 1992.
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12. Charles MacDonald, *A Time for Trumpets* (New York, NY: William Morrow, 1985), 531.
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14. Cole, 554.
15. Sorley, 79-80.
16. See for example, Cole, 550.
17. Sorley, 72.
18. *Ibid.*, 79.
19. MacDonald, 531.
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21. CB7C17, "Light Infantry Company Attack," Infantry Officer Advanced Course Practical Exercise (Fort Benning, GA: US Army Infantry School, December 1993), 5 and 11.



Orlando Ward and the Gunnery Department:

The Development of the FDC

by Captain Robert O. Kirkland



A decade had passed since World War I ended. That was time enough for the Field Artillery School at Fort Sill, Oklahoma, to evaluate the effectiveness of fire support during the war. Artillery support to the infantry had consisted of rolling barrages that dropped large concentrations of fire on successive areas.

But these rolling barrages had proved wholly unsatisfactory to American ground commanders. Artillery was unable

to shift the barrages from one coordinate point to another during the course of a battle. Artillery had lost its flexibility to support maneuver and, consequently, the confidence of the maneuver commander.

Critical to overcoming this shortfall of artillery doctrine was Major (later to be Major General) Orlando Ward's actions as Director of the Gunnery Department at the Field Artillery School from 1932 to 1934. Ward and his small cadre of gunnery instructors developed the fire

direction center (FDC) as it's recognizable today. In developing his FDC over a three-year period, he showed remarkable innovation and moral courage. Further, his FDC enabled the United States Field Artillery to reassume its rightful place as a decisive arm in war.

Beginnings of the FDC. Before the advent of what we know today as the FDC, Redlegs determined howitzer data by measuring a distance and angle between each battery and the known target

location. They performed calculations hours before the battle. This technique was known as unobserved fires.¹

Instructors at the Field Artillery School in the early 1930s realized that unobserved fire techniques were inadequate and probably obsolete. Articles by the British military theorist B.H. Liddel Hart and others foresaw a future battlefield that would be characterized less by static trench lines and more by fluid movement. Most serious officers realized that new methods were needed. There was

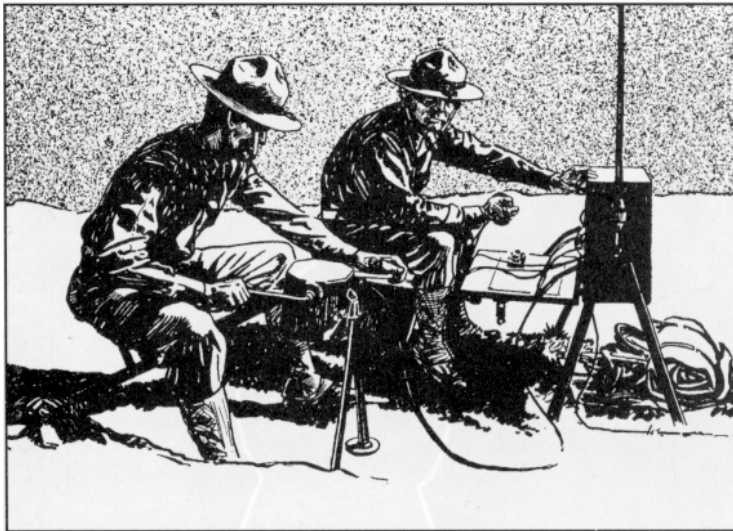
less agreement, however, as to what those methods should be; the Gunnery Department led the way.²

Several key advances were made between 1930 and the time Major Ward assumed directorship of the Gunnery Department. These advances laid the foundation for the FDC.

