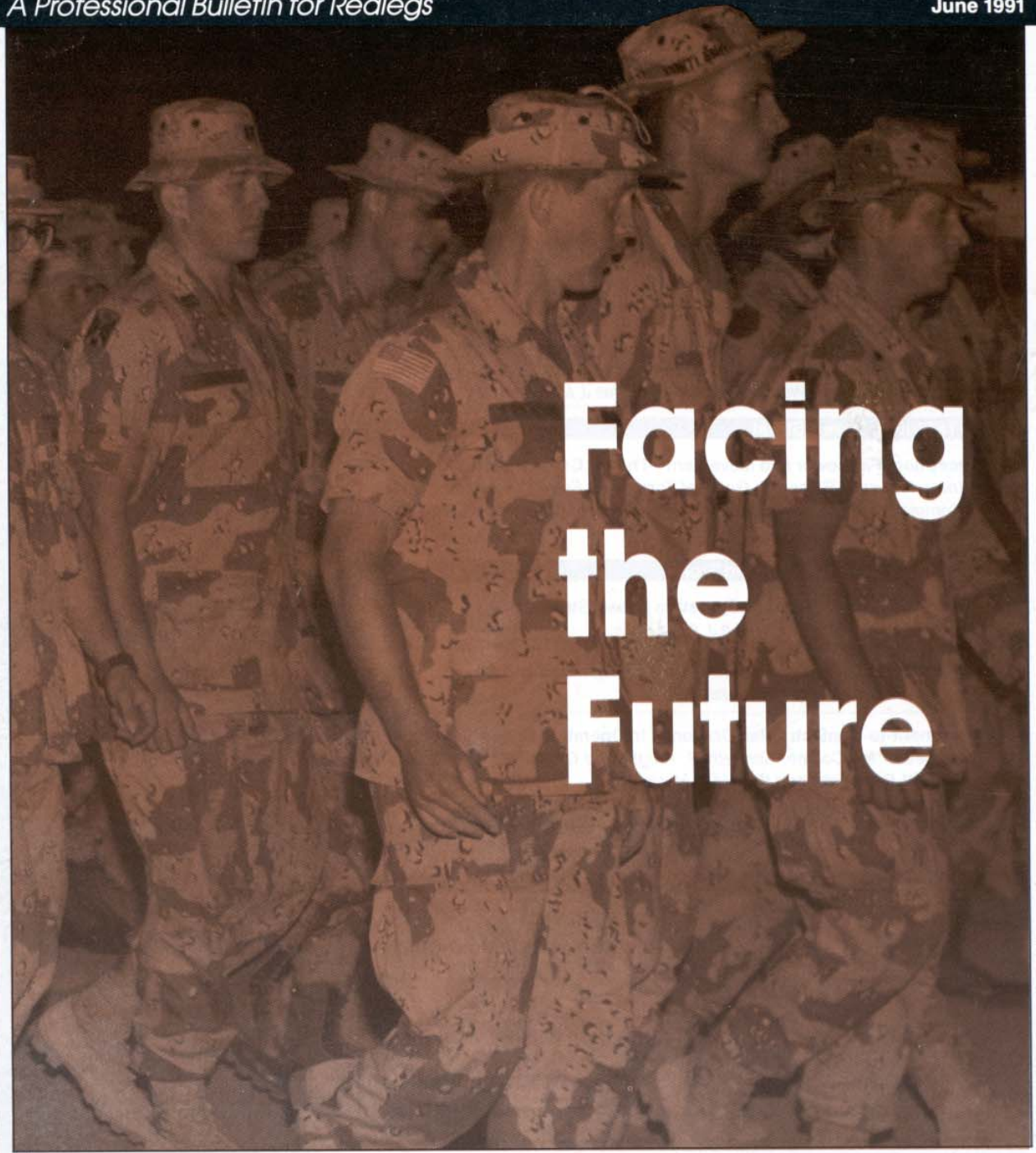




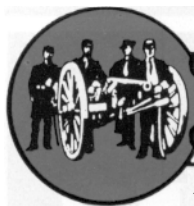
Field Artillery

A Professional Bulletin for Redlegs

June 1991



Facing the Future



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Parting Thoughts: Focus on the Future

It has been my privilege to serve as your Chief of Field Artillery for the past four years. But there comes a time for each to pass on the guidon, and my time is here. Together, we've trained and equipped the most lethal Field Artillery in the history of the Army—Desert Storm was proof the "King of Battle" still reigns.

Focusing on **doctrine**, we've dramatically enhanced our abilities to win the close and deep battles, including counterfire. Our doctrine is continually being honed to reflect requirements confirmed in recent contingency operations and the versatility of the superb weapons systems of the future.

With our integrated system-of-systems approach, our howitzers will be even more deadly, accurate and survivable. We'll have the inherent flexibility to employ them as the situation dictates, ranging from tight, centrally controlled operations to high-speed, independent "Shock Specialists."

To better define the future and build in the required versatility and lethality, we've completed studies on the role of fire support as the Army's AirLand Battle Doctrine evolves into AirLand Operations. Of particular interest was the work of Close Support Study Group IV. It examined fire support in the brigade and division fight and provided excellent recommendations for doctrine, force structure and equipment for the present and near term.

Field Artillery clearly leads the way in **force modernization**. During the past three-plus years, we've had a perfect record of 12 successful Army System Acquisition Review Councils (ASARCs). This record shows we're on target with our current and developing weapons systems. Programs such as the Paladin M109A6 howitzer, M119 light howitzer, Army tactical missile system (Army TACMS), high-mobility artillery rocket system (HIMARS) and several smart munition initiatives ensure the Field Artillery will continue to be versatile while delivering massive, lethal firepower.

In addition, command and control systems such as the advanced Field Artillery tactical data system (AFATDS)

and the interim light tactical fire direction system (LTACFIRE) are significantly increasing our automated capabilities and, therefore, responsiveness to the maneuver commander.

The quality of Redlegs' **training** at Fort Sill, Oklahoma, has continued to improve during the past several years, ensuring Field Artillery remains a force multiplier for the future. Our training goal remains the same: to produce technically and tactically proficient Field Artillerymen who can bring devastating firepower to bear for our maneuver forces on any battlefield. The results of Desert Storm are still being analyzed, but initial indications are our training is on track.

The combat training centers (CTCs) have proven to be key in our combat readiness. We're finally beginning to see the long-sought favorable reports of fire support performances at the CTCs. Your willingness to share your experiences at the CTCs, both positive and negative, have led to significant increases in our on-the-ground portrayal of fires and fall-of-shot effectiveness.

Combined with the success of the CTCs are the dramatic changes occurring in leader development courses at Fort Sill. The restructured Officer Basic Course (OBC) has been graduating more competent, qualified Army and Marine officers for a year. With its hands-on training and the addition of small group instruction (SGI), the Officer Advanced Course (OAC) is better preparing our junior officers to be fire supporters, commanders and staff officers.

At the same time, the Field Artillery Training Center (FATC), NCO Academy and Drill Sergeants School continue to improve the individual skills of the Artillery's most important assets—the first-line leader and the soldier.

Looking at **force structure**, I'm proud to report that Field Artillery maintains its reputation of having highly qualified soldiers and superbly competent leaders. And we must continue to live up to our reputation as we "build down" the Army.

Our Legal Mix VII Study, scheduled to be completed in October, will recommend a force structure mix based on fighting in AirLand Operations. The future Field

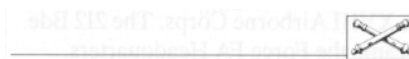


Artillery unit will be streamlined to meet the goal of increasing our lethality while using fewer resources. While building down, we have the opportunity to restructure the Field Artillery into more powerful, capable units, albeit fewer of them.

So, my **parting thought** for Redlegs is be proud of your many outstanding accomplishments, but not so proud you rest on your laurels. Though you are the world's finest Field Artillery, you won't remain so if you focus on your "press clippings." On any future battlefield, whether in the next few days or the next century, your objective must be constant: to provide the best possible fire support for the maneuver commander—an awesome responsibility. For battles are won or lost and soldiers live or die based on the quality of our performance.

As I leave, I thank you for your long hours and unselfish devotion and ask you give Major General Fred Marty, your new Chief, the same excellent support. You've made my job both personally and professionally rewarding.

I'm a Redleg—always have been and always will be. Let us never forget there's only one 24-hour-a-day, all-weather fire support system—the Field Artillery. **The Future Belongs to the Field Artillery!**

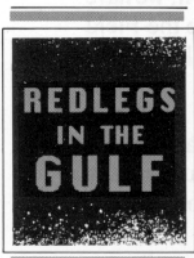


Major General Raphael J. Hallada was selected for his third star and assigned this month as Commanding General of Fifth Army and Fort Sam Houston, Texas. He has served as the Commanding General of the US Army Field Artillery Center and School, Fort Sill, Oklahoma, since August 1987. Major General Fred F. Marty, the Commanding General of the US Army Community and Family Support Center, Alexandria, Virginia, is the next Chief of Field Artillery.

Desert Storm Letters Home

During Operation Desert Storm, Captain John Sims, a liaison team leader from the 2d Battalion, 18th Field Artillery (2-18 FA), 212th Field Artillery Brigade (212 FA Bde), worked with an FA battalion in direct support (DS) of an infantry brigade in the 24th Infantry Division (Mechanized). In two letters home, he describes his experiences and feelings and

the lessons he learned. The following are excerpts of a letter to his wife, Theresa, and the second to his father, Lieutenant Colonel (Retired) Billy Sims, Field Artillery.



1 March 1991

Dear Theresa,

The war's finally over! I'm not sure where to start—at the beginning or the end. First, let me tell you I'm fine—we all are. No one in the battalion [2-18 FA] was killed or wounded.

I got my first six hours sleep in the last four or five days. Things have moved so fast and so intensely that days melt together and everything is blurred. The next week or so we'll all talk and think about what happened and start to understand it. Here's what I think happened.

I couldn't tell you on the phone our mission or where we were, but the news has probably filled in all the blanks. The 212 FA Bde reinforced the 24 ID Div Arty [24th Infantry Division Artillery], which spearheaded the main effort for the XVIII Airborne Corps. The 212 Bde became the Force FA Headquarters.

We were positioned about 10 kilometers from the Iraqi border on the west point of the neutral zone. On our left was the French Foreign Legion, our right, VII Corps. Our mission was to punch north to destroy several airfields, cut the Euphrates River and the lines of communications to Baghdad and trap the RGFC [Republican Guard Forces Command]. We would be the first to cross the river in the hopes of

drawing out the RGFC so VII Corps could attack its flank.

We knew G-Day (Ground Day) would be soon, but it changed several times. Finally, we crossed the line of departure (border). One day prior, we got the job of reinforcing 3-41 FA (a 155-mm howitzer battalion) DS to the 2d Bde [24th ID]. That was the best thing that could have happened—what a great unit!

Before we crossed the border, the tension got pretty high. The plan was for the operation to take seven to 14 days and cover about 300 kilometers. The first 12 hours, we were on schedule. After that, things were going so well we quickly exceeded the plan.

We encountered little resistance for the first 50 kilometers but expected heavy resistance as we moved north. The biggest danger was that much of our movement was at night, and the terrain was extremely rough. At one point, we ran into a sand trap that ate 13 of the battalion's vehicles, which later took days to recover. Some equipment was lost forever.

My liaison team was positioned well forward of the battalion, making me the first to cross into Iraq. (Because of this, my guys said I owed them a hamburger cookout at home!)

Before sunrise the first day, we reached our first objective. At that point we were on schedule, but the operation was going so well, we pushed north. That morning we fired our first mission on communications and headquarters sites.

It appeared the month of bombing had destroyed Iraq's ability to gather intelligence from the battlefield, and none of the RGFC moved out to meet us. That left only two light infantry divisions, an airfield and a large ammo dump to contend with.

The airfield was our second objective, and after an hour of intense artillery fire, the maneuver moved through with little resistance. If nothing else, the Field Artillery proved our "high speed" munitions such as Copperhead, DPICM [dual-purpose improved conventional munition] and MLRS [multiple launch rocket system] rockets are deadly effective.

For the first 36 hours, we sent terrain and situational information back to the S3. The 212 Bde was moved to 1 Bde's sector,

and we were cut off from returning to them. I was not going to risk driving alone 50 kilometers over enemy territory with no navigating device. At that point, we began to help 3-41 FA in whatever way possible.

What proved to be the corps' biggest problem was that we had moved so fast we quickly outran our logistical support—mainly fuel. Just when the tankers were about to reach us, we'd push on. Vehicles were dropping like flies, but the main body had to go on.

Once while moving, the battalion received an emergency fire mission. But one of C Battery's howitzers ran out of fuel two kilometers before the firing position. The battalion commander came on the radio and told the BC [battery commander] he didn't have time to stop for the gun and was to get into position. Besides, no one had any fuel.

We had brought two extra five-gallon cans of fuel for an emergency, and I figured this was one. I entered the net: "K44, this is LNO1, I'm with your downed howitzer. I've got 10 gallons of fuel—Break—We'll get him going and bring him into position—Over." Talk about building friendships, they couldn't quit talking about us. It was no big deal to us; we just wanted to help.

As we moved north, we ran into more fighting, but it was almost one-sided. Their artillery would fire at us, our Q-36 radar would pick them up and we would attack them with 24 guns' worth of steel and ruin their day!

Soon, we started taking Iraqi prisoners—they came out of everywhere. They *wanted* to surrender to us. At first we searched them, destroyed their weapons and put them in a vehicle going south. But soon there were so many and we were going so fast, we had to just drive by them.

It was almost comical. They'd hear us coming, come out of their holes, throw down their weapons and put up their hands, waiting for our vehicle to stop. We'd drive by, and they would put their hands down with a look of *dismay*. They repeated the procedures for other vehicles until someone finally accepted their surrender.

We had cut the East-West Highway and the Euphrates by Day Two, so corps turned us east to attack the RGFC. This was a little tougher but still successful. There were few breaks. As soon as we reached

our objective, we were pushed on to another one. At 0500 hours on Day Four, we fired a huge prep followed by the cease fire. We were ecstatic at the news of the cease fire.

Though I think we were in the "thick" of it (sometimes in front of the tanks), I saw very little resistance. I think the RGFC had been pounded so hard that they wanted nothing more than to surrender.

3 March 1991

Dear Dad,

General Schwarzkopf met with the Iraqi general and apparently made an agreement. People are really starting to show their emotions—joy, cheering, photo taking and laughing.

I learned a lot in this war. There have been emotional and physical extremes of every kind—probably something you can only experience in a situation like this. I'm not sure how I felt before the ground war. At times I was scared and not sure how I would act under fire. But for some reason, as soon as we crossed the border, I felt in complete control (at least of my team). Though there was artillery firing close enough to hear and smell, we went about our tasks as we had done a hundred times before—almost mechanically. If you were going to get hit, it would happen regardless of what you did.

I remembered what you said about executing everything with violence—which we did. I also remembered you said there were few times you felt in eminent danger, and you just knew you were going home. I really stressed that, and my guys and I actually had bets about who would be the first off the plane home.

I also learned, or reinforced, a couple of lessons:

1. Nothing should change when you go into combat—not your training, personality, standards, etc. If you haven't been doing it before you started fighting, now is not the time to begin. It will only add confusion to the situation.

2. You must stay calm. You will be nervous, but it must be controlled and not shown. If you are in control, it becomes contagious and everyone around you will be in control. Lieutenant Colonel Stephen Lutz, Commander of the 3-41 FA, proved

that. Even when the situation was hot, his easy-going style came across the radio and made everyone feel safe.

3. Follow the situation, not necessarily the plan. Things will change, equipment breaks, s_____ happens. No sense getting mad about it. Just fix it and drive on.

I actually think we liberated Iraq as well as Kuwait. Even the surrendering soldiers wave at us and hug us. Yesterday we were sitting on the side of the road when a Chevy Impala loaded with a family with waving kids stopped. I was leery when the driver got out and approached us. I moved toward him, and he grabbed my hand and said something obviously thankful. As my guys moved forward, he shook their hands too and then grabbed Sergeant Junior Krows, kissed him twice and began to cry. It was a touching scene as he waved and drove away.

Though it cost lives, I think we've done something good here. These people are the same as you and I. They just have an evil leader.

CPT John D. Sims, FA
LNO, HHB, 2-18 FA
Operation Desert Storm

Response to "Massed Fires—Room for Improvement"

The excellent article "Massed Fires—Room for Improvement" by Colonel Thomas Hogan and Captain Brendan Wilson in the October issue of *Field Artillery* covers many of the problems associated with massing fire support. The article, however, places too much emphasis on the gunnery solution and fails to deal effectively with the true complexity of the issue. Gunnery is not the problem; integration with maneuver is!

In fact, I agree with the authors that many of the gunnery problems that inhibit adequate massing are being addressed. The new graduates of the Field

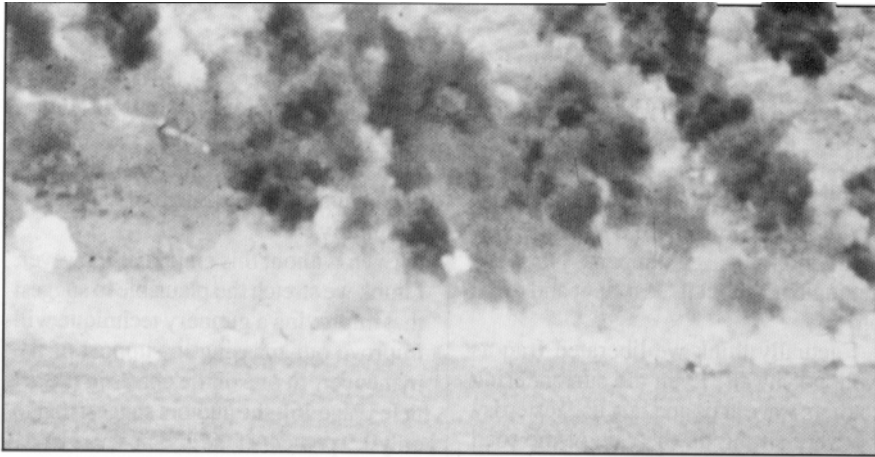
Artillery School—both officer and enlisted—have a more complete understanding of the five requirements for accurate predicted fire than graduates five years ago. With the renewed emphasis from the field and at Fort Sill, the dip in gunnery understanding will be fixed rapidly.

Even without this emphasis, however, I think we stretch the plausible to suggest that improving a gunnery technique will improve our massing in support of the maneuver. In one of the charts in the article [Page 16], the authors suggest that in only 1.9 percent of the 253 observed missions did a battalion mass at least two-thirds of its fire units, and in less than 10 percent did a battalion mass as many as half of its fire units. Although this analysis is somewhat ambiguous (it fails to specify what type of missions were requested in what tactical situation), it certainly suggests some issue other than gunnery.

I feel safe in asserting that a similar comparison of missions fired for Army training and evaluation programs (ARTEPs) across the Field Artillery would result in a much higher success rate than 1.9 percent or even 10 percent. Further, here at the Combat Maneuver Training Center (CMTC), we have no live-fire training component and allow a generally notional approach to gunnery, yet the battalions often fail to mass effectively.

Many of the gunnery roots of the massing problem are readily fixable at battalion level. Maintenance of a calibration workbook and application of muzzle velocity to the gunnery solution are a matter of discipline, not something mysteriously difficult to address. The technique for control of fires favoring "at my command" or "time on target" versus "when ready" is so easy to establish that we have seen units develop a successful standing operating procedure within the three weeks they spend training with us at the CMTC.

If not gunnery, then what? The problems are less an issue of "how" to mass than "when" and "where." Gunnery answers the "how." The "when" and "where" are a function of the integration of the fire support plan with the maneuver scheme. This is a problem that has existed since indirect fire became the standard method for Field Artillery. Certainly we understand the problem better



now, and we have worked to fix it, but the lack of complete integration accounts for our consistent failure to mass.

Consider what can happen if the artillery battalion does not understand "when" the maneuver commander wants to mass fire support. The S3 moves fire units at a time when he should have had them in place. Or the battalion is engaged firing on targets that preclude getting the whole battalion on the critical one. Or the observers are not positioned to afford the "eyes on" target observation to report a lucrative massed target. All these problems and more can be alleviated with an integrated plan.