Major Carlos Brewer, head of the department between 1929 and 1932, promoted the idea of using forward observers (FOs) to shift fires from one point to another on the battlefield. In searching for alternatives to unobserved fire, Brewer came across a book by Lieutenant Colonel Neil Fraser-Tytler of the United Kingdom Royal Artillery: *Field Guns in France*. Fraser-Tytler described in the book how he directed small parties of wireman and observers into no-man's land to establish observation points during the war. The observation parties waited for targets of opportunity and called back map coordinates to fire.³

Brewer grasped the importance of Fraser-Tytler's techniques; he established that the FO would move with the infantry and provide fire support. Brewer's innovation corresponded nicely with the advancing development of the radio, which led to an obvious increase in flexibility over Fraser-Tytler's wireman.⁴

By the end of Brewer's tenure in 1932, fire direction techniques consisted of an observer identifying a target of opportunity and communicating firing data to his battery, either by wire or radio. To mass more than one battery, the observer called the dedicated observer from his sister battery in the battalion, gave the target location and asked if he could observe the same target. If this observer could identify the target, he



An early FDC in the *Field Artillery Journal*, March-April 1940, Page 107.

adjusted his battery on the target. Once all observers had adjusted on the target, they fired for effect.⁵

Although crude by today's standards, this method was a leap forward in fire direction capability. For the first time, there was a systematic way to mass fires on a target with dedicated observers from each battery.

But Major Brewer knew he had not arrived at the final solution. In his last report to the Assistant Commandant, Lieutenant Colonel (later General) Leslie J. McNair in June 1932, Brewer wrote that "obviously there is a problem that we [still] must face...gunnery has become too complicated...and [there is a recognized need for] specialization."⁶

The problems were obvious to Brewer. First, each battery was its own firing unit, requiring it to compute its firing data—a tediously slow process. Second, if an observer was unable to contact fellow battery observers to pass grid coordinates, battalion mass fires would not be achieved. Brewer recognized how complicated this process was and that specialization was the answer. But it would be up to Major Orlando Ward to find the exact solution.⁷

Ward and the FDC. Ward was an excellent choice to head the Gunnery Department during this critical time. The department was small, consisting of a department head and five to six gunnery instructors. Ward nurtured an environment of individual innovation and initiative in his group that was critical to developing the FDC.

Captain John W. Lentz, a gunnery instructor at the time, explained Ward's leadership style: "His methods were not obvious. There was no prodding, no

laying out of objectives, only a gentle happiness with every new thought, every development. The result was a vastly greater change in every facet of our technique than has ever happened before or since."⁸

Having worked with Brewer in the department for two years, Ward was well aware of the fire direction problems. Like Brewer, he recognized that fire direction computation methods needed to be changed. The greatest need was to devise procedures that would allow a battalion to mass on a point and then shift fires to another point rapidly. The Saturday morning Field Artillery

shoots that were instituted under Brewer and continued under Ward served as the springboard for determining the solution.

During one Saturday morning firing practice in 1932, an FO under the direction of Ward adjusted three batteries successively on a target. From the target, the FO plotted the locations of the batteries. The observer then called for a new target. With all three batteries plotted on his firing chart, he computed firing data to the new target. These procedures gave birth to the observed fire chart and reduced the time to calculate firing data from hours to 30 minutes.⁹

Looking back at the evolution of the FDC, the discovery of the observed fire chart was its defining moment. Ward described the innovation as dramatic and the springboard for "extraordinary and infectious enthusiasm."¹⁰

From that one development, several innovations occurred in succession. A fellow gunnery instructor First Lieutenant Charles Blanchard devised a means to locate targets and firing batteries on a 1:20,000-grid map sheet. Soon after, he developed a crude range deflection protractor (RDP) for the grid sheet that enabled the observer to quickly measure distance and direction from the howitzer to the target.¹¹

The second key innovation that sprang from the observed fire chart was the computation of firing data in a central FDC. Under Brewer, the FO would compute the data for the howitzers from his position at the front. Ward realized the absurdity of expecting an observer who was in contact with the enemy to compute firing data on a map chart with an RDP and firing tables. Consequently, he directed all fire direction

computation be in an FDC located under cover in a centralized area. Applied to battalion operations, all battery firing computations would originate at the battalion FDC.¹²

These two innovations—Blanchard's chart and RDP and the centralized computation of firing data—solved the problem that had plagued the artillery since the development of indirect fire: shifting fires in a timely and accurate manner. All subsequent fire direction innovations were based on the chart, RDP and FDC.

Ward and his instructors had found the solution. But persuading the artillery community to adopt their techniques was another hurdle to overcome.

Overcoming Opposition. Ward was able to convince the Artillery School to adopt his new methods but struggled to convince others outside the school to adopt them. Captain Sidney Dunn, another gunnery instructor during Ward's tenure, described the problem in this way: "We felt that we had found the solution to the fire direction problem. Many people were skeptical. It was necessary for us to overcome others natural tendency to resist this change."¹³ This skepticism came from the Tactics Department within the school and from senior generals in the Field Artillery.

Ward had to overcome the Tactics Department's opposition before he could teach his new techniques to the students. Instructors in the Tactics Department were responsible for teaching gunnery and were still wed to the idea that the battery commander was responsible for his own fires. The Tactics Department had the most influence in the school because it was larger and its director out-ranked the director of the Gunnery Department. Ward feared that if the Tactics Department objections could not be overcome, the FDC could die of neglect.¹⁴

In 1933, Major Ward enlisted the help of Lieutenant Colonel McNair to save the FDC. McNair had followed the development of fire direction techniques under both Brewer and Ward and realized the importance of these

innovations. McNair used his influence as Assistant Commandant to shift the teaching of gunnery from the Tactics Department to the Gunnery Department. This move by McNair in 1933 ensured the preservation of the FDC concept within the school.¹⁵

While Ward succeeded in convincing the school to adopt his methods, he was unsuccessful with senior artillerymen outside the school. In the 1930s, the Chief of Field Artillery was located in Washington, DC—not as he is today also as the Commandant of the Field Artillery School at Fort Sill. Absorbed by the politics of Washington and sensitive to commanders in the field (a group that disliked the centralized FDC concept), the Chiefs of Field Artillery from 1932 to 1941 displayed attitudes that ranged from apathy to vehement opposition.

The most strongly opposed was Major General Upton Birnie, Chief of Field Artillery during the end of Ward's tenure (1934 to 1938). He fought against taking the firing prerogative away from the battery commander. Opposition was not overcome until General George Marshall, Chief of Staff of the Army, witnessed a demonstration of a massed division at Fort Sill in 1941. He then directed the Chief of Field Artillery, Major General Robert Danford, to implement Ward's methods throughout the artillery.¹⁶

Ward's Legacy. Orlando Ward and his cadre of gunnery instructors were truly remarkable men. Their time in history was fortuitous for the United States Army. Ward established the FDC in 1934, codified it in the Field Artillery School's *Digest of Field Artillery Developments* printed in 1935 and established it doctrinally in *TR 430-85 The Field Artillery Book, 161, Gunnery* printed in 1936. The system was fully in place for the thousands of newly commissioned lieutenants as they trained at the Fort Sill Officer Candidate School in 1941. Few of these lieutenants realized the methods they were learning were developed only a few years earlier by a small group of forward-thinking men.

Countless testimonials to the effectiveness of the FDC during World War II can be found. A paraphrase of a radiogram sent by General Douglas MacArthur in March 1942 concerning the FDC states, "I can make no suggestions for the improvements of methods taught at Fort Sill. The strong effect of massing artillery fires using the fire direction center connected with all observation posts has been proven beyond question. In many situations that seemed desperate, the artillery has been the most vital factor."¹⁷

Today, Field Artillery leaders face budgetary constraints similar to those Ward and his instructors faced in the depression Army of the 1930s, but not as severe. Likewise, changing missions and technical advances demand we be as innovative as Orlando Ward and his Gunnery Department.

Hopefully, future innovators won't face the opposition that Ward did. But most often, implementing changes—even those that solve serious problems—causes opposition. Orlando Ward's determination to implement his new fire direction procedures, even in the face of opposition from senior Field Artillerymen, shows a moral courage worth emulating.