Our understanding of "where" the commander wants to kill the enemy further focuses the battalion effort. What I see so often is a hectic attempt to shoot every target with the result that each target receives some fire but no target receives a timely killing volume.

I believe that a well-articulated commander's intent for fire support, back-briefed to the commander, will improve our poor record of mass fires. Certainly, however, this technique does not address the major issue—the maneuver commander's incomplete appreciation of fire support capabilities and limitations.

Here at CMTC, we have begun to address the integration issue with the maneuver commanders. At the direction of the Chief of Operations Group, we now discuss fire support integration with the key maneuver commanders and their fire supporters. Principal attendees include brigade, task force and team commanders; task force fire support officers (FSOs); team FSOs; and the direct support artillery commander. Conducted by senior fire support observer/controllers,

these discussions are typically lively and "lights go on" throughout the AAR [after-action review] room. We feel that, in a small way, we are improving everyone's understanding of this complicated fire support business and the complexity of its integration into the overall scheme.

Until we can effectively address integration by improving our ability to articulate the fire support system's capabilities and improve the maneuver force's understanding of it, we will continue to see units at the CTCs that cannot consistently mass.

In the interim, however, let's not fall in the trap of ascribing the problem to gunnery. I, for one, don't believe it is.

LTC Bristol W. Williams, Jr., FA
Senior Fire Support Trainer
CMTC Hohenfels, Germany

FireStrike Anxiety

The purpose of this letter is to challenge several points presented in Lieutenant Colonel C. William Rittenhouse's article "Operation FireStrike" published in your February 1991 edition. I have major objections to the article. First, he writes based on the premise that the AirLand Battle-Future (ALB-F) late 1990s high-tech intelligence network will be capable of providing the kind of precise, complete data needed to accurately access and target the entire deep battlefield. Next, he assumes the corps commander will be able to determine enemy intent (main and supporting attacks) long before maneuver forces are

committed or clash and the battlefield is shaped. Third, the implication is that the ALB-F nonlinear concept will involve a massive movement-to-contact or meeting engagement between maneuver forces only after a FireStrike operation has first been effected. Finally, the author implies that a well-executed FireStrike will provide the combat power necessary to so severely reduce the enemy that friendly maneuver forces have only to mop up.

Lieutenant Colonel Rittenhouse's article presents a fire support paragon with the capability to execute routine "surgical precision" deep fires, especially artillery fires. The fire support assets would employ a seemingly vast and limitless array of high-tech ordnance against a myriad of point targets from an unspecified sized (possibly corps-sized) moving enemy armored force not in contact. FireStrike would be administered "independent of maneuver" to "condition the enemy" so "the success of our ground maneuver depends [solely] on how well [FireStrike] can set up the enemy force with fires."

I submit this concept is a formula for failure. The force commander would be remiss if he relies on FireStrike, as described, before employing maneuver forces to defeat the enemy.

FireStrike operations place an enormous degree of faith in a "formidable detection capability" and "linking sensors with shooters" to provide all of the information required by the targeting process detect mode. According to this formula, FireStrike high-payoff targets can be identified, confirmed, attacked and ultimately destroyed only if precise deep enemy locations for all high-value targets can be detected (and the enemy intent uncovered) very early in this high-tempo ALB-F environment. FireStrike requires an ideal intelligence network to function surgically.

More realistically though, detection is an extremely complicated and involved process. It is never exact, never an absolute, and it has meaning only as it applies to a specific enemy in a specific situation on a specific battlefield. Intelligence preparation of the battlefield (IPB) templates will provide the commander and his fire support coordinator a basic idea where the enemy should or will be, and some sensors may assist by furnishing additional general locations. But FireStrike fires that rely entirely on

high-tech sensors and reconnaissance assets to continually detect and fix the enemy will miss deep targets, particularly if they're moving. A cunning enemy also will employ deception to add to sensor failure. Target damage assessment will be equally difficult.

A dynamic battlefield requires gathering essential information from all sources; the information is then analyzed and fused continuously to provide an accurate and timely view of the battlefield. "In some cases, it may even be necessary to mount sizable operations by combat units to gain information" (*FM 100-15 Corps Operations*).

Further, control and distribution of intelligence information within and among corps command posts is an awesome task in itself; sometimes intelligence isn't timely or doesn't get where it is supposed to go (or where it is needed). In other words, detection is not ideal, and it does not have the capability to make FireStrike do all of the things the article says.

Fighting the future battle requires the force commander to rapidly seize and retain the initiative. To do this, he must be able to determine the enemy commander's intent, then think, plan and act faster than the enemy to develop superior combat power at a decisive point to defeat him. Enemy intent includes his campaign or tactical objectives, direction of maneuver or defensive orientation, distribution of units, disposition and the enemy commander's operational concept and decision cycle.

The force commander is responsible for shaping the battlefield in the corps area of influence to create opportunities that make the enemy fight the battle on the corps' terms. The commander accomplishes this by synchronization of command and control, intelligence collection and analysis, deception efforts, probes through gaps in enemy defenses and the aggressive tactical actions of friendly combined-arms forces. Ascertaining enemy intent, favorably shaping the battlefield and securing the initiative is realized through the simultaneous, timely and violent application of combined-arms forces supported by powerful, responsive fires throughout the depth of the battlefield. FireStrike alone will not achieve these things.

The nonlinear concept requires the swift positioning of forces to strike the

enemy's flank, attack his rear, cut his lines of communications, bog him down in nondecisive areas, attack an isolated segment of his force, or elude his attack. The battlefield is fluid; the environment is dirty; and doctrine emphasizes maneuver with timely shifts in the main effort to take advantage of opportunities, momentum and the rapid destruction of deep enemy formations and defenses. "An operational plan anticipates battles and disposes forces in ways which create the tactical advantages of relative positioning which influences killing power and speed of action before the battle is joined" (FM 100-15).

Nonlinear battles are fought in the corps area of operations and zone of attack with surveillance units and combined-arms forces performing reconnaissance forward and with security forces seeking soft spots in enemy defenses. Maneuver forces are employed to attack deep, to conduct the corps main effort and to participate in supporting attacks. Committed units (brigades and divisions) engage the enemy's main fighting units with maneuver and fire while corps operational reserves, using indirect approaches, attack vulnerable areas on the enemy's flank or rear. The nonlinear corps attack moves fast, follows reconnaissance units or successful probes through gaps in enemy formations and defenses. The corps then shifts its strength quickly to widen penetrations and reinforce its successes, carrying the battle deep into the enemy rear. Fires are employed to support maneuver, protect flanks and destroy enemy forces in depth.

Operation FireStrike should not be "independent of maneuver" with "fires occurring before a scheme of maneuver is put into effect" to "shape the enemy force [and battlefield] for final defeat [mopping up] by the maneuver forces." FireStrike may very well be carefully planned massing of fires against leading elements of an enemy force—but it should not be independent of maneuver.

The statements "the success of our ground maneuver depends on how well we can set up this force with fires" and "the corps commander now could commit his maneuver forces to decisively defeat the enemy" are misleading. It is the skillful application of large maneuver units synchronized with fire support in depth that achieves decisive, concentrated combat power for the corps commander.

History is replete with examples where overwhelming, massed fires singularly failed to favorably condition enemy forces for maneuver exploitation. FireStrike alone will never establish the conditions for ultimate maneuver exploitation.

"Maneuver—movement of forces supported by fire to achieve a position of advantage from which to destroy or threaten destruction of the enemy" is the definition in *FM 101-5-1 Operational Terms and Symbols*. Using the term "maneuvering [artillery] fires" doesn't fit the definition. FireStrike cannot assume the lead by becoming another combat arm of decision; fire support is not maneuver.

Technological progress continues to increase the range, speed, accuracy and lethality of offensive and defensive weapons systems. And, certainly, intelligence and surveillance systems have reached phenomenal sophistication and capabilities. But the frictions of war multiply proportionally, and the future battlefield will continue to be a challenging, uncertain and risky environment for future commanders. There is danger in overreliance on technology.

"The objective of deep fires is to functionally kill specific enemy capabilities [emphasis added] which could affect the successful accomplishment of the corps objectives" (*FM 6-20 Fire Support in the AirLand Battle*). "By attacking the enemy in depth . . . the corps commander can create opportunities to seize or retain the initiative by disrupting the enemy plan, shattering his coordination, and destroying his most sensitive forces . . ." (*FM 100-15*).

The future battlefield will continue to rely on synchronized, concentrated combined-arms combat power with fire support providing the second leg of the ALB-F triad—combat support. The purpose of the deep attack will remain unchanged.

FireStrike is not the force commander's panacea; integrated ground forces will continue to bear the ultimate responsibility of winning the AirLand Battle.

Major John M. Mach, AR
C, Combined-Arms Division
Fire Support and Combined Arms
Operations Department
Field Artillery School



*General Carl E. Vuono
31st US Army Chief of Staff
23 June 1987 to 21 June 1991
Premiere War-Fighter, Trainer and
Field Artilleryman*

Change, Continuity and the Future Field Artillery

by General Carl E. Vuono

This article was taken from a speech General Vuono presented on 9 May 1991 at the Senior Artillery Leaders Training Seminar at Fort Sill, Oklahoma. Having served as the US Army's Chief of Staff for the past four years, General Vuono delivered the speech on the occasion of his last active-duty visit to Fort Sill; he will retire 21 June 1991 after 34 years of service.

This is a time of great pride in America—pride born of victory in battle and rooted in the demonstrated character of the American soldier. Throughout this land, the American people are giving voice to their pride and displaying the endless rows of American flags and yellow ribbons that wave proudly in our breezes.

In the midst of this well-deserved celebration, I want to discuss Operation Desert Storm in the broader context of our national military strategy and focus on the challenges the Field Artillery (FA) faces as we shape the force for the future. These challenges are captured in the parallel themes of change and continuity: change in the international environment, our strategy and force structure, but with the continuity of our vision and capabilities as we forge ahead into a new era.

Active Engagement

Think back to 2 August 1990, a pivotal moment in history that defined the end of an era and dawn of another. It was on that day the legions of Saddam Hussein brutally invaded Kuwait and threatened the very fabric of the international system. On that same day on the other side of the world, President Bush announced a new national military strategy for the United States: Active Engagement. This strategy has profound implications for the Total-Army and received its "baptism of fire" in Desert Storm.

The strategy is based on three factors that define the nature of the international system in the post-Cold War era. The first and most important of these is the unambiguous success of our strategy of containment combined with the collapse of the Soviet empire. Second is the challenge of a world in a state of revolutionary change—a world alive with unprecedented opportunities but also rife with instability and violence fueled by the accelerating spread of sophisticated weapons. The final factor is, of course, the precipitous decline in the resources the American people are willing to devote to national defense.

These three factors have led us to go beyond the venerable and victorious strategy of Containment to a military strategy of power projection. And at the heart of this strategy stands the US Army with the Field Artillery as an integral part of the trained and ready combined-arms team.

“The new military strategy rests on the time-honored principles of deterrence and collective security..[and] places new emphasis on three concepts: forward presence, power projection and force reconstitution.” ”

The new military strategy rests on the time-honored principles of deterrence and collective security. At the same time, in recognition of the changing environment, the strategy places new emphasis on three concepts: forward presence, power projection and force reconstitution. Each of these is of central importance to the Army and the Field Artillery and must be understood by all our leaders as we move into a time of great international uncertainty.

First, as an element of our nation's **forward presence**, the Army will maintain powerful forces stationed in Europe and the Pacific to anchor stability and provide a credible capability to influence events in those critical regions. As in the past, the Field Artillery will be central to forward presence, providing a powerful argument for deterrence and a critical link between our conventional forces and our strategic nuclear arsenal.

Commensurate with the declining Soviet threat, however, we will reduce our forces in Europe to lower levels. After more than four decades along the Iron Curtain, many of America's forces now can come home, and they will come home in triumph.

The heart of our new military strategy is the second element—the rapid projection of massive combat power from within the continental United States to regional crises around the world. Immediate **power projection** demands a force of a minimum of five fully structured active divisions with enough combat support and combat service support for 30 days of combat operations. We must have a force coiled in readiness to immediately deploy, fight and win. From our powerful grouping of armored, mechanized, light, airborne and special operations force (SOF) units, we will tailor the force-mix package appropriate to the threat we confront.

Power projection also requires that the Army be able to reinforce our committed forces with Active Component (AC) divisions rounded-out by maneuver brigades from the Reserve Component (RC). For more protracted or larger scale conflicts in Europe or elsewhere, the Army will rely on its remaining reinforcing units, the combat divisions of the National Guard.

In power projection, the RC FA brigades will play a crucial role as well, a role already amply demonstrated in combat. Indeed, for those who would question the power of our RC units, I would invite them to consult with the forces of Saddam Hussein who have had recent exposure to the might and muscle of the National Guard's 142d and the 196th FA Brigades.

The final aspect of the strategy is the requirement to reconstitute the force. **Reconstitution**, put simply, means generating additional forces from units that are not fully manned or forming additional forces "from scratch." Along this line, we are examining the utility of establishing cadre divisions; these are divisions that would have leaders and equipment but would have to be fleshed-out with troops during a national emergency.

That is the essence of our new strategy: forward presence, power projection and reconstitution. It is a strategy in which the US and the Field Artillery will be at the very center. And it is a strategy with profound and pragmatic implications for every Field Artilleryman—from our most senior commanders to our most junior cannoners.

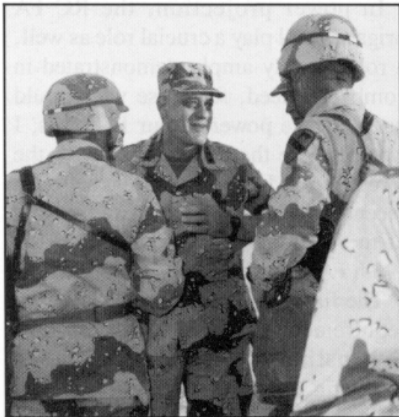
Desert Storm

Seldom has a national strategy been more quickly tested by fire. For even as the President was announcing the

strategy, the Iraqi Army stood victorious in Kuwait and was poised like a dagger at the throat of the entire world. With virtually no American forces forward deployed in the region, the United States faced the monumental challenge of projecting credible, capable combat power from the US and Europe.

Beginning with the first 105-mm batteries from the 82d Airborne Division in those uncertain days in early August, the US and our Coalition partners methodically built a mighty force to withstand the power of the Iraqi Army and drive the forces of Saddam Hussein from Kuwait.

Those who would challenge the United States would do well to contemplate the images of the fourth largest army in the world, crushed and burning in the wake of the most overwhelming onslaught of military power in our nation's history, including the relentless pounding of the world's finest Field Artillery. The 100-Hour War clearly demonstrated



General Vuono talks with Redlegs in the 1st Cavalry Division.

what power projection is all about.

Desert Storm was a triumph for our strategy and the combined-arms team. First and foremost, it was a victory for the American soldier—men and women who are courageous in war, compassionate in peace and committed to the defense of our nation.

And it was a victory for the Field Artillery. It was a victory for the 105, 155 and 8-inch battalions that blew apart the first line of Iraqi defenses until the Iraqi Army yielded its best positions without firing a shot. It was a victory for the multiple launch rocket system (MLRS) that gave new meaning to the expression, "Reach out and touch someone." It was a victory for the Army tactical missile system (Army TACMS) that paved the way for the air offensive and fired the first rounds in the ground war. And it was a victory for the integrated fire support system that was so overpowering the Iraqi artillerymen simply refused to fire, knowing the awesome devastation that awaited them if they were to be so bold as to pull even a single lanyard.

The Future

Desert Storm was, indeed, a triumph of historic dimensions, one that now has become part of American lore. But we cannot afford to rest on our laurels. We must continue the disciplined evolution of the Army and the artillery to forge the force the nation will need under the new military strategy in the mid-1990s and beyond.

In the years ahead, we will shape an army of 20 divisions, Active and Reserve Components. The Army will be its smallest since the eve of World War II, a force perilously small for a nation with

the global interests of the United States. We must carefully *shape* such a force if we are to preserve training, readiness and, above all, the quality of the force—the essence of the Army that fought and won in Desert Storm.

If we are imaginative, if we are determined and responsible, the result will be an army with the characteristics fundamental to the strategy and to the needs of the nation. For the Army must be **versatile** in its ability to respond to a wide range of requirements in multiple theaters with force packages effective against the threats our nation will face.

It must be **deployable** with the ability to project power rapidly and massively throughout the world. The Army must be **expansible**—able to grow rapidly to meet a resurgence of Soviet adventurism or the rise of violence wherever it threatens our interests around the globe.

Finally, the Army must be **lethal** with the unambiguous ability to fight and win on any battlefield at any time. Nobody understands lethality more than Field Artillerymen, who have inflicted more than 75 percent of the casualties on our nation's enemies in this century alone. The FA devastation unleashed during Desert Storm only foreshadows our future capabilities.

That is the Army the nation needs, and that is the Army we must build.

Continuity

In the midst of these massive changes in the environment, our strategy and force levels, we must retain steel threads of continuity—continuity of commitment and of capabilities to preserve the quality of our force as we move into a future we can only dimly see.

These vital threads of continuity have their clearest expression in the vision of the Army of the future. This vision is one each of us as leaders must share: a trained and ready Army, today and tomorrow, that can fulfill its strategic mandate anytime, anywhere.

We can maintain continuity and achieve a trained and ready future force if we unyieldingly adhere to the Army's six imperatives now firmly embedded at all levels. They are of singular importance to the Army and the foundation for building the fire support capabilities we will need in the future.

The first imperative—first listed and first in importance—is to **maintain the quality of the force** throughout the Total Army. We have achieved levels of quality

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unprecedented in our nation's history, and this must be the standard for the future as well.

Leaders, you have a solemn responsibility to maintain the quality of the force, for you establish the environment in which our soldiers work and live. You must set and maintain an environment that affords every artilleryman and artillery family the opportunity to grow and achieve. It must be an environment in which every soldier is treated with dignity and respect.

Second, we must **maintain an effective war-fighting doctrine**. At no time in our history has doctrine proven its importance so decisively as it did in Desert Storm. AirLand Battle is now part of the vernacular of America. It is manifest in images of sling-loaded artillery assaulting from the skies hundreds of miles behind enemy lines, of missiles and rockets arcing majestically through the desert skies toward a lethal rendezvous with targets deep in the Iraqi interior, of M109 howitzers racing north alongside Abrams tanks and Bradley fighting vehicles to seal the fate of the Iraqi Army and of the entire combined-arms team crashing violently against the unsuspecting Republican Guards to destroy Iraqi resistance.

We now must ensure our doctrine continues to evolve so it will be as effective on the battlefields of tomorrow as it was during Desert Storm. That is the purpose of AirLand Battle-Future, and the artillery community must closely follow its evolutions. For let there be no doubt: the Field Artillery of tomorrow, with its unique ability to range throughout the length and breadth of the battlefield, will be at the cutting edge of our doctrine in the next century.

Third, we must **maintain the right mix of forces** in our Active and Reserve Components—armored, light and special operations. This is particularly important to the Field Artillery; we cannot afford to have FA leaders who are experts in only a single dimension of the mix of forces. Every artilleryman must understand you cannot be solely light artillery, mech, airborne, air assault or SOF. You are the "King of Battle," a principal member of the combined-arms team, and you must be expert across the entire spectrum of fire support.

Fourth, we must **continue to train to tough, realistic standards**. These standards must be uncompromising in application and uniformity throughout the force. We have a solemn obligation to our

soldiers to ensure they are as trained as we can make them. It was training that created the skill in artillery batteries to bring such timely and accurate fires on the Iraqis, which they described as "Steel Rain."

Leaders and soldiers who made it happen universally confirm this war was won before the first rounds were fired. It was won in the combat training centers, the observation posts of Grafenwoehr, the mud of Baumholder and the classrooms of Snow Hall. And when the nation called upon its Army, the payoff for our investment in training was the destruction of a powerful enemy and the low casualties our forces suffered. The payoff was manifest by one young 13B Cannoneer when he said, "After the OPFOR [opposing force at the National Training Center], the Medina ain't nothing."

Fifth, we must **continue to modernize** both our Active and Reserve Components. In the sands of the Arabian desert, we vividly witnessed the life and death difference that modernization makes. Army TACMS and MLRS proved their worth in combat; Firefinder radars located and orchestrated the destruction of enemy artillery batteries beyond counting; and Copperhead and dual-purpose improved conventional



The Field Artillery's multiple launch rocket system (MLRS) proved its worth in the sands of the Arabian desert.

munitions (DPICM) destroyed Iraqi mechanized formations in large numbers.

At the same time, we found we cannot afford to modernize the force in a piecemeal fashion. The challenges our older systems experienced in keeping up with the pace of battle underscored, once again, the vital role of the Armored Systems Modernization (ASM) program for the future. ASM will build our entire armored force—tanks, fighting vehicles, engineer equipment and Field Artillery—on a common chassis with a common engine. We must not and shall not back away from ASM as our future.

And we must look ahead to capture the revolution in fire support that stands within our grasp. It includes howitzers that can fire 40 kilometers, warheads of unprecedented destructive power and computers that will determine the firing solution in microseconds. The revolution in fire support is the promise of technology and the future of the Field Artillery.

Finally, we must **continue to develop leaders**—sergeants and officers who are, first and always, professionals. Now, professionalism is a humble word, but it is also a mighty concept that captures the essence of what each of us must be and the legacy we must pass to those who will one day take our places.

The leaders of tomorrow, like the leaders of today, must be competent in the art of war and expert in the complexities of fire support. While others may focus on narrow aspects of our profession, the artilleryman must command expertise across the entire range of combat operations. It is not enough to be proficient in the delivery of fires; the FA leader also must understand to the very depths of his soul the principles of maneuver, logistics and combat support.

Our leaders also must be responsible—responsible for themselves and for every soldier they are privileged to lead. For a Field Artilleryman, responsibility, like competence, extends far beyond the confines of the gun tube. You are the ultimate arbiter of battle, and you will decide the fate of thousands of young infantrymen and tankers who depend upon you for their very lives. That is a level of responsibility that exceeds what is expected of other leaders, but that is the price for wearing the Crossed Cannons of your nation.

And our professionals must be committed—to the Army, to the American people and to a sacred set of principles that embodies the character of America.

Throughout a lifetime of service, the artillery leader must be a model for the profession of arms with honor untarnished and ethics unsullied. You must be able to look into the eyes of your soldiers and say with confidence, "Do as I do. Follow me."

Those are the Army's imperatives, and they are vital to our future. In the years ahead, there are those who will "make a run" on those imperatives. They will argue we no longer need the high quality of the force we have today, that we can afford to lower our standards on training, that our equipment is good enough and that we no longer need to modernize. And they will argue that our leaders need no further development.

You must stand *firm* in the face of this assault on our imperatives. Otherwise, the nation runs the risk of awakening in the mid-1990s to discover it has a smaller Army that is neither trained nor ready. And such a force would produce tragedy on the battlefields of tomorrow.

Therefore, each of us must go forward with renewed commitment to the imperatives and apply them without compromise or equivocation. For they are the blueprint for shaping the Army capable of meeting the challenges of tomorrow.

Conclusion

In conclusion, let me underscore the importance of the imperatives with a story, one that goes to the heart of the phrase "Trained and Ready." Chapter One of our story begins in the early days of June 1950 with elements of the US Army serving on occupation duty in Japan.

Nobody expected a war, and nobody wanted one. Nonetheless, in mid-June, the armies of Kim Il Sung marched on South Korea as the spearhead of North Korea's naked aggression, and Task Force Smith was scraped together from the occupation forces and dispatched to stem the onslaught.

Task Force Smith had many courageous soldiers as it took up positions south of Osan. But it was ill-prepared, undermanned and ill-equipped—abandoned by a nation that had lost its vision of a trained and ready Army. Consequently, thousands of Americans died, and our forces were nearly driven into the sea by a backward and impoverished nation.

In Chapter Two of our story, we leap ahead more than 40 years and half a world away. The soldiers of the US Army were again among the first to fight—"walking point" in an international coalition.

But this time it was different. This time, they were trained to a razor's edge, led by sergeants and officers of unparalleled ability and equipped with the finest weapons our nation could produce.

In one of the most complex and audacious operations in history, eight divisions marched in secrecy more than 600 kilometers to the west of the Iraqi defenses, plunged north into Iraq and raced hundreds of kilometers through enemy territory. And then, led by the fire and steel of the Field Artillery, these divisions waded into the heart of the Republican Guards, destroying division after division and thousands of Iraqi tanks until finally ordered to stop. All this was accomplished at the cost of fewer than 100 soldiers.

Today, you and I are writing Chapter Three. We are defining the Army and Field Artillery of the next century. And as we move forward, we have a sacred obligation to all Task Force Smiths of years gone by and all soldiers yet unborn to build an army our nation will need in an uncertain and tumultuous future. That is our sacred responsibility, and we shall not fail.



General Carl E. Vuono, who became the 31st Chief of Staff of the Army on 23 June 1987, will retire from the Army 21 June 1991 after 34 years of service. He was Commanding General of the Training and Doctrine Command (TRADOC), Fort Monroe, Virginia, and Deputy Commanding General of TRADOC and Commanding General of the US Army Combined Arms Center and Fort Leavenworth, Kansas. General Vuono also served as the Army's Deputy Chief of Staff for Operations and Plans, Washington, D.C. His other commands include the 8th Infantry Division (Mechanized), Germany; the 82d Airborne Division Artillery, Fort Bragg, North Carolina; and the 1st Battalion, 77th Field Artillery, and later the 1st Battalion, 21st Field Artillery, 1st Cavalry Division, both in Vietnam.

Reshaping the Field Artillery



by Colonel E. G. Anderson III

Challenge of the 1990s: Respond to global contingencies with a significantly smaller Army.

Events in the past year and one-half have dramatically changed the nature of the world in which we operate. The collapse of the Warsaw Pact, unification of Germany and a severely strained Soviet economy have significantly reduced the outward threat facing NATO and US forces. At the same time, requirements to respond to short-notice contingency deployments such as Operations Just Cause and Desert Shield and Storm are increasing.

Events in Europe coupled with our domestic requirements have caused the Congress to call for major reductions in military strength and defense spending through FY 95. Thus, the challenge facing us in the decade of the 90s is to respond to global contingencies with a significantly smaller Army.

Redesigning the Force

The Total-Force Policy Study Group, in its December 1990 report to the Congress, postulated what a reasonable force level in post-1995 would look like. The group envisioned the Army composed of

forward-presence, contingency and rein-forcing forces. (A "forward-presence" force would be a minimal one deployed to act as a US presence and, therefore, deterrence. This compares to our current "forward-deployed" forces in Europe and South Korea, which are formidable ones a threat would have to reckon with.)

The group felt the Total-Army structure could consist of 12 active divisions and eight Reserve Component divisions. Among the active divisions, eight would be heavy and four light. In the Reserve Components, four divisions would be heavy, two light and two "cadre" divisions, which would be manned by approximately 3,000 personnel each. The cadre division (with or without equipment) is currently being designed with the decision pending for July 1991. These anticipated reductions are illustrated in Figure 1.

In terms of manpower, the study group speculated that active Army end strength would be reduced from 730,000 in FY 90 to 540,000 in FY 95. Concurrently, the group envisioned a Reserve Component end strength reduction from 750,000 in FY

90 to 550,000 in FY 95. Details of the projected manpower reduction are in Figure 2 (see Page 12).

The impact on the Field Artillery (FA) would be to reduce the number of FA spaces (Active and Reserve Components) from 141,500 in FY 90 to approximately 86,700 in FY 95, a reduction of 39 percent.

	FY 90 Active/Reserve	FY 95 Active/Reserve/ Cadre
Corps	6	4
Divisions		
Light	8/6	4/2
Heavy	10/4	8/4/2
Total Divisions	18/10	12/6/2

Figure 1: The Army force level for post-1995 recommended in the Total-Force Policy Study Group's December 1990 Report to the Congress. The Army would consist of four Active Component corps and 12 Active and six Reserve Component divisions with two cadre (-) divisions. Not including the cadre divisions, this reduces the number of Total-Army divisions by 36 percent.

US Army End Strength FY 1990-95* (In Thousands)			
Components	FY 90	FY 93	FY 95
Active	730	620	540
Reserve	750	620	550
Total	1,480	1,240	1,090

* Source: Total-Force Policy Study Group Report to the Congress, December 1990

Figure 2: The study group's recommendation of a reasonable size for the Total Army in FY 95. Total-Army end strengths would be reduced by 390,000 or by 26 percent. The Active and Reserve Component FA spaces would be reduced from 141,500 in FY 90 to 86,700, or by 39 percent, in FY 95.

Building-Down Process

To avoid creating a "hollow" force with reduced readiness, the Army's plan is to "build down," wherever possible, by reducing the number of standard type organizations, or "building blocks" (e.g., a division artillery), of the current force design. The Army of Excellence (AOE) is the force design that encompasses today's division, brigade and battalion organizations.

The AOE objective force design for FA organizations is shown in Figure 3. The standard organizations in the design are the division artillery (Div Arty), the Div Arty's FA brigade and the corps' FA brigade. The Div Arty is composed primarily of cannon battalions in the calibers and types that can provide close support to the maneuver brigades of the division. It also can provide fire support coordination, fire control, target acquisition, survey control and meteorological support to the division.

The next building block is the FA brigade for each division. It has the mix of cannon and rocket battalions to provide reinforcing fires to the division as well as general support fires for the corps. These battalions must have mobility comparable to that of the forces they support.

The final standard organization is an FA brigade for each corps, composed primarily of rocket and missile battalions providing general support for the corps.

These organizations will be a mix of Active and Reserve Component units.

To illustrate the impact on the FA of reducing the force structure by building blocks, picture what occurs when a division is removed from the force. For example, the 2d Armored Division at Fort

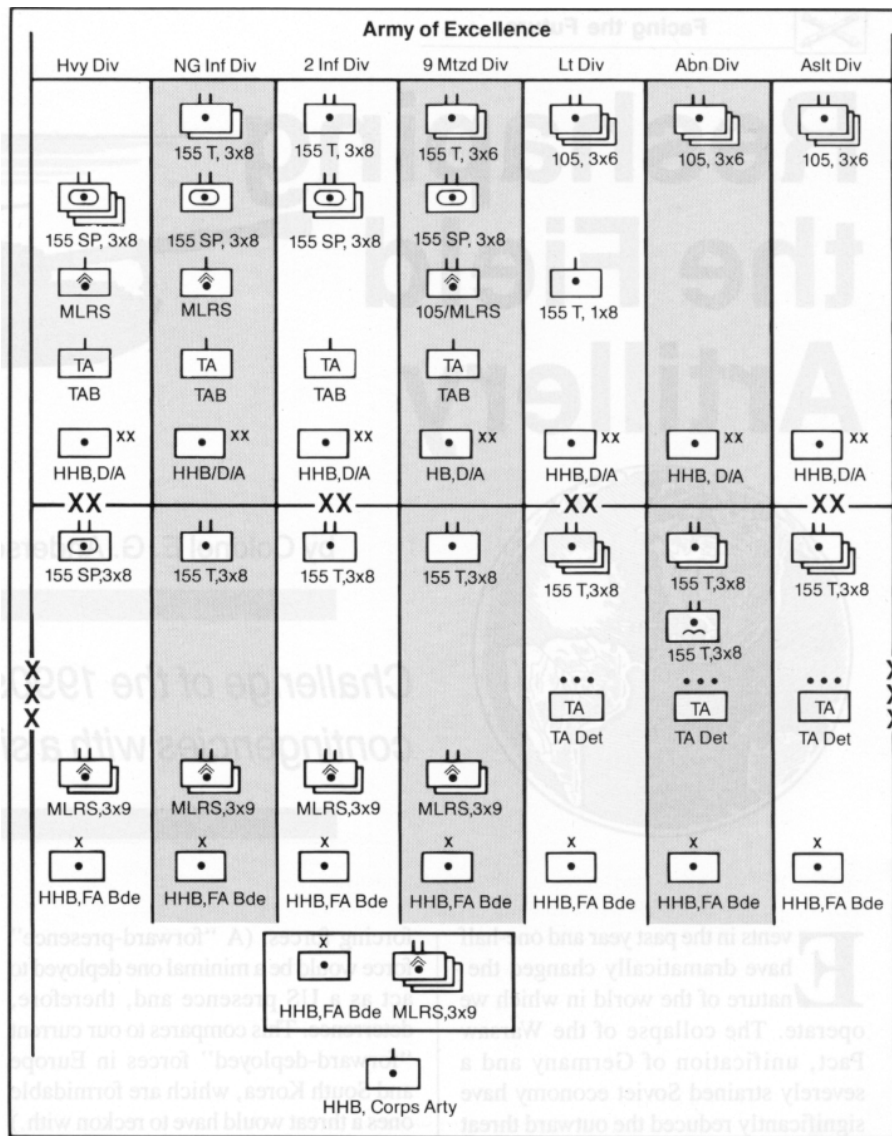


Figure 3: The Army of Excellence Objective Force Design for Field Artillery Operations.

Hood, Texas, is in the process of inactivating. As part of the division, the Div Arty also is scheduled for inactivation. In addition, that eliminates the requirement for one FA brigade and its three battalions. (See Figure 4 for a list of FA units inactivated and those projected for inactivation this fiscal year.)

Army-wide Trends

Focusing on reshaping the Army for the future, the question is: "Where do we go from here?" The Training and Doctrine Command (TRADOC) conducted a comprehensive examination of AirLand Battle doctrine to determine what refinements are necessary, considering changes in force structure, the

threat and our national military strategy. From this effort has emerged AirLand Operations. Detailed war-fighting concepts and force design alternatives are still evolving, but several trends are emerging that will affect the future Army and the FA (see Figure 5).

Perhaps the most significant trend is the fundamental change in the Army's focus from forward-deployed (forward-defense) to forward-presence (forward-deterrence) forces with the requirement to project combat power in response to a broad range of short-notice contingencies. This requires a more deployable fighting force with the versatility and lethality to support a variety of missions. But one with the capability to be expanded to a larger force.

Units*	Parent	Location	End Date	Component
Units Inactivated To Date				
3-3 FA (155 SP)	2 AR Div	TX	Sep 90	AC
1-14 FA (8")	18th FA Bde	GA	Sep 90	AC
1-20 FA (8")	212 FA Bde	TX	Sep 90	AC
4-9 FA (Pershing)	56 FA Cmd	GE	Sep 90	AC
5-15 FA (155 T)	1 Corps Arty	CA	Sep 90	AC
18 FA Det (Whd Spt, 8")	SETAF	GR	Oct 90	AC
434 FA FA Bde HHB	Sep Bde	IL	Oct 90	USAR
6-83 FA (155 T)	Sep Bn	UT	Oct 90	USAR
1-84 FA (105/MLRS)	9 IN Div	WA	Jan 91	AC
2-9 FA (Pershing)	56 FA Cmd	GE	Mar 91	AC
4-7 FA (8")	42 FA Bde	GE	Mar 91	AC
4-14 FA (8")	72 FA Bde	GE	Mar 91	AC
2-77 FA (8")	17 FA Bde	GE	Mar 91	AC
2-5 FA (155 SP)	1 IN Div	GE	Mar 91	AC
Units to Inactivate in FY 91*				
9 IN Div Arty HHB	9 IN Div	WA	Jun 91	AC
1-9 FA (Pershing)	56 FA Cmd	GE	Jun 91	AC
56 FA Cmd HHB (Pershing)	USAREUR	GE	Jun 91	AC
2 AR Div Arty HHB	2 AR Div	TX	Jul 91	AC
74 FA Det (Whd Spt, Pershing)	59 Ord Bde	GE	Jul 91	AC
85 FA Det (Whd Spt, Pershing)	59 Ord Bde	GE	Jul 91	AC
1-209 FA (8")	42 IN Div	NY	Sep 91	ARNG
2-103 FA (155 T)	103 FA Bde	RI	Sep 91	ARNG
1-187 FA (105)	42 IN Div	NY	Sep 91	ARNG
4-112 FA (8")	50 AR Div	NJ	Sep 91	ARNG
E-105 FA Btry (TA)	42 AR Div	NY	Sep 91	ARNG
4-8 FA (155 T)	479 FA Bde	PA	Sep 91	USAR
E/333 FA Btry (TA)	9 ID	WA	June 91	AC
1-18 FA (155 SP)	17 FA Bde	GE	Jun 91	AC
2 FA Det (Whd Spt, 155/8")	59 Ord	GE	Aug 91	AC

*These are the FA unit inactivations that are releasable; more units may inactivate in FY 91.

Figure 4. FA units inactivated and those projected for inactivation in this fiscal year. (Source: Force Development Branch, Systems Integration and Priorities Division, Directorate of Combat Developments, Field Artillery School.)

Emerging Trends and Implications Army-wide

The security environment in Europe is improving.

- Worldwide US interests increasing while regional instability is increasing.
- Defense budgets of many nations pressured by domestic requirements.
- Operational continuum impacted by exported technology.

The Army's role is becoming more strategic.

- Must maintain significant forward-defense and forward-presence forces with out-of-theater employment capabilities.
- Increased reliance on ability to support more contingencies from the continental United States (CONUS).
- A smaller force must be capable of supporting a wider variety of missions.

The Army's fundamental task is projection of combat forces from CONUS and forward-presence locations.

- Must focus on joint deployment and employment in multi-national operations.
- Deployable force packages depend on strategic air and sea support.
- Mission and budget require a force that's versatile, deployable and lethal.
- Future battlefield will be increasingly nonlinear.

We must foster and leverage technology.

- Selected technologies, while expensive, give a smaller force overwhelming capabilities—the smaller the force, the more important the technology.
- Must fight smart using deployable command and control, precision weapons and deception.
- Must improve training using simulations.

The world of the future will be neither simpler nor necessarily safer. We'll face a security environment that's demanding and dangerous; we'll perform our operations in an increasingly joint and combined environment; and we'll do all in an era of reduced defense resources.

Figure 5: Trends affecting the Army and FA as AirLand Operations evolves. (Source: Part of "Trends and Implications for the US Army's Future AirLand Battle," Draft, Training and Doctrine Command, Fort Monroe, Virginia, 18 January 1991.)

Second, domestic requirements and the increasing cost of maintaining a modern army have contributed to reducing the force levels. The implications of this trend, again, are that our forces must become more versatile and lethal as they grow smaller. Therefore, we must continue to leverage our technological advantage to offset decreasing force levels. The force of 1995 must be a smaller one with equivalent or greater combat capabilities than the current force.

The modernization program we've developed for the FA takes advantage of new technologies. This is particularly significant as technology can dramatically improve our target acquisition capabilities and link our longer range precision munitions platforms with a near, real-time command and control system. With these improvements, the Army will be able to engage and destroy the enemy with organic weapons at longer ranges.

Our modernization program must consider the entire fire support system—a system-of-systems, a chain no stronger than its weakest link. The firing weapon is very important, but the munition, target acquisition, command and control and support and sustainment systems are also critical in the total effectiveness equation. Thus, individual system modernizations must fit into the overall system-of-systems plan.

Current and near-term systems showcasing our 1991-95 modernization efforts are—

- **Paladin (M109A6).** This howitzer is a synthesis of several existing technologies that significantly improve the stalwart M109 155-mm howitzer. Some of the more important changes include on-board navigation and computer systems and other modifications that improve survivability, reliability, availability and maintainability (RAM) and range. The Paladin will be fielded in 1993.

- **Sense and Destroy Armor (SADARM). Munitions for 155-mm Howitzers and the Multiple Launch Rocket System (MLRS).** This munition is primarily designed for counterfire. After delivery by either a 155-mm howitzer or MLRS, submunitions dispense, orient, stabilize and descend by parachute over the target area. When a target is identified within the submunition scan area by millimeter wave or infrared sensor, an explosively formed penetrator is fired from the submunition

to destroy the target. The 155-mm munition will be fielded in FY 1994.

- **High-Mobility Artillery Rocket System (HIMARS).** This lightweight rocket system is expected to be a wheeled version of the current MLRS launcher—a more deployable system that can be sent any where in the world. It will allow the maneuver commander to use the full suite of MLRS-type munitions at the beginning of any armed conflict. Key to its deployability is its transportability by C-130 and larger Air Force aircraft. Fielding is planned for FY 1994.