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1. Lieutenant Colonel Frank G. Ratliff, "The Field Artillery Battalion Fire Direction Center: Its Past, Present and Future," *Field Artillery Journal* (May-Jun 1950), 116.
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4. *Ibid.*, 56.
5. Russell Gugeler, "Fort Sill and the Golden Age of the Field Artillery," unpublished manuscript in Morris Swett Library, US Army Field Artillery School (Fort Sill, OK), 9.
6. Letter, Brewer to Commandant, 2 June 1932, US Army Field Artillery School (Fort Sill, OK), 3.
7. *Ibid.*, 5.

8. Gugeler, 11.
9. *Ibid.*, 13.
10. *Ibid.*, 14.
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13. Letter, Dunn to Commandant, 21 February 1944, US Army Field Artillery School (Fort Sill, OK), 4.
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Fire Support at the Battle of Chickamauga

by Captain Christopher P. Govekar, CH



The effectiveness of artillery at Chickamauga was limited because of the rough nature of the terrain and the dense vegetation.¹

Confederates. The Union artillery did, in fact, save the Army of the Cumberland from total destruction.

Organization, Terrain and Tactics

Fire support is defined in *FM 100-5 Operations* as: "...the integration and synchronization of fires and effects to delay, disrupt or destroy enemy forces, combat functions and facilities in pursuit of operational and tactical objectives."² The manual goes on to emphasize that to generate effective firepower, fire support must be integrated with other combat functions.

But during the Civil War, coordinating for the employment of fire support assets was not as essential because each brigade commander had his own cannon battery. Fire support for the Civil War commander was more responsive than for the modern commander and can be likened to our employing the battalion mortar platoon of today.

The basic unit for Field Artillery during the Civil War was the battery. Federal batteries consisted of six guns each while a Confederate battery

mounted only four guns. At the Battle of Chickamauga, General Rosecrans put 33 and 1/3 batteries in the field for a total of 201 guns. Of these, 98 were smoothbore and 103 rifled. The Confederate Army of Tennessee had 40 and 1/2 batteries (175 guns) with only 150 identified by type in surviving records. These included 27 rifled and 118 smoothbore.³

In terms of distance and accuracy, the rifled artillery pieces the Union forces had were far superior to the smoothbores of the Confederates. This advantage was negated by the restricted and heavily wooded nature of the terrain that interfered with fields of fire.⁴ Adding to the Confederates' difficulties was the fact that most batteries had two or three calibers of guns; this caused extreme supply and employment problems for Bragg's commanders.⁵

Changing infantry tactics also had a profound effect on the role of the artillery. By this time, the tactical defensive was shown superior to the offensive. The rifled musket allowed the defender to mass firepower on an attacker from long ranges. In a war where commanders believed that to mass firepower you had to mass people, the rifle was devastating.

This assertion from the Command and General Staff College's *Handbook for the Battle of Chickamauga* would seem to end any discussion of the role of artillery in this Civil War battle. Although the overall effect of artillery on the battle was small, there were several instances where the application of this asset greatly affected the outcome of specific engagements. In this sense, then, the artillery played a greater role than it's given credit for in histories.

At the Battle of Chickamauga in September 1863, General Braxton Bragg, commander of the Confederate Army of Tennessee, faced Union Major General William S. Rosecrans, commander of the Army of the Cumberland, not far from Chattanooga, Tennessee, along Chickamauga Creek. Although General Bragg was credited with a victory at Chickamauga, Union forces employed artillery with far greater success than the

This increased accuracy resulted in artillery no longer being effective as an offensive weapon. Earlier in the Civil War, the attacker advanced to a point 400 yards or so from the defender's position and then brought his artillery forward. Once the artillery was forward, it fired canister shot at the defensive positions to open holes in the defender's lines for the infantry to attack through.⁶

This allowed the attacker to take advantage of the psychological effect of his artillery. In his book *Battle Tactics of the Civil War*, Paddy Griffith states, "It was here that the flash and crash of the heavy Napoleons, firing two and a half pounds of powder with each detonation, could numb and stagger the enemy, even when they did not physically hurt him."⁷

By the Battle of Chickamauga, artillery had abandoned this traditional tactic and adopted a mostly defensive role. The focus of the artillery had changed from winning the close quarters battle to keeping the enemy at a distance where the defender could take advantage of the range of the rifled musket.⁸

One of the most effective uses of artillery at this time was to keep the guns back of the defenses until the enemy's infantry came within about 300 yards. This mass of soldiers presented a good target, and great damage could be done with a few rounds of canister.⁹ In fact, one Union soldier in the Atlanta Campaign observed, "The Rebels seldom fire their cannon except when they can use grape or canister."¹⁰ This effective tactic limited General Bragg's Field Artillery role in the Battle of Chickamauga as the Confederates were on the offense for the majority of the battle.

Union Artillery Effectiveness

The Battle of Chickamauga includes several instances where Union artillery was particularly effective in the outcome of engagements. In each engagement, the artillery contributed significantly to saving the Union Army from complete destruction.

Alexander's Bridge. On 18 September at Alexander's Bridge on Chickamauga Creek, two sections (four guns) from Union Captain Eli Lilly's 18th Indiana Battery took up a defensive position with Colonel James H. Wilder's brigade near the bridge. Lilly's guns were emplaced on a small hill 400 yards from the bridge near the Alexander home.¹¹ From this position, the guns had good fields of fire

across an open area to the bridge. Wilder had orders to hold or dismantle the bridge to keep the Confederates from crossing.¹²

At about 1230 that day, the advance elements of General William H.T. Walker's corps (Walthall's brigade of Liddell's division) made contact with the Federal skirmishers and drove them back across the creek. Walker's column then began to advance on the bridge, only to have its advance stopped by canister and shells from Lilly's guns and fire from Wilder's Spencer rifles.

Twice the Confederates charged, and twice they were repelled by the combined fires of Lilly and Wilder. General Nathan Bedford Forrest, who was with Walker's column, ordered his own artillery to position two guns to fire counterbattery against the Union guns. Lilly's men rapidly shifted their fires onto Forrest's guns, and the Confederates were only able to get off four rounds before they were forced to withdraw.¹³

The effective fires of Lilly's guns allowed Wilder's men to dismantle the bridge and forced Liddell's division to cross downstream at Byron's Ford. This cost the Confederates time they could not afford at that stage of the battle. Liddell's failure to cross at Alexander's Bridge removed Bragg's hope of conducting a coordinated attack on the 18 September and forced him to reposition forces using other crossing sites before mounting his attack.

Wilder had integrated his artillery with the fires of his Spencer rifles to disrupt and delay the Confederate advance in a textbook example of FM 100-5's use of fire support.

Brotherton Field. On 19 September at about 1430 in the afternoon, Confederate General A. P. Stewart's division, supported by Major General Bushrod Johnson's division, attacked toward the Brotherton house, driving Van Cleve's division before them. Johnson's division attacked in the general vicinity of Lilly's position, but Wilder's men were able to push him back across the road while Lilly's guns "... shelled the woods in support."¹⁴

At 1600 that afternoon, Hood's division attacked Wilder, determined to make a breakthrough. The Confederate forces also attacked Davis' division and drove it back into Wilder's line; Lilly's artillery finally broke the Confederate charge by firing canister into the advancing line. The Confederate soldiers moved into a small ravine to take shelter from the effects of the artillery fire and continued to advance.

Captain Lilly was quick to recognize the opportunity to defeat the enemy and moved his guns into positions where he could fire down the length of the ditch. He then opened up with triple shots of canister, forcing the Confederate soldiers to "...retreat in confusion."¹⁵ During this engagement, Lilly fired 200 rounds of double-shotted canister into the ditch, causing Wilder to remark that "...it seemed a pity to kill men so."¹⁶

This halting of the Confederate advance proved to be key to the Union cause. It allowed Davis the time he needed to reorganize his division and for Wood's division, which was moving to support the defense, to arrive.¹⁷

While it can be argued that Wilder's repeaters, not Lilly's artillery, were the cause of the Union success at Alexander's Bridge, it seems clear that artillery was the key to the Union success at Brotherton Field. Davis' division was hopelessly disorganized after Stewart's assault and would have given way if the artillery fire had not provided time for it to reorganize and meet up with Wood to reinforce the line. The engagement at Brotherton Field is a good example of fire support's ability to delay and disrupt, leading to Union success on the field.