- **Army Tactical Missile System (Army TACMS).** An improved conventional munition, Army TACMS will attack targets beyond the range and accuracy of existing cannon and rocket systems. It's fired from the MLRS and has a range in excess of 100 kilometers with three times the accuracy of the nonnuclear Lance missile system. After completion of a highly successful operational test in June 1990, the system was fielded in September 1990 and successfully employed in Operation Desert Storm.

- **MLRS Terminally Guided Warhead (TGW).** This munition, fired from the MLRS, is an autonomous, terminal-homing, fire-and-forget warhead using a millimeter wave seeker. TGW is extremely effective in defeating moving and stationary armored vehicles and equipment. Currently France, Germany, the United Kingdom and the US are developing the system in a combined effort with fielding tentatively scheduled for FY 95.

- **Firefinder Block II.** The radar's development has been in two phases with Block II improving the basic Q-36 radar by putting it on a high-mobility multipurpose wheeled vehicle (HMMWV). Its enhanced capabilities include air- and ground-mobility improvements, crew-size reductions and battlefield-survivability improvements. The system will be fielded in late FY 1991 starting with the light divisions.

- **Advanced Field Artillery Tactical Data System (AFATDS).** This is a computer system to replace the tactical fire direction system (TACFIRE) and provide command, control and fire direction functions for the FA and coordination and planning functions for all fire support agencies. AFATDS considers all fire support assets for planning and execution, uses target-value analysis to establish target priorities and selects the

best fire support system and munition to engage the target. This critical system ties target acquisition and sensor assets with the various attack systems in the fire support system-of-systems. The first unit will be equipped in FY 1993.

Mid- to far-term materiel modernization systems exploiting current and emerging technologies for the 1996-2005 timeframe are—

- **Lightweight 155-mm Howitzer.** This weapon will combine the lethality of the current 155-mm system with a superior deployment capability. Air Force aircraft will be able to transport and air-drop it, and CH47 and UH60 helicopters will be able to lift it. The howitzer will greatly increase the overall capabilities and lethality available for light divisions and is projected to be fielded in 1999.

- **Advanced Field Artillery System-Cannon (AFAS-C).** The new howitzer will be capable of fully autonomous operations with a greatly reduced crew size. Operating with a crew of four, AFAS-C will provide twice the effectiveness of the Paladin system. It'll feature such improvements as an advanced propellant system, automatic loading,

automatic ammunition resupply, extended range, direct-fire laser range finder and improved nuclear, biological and chemical (NBC) protection. The AFAS-C's rate of fire will be 12 rounds per minute using a totally automated loading system. This developmental howitzer is tentatively scheduled for fielding in 2003.

- **Army TACMS Block II Munition.** The Block II munition will have terminally guided submunitions to attack moving armored combat vehicles at depth. Once over the target area of interest, the submunitions will dispense, glide while acquiring armored vehicles and home in for the kill. This munition will combine high-tech capabilities with the highly successful MLRS system at ranges now targeted only by combat aircraft. It should be fielded in 1996.

- **Advanced Target Acquisition Counterfire System (ATACS).** This counterfire system, which will replace the Firefinder radars, will use leap-ahead technology to provide passive or passive and active cueing abilities. It'll significantly reduce the manpower and equipment needs of current systems. ATACS will provide the entire corps area of influence enhanced target processing and multiple fires capabilities. It's tentatively projected for fielding in 2002.



Preliminary Testing for HIMARS Development. In April at White Sands Missile Range, New Mexico, this modified Honest John missile launcher successfully fired multiple launch rocket system (MLRS) rockets in a test to see if rockets could be fired from a vehicle.

Continuing Assessments

In light of the changes as a result of the application of technology to future FA systems and the changes in the Army's war-fighting concept, the FA School also is examining future FA force structure, organizations and roles. The Directorate of Combat Developments, FA School, is conducting two comprehensive analyses: Legal Mix VII Study and a Functional Area Assessment (FAA).

The Legal Mix VII Study is a Department of the Army-directed study to determine the preferred composition of FA to meet worldwide requirements for 1995 and beyond. It'll provide the analytical basis for future decisions regarding the requirements for and selection, development and employment of FA organizations and systems. The FAA will take the results of Legal Mix VII, apply those results to AirLand Operations force designs and assess our ability to doctrinally and organizationally (from corps artillery to the firing battery) transition to the future.

The Legal Mix VII Study, to this point,

has focused on light and contingency forces in a mid-intensity scenario. Emerging insights from the analysis indicate a requirement for a rocket system to support light forces. The study also has determined that the 105-mm howitzers (M102 and M119) need a dual-purpose improved conventional munition (DPICM) to increase light forces' near-term capabilities, but an objective lightweight 155-mm system is preferred. Additionally, the study has revalidated the requirement for precision munitions for the light forces, such as SADARM and TGW. The Legal Mix VII Study is scheduled to complete its analysis in October 1991.

Summary

The decreased threat in Europe and domestic pressures to reduce defense spending have mandated we transition to a "leaner, meaner" force without adversely affecting force readiness or ongoing deployments. At the same time, the evolution of the AirLand Operations concept in TRADOC is reshaping the Army

for the future. Our Army will change and so must the Field Artillery. But with our new systems coming on line that take advantage of technology and significantly improve our FA units' capabilities, the contribution of the Field Artillery to victory on the future battlefield will be awesome. The future truly belongs to the Field Artillery.



Colonel (P) E. G. Anderson III is Director of the Directorate of Combat Developments, Field Artillery School, Fort Sill, Oklahoma. He commanded the 17th Field Artillery Brigade in Germany; the 1st Battalion, 18th Field Artillery, also in the 17th Brigade; and two batteries, one in South Korea and one in Vietnam. Colonel Anderson served in the Office of the Deputy Chief of Staff for Research, Acquisition and Development at the Pentagon and as Director of Firepower in the Office of the Deputy Chief of Staff for Combat Developments, Headquarters, Training and Doctrine Command (TRADOC), Fort Monroe, Virginia. He holds a master's degree in aeronautical engineering from Georgia Institute of Technology.

REDLEG REVIEWS

BOOK REVIEWS

Caissons Across Europe: An Artillery Captain's Personal War

Richard M. Hardison. Austin, Texas: Eakin Press, 1990. 306 pages. \$18.95

Anyone looking for descriptions and details of Field Artillery tactics and battles during World War II won't find them in this book. Instead, you'll find an excellent collection of human interest stories about soldiers and civilians brought together in the crucible called the Second World War.

Beginning with graduation from Texas A&M and commissioning in the Field Artillery in June 1941, Richard Hardison traces his journey to war and back. He's assigned to the 399th Armored Field Artillery Battalion (AFAB), a 105-mm self-propelled unit with the 8th Armored Division. As a member of the 399th AFAB, he experiences mobilization; combat in France, Belgium and Germany; and the occupation of Germany. His journey ends right where it began four and one-half years before, at Texas A&M.

Hardison's reflections of the war aren't about brilliant tactical maneuvers or Hollywood glamour. He remembers war the way most soldiers remember it—a collection of personal interactions with his comrades, the enemy and the

civilians caught in between. Readers can't help but become entangled in the humor, sorrow and horror of the war as Hardison vividly relates his experiences. The everyday challenges of mobilization, combat and demobilization should cause every Army leader to reflect on what he or she would do if faced with the situations Richard Hardison recounts.

Though the book contains few descriptions of Field Artillery operations, it should prove interesting to today's artillerymen. Also, Hardison's pre-World War II portraits of Fort Sill and Lawton are both interesting and humorous.

Caissons Across Europe is enjoyable and thought-provoking. I'd recommend it to any leader interested in war at the grassroots level. While it won't make you a better strategist or tactician, this book will help you appreciate the day-to-day struggles of going to war and back.

MAJ Joseph P. Nizolak, Jr., FA
S3, 3-7 FA, 25 IN Div (L)
Schofield Barracks, HI

Desert Storm, A Smaller Army and You: One Soldier's Philosophy

by Brigadier General Raymond T. Roe

This article was taken from Brigadier General Roe's graduation address to the Field Artillery Officer Advanced Course 1-91, Fort Sill, Oklahoma, on 15 March 1991. Brigadier General Roe has commanded the 9th Infantry Division (Motorized), Fort Lewis, Washington, since 1 March 1991.



Today is a great day to be a soldier—indeed it's a great time to be a soldier. Desert Storm, that fantastic success in Southwest Asia, will be a military and political watershed in American history. And all soldiers, including those of us who didn't deploy to Southwest Asia, share accolades for the Total-Army effort to make Desert Storm such a success.

As we try to digest all the ramifications of Desert Storm and the changes in the past year and one-half in the Warsaw Pact (previously our most significant threat), we face more changes: the Army's "building-down" process. But quality officers with potential for performance at higher levels have no cause to fear during the force reductions, whether they're combat veterans or not. For it's the total excellence of your performance, not just where you've been deployed to, that's reflected in your files.

Desert Storm

As you know, for most of this year we've been inactivating the 9th Division. Since August, the division has been

steadily casing battalion colors. We also were simultaneously forming the 4,000-man 199th Infantry Brigade (Motorized) (Separate) to remain after the division inactivates and deploying 1,500 soldiers to Desert Shield and Storm. We deployed everything from howitzer crews and a target acquisition platoon of OH58D helicopters to 40+ door-gunners (all volunteers)—not to mention individual replacements and fillers for National Guard units (again, almost all volunteers).

I know that before many of you came to the course, you were sending people as well. While you were at Fort Sill, more soldiers deployed. Now the war is over, and *you didn't get to go*.

I'm here to remind you that, although you may not have been in the desert, all of you share in this great victory and our nation's great success. All of you contributed to that victory.

In Desert Storm, our soldiers were great—well trained. You helped train them. You helped get rid of poor performers and retain good ones.

Equipment worked. You helped develop

and field most of our equipment. You also helped the Army determine what worked and what didn't.

Tactics worked. The tactics and doctrine of AirLand Battle, written in manuals, perfected at the NTC [National Training Center, Fort Irwin, California] all worked, and you helped develop them. You participated in NTC rotations, computer simulated exercises, and REFORGER [return of forces to Germany] exercises—all these helped leaders learn.

Our strategy worked because there's now only one superpower. You and officers like you, who for 40+ years have been squared-off with the Soviets around the globe, prevailed. The Soviets blinked and ceased being a superpower.

You brought the Berlin Wall down. The Warsaw Pact is extinct, and the iron curtain is no more than a rusted heap on the trash pile of history.

As a result, the Soviets supported the UN resolutions and didn't come to the aid of Iraq, their ally for 30 years. Without the demise of the Warsaw Pact threat, I

can't imagine a full corps coming out of Europe to deploy to Saudi Arabia.

The point is, you're part of this victory, and you must recognize that all your work, your sacrifices and those of your families, have paid off. Be proud.

A Smaller Army

My second message is an attempt to allay some of your fears about competition and our Army's building down. The Army is getting smaller, and there will be fewer command opportunities. Some say, "One bad OER [officer efficiency report] and you're done," and "You must get the best jobs." We hear it now, and we've heard it before.

I'd like to share with you my philosophy about all this—you didn't ask for it, so you don't have to accept it, but try to listen. I'll be brief and to the point.

On Competition Being Tough. You picked this profession. It's the most competitive in the world. In this business, second best is a loser. Second best means soldiers are killed. What could be more competitive?

My point is this: you love competition—you thrive on challenge. Stop whining about it. Do your best. Train your best.

Compete daily *against yourself*. Since you can't see what all the other captains in the Army are doing, don't worry about them. The only person's future you have control over is your own—never forget it. Key: do your best. . . .at everything. . . always.

On Loving Soldiers. People say they love soldiers. I've come to the conclusion that more people *say* they love soldiers than *really love* soldiers. I'm always suspicious of someone who feels the need to announce he loves soldiers. Actions speak louder than words.

If you really don't like people . . . if you really don't like visiting your howitzer crews at 0300 in the mud and finding out what's happening . . . if you don't get enormous satisfaction out of solving a difficult problem a soldier has brought to you (a personal problem he would share with no one except you because he knew you would listen) . . . if you don't love singing "C-130 Rolling Down the Strip" with 40 young guys who have never seen a C-130—then you aren't going to do well in this profession. And if you do succeed, by some quirk of chance, you won't be fun to be around.

Please recognize this early. We already have enough guys using soldiers as a vehicle for advancement.

On Seeking Command. Please don't fight for a command unless you really want one. Some officers are commanding because they think they must.

Commanders take care of soldiers. And when I say "take care," I don't mean coddle. Taking care means hard training, tough discipline and straight talk. Command is a demanding job, and you won't do your best unless you want the job.

About Command. Most of you feel as I do about soldiers and soldiering—you want to command. The truth is, there may not be enough commands for every captain. Command tours may be shortened to allow more officers a chance to command. In the 9th Division, we were forced to establish a centralized captains command list to ensure we considered everybody.

How do you get a command in such an environment? Do your best—in whatever the job, in whatever the discipline, regardless of title.

I was once the Beach Officer at Fort De Russy, Hawaii. I was in charge of beach operations: sailing, surfing, sunbathing. When I took the job, my inventory included 100 surfboards. Fortunately, they needed a battery commander in the 25th Infantry Division, and the battalion commander was looking for a

Field Artillery captain. My "beach" boss told him about me, and I was reassigned as the battery commander, the next week. I had done the best job I could as Beach Officer, and my boss had recognized and appreciated that.

On Turning Down Command. Don't get picky about what kind of battery you're offered. Your battalion commander is trying to build the best unit possible. If he tells you he needs you to command a battery you consider less than prime, say, "Yes, Sir," and command it the very best you can. Believe me, it'll pay off.

On Challenge. You've heard me talk about competition already. Compete against yourself—challenge yourself.

As we get older and more senior, we somehow become more concerned about "looking bad" or not "being best." One reason people don't take up new sports is they're afraid to look bad.

You can't afford that attitude; challenge yourself daily. Learn to use computers. Learn about new equipment. You know you aren't challenging yourself when you take your PT [physical training] test in the corner of the gym with a couple of other captains or as CO [commanding officer] with your first sergeant. You know what I'm talking about—you count his, he counts yours. Take your APFT [Army physical fitness test] with your soldiers watching. It doesn't matter



Brigadier General Roe talks with soldiers in the 9th Infantry Division.

SPC Victor Anglin

if you don't max the test. Do your best!

That brings me to another point. For God's sake, don't take yourself too seriously. Laugh at yourself. You're probably a pretty funny guy; I guarantee that some of your subordinates think so. Life is too short to miss an opportunity to smile.

On Being in Charge. Keep this in mind when you take command: commanders are in charge, not bureaucrats. I say this over and over to junior commanders. They give me those pelican nods—"Yeah, yeah, I'm in charge." Then the first time some GS9 or supply warrant officer says "Boo!" they roll over like puppy dogs.

Example: in my division, I have many companies sharing buildings, so they have two dayrooms but only one on each blueprint. Naturally, I assumed each company had a TV. I found out that some civilian in the installation property office was telling commanders they couldn't have another TV—"only one per building according to the blueprint." But we had inactivated two brigades—we had a warehouse full of TVs!

This civilian was acting like a "toad in the road," and the captains were letting him do it. Finally, one captain sounded the alarm up his chain of command—commander to commander. "Sir, I have a toad who is messing with soldiers."

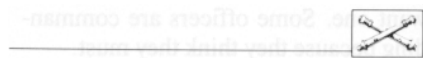
Here's my message to you. You're in charge, not the installation property branch, ID card section, range control or DEH [director of engineers and housing]. You're in charge. When in charge, take charge. And always believe you make a difference.

On Remembering Your Family. Finally, if you're married, recognize this is a team effort. If I can be considered successful, it's because I was lucky enough to pick the right woman to be my wife.

This is a tough, demanding business, and it's hard on families. Don't forget to thank your family for their help and support. Hugs go a long way. Flowers help too. Never forget anniversaries or children's birthdays. And listen carefully to this: only self-centered creeps forget about their families and pretend they're too busy.

The quality of the person and excellence of his performance will make an officer successful in tomorrow's Army, just like it has made officers successful today. Don't get distracted by the

peripheries—concentrate on you. Work hard and always do your best—but don't forget to have fun. Thank you for listening.

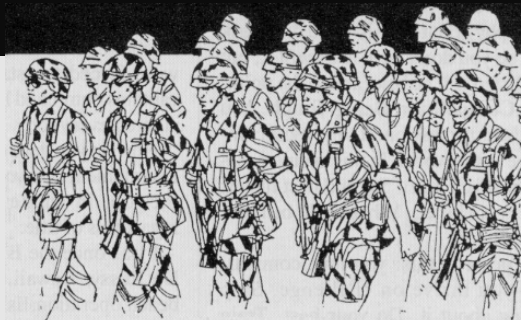


Brigadier General Raymond T. Roe commands the 9th Infantry Division (Motorized), Fort Lewis, Washington. He also commanded the 42d Field Artillery Brigade,

Germany; 3d Battalion, 35th Field Artillery, 72d Field Artillery Brigade, Germany; and three batteries, one each in the 2d Battalion, 15th Field Artillery, Alaska; 8th Battalion, 4th Field Artillery, Vietnam; and 3d Battalion, 13th Field Artillery, 25th Infantry Division (Light), Schofield Barracks, Hawaii. Brigadier General Roe is a graduate of the US Army War College, Carlisle Barracks, Pennsylvania, and holds a master's degree in management from the University of Southern California.

CSA Guidance on Soldiers' Career Progression, Desert Storm Vets or Not

General Carl E. Vuono, Chief of Staff of the Army (CSA), directed the US Total Army Personnel Command (PERSCOM) help ensure that all soldiers



have career opportunities based on the "whole person" concept and not on whether they're veterans of Operation Desert Storm. General Vuono is hearing from the field that some officers and NCOs are concerned their lack of Desert Storm experience will work to their disadvantage when they compete with Desert Storm veterans for schooling, promotions, assignments and retention during the Army's "building-down" process.

1. To counter this perception, the CSA issued the following guidance to PERSCOM:

- Those soldiers in units not deployed will not be penalized. Wars of the future are likely to be come-as-you-are short wars, such as Operations Just Cause and Desert Storm. An officer or NCO's participation will be a function of his/her assignment at the time units are deployed to a combat zone, something over which he/she has no control.

- All soldiers will receive fair treatment. PERSCOM will ensure soldiers are assigned, promoted, selected or retained based on their

past performance and demonstrated potential.

2. To implement the CSA's guidance as policy, PERSCOM will—

- Ensure the "guys on the phones in the pits" in the Officer and Enlisted Personnel Management Divisions (OPMD and EPMD) understand the guidance and back-up their words of fair, unbiased treatment with actions.

- Ensure Department of the Army selection boards understand the guidance. For example, if there are reductions-in-force (RIFs), a soldier's experience/lack of experience in Desert Storm will not be a criterion for retention/separation.

Outstanding, talented, high-potential officers and NCOs who didn't deploy to Southwest Asia also will be the battalion/brigade commanders and command sergeants major of the future.

(Summary of "Memorandum for Record, SUBJECT: CSA Guidance on '1st Team, 2d Team' Perception, 14 March 1991," signed by Major General Robert L. Ord II, Commander of PERSCOM.)



Inactivation: The Reality of Building Down



by Lieutenant Colonel Randall C. Williams, Jr.

Inactivate: To remove a unit from the active list of the Army (*Army Regulation 310-25 Dictionary of US Army Terms*). Mention the word anywhere in the Army today, and it'll generate an emotional response. As the post-Desert Shield and Storm Army continues to "build down," we'll all become very familiar with the word and its implications.



On 14 September 1990, we inactivated the 5th Battalion, 15th Field Artillery (5-15 FA), an I Corps 155-mm towed battalion attached to the 7th Infantry Division (Light) at Fort Ord, California. Inactivating our battalion was an emotional experience and one of our most demanding missions.

This article offers suggestions to commanders of units designated to inactivate. But what worked for us may or may not work for you in all aspects of the operation.

As a commander during a unit inactivation, you have added communications responsibilities. You must keep soldiers informed on the progress of the inactivation as well as plans for their reassignments. Dispel rumors immediately! You know more about the inactivation than the guy in the snack bar—make your soldiers believe it.

Also, maintain a sense of mission. You and all your leaders and soldiers must understand that there's life after inactivation.

When you find out your unit is inactivating, you'll receive an End Date (E-Date), the date by which you must retire the colors and complete the inactivation. Use the backward planning process to develop your time line to complete the mission (see the figure on page 20); allow enough time to complete all of the required inspections and inventories.

I strongly recommend inactivating by battery. This permits you to prioritize your efforts in the maintenance and property accountability of each battery, based on its inactivation date.

The 5-15 FA was preparing for two significant events when we were notified of our impending inactivation. First, we were preparing to up-gun to a 3x8 modification table of organization and equipment (MTOE). Common sense put a halt to our preparation.

Second, we were preparing for a rotation at the National Training Center (NTC), Fort Irwin, California. It was to be the Army's first light-heavy NTC rotation. We were to be the live-fire artillery battalion. I thought it very important to the battalion's morale to drive on with the training opportunity. Fortunately, our chain of command supported this, and the battalion went to the NTC.

This opportunity to execute final, demanding, battle-focused training paid great dividends in soldier spirit later on.

Activity	Level of Responsibility	Date
Return from NTC 90-8	Battalion	1 May 90
Refit to Fight	Battalion	1-9 May 90
Refit to Fight Inspections	Battalion	10 May 90
Equipment Technical Inspection (TI) Window Opens/C Btry	Unit/DOL/G4	21-25 May 90
Equipment Turn-In Window Opens	Unit/DOL	28 May-Until Complete NLT 31 May 90
Personnel Command (PERSCOM) Redirects Excess Soldiers Orders Cut	DA/G1	
Equipment TI Window Opens/B Btry	Unit/DOL/G4	28 May-1 Jun
Equipment TI Window Opens/A Btry	Unit/DOL/G4	11-15 Jun 90
Equipment TI Window Opens/Service Btry	Unit/DOL/G4	9-13 Jul 90
Equipment TI Window Opens/Headquarters and Headquarters Btry	Unit/DOL/G4	23-27 Jul 90
B Btry Stands Down	Unit	14 Aug 90
A & C Batteries Stand Down	Unit	31 Aug 90
Inactivation E-Date	Battalion	14 Sep 90

A brief time line for 5-15 FA to inactivate by battery.

In addition, our soldiers carried the individual skills learned or reinforced at the NTC to their new units.

We terminated our nuclear capability as soon as we were removed from applicable war plans. We destroyed or turned in all emergency-action related communications and security (COMSEC) material and tried to get disposition instructions for the trainers and special weapons tool kits. The remainder of our COMSEC material we turned in or destroyed after the NTC rotation.

Personnel

The disposition of personnel was relatively easy for us. The trick is to keep it from becoming as impersonal as it sounds.

With a division artillery at Fort Ord, there were plenty of potential homes for most of the battalion's soldiers. There were also plenty of slots for the low-density military occupational specialty (MOS) soldiers throughout the division. But soldiers need to know they aren't just another disposable commodity; the entire chain of command must be involved in reassigning every soldier.

You need to seek the soldier's input—try to fulfill his requests while being up front about the needs of the unit taking precedence. As always, the bottom line is "Take care of soldiers, and they'll accomplish the mission."

As we zeroed out a battery's equipment, we transferred most of the personnel to their gaining units. We retained the maintenance and supply personnel and transferred them to service battery and headquarters and headquarters battery to ensure we had an adequate work force to

help solve problems as we approached our E-Date.

Two of our battery commanders had less than a year in command at our E-Date. You may be able to preclude this problem when you determine the date for each battery to inactivate. But if you can't, then you need to work very closely with your fellow battalion commanders and the division artillery commander to ensure they get back in to command as soon as possible.

Equipment

Treat equipment disposition instructions as suspect from the beginning of the operation. Despite the automation of property books and the good intentions of all the key punchers, your instructions probably will continue changing until the last piece of equipment is gone.

These instructions should identify the units gaining the equipment down to battery or company level. Ensure the units designated to receive your property have the disposition instructions—this won't happen automatically. Even if the instructions do get to the gaining unit, the commander may not know about it. Gaining units also must understand these are directed lateral transfers, and if the equipment meets the published acceptance criteria, they must accept it.

Lateral transfers and turning in 100 percent of your MTOE and installation property will be your most frustrating challenge as a commander. Current, up-to-date hand receipts, component lists and shortage annexes will reduce some of this frustration. If you maintain these documents properly as a matter of normal business, they'll minimize the

reports of survey, statements of charges and cash collections you'll have to do.

Local guidance will establish the rules for transferring equipment with properly documented shortages. You can rest assured that equipment with undocumented shortages will be impossible to transfer or turn in.

As a non-divisional unit, we were authorized our own property book officer (PBO). He was the busiest man in the battalion until completion of the operation. The PBO or the S4 must coordinate daily with gaining units and Division Material Management Center (DMMC) personnel to stay up on the changes or issues that impact on transactions.

All batteries concurrently inventoried, inspected and maintained equipment in preparation for turn-in or transfer. The priority battery (based on the time line) got the outside assistance (i.e., battalion and direct support, or DS, maintenance). Equipment was transferred "when ready," regardless of priority, to ensure we wouldn't run out of time as we approached our E-Date.

Transfers and turn-ins demanded the daily attention of battery commanders and supply officers for a variety of reasons, the most common of which was the designated gaining unit hadn't seen the disposition list and was unaware of the impending gain. Gaining units also were reluctant to accept a piece of old equipment to fill a shortage, but as previously stated, they have no choice if you've done your homework.

Turning in property to the Director of Logistics (DOL) probably will be the most difficult aspect of this operation. All equipment designated for turn-in to DOL must be inspected and classified by your support maintenance unit. Most of this equipment will be classified serviceable for turn-in, but some will be unserviceable and turned in to the property disposal yard.

Army regulations require that equipment turned in to DOL for further disposition be maintained to 10/20 standards in accordance with the appropriate technical manuals (TMs). There's very little negotiation on this, and the primary issue will be equipment with valid requisitions due in. You'll have to work this out on a case-by-case basis with your DOL.

We were lucky in this area. A local Army Reserve command wanted a large number of our trucks. It accepted them

with shortage annexes if the trucks were mission-capable. Seize such an opportunity if given the option.

Your battalion motor officer (BMO) and battalion maintenance technician (BMT) will earn their pay throughout this operation. Current TMs are pretty definitive in what constitutes a mission-capable piece of equipment. But both you and the gaining units will differ on what is or isn't mission-capable, and it's usually the BMO or BMT who'll iron this out. Your DS maintenance battalion should be the referee when you can't resolve this at the unit level.

You must identify a target date in the time line to cut off Class IX requisitions. You may have to shift this date as problems arise, so be flexible. Don't let the bean counters set this date—it's your decision. Your BMO or BMT must track your prescribed load list (PLL) stockage and your DS unit's authorized stockage list (ASL) throughout the inactivation so you can slip the date, if necessary.

Periodic in-progress reviews (IPRs) are required to identify problems and plan future actions. Your personality, the competence of your staff and your location on the time line will determine the frequency of these meetings.

Early in the operation, we met twice a month. We then progressed to weekly and ultimately twice-a-week meetings as we got closer to the E-Date. I briefed the division artillery commander weekly. The S4, PBO and I talked informally about our status and problems daily.

Our IPRs initially addressed the percentage of completed transactions. As our window narrowed, we talked about each line on the property book.

Environmental Impact

An environmental impact assessment was required as part of our inactivation process. Neither the installation nor the unit was aware of this requirement initially.

This caused several problems. Our initial time line was developed based on an E-Date of 15 July 1990. Inspections and classification of equipment had begun and initial property disposition instructions had been developed. But with the requirement for an environmental impact assessment, the original inactivation order was revoked, and a tentative new E-Date of 15 September 1990 was established, pending the outcome of the assessment. We continued to inspect, maintain



Prior to inactivating the 5-5 FA, soldiers continued to train hard, and that paid great dividends in high esprit de corps.

and transfer some property within the division artillery.

Morale and leader credibility suffered somewhat during this on-again, off-again phase of the operation. To help, we conducted common task test (CTT) and skill qualification test (SQT) training to give the soldiers a break from the motor pool.

Don't get caught by surprise. Identify the requirement for an environmental impact study early in the planning process.

Summary

The inactivation of a unit is an emotional and stressful operation. Except for combat missions, it'll tax you and your staff as much as any mission you'll perform.

Early identification of all requirements, staff planning, communication and hard work will ease the pain—but not eliminate it. There will be some expertise at higher headquarters and the installation you must identify and draw on. If you have doubts about supply accountability in your organization, fix it *now*.

And above all, take care of your people—they're your greatest asset in this mission.



CALL Inactivation Newsletter

The Center for Army Lessons Learned (CALL) Newsletter 90-10 Inactivation, dated November 1990, has checklists that address the subject in detail. It also has inactivation model time lines, one for a 365-day schedule and one for a 180-day schedule.

Units may order the newsletter by writing the Commander, US Army Combined Arms Center, ATTN: ATZLCTL, Fort Leavenworth, Kansas 66027-7000 or by calling AUTOVON 552-CALL/4317 or commercial (913) 684-CALL/4317.

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The "building down" of forces provides the Army the unique opportunity to strengthen weaknesses in the heavy division artillery's (Div Arty's) table of organization and equipment (TOE) (Figure 1) and structure to meet the challenges of the future. We can build a division that has

the organic artillery to fight the close and deep battles, including the counterfire fight, and without adding additional forces. We have the opportunity to simplify the training, coordination and maintenance of the Div Arty and produce a force vastly superior to the current organization. We can realize these benefits

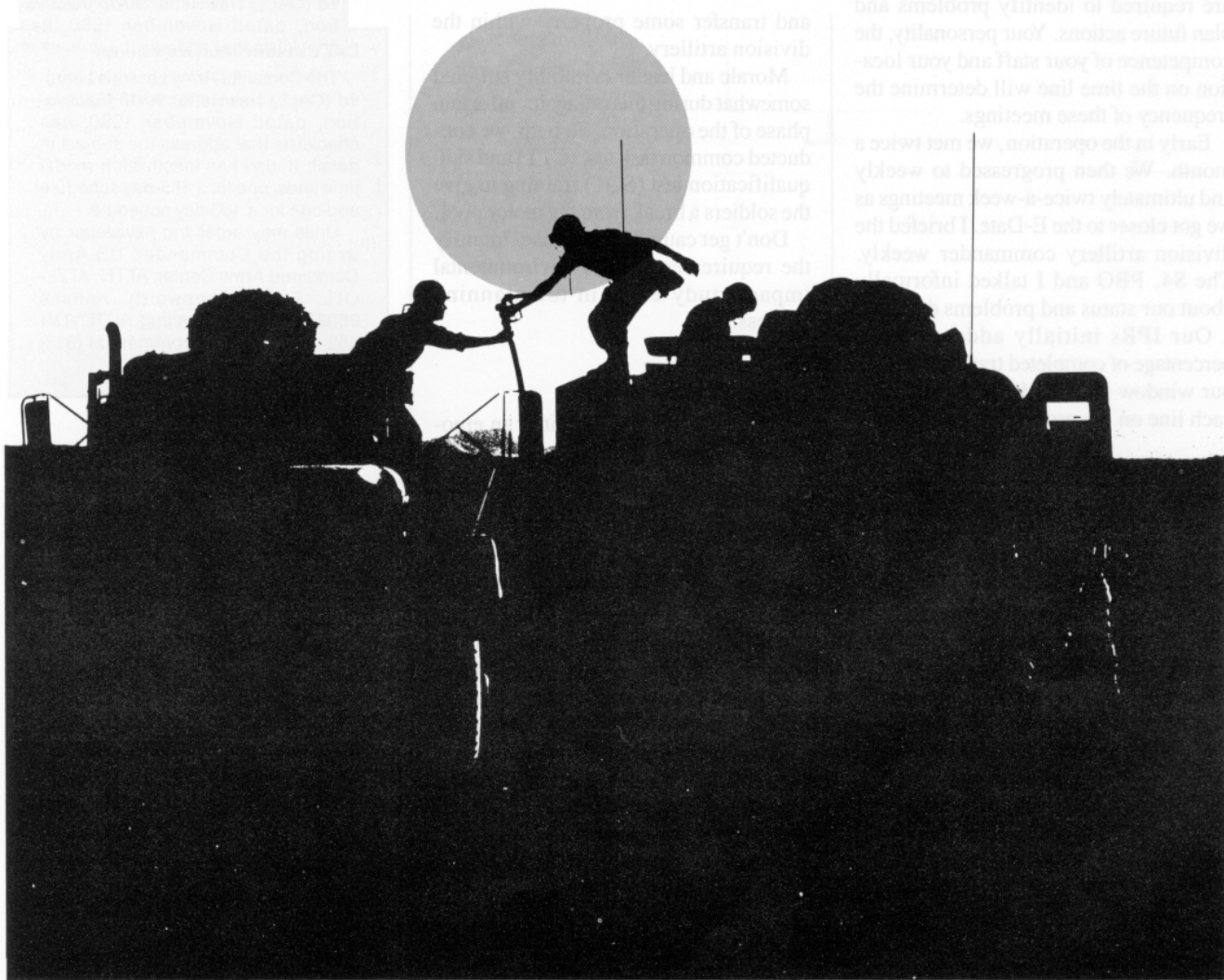
by adding soldiers and equipment from inactivated units.

To redesign the heavy Div Arty, I propose three major changes (see Figure 2). First, it's absolutely critical we eliminate the separate multiple launch rocket system (MLRS) battery and establish a general support (GS) MLRS battalion. The primary mission of the battalion would be to provide more extensive fires for the deep battle and counterfire fight. We must equip the battalion with launchers that can fire MLRS rockets or the Army tactical missile system (Army TACMS), depending on the situation, and, as developed, the entire suite of MLRS family of munitions (MFOM).

Second, we must put the assets responsible for controlling the counterfire battle under one commander. This plan would include putting the Q-37 radars on heavy expanded-mobility tactical trucks (HEMTTs) and, ultimately, on MLRS chassis, and integrating the platoon into

The New Heavy Div Arty

by Major Peter S. Corpac



the Div Arty's headquarters and headquarters battery (HHB). It also would eliminate the Q-36 radars and the target acquisition battery (TAB). The elimination of two of the three separate batteries (MLRS and TAB) has the added benefit of alleviating the considerable administrative and logistical burdens they entail.

Finally, we need to simplify maintenance by restricting our vehicles to the modern chassis of the M109 howitzer, Field Artillery ammunition support vehicle (FAASV), high-mobility multipurpose wheeled vehicle (HMMWV) and HEMTT. I propose we replace the M577 command post (CP) carriers and M548 ammunition carriers with FAASV chassis and the 2 1/2- and 5-ton trucks with HMMWVs and HEMTTs. We could eliminate each division's M577s and M548s as soon as the replacement vehicles become available from inactivating units.

HHB Div Arty

HHB would change its structure, having a slightly larger Div Arty main CP and a radar platoon.

The Div Arty main CP would be responsible for command and control of the organic and attached battalions and for control of the counterfire and deep fights. The counterfire cell in the main CP would serve both as the counterfire main CP and as the controlling element for the radars. The counterfire personnel from the current division TAB and from the Div Arty HHB would man the cell. The main CP and fire direction center (FDC) would operate out of modified FAASVs with the ammunition-handling equipment removed.

The radar platoon would consist of a platoon leader, platoon sergeant and four Q-37 radars mounted on the HEMTT and, eventually, the MLRS chassis. Mounting radars on the HEMTT or

MLRS chassis would eliminate the Q-37's mobility problem. When mounted on the MLRS chassis, the radar also would have a self-locating capability.

This equipment change would allow us to eliminate the Q-36 radars while significantly increasing long-range target acquisition capabilities. The current personnel in the division TAB would either be integrated into HHB or be no longer needed.

DS Battalions

The missions and structure of the direct support (DS) battalions wouldn't change significantly. We'd still provide a DS battalion to each maneuver brigade. (If the aviation brigade is employed as a "fourth brigade," then an additional DS battalion could be needed.)

The most significant changes to the DS battalion would be the equipment. We would simplify and streamline the maintenance of the DS battalions by equipping them with FAASVs, HEMTTs and HMMWVs.

FAASVs, which are on M109 chassis, would replace the M548s and M577s. The FAASV is already replacing the M548 in the Army. With all the ammunition-handling equipment removed, the FAASV provides a spacious, armored CP. The tactical fire direction system (TACFIRE) shelter, main CP vehicles and FDCs also could be FAASVs, greatly simplifying maintenance.

Admittedly, we can't get FAASVs as easily as HMMWVs and HEMTTs—we can't get enough FAASVs to do the job from inactivating units. But programming FAASV replacement of CP vehicles, as well as the M548s is just good sense.

The older the 2 1/2- and 5-ton trucks get, the tougher they are to maintain. Installing seats to transport troops in HEMTTs would be one solution; of course, the appropriate agency would have to certify these vehicles as "safe" troop carriers. Outfitting units with HEMTTs and HMMWVs would reduce the number of types of wheeled vehicles per unit and simplify maintenance.

It would take approximately 15 HEMTTs and 10 HMMWVs to replace the 36 trucks currently in the battalion. This upgraded equipment would be issued as units inactivate and at a minimum cost. No additional personnel would be required for the DS battalions in the new Div Arty.

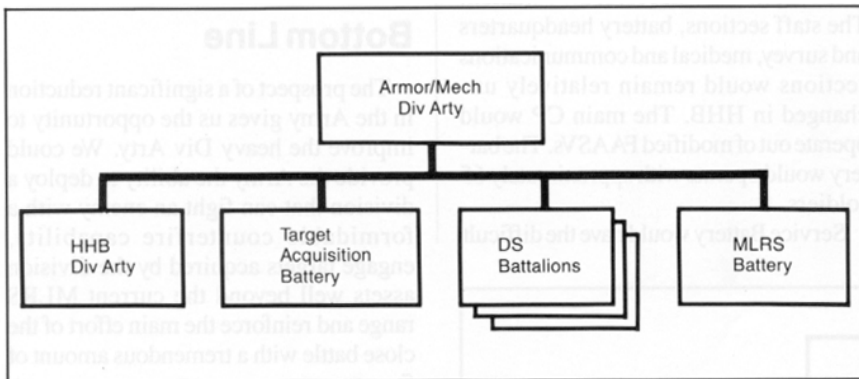


Figure 1: Current Heavy Div Arty Organization

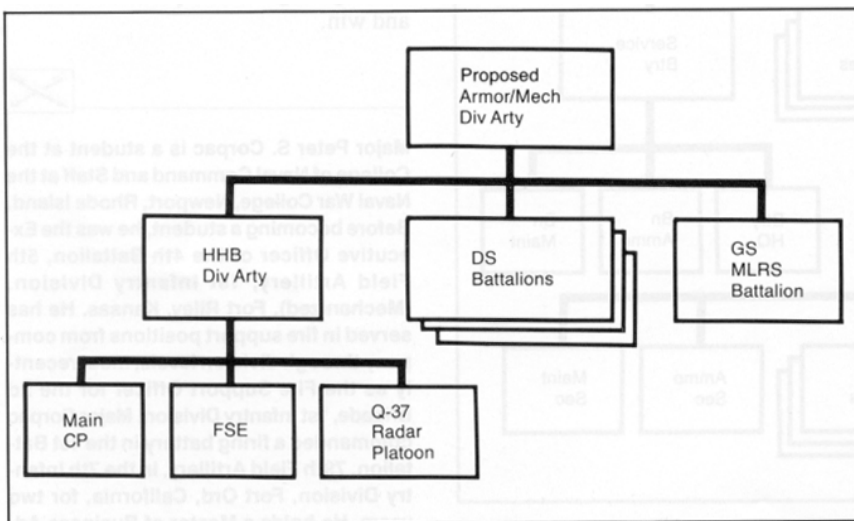


Figure 2: Proposed Heavy Div Arty Organization

GS MLRS Battalion

The GS battalion (see Figure 3) would be employed significantly differently than current MLRS or other battalions with GS missions. The battalion, or battalion (-), usually would receive a non-standard GS mission. The mission would be modified by guidance on the use of assets for the counterfire fight and deep battle.

Specific guidance on positioning, ammunition constraints and mission priorities is critical. This tells the GS MLRS battalion commander the information he needs to arm his launchers with MLRS or Army TACMS and position his batteries to accomplish the mission. If other battalions are available for the counterfire fight, they could have the mission of reinforcing (R) or general support reinforcing (GSR) to the GS battalion.