Snodgrass Hill. On the afternoon of 20 September, artillery once again contributed to saving the Union Army. After Lieutenant General James Longstreet's corps broke through at the Brotherton Field, Major General George H. Thomas rallied the scattered fragments of the Union forces on Snodgrass Hill and determined to hold at whatever the cost. When Thomas rode out to check the line, he said to Colonel Opdycke of Harker's brigade, "This point must be held." Opdycke replied, "We will hold it or go to heaven from it."¹⁸ Hold it they did, and at a terrible cost to the attackers.

Longstreet ordered an all-out assault on Thomas' positions with the aim of sweeping the Federals from the field and crushing the Army of the Cumberland with one decisive blow. Between the initial breakthrough and the assault, Union Major General James B. Steedman was able to add his two batteries of artillery to the four already on the hill. As the Confederate divisions now under Bushrod Johnson's command began their advance, Steedman opened up with his artillery and "...did fearful execution."¹⁹

Steedman had his artillery fire triple shots of canister into the advancing Rebels, which, "...tore away the rifling from the guns and tore equally well into the ranks

of the Confederates.²⁰ The Southern infantry continued its advance but was finally forced to withdraw under the withering effects of the artillery and the fire from muskets and Colt-revolving rifles brought into action by seven companies of the 21st Ohio.

In his later memoirs of the battle, Longstreet would say he made 25 separate assaults on Snodgrass Hill. None met with any more success than the first. The combined fires of the artillery and rifles resulted in a loss of more than 1,000 men from the attacking divisions and kept Thomas' forces from being destroyed completely.

On Snodgrass Hill, as at Alexander's Bridge, it was the integrated fires of rifles and artillery that saved the Northerners, allowing them to retreat toward Chattanooga.

Compare and Contrast

Union forces had far more success using artillery than the Confederates had at Chickamauga. Their successes, while to all appearances small, had a great impact on the outcome of the battle as they kept Rosecrans' army from being totally surrounded and defeated in detail.

There were several reasons why the Union forces' artillery was more effective—first, tactics and equipment. The Union forces spent the battle in the defense, which at that time made the best use of artillery. While artillery did not have the range of the rifled musket, one tube of artillery could put out a devastating amount of fire in a very short time. The effects of defensive artillery in Lilly's stand at Brotherton Field was in large part responsible for keeping the Southerners from turning the flank of the Union Army and defending Snodgrass Hill. In all, Union forces were able to use artillery effectively to disrupt the

Confederate battle plan enough to keep what was a defeat from becoming a rout.

In contrast, the Confederate forces did not have much success with their artillery. The only time Confederate artillery could have been successful was in Cleburne's night assault at Lafayette Road, and darkness kept it from having any effect.

On the evening of 19 September, Confederate Major General Pat Cleburne employed his artillery at Lafayette Road. At 1800, Cleburne attacked along the road supported by Cheatham's division.²¹ The Confederates pushed back the Federal right flank, in some places a mile, before the attack stalled in the Winfrey Field.

In an attempt to regain his momentum, Cleburne ordered his artillery pieces forward. They set up in a position 80 to 100 yards from the Union line and opened fire.²² Unfortunately, due to the darkness, they shot high with devastating effects only on the trees in the area.²³ While the firing of the artillery pieces doubtless had a psychological effect on the defenders, Cleburne was still unable to break the Federal line and was forced to retire to the far side of Lafayette Road.

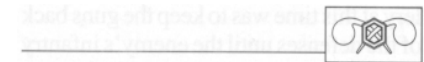
Cleburne attempted unsuccessfully to use the shock effect of his artillery to break the Union soldiers' will to fight. This was typical of Confederate forces' results when they tried to use their artillery, partly due to the nature of the terrain.

Also, the Confederate artillery lacked overall direction. As Larry Daniel states in his book *Cannoneers in Gray: The Field Artillery of the Army of Tennessee, 1861-1865*, "Bushrod Johnson instructed his batteries to 'move with the infantry and come into action whenever opportunity permitted.' ...Batteries were always committed individually and never in mass."²⁴ Lack of mass resulted in lack of effectiveness for the Confederate artillery. Confederate forces had little practical

knowledge in employing artillery as their two most qualified officers, Lieutenant Colonel Bondurant of General Polk's wing and Colonel Edward P. Alexander of General Longstreet's wing were not at the battle.²⁵ This lack of knowledge and vision for using artillery kept the Confederates from massing their artillery at any point on the battlefield; they were unable to take advantage of the restrictive terrain's effects on the Union defenders ability to maneuver.

Union forces had a plan for employing their artillery and stuck to it. They took advantage of their position as the defender and massed the effects of their artillery to achieve the greatest results.

While most historians think the artillery's role in the Battle of Chickamauga was not significant, the effect it had on the outcome of specific engagements was significant. While Union forces were defeated at Chickamauga, the Union artillery allowed them to live to fight and win another day.



Captain Christopher P. Govekar, Chemical Corps, won Third Place in the US Field Artillery Association's 1995 History Writing Contest with this article. He's the Chemical Officer for the 325th Airborne Infantry Regiment at Fort Bragg, North Carolina. In the 4th Infantry Division (Mechanized) at Fort Carson, Colorado, he was the Chemical Officer for the 1st Battalion (Mechanized), 8th Infantry and the Decontamination Platoon Leader, Smoke Platoon Leader and Executive Officer for the 31st Chemical Company. He's a graduate of the Chemical Officer Advanced Course, Fort McClellan, Alabama, and the University of Notre Dame.

Notes:

1. Dr. William G. Robertson, Editor, *Handbook for the Battle of Chickamauga, 18-20 September 1863* (Fort Leavenworth, KS: US Army Command and General Staff College, not dated), 31.
2. *FM 100-5 Operations* (Washington, DC: Headquarters, Department of the Army, 14 June 1993), 2-13.
3. Larry J. Daniel, *Cannoneers in Gray: The Field Artillery of the Army of Tennessee, 1861-1865* (Tuscaloosa, AL: University of Alabama Press, 1984), 95.
4. Robertson, 31.
5. Daniel, 94.
6. Robertson, 43.
7. Paddy Griffith, *Battle Tactics of the Civil War* (New Haven, CT: Yale University Press, 1989), 170.
8. Griffith, 171.
9. *Ibid.*, 168.
10. Hamlin A. Coe, *Mine Eyes Have Seen the Glory* (Cranbury, NJ: Associated University Presses, 1975), 152.
11. John W. Rowell, *Yankee Artillerymen: Through the Civil War with Eli Lilly's Indiana Battery* (Knoxville, TN: University of Tennessee Press, 1975), 112.
12. Robertson, 149.
13. Rowell, 116.
14. *Ibid.*, 117.
15. *Ibid.*, 117.
16. *Ibid.*, 117.
17. *Ibid.*, 118.
18. Glenn Tucker, *Chickamauga: Bloody Battle in the West* (Dayton, OH: Morningside Bookshop, 1984), 336.
19. Tucker, 350.
20. *Ibid.*, 350.
21. *Ibid.*, 182.
22. Daniel, 97.
23. Tucker, 183.
24. Daniel, 102.
25. *Ibid.*, 102.

1996 History Writing Contest

The US Field Artillery Association is sponsoring its 11th annual History Writing Contest with the winners' articles to be published in the July-August 1996 edition of *Field Artillery*. To compete, submit an unpublished, original manuscript on any historical perspective of Field Artillery or fire support you chose by 5 February 1996.

The Association will award \$300 for the First Place article, \$150 for the Second Place and \$50 for the Third. Selected Honorable Mention articles also may be published in *Field Artillery* or the Association's "Forward Observer" newsletter.

Any US service member, ally or civilian is eligible to compete—you don't have to be a member of the Field Artillery Association.