The individual firing batteries also could be detached from the battalion and given the mission of R or GSR to a DS battalion. Here a battery would be positioned by the DS battalion, linked into its TACFIRE and answer calls for fire from the brigade's observers.

In this case, the battery would operate with a "hot" platoon to provide responsive fires for the brigade. The hot platoon (or platoons, depending on the situation) would have launchers on a firing position or in a hide position within minutes of the

firing position. The battery could have rockets on target within five minutes of receiving the fire mission.

Each firing battery would have three platoons of three launchers capable of firing MLRS or Army TACMS rockets. The battery would retain small ammunition, maintenance and logistics sections to maintain the ability to function as a separate battery.

However, the battery could be reduced to 115 personnel. This is slightly smaller than a current MLRS battery because portions of the maintenance, ammunition and logistics sections would be moved to HHB and Service Battery. And like the rest of the Div Arty, the GS battalion would replace its 2 1/2- and 5-ton trucks with HMMWVs and HEMTTs for better mobility.

The headquarters battery would be configured differently than the current HHB in an MLRS battalion. The diverse missions and required positioning of the firing batteries would cause them usually to be split from the rest of the battalion. The staff sections, battery headquarters and survey, medical and communications sections would remain relatively unchanged in HHB. The main CP would operate out of modified FAASVs. The battery would operate with approximately 65 soldiers.

Service Battery would have the difficult

mission of maintaining, resupplying and rearming the firing batteries. It would be structured similarly to a DS battalion that has task organized the battery maintenance sections out to the batteries. Service battery would consist of a battery headquarters and battalion maintenance, supply and ammunition sections. The ammunition section usually would be supplemented by the battery teams. Service battery would be manned by about 80 soldiers.

Approximately 490 soldiers would be needed to man the GS battalion. One hundred and thirty-one soldiers in the MLRS battery are already in the Div Arty. Eliminating the Q-36 radars and the division TAB could provide approximately 24 more personnel. This leaves 335 soldiers per heavy Div Arty to come from inactivating units.

The equipment required should be attainable. The MLRS launchers, HEMTTs and HMMWVs critical for improving the unit's mobility and maintainability could come from inactivated units.

Bottom Line

The prospect of a significant reduction in the Army gives us the opportunity to improve the heavy Div Arty. We could provide the Army the ability to deploy a division that can fight an enemy with a formidable counterfire capability, engage targets acquired by the division assets well beyond the current MLRS range and reinforce the main effort of the close battle with a tremendous amount of firepower.

The Div Arty could be a trained team that has the personnel, equipment and training to fight the deep and close battles and win.

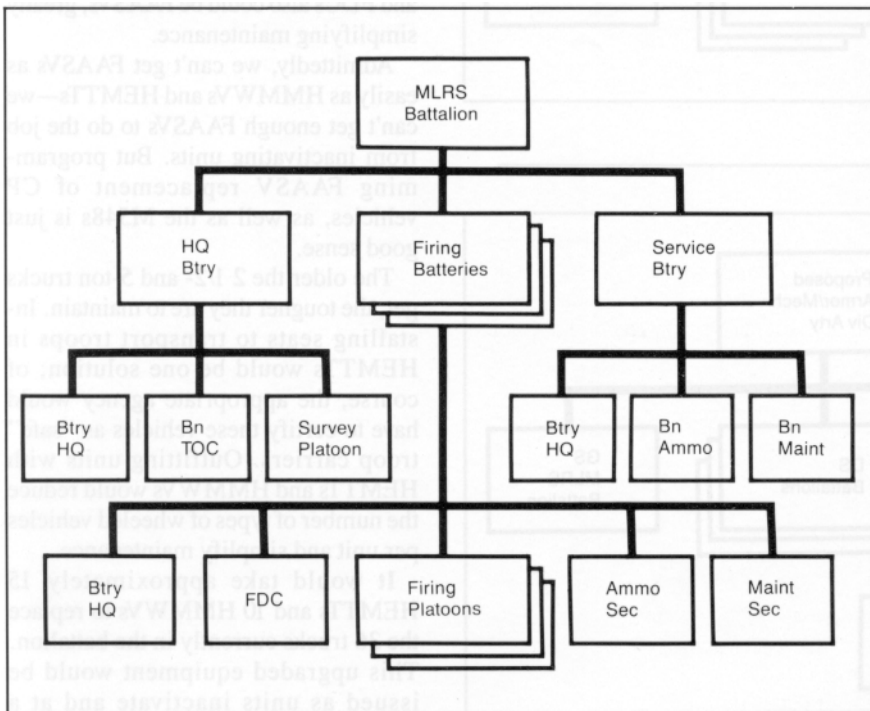


Figure 3: Key Elements of the new GS MLRS Battalion

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Moving into History



The Inactivation of 1-84 FA

by Major William R. Ward and Colonel Douglas J. Middleton

The battalions of the Field Artillery stand ready to serve the US in a variety of ways. They can have many viable missions: acting as part of a UN peacekeeping force, helping to liberate Latin American countries, defending against aggression in the Middle East—even fighting forest fires.

Also serving the best interests of the US is another mission many units now are being called on to perform: inactivation. On 15 January 1991, the 1st Battalion, 84th Field Artillery (1-84 FA), was inactivated as part of the inactivation of the 9th Infantry Division (Motorized), Fort Lewis, Washington.

The 1-84 FA, a 105-mm howitzer and multiple launch rocket system (MLRS) battalion, was the last active battalion of the 84th Field Artillery Regiment, tracing its roots back to 16 September 1916. The battalion had been associated with the 9th Infantry Division since 1 October 1940 and served with the division in World War II and Vietnam.

The battalion's mission was to provide general support (GS) fires to the 9th Division and direct support (DS) fires to the 9th Cavalry Brigade (Air Attack). Two batteries of M102105-mm towed howitzers were used for the DS missions, and MLRS by the battalion's C Battery accomplished the GS mission. This configuration resulted in the battalion's being the Army's only light artillery and rocket (LAR) battalion.

Planning

On 25 June 1990, the battalion was notified that on 15 August its combat mission was to end and its inactivation to begin. This allowed the battalion about six months to inactivate.

But because of responsibilities, the battalion trained hard beyond the 15 August change-of-mission date. From late May until mid-July, two batteries were deeply involved in supporting the 4th Reserve Officer Training Corps (ROTC) Region summer camp. From 26 June to 6 August, the battalion trained in crowd-control techniques and was on-call to respond to any civil disturbances that might have disrupted the Goodwill Games in Seattle. From 6 to 9 August,



that might have disrupted the Goodwill Games in Seattle. From 6 to 9 August, the battalion trained in air assault techniques, conducting six artillery raids in three days.

Then on 10 August, the battalion was alerted to provide soldiers for fire-fighting duties in Oregon. A force of 223 battalion soldiers deployed to Oregon on 13 August and returned to Fort Lewis on 22 August.

Throughout this period, the battalion was framing a detailed inactivation plan. The plan centered around an operations order (OPORD) that outlined every phase and task commanders and staff had to accomplish. In addition, the OPORD had a milestone inactivation schedule as Annex H (see Figure 1).

As expected, the commander's intent was the heart of the OPORD. Lieutenant Colonel William A. Ryan, who had commanded the battalion since 15 December 1988, took care to outline his intent, including paragraphs devoted to the following special topics.

• **Maintain Good Order and Discipline.** The commander thought the anticipated short-notice loss of critical links of the chain of command called for reinforcing the concept that someone be in charge at all levels, at all times. In addition, unit and section integrity was stressed during all inactivation activities.

• **Care for Soldiers and Their Families.** This paragraph covered two areas of concern. First, keeping the soldiers and their families informed became an issue of primary importance. Lessons learned from the inactivation of some 9th Infantry Division maneuver units showed that uncertainty about the immediate future severely hurt morale. This would have a negative effect on the inactivation process.

Second, the battalion took all steps to enhance the promotion potential of the units' soldiers. Promotion boards,

15 Jul 90	Schedule initial technical inspections (TIs). Begin unit 100 percent inventory.
19 Jul	Verify vehicle and equipment serial numbers. Review DEH work orders; cancel as appropriate. Begin repair of property and facilities to prescribed standards; identify shortages. Begin 100 percent unit inventory (organizational, installation, FMB and facilities). Begin initial TIs of facilities, commo equip, vehicles, etc.
27 Jul	ID soldiers with early expiration term of service (ETX), P-3 physical status, bars and investigations. ID soldiers not critical to inactivation and available for reassignment. ID soldiers on present duty assignment (PDA), education benefits, other reenlistment options and (or) stabilized tours. ID soldiers in critical positions.
31 Jul	Coordinate G6/DEH building/FMB/installation property pre-turn-in inspections.
01 Aug	Inventory 100 percent key and lock (arms room). Begin turn-in of maps and NATO documents.
10 Aug	Turn in all OPORD annexes (Inactivation) to S3.
13 Aug	Complete map turn-in.
15 Aug	Turn in/lateral transfer communications-electronic (Comm-Elec), command and control information (CCI) and communications and security (COMSEC) equipment.
20 Aug	Coordinate with Provost Marshal (PM) on weapons transfer turn-in dates.
29 Aug	Identify to G1 soldiers in critical positions or with special skills who will be retained until the end of unit inactivation. Complete NATO document turn-in.
30 Aug	Start processing all adjustment documents. Complete unit equip and facilities TIs. Complete unit 100 percent inventory.
31 Aug	Turn in operations plans (OPLANS).
01 Sep	ID soldiers who will be TDY during inactivation.
04 Sep	Provide turn-in plan to logistics activity group (LAG). Turn in COMSEC/CCI to 1-84 FA COMSEC vault. Sequence: A Btry 4 Sep B Btry 5 Sep Service 6 Sep HHB 6 Sep C Btry 7 Sep Turn in Comm-Elec to 1-84 FA Commo Platoon headquarters. Sequence: A Btry 4-7 Sep B Btry 10-14 Sep Service 17-21 Sep HHB 24 Sep-4 Oct C Btry 9-19 Oct Make-ups 22 Oct-2 Nov
07 Sep	Notify PM/Physical Security Office on clearance of arms room and joint service interior detection system (JSIIDS). Notify Directorate of Security (DSEC) of personnel transferred to other units. Send draft battalion turn-in plan to LAG. Provide battalion draft equip distribution/turn-in schedule. Brief division on plan (tentative date).
10 Sep	Commanders complete interview with soldiers to determine reassignment desires (won't apply to all soldiers).
11 Sep	Brief turn-in plan to LAG.
13 Sep	Brief turn-in plan to assistant division commander(s).
14 Sep	Complete Light TACFIRE preparation for turn-in.
17 Sep	Brief battalion soldiers. Pick-up COMSEC account inventory report from Division Central Office of Records (DCOR). Coordinate with DEH, Directorate of Logistics (DOL) and G4 for turn-in of all property.
18 Sep	Get battalion turn-in plan approved, based on turn-in directive. Begin DOL acceptance TIs.
20 Sep	Complete ID of soldiers for early ETS (within 90 days of E-Date).
21 Sep	Turn-in COMSEC equipment to DCOR.
28 Sep	Receive relief of accountability statement for COMSEC account. Brief turn-in plan to CG.
30 Sep	Complete acceptance TIs.
01 Oct	Transfer special duty (SD) soldiers to gaining units.
10 Oct	ID release dates for all soldiers.

Figure 1: Annex H (Milestones of the 1-84 FA OPORD 22-90 (Inactivation)). (Chart continued on next page.)

15 Oct	Stop prescribed load list (PLL) replenishment.
16 Oct	Inventory all Training Service Center (TSC) equip. Clear classified documents; inspect classified document holding areas. Official end of tasking date.
17 Oct	Parts requests submitted on exception basis only—exceptions approved by Division Materiel Management Center (DMMC). Adjust unit status report spreadsheets to delete C5 units. Produce NCO and officer efficiency report (NCOER and OER) shells for all remaining NCOs and officers. Turn in hazardous waste. Develop unit historical report.
27 Oct	Turn in weapons.
29 Oct	Schedule CG for billet inspection.
30 Oct	Complete reports of survey and adjustments documents.
31 Oct	Submit request for termination of barracks cable TV service, effective E-Date.
01 Nov	Begin reassignment of soldiers not critical to inactivation.
05 Nov	Distribute excess equip and turn in intelligence reference materials to G2 and division artillery.
15 Nov	Complete food service equip TIs.
16 Nov	Complete 100 percent inventory of all unit historical property. Turn in all TSC equipment; clear account.
28 Nov	CG inspects billets.
30 Nov	Notify DSEC of personnel transferred to other units. Complete all weapons turn-in. Notify PM/Physical Security Office on clearance of arms room and JSIIDS.
01 Dec	Complete Post Office change-of-address cards. Complete Uniform Code of Military Justice (UCMJ)/chapter actions.
05 Dec	Conduct residual equip distribution (RED) meeting.
14 Dec	Consolidate automated data processing (ADP) packets for turn-in. Package and ship unit historical items and memorabilia (trophies, etc.). Begin separating soldiers who will ETS within 90 days of E-Date.
15 Dec	Turn in organizational equipment and close out Army oil analysis program (AOAP) and calibration coordination.
10 Dec	Complete all change of rater OERs/NCOERs.
20 Dec	Inventory and turn in all forms unnecessary for inactivation.
21 Dec	Turn in ADP packets to Division Automation Management Office (DAMO).
27 Dec	Coordinate with PM for vacant building security patrols. Turn in unit historical report to Public Affairs Office (PAO).
28 Dec	Notify DSEC of what ADP equipment remains.
30 Dec	Complete CONNEX container TIs. Complete billets pre-clearance inspection.
07 Jan 1991	Send final personnel security clearance to DSEC.
15 Jan	Close out meal card account. Conduct inactivation ceremony. Complete any remaining OER/NCOER/admin actions.
20 Jan	Submit final dining facilities personnel status report and turn in account card. Close out unit organizational hand receipts and reconcile property book.
30 Jan	Complete turn-in/lateral transfer of FMB, installation property and facilities. Vacate buildings/facilities.
04 Feb	Reconcile FMB, installation and facilities hand receipts.

Figure 1: Continued: Annex H of 1-84 Inactivation OPORD.

schooling and skill qualification test (SQT) training were stressed throughout the inactivation process.

• **Maximize Individual Readiness Training.** This paragraph also had two areas of emphasis. First was physical fitness. The battalion planned to capitalize on every opportunity to increase the level of physical fitness for all soldiers. The goal was to have every soldier leave with a recent, passing physical training (PT) test score and be within weight standards. Second, individual

training in combat skills, such as weapons and nuclear, biological and chemical (NBC) proficiency, was stressed so soldiers would go to their new units fully prepared to deploy.

Also included in the commander's intent were separate paragraphs that addressed turning in equipment and clearing facilities.

The scope of the inactivation mission may be better visualized by citing some statistics. Each of the five batteries had separate hand receipts for organizational,

installation, morale support and furniture management branch (FMB) property. Organizational property alone consisted of 680 lines and 6,084 items of equipment. The battalion had 167 vehicles plus associated trailers and generators to process.

Ten floors of billet and office space had to be cleared in the battalion area as well as two separate motor pool complexes. A total of 22 separate facilities had to be prepared and cleared.

To attack inactivation on all fronts simultaneously, it was divided into four areas: facilities, personnel, motor maintenance and other equipment. The battalion command sergeant major (CSM) became the expert on billets and furnishing, the S1 developed a personnel plan and the battalion executive officer and maintenance technician coordinated all requirements relating to automotive and generator equipment. All other inactivation requirements were divided among subject area experts or became the responsibility of battery-level supply persons. The battalion had to monitor and control the progress on all four fronts carefully.

Facilities

The CSM profited from the experience of units that had already gone through inactivation. The common advice was to start the cleaning and repair of billets as soon as possible.

In late August, the unit began to consolidate billet space, requiring soldiers to move off floors while they were prepared for turn-in. To minimize the turbulence to soldiers, a plan was developed that required soldiers to move only once.

Coordination with two different agencies was needed to have all areas of the billets inspected early and then again for final turn-in and acceptance. The Directorate of Engineering and Housing (DEH) inspected the buildings, pointing out such items as roof and floor tiles that needed to be replaced, and the FMB inspector indicated which furniture should be repaired or coded out. Expecting that other units would eventually be moving in, we were to leave all furnishings in place.

A 20-man team of battalion soldiers did all the repairs, maintenance and painting. The first floor took three weeks to finish. To ensure the billets maintenance team was on the right track, the battalion requested a courtesy inspection from the same DEH inspector who would give the final "Okay" to the entire battalion area.



After the inspection, the subsequent floors each took less than two weeks as the team became more proficient.

Starting with 10 floors of billet and office space, the battalion consolidated into one three-story building by 7 December 1990. The headquarters moved its operations into a building once used as a troop medical clinic.

The funding of DEH Self-Help Supply became a complicating factor. The DEH inspector identified cracked floor tiles, stained ceiling tiles and other normally deferred maintenance items that had to be fixed before the billets could be turned in. However, because of funding constraints, many of the repair items weren't available until 7 November, almost three months after some rooms were cleared.

Due to the efforts of the NCOs and soldiers on the billets clearing team who "worked the system," the first building was cleared by 28 November 1990. All other billets, offices and motor pool facilities were closed out by 9 January 1991.

Personnel

In the personnel arena, the battalion developed a plan that considered the wishes of every soldier in the battalion. A soldier's request for a follow-on assignment at Fort Lewis was granted whenever there was an opening and he met the grade requirements. Stabilization for 12 months was granted to those soldiers who requested it.

The actual release dates were planned around the Thanksgiving and Christmas Holidays to allow 1-84 FA soldiers to take well-deserved leave before reporting to their new units. More than 80 percent of the battalion's soldiers were taken care of in this manner.

Artillerymen holding 13M (MLRS

Crewman) and 13P (MLRS Fire Direction Specialist) military occupational specialties (MOSs) were notable exceptions. With the inactivation of the only MLRS systems at Fort Lewis, the post didn't have duty positions available for soldiers with the 13M and 13P MOSs. These soldiers fell into two groups: first-termers who received orders to report to Germany and all others who were sent to Korea after advanced system training at Fort Sill, Oklahoma.

Soldiers with permanent change of station (PCS) reporting dates as late as mid-May 91 were encouraged to request a 90-day early-arrival authorization. This prevented soldiers from being reassigned when the battalion inactivated on 15 January 1991 only to begin out-processing for reassignment in less than three months.

The unit's personnel and administration center (PAC) and S1 worked with 9th Division Adjutant General (AG) personnel on a daily basis in an effort to keep soldiers and their families informed of their reassignment status. The division AG personnel worked each soldier's file individually at the Department of the Army (DA) level.

As with all plans, however, there were modifications. Six lieutenants were transferred to other artillery battalions before 1-84 FA actually began the inactivation process. Several Fire Support Specialists (13F) and others deployed to Southwest Asia on short notice to support Operation Desert Shield. The freeze on PCS moves and separations announced in early December caused the reassignment

plans of nearly 50 artillerymen to be changed temporarily. Fortunately, the other two battalions of artillery at Fort Lewis (1-11 FA and 3-11 FA) were in the process of up-gunning to 3x8 organizations, so there were positions to fill in the Fort Lewis artillery community.

To ensure all soldiers left fully able to compete for promotion and prime duty positions, the battalion continued to convene promotion boards and emphasized schools attendance and the conduct of basic soldier and MOS skills training throughout the inactivation period.

Motor Maintenance

To prepare all motor equipment for either lateral transfer or turn-in by the inactivation date, the battalion put a plan into effect well ahead of the official change-of-mission date. The 1-84 FA had 167 vehicles plus associated trailers and generators to prepare (see Figure 2).

The battalion maintenance technician, Chief Warrant Officer Two Richard Boggs, was a veteran of a previous unit inactivation and knew which areas would require the most work. Armed with the knowledge that trailers and generators are the most neglected pieces of equipment in the Army, Mr. Boggs had his mechanics systematically inspect and repair trailers and generator systems. With a good start on the equipment most likely to cause problems, the main effort began on 15 August 1990.

To better control and keep track of expenses and repair parts, both the document register and prescribed load list



Redlegs of the 1-84 FA conduct air assault artillery raids prior to inactivating.

(PLL)/The Army maintenance management system (TAMMS) were consolidated at the battalion level. Mechanics from the MLRS battery were responsible for preparing their unique equipment for turn-in while the rest of the battalion's mechanics were divided up by equipment type.

As a team of mechanics completed a particular vehicle type, they shifted to another. For example, when the mechanics working on the 14 2 1/2-ton trucks finished, they joined those working on the unit's 71 high-mobility multipurpose wheeled vehicles (HMMWVs). This centralized effort proved to be effective and flexible enough to allow for the short-notice (three-day) conversion of six specialized tactical fire direction system (TACFIRE) HMMWVs to 10/20 standards for shipment to Operation Desert Shield in October.

The cost of preparation for turn-in was relatively low because the battalion's equipment was well-maintained, and

credit for turn-in of PLL helped counter the expense of any needed maintenance. In fact, the battalion ended up more than \$11,000 ahead due to credits on high-value MLRS items turned in.

Other Equipment

For all other equipment, an NCO had the mission of becoming the expert on the procedures for turn-in. The assigned NCO coordinated inspections, assistance visits and turn-in dates and became the point of contact between the battalion and the final turn-in location. The battalion used this system with individual and crew-served weapons and equipment, tentage and all other canvas items as well as for compasses and survey and optical equipment.

The communications and NBC officers coordinated the turn-in of all equipment in their areas of expertise. When the NBC officer deployed to Desert Shield in October, an NCO finished the job.

Control

To keep track of the battalion's progress on its four areas of inactivation and head off any minor problems before they became major ones, the lines of communication had to remain open. Meetings at the battalion level were held twice a week with subject area experts updating commanders and staff. Each battery commander had to discuss in detail his unit's turn-in and lateral transfer status.

The division G4 hosted a division-level meeting each week. Here, the battalion staff briefed division staff representatives on the progress being made and areas where the battalion needed help. Periodically, the battalion executive officer briefed the division commander on inactivation issues. The battalion was expected to stay within the inactivation schedule (see Figures 3 and 4 on Page 30).

At the same time 1-84 FA was inactivating, the 199th Infantry Brigade (Motorized) (Separate) was being formed in the division. The two remaining artillery battalions were going 3x8, with one of those becoming a corps asset. Because of the many changes, lateral transfer directives and table of organization and equipment (TOE) requirements changed daily. As much as is possible, an inactivating unit should be insulated from this turmoil.

During the inactivation process, the battalion learned several lessons useful to any unit inactivating.

- **Start the billets turn-in process early.** This will take the longest time and the greatest number of people.

- **Make a detailed plan.** Incorporate the experiences of any units that have inactivated. The plan must balance a shrinking battalion population with the amount of work to be done to keep the unit on track with its turn-in schedule.

- **Keep soldiers and family members informed.**

- **Pre-inspect.** Get early pre-inspections by any outside agencies you may have to deal with. This is especially applicable for billets and furnishings. In each area, it pays to understand all procedures from initial inspection to final turn-in. In some cases, it may help to have the chain of authority or any agreements made put in writing so all inspectors, clerks, warehousemen and others involved are aware of procedures agreed to.

1. Vehicles Status:						
Type		# On Hand	# TI*	% TI		
HMMWVs		71	52	73		
2 1/2-Ton Truck		14	13	92		
5-Ton Truck		34	22	65		
10-Ton Truck		20	18	90		
M102 Howitzer		12	12	100		
M270 Launcher		9	9	100		
Trailer		39	28	72		
Tank and Pump Unit		3	3	100		
Total		202	157	78		
2. Overall Equipment (As Reflected by Property Book Printouts):						
Btry	Total LIN**	LIN TI	% TI	Total Items	Items TI	% TI
HHB	178	82	46	2,055	1,177	57
A	121	102	84	724	690	95
B	124	106	85	747	672	90
C	138	84	61	1,642	1,175	72
Svc	119	62	52	915	701	77
Total	680	436	64	6,084	4,415	73
3. Battalion Personnel Recap: (see Personnel Status Report (attached) [Not Included in Figure 2])						
4. Equip scheduled for TI:						
Item		Date				
a. HMMWVs - 1-11 FA 199th IN Bde (Sep)		16 Nov TI				
b. 5-Ton - 1-11 FA		16 Nov TI				
5. Critical equipment TI: (Nothing critical since 21 Sep)						
*TI = Technical Inspections Completed						
**LIN = Line Identification Numbers						

Figure 2: The 1-84 FA Inactivation Update (As of 13 November 1990). The mission to inactivate the battalion began officially on 15 August 1990 and culminated in the battalion's inactivation on 15 January 1991. In the interim, the battalion closely tracked the status of its vehicles, other equipment and personnel to stay on schedule.

- **Work from a strong base.** It pays great dividends to have good systems in place ahead of time. The numbers of transactions in the S4 shop went up dramatically as did the workload in the S1 shop. Neither staff section would have been able to keep up with the pace of events if it hadn't already had efficient operators.

- **Maintain established relationships.** The normal association between 1-84 FA and its support battalion changed

at the beginning of the inactivation cycle. Until new point of contact (POC) relationships were established and slight differences in procedures understood, there was added confusion. This was particularly true when it came to maintaining our howitzers; the 1-84 FA was the only battalion on Fort Lewis with 105-mm howitzers.

On 15 January 1991, the 1-84 FA was inactivated until called upon once again. Inactivation is a mission with unique challenges. It must be approached using

standard military procedures with emphasis on the NCO chain of command. The S1, S4 and maintenance operations must be effective going in.

When the last 1-84 FA mission was completed, professional artillerymen and well-maintained equipment were freed to serve elsewhere.

1-84 FA Commander's Advice to Commanders of Inactivating Units

1. Approach inactivation as you would any other mission. Foster a strong team orientation and positive attitude.
2. Centrally coordinate and monitor your plan. Do your homework. Brief everyone. Synchronize. Resynchronize. Track religiously.
3. Understand the standards and rules of engagement. Have the staff mark the route.
4. Conduct initial inspections and inventories early. Be ready to adapt.
5. Gain and maintain contact with the key players and organizations. Keep them in the net. Understand your battalion's inactivation isn't everyone's highest priority. Work friendly.
6. Decentralize the execution of your plan. Maintain a flexible response capability. Do it right the first time. "Police the battlefield" as you go.
7. Protect the force. Work normal duty hours. Don't panic. Take time for diversions and maintain morale. Stress safety.
8. Get on the buildings and facilities early.
9. Surface the challenges. Insulate your unit from frustration. Have the system help address the challenges.
10. Orient soldiers. Talk to them often to keep them informed. Keep commanders visible, communicating and where the action is. Provide rewards. Close with meaningful ceremonies. Don't forget families.



Figure 3: The 1-84 FA Organizational Equipment Turn-In Chart. As this graph shows, the battalion was expected to stay within its inactivation schedule.

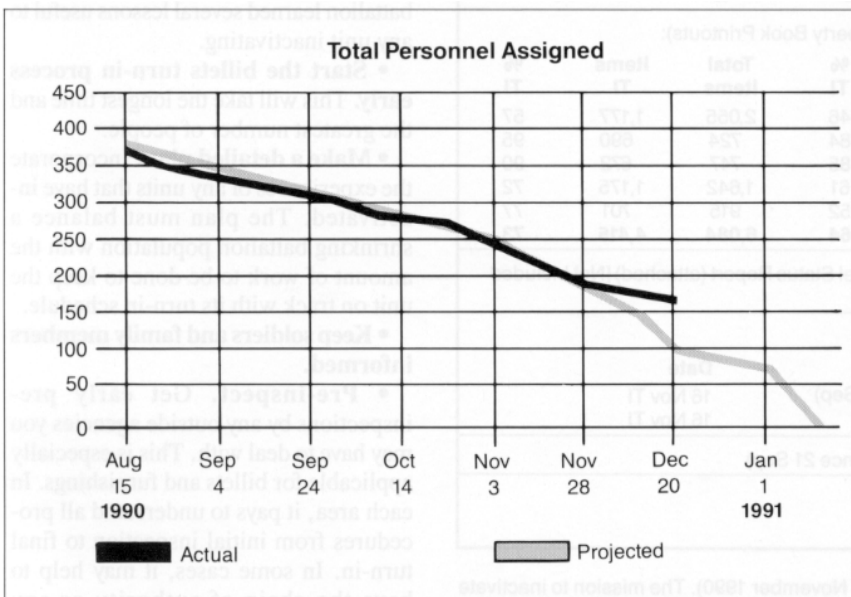


Figure 4: The Personnel Reassignment Schedule for 1-84 FA's Inactivation (as of 20 December 1990). The battalion's plan called for all 450 soldiers to have their assignments (most already reassigned) by 1 January 1991 before the inactivation on 15 January.

Major William R. Ward is the S3 of the 3d Battalion, 11th Field Artillery, 9th Infantry Division (Motorized), Fort Lewis, Washington. He was the last S3 of the 1st Battalion, 84th Field Artillery, part of the 9th Infantry Division, until its inactivation in January 1991. He also has served in Vietnam and commanded a firing battery in Germany and a warhead detachment in Turkey.

Colonel Douglas J. Middleton is Chief of Staff of the 9th Infantry Division. Until recently, he commanded the 9th Infantry Division Artillery and oversaw the inactivation of the 1st Battalion, 84th Field Artillery. Colonel Middleton commanded the 1st Battalion, 41st Field Artillery, 56th Field Artillery Command, Germany, and three batteries, one in Vietnam and two in Germany.

Brigadier General Tommy R. Franks, Former Assistant Division
Commander for Manuever, 1st Cavalry Division



Sam Orr

1st Cav in Desert Storm ***Deception, Firepower and Movement***

Interview by Patricia S. Hollis, Managing Editor

Brigadier General Tommy R. Franks was Assistant Division Commander for Maneuver with the 1st Cavalry Division, when the "First Team" deployed to Saudi Arabia in September 1990 for Operations Desert Shield and Storm. By mid-October, the division, then attached to XVIII Airborne Corps, was closed in Saudi Arabia and assembling in the desert about 160 kilometers west of Dharhan. By early January 1991, the First Team had repositioned almost 500 kilometers to the northwest, in the vicinity of King Khalid Military City (about 50 kilometers south of the Iraqi border). When the air campaign started, the division was in defensive positions along the Wadi Al Batin, a historic avenue of approach that runs from Kuwait and Iraq into Saudi Arabia. The next 40 days were exciting for the First Team and key to the success of Operation Desert Storm.

What were the 1st Cavalry Division's missions during Operations Desert Shield and Storm?

While attached to the XVIII Airborne Corps, our mission was to defend Saudi Arabia and deter attack by the Iraqis. After repositioning, the division was attached to VII Corps, and our mission was to defend the historic approaches into Saudi Arabia. It was during these defensive operations that we started planning the counteroffensive. At this time, the division was "on a string" to CENTCOM [Central Command] as the theater reserve.

During January, we moved north through a series of defensive positions to the tri-border area on the Wadi Al Batin. By tri-border, I mean the juncture of the Kuwait, Iraq and Saudi borders. We focused on security operations, still defensive in nature, but initiated planning for offensive operations.

In the first week of February, soon after the air war started, the division received the mission to be a part of the deception force. Our purpose was to deceive Saddam Hussein into believing that Coalition Forces would attack up the Wadi Al Batin into Kuwait. We wanted him to mass his forces in the area across from the 1st Cavalry Division. So we set up operations along the border and conducted feints and raids prior to G-Day [Ground-Day] on the 24th of February.

From our positions on the border, we conducted massive rocket raids. I recall one occasion when our division artillery, augmented by the fires of an additional MLRS [multiple launch rocket system] battalion, fired more than 400 rockets

deep into Iraq in less than 90 seconds. We were after Iraqi artillery, command and control targets of the front-line divisions and his air defenses. We found out later the raids had been very effective, and the forces immediately across the border



An S-60 57-mm Iraqi anti-aircraft gun destroyed in Desert Storm.

from us (several infantry divisions) had been fixed in place and effectively blinded to the repositioning of the VII and XVIII Corps.

We continued these raids up until G-Day and, in fact, conducted mounted operations 30 to 40 kilometers into Iraq on several occasions. Our purpose was twofold. One, to continue to gain and develop intelligence on the enemy. And second, to reinforce Saddam's belief that the Coalition would attack Kuwait by coming up the Wadi Al Batin.

During deception operations, several things happened. The division took almost 2,000 prisoners along the border in the two weeks just prior to G-Day. And it was through the interrogation of these prisoners that we confirmed the enemy's tactical template—the locations of his front-line divisions.

Then, on G-Day, we launched a limited attack into the major trench and obstacle works of the divisions immediately to our front. This was to continue to persuade the Iraqis that we were the spearhead of the main effort.

Meanwhile, the campaign plan unfolded, and both US Corps were brought to bear well out to the west to envelop Iraqi front-line divisions and destroy the Republican Guard's divisions further to the north—the flanking operation General Schwarzkopf called the "Hail Mary."

Sun Tzu said 2500 years ago, "Make your way by unexpected routes and attack unguarded spots." That's what the campaign plan called for, and that's exactly what we did . . . it was a masterstroke.

Once G-Day kicked off, the deception was complete, and the division was pulled off line, brought to the west 40 to 50 kilometers and moved up through the breach created by the 1st Infantry Division. The 1st Cav broke contact, moved to the north almost 300 kilometers, rearmed, refueled and linked up with the 1st Armored Division in less than 24 hours. We were prepared to continue operations into Al Basra when the ceasefire was announced.

I could not be more pleased with the incredible performance of our soldiers, leaders and equipment.

In the 1st Cav's fast-paced operations, how did the artillery do keeping up with the maneuver forces?

The artillery did a super job of keeping up because Colonel Jim Gass, our Div Arty Commander, and his guys planned, prepared and rehearsed the actions necessary to keep up. The division first moved 160 kilometers to the west of Dhahran and established itself in an assembly area in the desert. Next we moved almost 500 kilometers up to the northwest to the vicinity of King Khalid Military City, and then we moved through a series of defensive positions up to the Iraqi border. You might say, we had a lot of practice before G-Day. Finally, we moved another 300 kilometers into Iraq.

Colonel Gass had worked our division artillery very hard in practicing desert movement. It was a challenge to move command and control and cannons along with maneuver forces in a movement-to-contact. But our success proved the old adage, "You do well in war what you practice in peace."

As far as specific vehicles were concerned, we confirmed that the old M548 cargo carrier is not able to provide artillery ammunition resupply during fast-paced, mobile operations. I say we "confirmed" because we've known the M548's shortcomings for some time. We need to buy more FAASVs [Field Artillery ammunition support vehicles] now, and of course we will continue to work the development of the FARV-A [future armored resupply vehicle-ammunition] for the out years.

We also confirmed that the modern generation of wheeled vehicles, such as the HMMWV [high-mobility multipurpose wheeled vehicle] and HEMTT [heavy expanded-mobility tactical truck], do well moving across country in a desert environment, while our older equipment isn't as capable.

We learned that the FIST-V [fire support vehicle] isn't a mobile enough companion for the M1 tank and the Bradley fighting vehicle. In fact, we modified some Bradleys to accomplish the FIST-V mission. By mounting GVLLDs [ground-vehicular laser locator designators] on the Bradleys, we were able to keep our fire supporters in the fight.

In the final analysis, I give a great deal of credit to Major General John Tilelli, the First Team's Commander, and our brigade commanders. They recognized the mobility strengths and weaknesses of our equipment, and movement tables were planned and executed accordingly.



A combat-ineffective Iraqi UAZ-469B Republican Guard jeep.



Iraqi T-72 tanks, casualties of the Storm.

Should we consider modifying Bradleys to use as FIST-Vs Army-wide?

Yes, I think so—we need a fire support vehicle that looks like the vehicles with which it fights. But we also need to continue our efforts to find an appropriate command and control vehicle for both the artillery and maneuver forces. Mobility and command and control will remain key ingredients of fire support into the 21st century.

Was range a problem for the artillery?

When we discuss range—more is always better. The MLRS provided range out to 30 kilometers, and on a variety of occasions, we had the Army TACMS [tactical missile system] with even greater range. Couple that with close air support [CAS] and, in some cases, BAI [battlefield air interdiction] by the Air Force, and we got the job done.

The issue isn't simply longer range, but the volume and responsiveness of fires at longer range. We need longer range cannons to provide greater volumes of fire at the direct call of the maneuver commander.

Approximately what percent of DPICM [dual-purpose improved conventional munitions] did the 1st Cav fire and how effective was it?

The preponderance of ammunition we fired was DPICM—perhaps 70 percent. It was very effective. We saw the devastating results of top-attack of armored and soft-skinned vehicles as well as trenchworks and troop targets. I think ICM proved to be a winner.

But I will also tell you, there's "room at the inn" for HE [high explosive munitions]—volumes of high explosive rounds did a great job on bunkers and built-up logistical and C² [command and control] sites. We need to retain a mix of munitions in response to the lessons of Desert Storm.

At this point, let me digress and talk a minute about the value of training and training devices. When we deployed to Saudi Arabia, our soldiers had fired no live DPICM and very few MLRS rockets and Copperhead rounds. But in combat, they fired tens of thousands of rounds of DPICM, thousands of rockets and about 30 Copperheads—they were on target in virtually every case. The fact is that soldiers had used training devices to practice these skills. Sergeants had trained their soldiers to standard, and our training devices worked. There's no substitute for smart, realistic training. It's a testament to the quality of our training,

our training devices, and quality of our soldiers that they were able to fire these munitions so successfully when they had never fired them before.

Our suites of munitions worked well, and I must say the 1st Cav used them all. We were among the first to fire high volumes of DPICM in battle. The same with high volumes of MLRS fires—the first to fire Copperhead.

Feedback from Desert Storm indicates cannon artillery typically fired battalion or larger fire-for-effect missions. Did the 1st Cav confirm that?

Yes. The joint munitions effectiveness manuals (JMEMs) tell us we get the best results when we mass fires. That's one of the principles of indirect fire support. We fired a lot of rounds at a few targets, rather than a few rounds at a lot of targets, and I think the results speak for themselves.

We had missions where we fired several battalions of 155-mm munitions and MLRS rockets into the same target area, multiple volleys of 155—up to 10 volleys per battalion. The results were devastating.

We need to continue to reinforce this lesson from Desert Storm at our home stations and training centers.



Brigadier General Franks surveys an Iraqi T-72 tank damaged in Desert Storm.



An Iraqi BMP, the last kill of the 1st Cav in the 100-Hour War.

In your Desert Storm experience, you learned a great deal about logistical operations in the desert. AirLand Operations (the evolving AirLand Battle-Future) foresees a battle over a large area such as the desert. What recommendations for logistics would you offer to support AirLand Operations?

We need to increase the focus on combat service support [CSS] for the Army—not just for the Field Artillery or the fire support community. We referred to CSS operations in Saudi Arabia as "the long pole in the tent." The Army needs to continue to increase the mobility and materiel-handling capabilities of our logistical force—across the board.

When we mass artillery fires, the volume of ammunition required is tremendous. As you know, the Field Artillery School is working diligently to develop the materiel-handling and automated capabilities we need to supply enough ammunition for AirLand Operations.

Additionally, we have to take a look at CSS for our FA brigades—I think we'll have to give each brigade something like a forward support battalion to get the dedicated support we'll need in the future.

How did the Firefinder radars do in Operation Desert Storm?

Our Firefinder radars were extremely successful. The Iraqis were not very sophisticated in using indirect fire, at least from what I saw. When we probed their defenses, they simply fired "final protective fires"—in most cases. The Firefinders were able to pick up these

firing units, and we deliberately and diligently destroyed them.

I will say that from my experience, the Q37 needs increased mobility. And we need to downsize the Firefinder over time to increase its deployability. These fixes are in the works.

I'd also like to see the range of the Q36 increased. It's a mobile and capable system now. . . .with increased range, we'll have a real winner.

It appears joint doctrine for fire support coordination and targeting may need some refinements. What were your impressions and what do you recommend?

I think "refinement" is the right word. We have sound doctrine. The doctrine establishes fire support coordination measures and fire support coordination lines; our joint appreciation of that concept needs to be developed, and we need to practice what we teach.

The relationship between the Army and the Air Force, with respect to who attacks what part of the battlefield, when, will have to evolve over time because of the new technology we're developing for command and control, target acquisition and attack systems. But for now, we simply need to train to execute the doctrine we have.

What was one of the 1st Cav's greatest training carryovers from the NTC [National Training Center, Fort Irwin, California]?