Your submission should include the following:

- A double-spaced, typed unpublished manuscript of no more than 3,000 words; it should include footnotes and a bibliography.
- Comprehensive biography.
- Graphics, maps, photos, slides, charts, etc. to illustrate your article, if possible.

The article should include specific lessons or concepts that apply to Redlegs today—it should not just record history or document the details of an operations. You may write about any historical period you choose.

A panel of three expert historians will judge the manuscripts, which will not include the authors' names. The panel will determine the winners based on writing clarity (30%), application to today's Redlegs (30%), historical accuracy (30%) and originality (10%).

By 5 February 1996, send the manuscript to the US Field Artillery Association, ATTN: History Writing Contest, P.O. Box 33027, Fort Sill, Oklahoma 73503. For more information, call *Field Artillery* at DSN 639-5121 or 6806 or commercial at (405) 442-5121 or 6806

1995 History Contest Winners

First Place: "The Relationship Between FA and Maneuver in the Relief of Bastogne" by Captain Kevin J. Dougherty, Infantry

Second Place: "Orlando Ward and the Gunnery Department: The Development of the FDC" by Captain Robert O. Kirkland

Third Place: "Fire Support at the Battle of Chickamauga" by Captain Christopher P. Govebar, Chemical Corps



Judges of the 1995 History Contest

• **Colonel (Retired) John R. Elting** of Cornwall-on-Hudson, New York, is the author or co-author of nine books on military history and editor or co-editor of or contributor to eight more. His his latest book, *Military Life Under Napoleon*, was published by The Emperor's Press in 1995. Colonel Elting taught at the US Military Academy, West Point, in the Department of Military Art and Engineering for 11 years. He was commissioned a second lieutenant in the Field Artillery upon graduation from Stanford University in 1932 and trained with the horse-drawn French 75-mm gun. Among other assignments, he served as Service Battery Commander for the 71st Armored Field Artillery Battalion, 5th Armored Division from 1942 to 1943 at Camp Cook, California, and in the Tennessee Maneuvers and was Executive Officer of the 24th Field Artillery Battalion (Philippine Scouts) in 1946 and 1947. He retired in 1968.

• **Colonel Stephen L. Bowman**, Infantry, is the Director of the US Army Military History Institute, Carlisle Barracks, Pennsylvania. His previous assignment was as the Director, Theory of War Studies on the faculty of the US Army War College, also at Carlisle Barracks. He is a 1990 graduate of the Army War College, serving as an Army Fellow at Ohio State University. Colonel Bowman has a Master of Art and a Doctorate of Philosophy in History from Duke University and taught History at the US Military Academy at West Point where he also served as the History Department Executive Officer. In 1990, he served as Deputy Commander of the Berlin Brigade in Germany until coming to Carlisle Barracks in 1992. He commanded the 2d Battalion, 2d Infantry, (Combined Arms Heavy), 9th Infantry Division (Motorized) at Fort Lewis, Washington, and a company in the 4th Infantry Division (Mechanized), Fort Carson, Colorado.

• **Colonel Jerry D. Morelock** is Director of the Combat Studies Institute at the US Army Command and General Staff College, Fort Leavenworth, Kansas. He holds a Master of Science in Industrial Relations from Purdue University and the Master of Military Art and Science from the Command and General Staff College. Colonel Morelock currently is working on his Doctorate in History from the University of Kansas. His previous assignment was as Chief of the Russia Branch, J5, Joint Chiefs of Staff at the Pentagon. Among other assignments, he was a Staff Group Leader at the Combined Arms and Services Staff School at Fort Leavenworth. He commanded the 570th US Artillery Group in Germany for three years and two batteries, including one in Vietnam. Colonel Morelock won the first US Field Artillery Association's History Contest in 1986 and served as a judge in 1987

Field Artillery Themes for 1996

Editions	Theme	Copy Deadline
January-February	Targeting	18 Sep 95
March-April	Training	20 Nov 95
May-June	The Fire Support-Aviation Team	17 Jan 96
July-August	History Writing Contest	5 Feb (Contest) 20 Mar (Other)
September-October	Digitizing the Force	15 May
November-December	Red Book Annual Report	17 Jul