I'd say the efficiency of the fire support system (the "system of systems") as a whole—the fire support process "paired" the combat power of individual cannons and rockets with targets to be

fired. The linkage between and among the fire supporters, our maneuver forces and our cannon and rocket units was exceptional. For anyone who has spent much time at the NTC, that's what it takes to win.

Our training centers focus great energy on bringing fires to bear at points critical to the maneuver scheme. That's what we took from the NTC into the desert with us. Decide, detect, deliver. . .

What message would you send Redlegs worldwide?

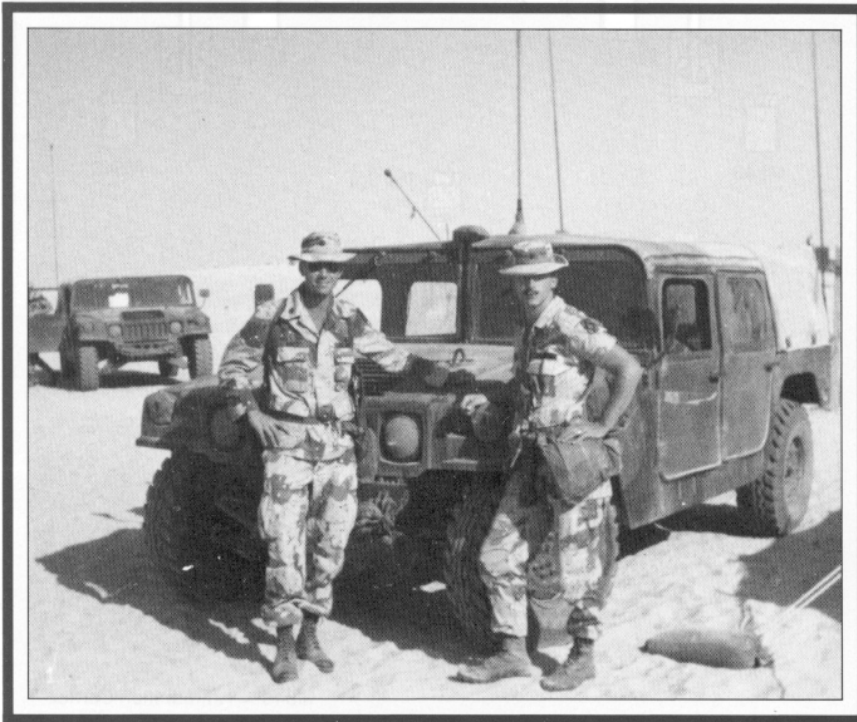
We have the best-trained, best-equipped and best-led Army in the world. Fire support is a key ingredient of that Army. But we can't afford to rest on our laurels. We must continue to recognize that the world is a dangerous, dynamic place. And as we evolve the fire support mission area, we must press the technology "envelope" while we train soldiers and leaders to respond to the dictates of future battlefields.

The business of fire support is not an amateur sport. We have to continue to provide fires for the maneuver commander—when and where he needs them. Napoleon once said, "God fights on the side with the best artillery." We have no choice but to continue to train and field the best artillery. The alternative is unacceptable.



Brigadier General Tommy R. Franks was the Assistant Division Commander for Maneuver of the 1st Cavalry Division in Southwest Asia during Operations Desert Shield and Storm. Currently, he's the Assistant Commandant of the Field Artillery School, Fort Sill, Oklahoma. He has served as Chief of Staff of the 1st Cavalry Division, and he commanded the 1st Cavalry Division Artillery, both at Fort Hood, Texas. He also commanded the 2d Battalion, 78th Field Artillery, 1st Armored Division, Germany; an artillery battery at Fort Sill; and a howitzer battery as well as the 84th Armored Engineer Company in the 2d Armored Cavalry Regiment in Germany. In addition to other assignments, Brigadier General Franks served in several positions with the 9th Infantry Division in Vietnam.

"Roadrunner" Operations in Desert Storm



by Lieutenant Colonel Stephen J. Arntz

In Operation Desert Storm, the 5th Battalion, 18th Field Artillery (5-18 FA) "Roadrunners," part of the 75th Field Artillery Brigade (75 FA Bde) of III Corps Artillery, thrust across the Iraqi border north with the 1st Infantry Division (Mechanized) and then joined the 1st Armored Division moving east to attack the Republican Guard Forces Command (RGFC). During the war, the 5-18 FA traveled more than 340 miles and fired almost 3,000 rounds.

Under the control of the 42d FA Bde, the 5-18 FA initially provided general support reinforcing (GSR) fires for the 1st Infantry Division, part of VII Corps' main attack. The battalion crossed the Saudi-Iraqi border marked by 12-foot high berms and participated in the division's preparation fires. Then the battalion changed missions, reinforcing the 3d Bde's direct support (DS) battalion for about six hours. After crossing a breach in a large minefield, the battalion reverted to the 75 FA Bde's control and marched 150 miles to join the 1st Armored Division, which was then embroiled in VII Corps' main attack. The 5-18 FA provided GS fires for the division for the remainder of the war.

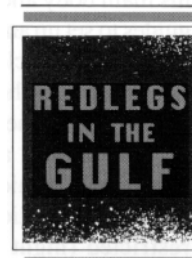


Operations Desert Shield and Storm offered a wide-open environment that significantly changed the way we operated. The desert influenced everything from firing battery operations to logistics—facilitating the former, but complicating the latter. This article describes the procedures and techniques our battalion implemented during our six months of supporting Desert Shield and Storm.

Operations

The 5-18 FA, a 3x8 8-inch howitzer battalion, completed its deployment to Saudi Arabia on 5 October 1990. We were well-trained in conventional movement and occupation techniques, but we weren't well-practiced in open, cross-country movement.

We quickly recognized the desert wedge formation was the best means to rapidly occupy prepared or unprepared positions and was relatively simple to control with our view unrestricted in the desert. (See Figure 1 on page 36 for the platoon wedge formation.) We learned to open or close the wedge, depending on terrain features and the degree of nighttime illumination. AN/PRC-126 radios, five per platoon, also helped our movement and rapid occupations.



Each firing battery formed two platoon wedges (see Figure 2), one slightly offset and behind the other, as a part of a larger battalion wedge. Each firing battery commander (BC), equipped with a small lightweight global positioning system (GPS) receiver (SLGR), called a "slugger," preceded his convoy by 300 meters along a series of checkpoints (grids provided by the battalion S3) en route to a limit-of-advance or until told to stop.

The BC deviated from his preselected course when he had to avoid terrain restrictions that would limit his platoons' time to react. In reduced visibility, the commander slowed his convoy long enough to check out possible terrain obstacles.

If the battery had enough warning, platoon leaders and advance parties occupied predetermined positions. When this occurred, the BC returned to lead his convoys to their locations. More often than not, however, platoons practiced occupying unprepared positions—the way we ended up doing business in the rapid pace of Desert Storm, particularly while pursuing the RGFC.

We found two methods worked well for occupying unprepared positions. In one method, the platoon leader, when notified, would speed up with his advance party 300 to 500 meters in front of his main body and drop off his four gun guides to set up an aiming circle. The advance party vehicle then ran communications wire from the aiming circle to a terminal strip in the center of the battery, and gun guides and the fire direction center (FDC) guide would connect to it. We used this option when visibility was restricted (night or bad weather) and when moving forward 300 to 500 meters from the march column was possible.

In the other option, the FDC track signaled the convoy with a flag that it was to occupy immediately. The FDC track oriented on the azimuth of fire, and the guns moved to their relative positions, movements practiced in lots of rehearsal. The platoon leader then set up the aiming circle while his advance party vehicle dropped off advance party personnel to hook up communications wire.

In most cases, we initially laid the platoon using the AN/PRC-126 and sent final lay data over the telephone. The FDC monitored final lay data and could compute the platoon's position information for rapid firing.

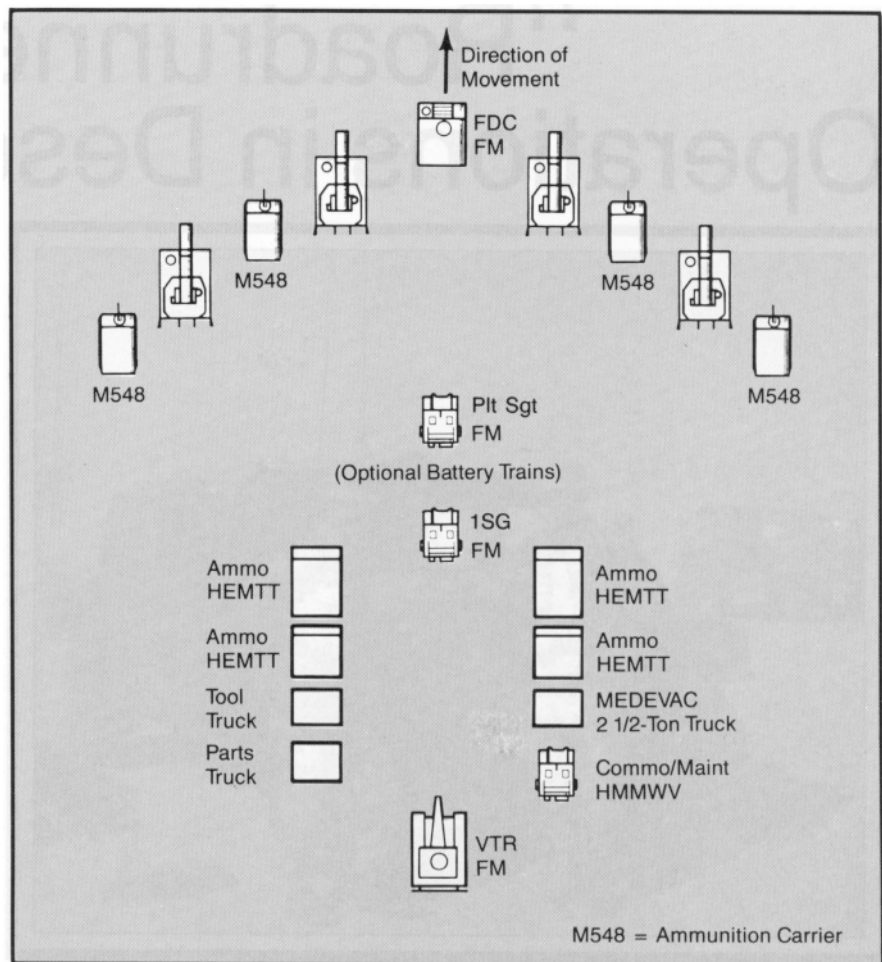


Figure 1. An 8-Inch Howitzer Platoon in a Wedge Formation. The battery trains following the platoon (optional) would make it the battery's heavy platoon.

The position and azimuth determining system (PADS) surveyed, in priority, the lead and rear platoons and then moved to the battery without PADS. A platoon leader awaiting PADS laid on magnetic then updated his azimuth of fire in the battery computer system (BCS) after PADS arrived or after he conducted a simultaneous observation (SIMO). These methods were faster and made more sense than relaying the battery to correct a few mils of difference between PADS and magnetic.

Rapid movement over great distances required us to continuously update our declination constants for our safety circles. On occasion, we ran short of time to establish a true declination station, and we simply used the map's grid magnetic angle to establish the declination constant. If we couldn't get the angle to agree with PADS within 10 mils, we used a survey instrument azimuth gyro lightweight (SIAGL) system in the

daytime and Polaris and Kochab stars at night. The key, however, was to update declination constants. We always used a second circle to safety-check our lay.

Using these procedures, the entire battalion could routinely lay the guns, safety-check the lays, prepare the ammunition and be ready to fire (including survey, meteorological and velocity error data) in 15 minutes or less.

We complemented our movement and firing procedures with some variations during Desert Storm. For example, once we left the 1st Infantry Division, we marched 150 miles cross country in five-battery columns and then reassumed our wedge formation as we joined the 1st Armored Division.

There we fell in behind the lead maneuver brigade's DS artillery. On our left flank was a multiple launch rocket system (MLRS) battalion and A Battery, 6-27 FA MLRS. Because of nonexistent air and negligible counterfire threats, we

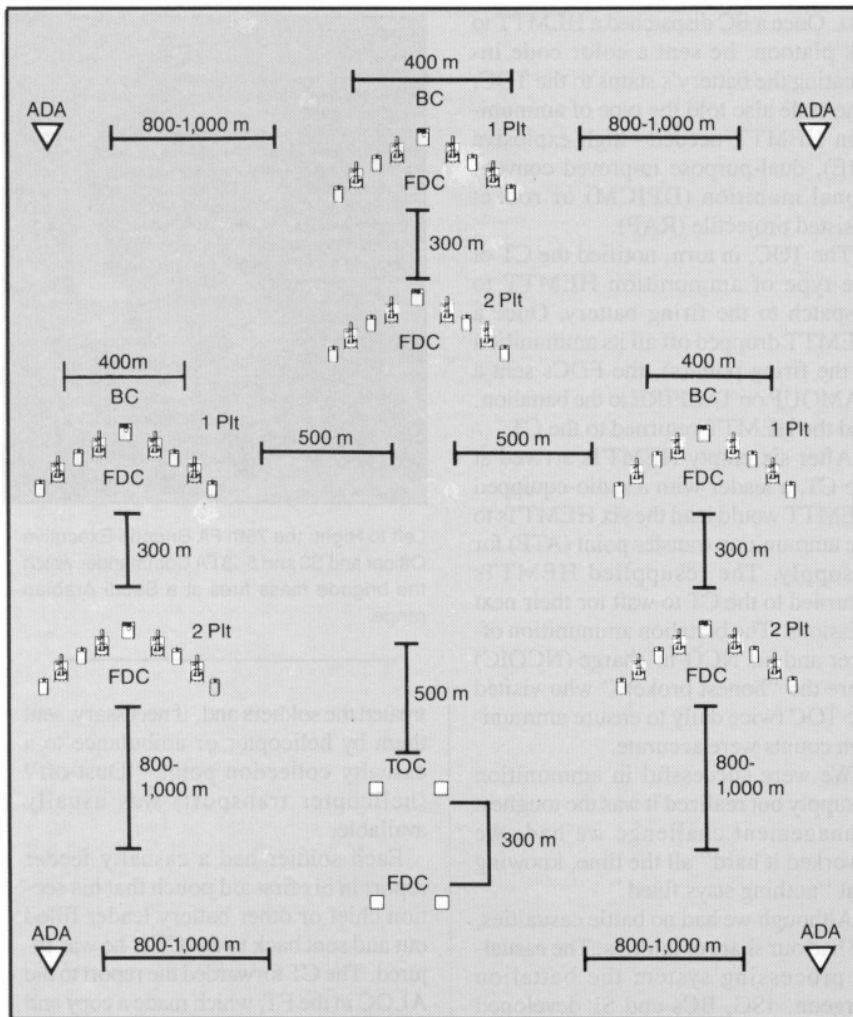


Figure 2: Battalion Wedge Formation. Each battery formed a two-platoon wedge to move in a battalion wedge formation. When the Desert Storm ground war began and it became apparent there was no air or counterfire threat, the battalion formation tightened up considerably and the Air Defense Artillery (ADA) Stinger (or Vulcan) teams were redistributed.

closed our wedge formation to 800 meters wide and 1,500 meters deep. The entire division moved together with the artillery right behind the maneuver elements. If fires were needed, we stopped, shot as a battalion and moved again.

We never fired less than a battalion three-round, and every time we fired, the MLRS units next to us fired. This tight control of the reinforcing artillery enabled our FA brigade and the division artillery to mass our battalion and the MLRS battery and battalion on a tank regiment and destroy it. In that attack, we fired a battalion 10-round.

Combat Service Support

Our firing batteries had only tracks and high-mobility multipurpose wheeled vehicles (HMMWVs) in the firing

platoons. The battery trains consisted of the battery maintenance trucks, the first sergeant's (1SG's) vehicle, four heavy expanded-mobility tactical trucks (HEMTTs) carrying ammunition, an M88 or M578 vehicle track recovery (VTR) and a medical evacuation (MEDEVAC) 2 1/2-ton truck ("coughed up" by each firing battery).

We worked load plans for all vehicles until we were "blue in the face." When we finally determined what worked best, we documented it and provided national stock numbers (NSNs) for each vehicle's contents to our administration and logistics operations center (ALOC) in the event we had to order replacement equipment damaged in war.

The battery trains usually set up 300 to 500 meters behind the firing platoons.

The 1SG monitored the administrative/logistics (A/L) radio net and coordinated everything from "beans to bullets" for his battery.

Our tactical operations center (TOC) remained small for rapid displacement. It was 500 to 3,000 meters behind the firing batteries. The TOC consisted of the operations and intelligence (O&I) tracks, the tactical fire direction system (TACFIRE) section, a radio repairman and wireman, the survey chief, a radio teletypewriter (RATT) rig, the S3 vehicle, a 2 1/2-ton truck and the battalion commander's vehicle. (We didn't use the RATT because of the perceived Iraqi direction-finding threat.) We had enough personnel for 24-hour operations and defense—approximately 45 folks.

The combat trains (CT) was located from 1,000 to 3,000 meters behind the TOC. That was as far back as the firing batteries ever went for any type of support.

The CT consisted of the headquarters and headquarters battery (HHB) BC and 1SG; an operations center (a built-up HMMWV with two VRC-46 radios); the executive officer and command sergeant major; battalion ammunition (-) and radio repair (-) sections; wire teams; a recovery vehicle and the fuel tankers; the battalion maintenance technician (BMT); radio repair and armament contact teams from our support maintenance; the battalion aid station (BAS); two M13 Sanators (vehicle spray-down devices) with two 500-gallon water blivets; and the chaplain.

The CT pushed supplies forward, processed all battery requisitions and relayed log reports to the field trains (FT). It made logistics responsive to the firing batteries, handling everything from mail to sewing up injured soldiers. The CT's proximity to the TOC greatly facilitated ammunition management.

The FT operated 500 meters to 20 kilometers behind the CT, usually 10 to 15 kilometers away and in the vicinity of maneuver brigade support area (BSA). During exploitation operations, it "hugged up" behind the CT.

The FT consisted of the service BC and 1SG, the battalion's consolidated mess activity, all supply sergeants, the bulk of our maintenance support contact team and the ALOC, which was manned during different shifts by the S1, battalion motor officer (BMO), S4 and property book officer (PBO).

The FT focused on coordinating water, chow, supply, personnel support and major repair activities. It also served as the liaison with support activities, which changed frequently.

We maintained these logistical procedures throughout Operation Desert Storm.

Training

During Desert Shield, once we established the composition of our various elements, we found that a "crawl-walk-run" approach to training helped us learn the different techniques quickly and helped integrate them into battalion operations. We usually adhered to the following sequence when training a new technique: chart-board drills with key leaders, sand-table rehearsals with leaders, "HMMWV exercises" with leaders and key players, "pedestrian drills" (dismounted operations using drivers and chiefs, for example, positioned relative to one another to replicate wedge formation movement and occupations), platoon evaluations and battery then battalion field training exercises (FTXs).

Another technique that worked especially well for implementing logistics activities was a log command post exercise (CPX). We used half the TOC on AN/PRC-127s as controllers following a master events list (MEL). The rest of the TOC and all key logistics players (BCs, 1SGs, platoon sergeants, CT, FT, etc.) responded on the radio, sent reports and delivered ammunition (3x5 card simulations), all using a condensed time clock. We could accomplish a great deal of training with minimum vehicle movement, which helped us balance maintenance and training sustainment.

One difficult area we finally conquered was ammunition management. We had to train hard to determine the best procedures. We came to the conclusion that platoons would only report ammunition on the firing point through their FDCs to the battalion O&I sections on the TACFIRE AFU;BAMOUN (ammunition and fire unit; battalion ammunition update) formats.

The BC or 1SG reported the ammunition status in the battery trains directly to the TOC. BCs reported a green, amber or red status for ammunition: green meant four HEMTTs full of ammunition, amber three HEMTTs and red, two or

less. Once a BC dispatched a HEMTT to his platoon, he sent a color code indicating the battery's status to the TOC. The code also told the type of ammunition HEMTT needed—high explosive (HE), dual-purpose improved conventional munition (DPICM) or rocket assisted projectile (RAP).

The TOC, in turn, notified the CT of the type of ammunition HEMTT to dispatch to the firing battery. Once a HEMTT dropped off all its ammunition at the firing point(s), the FDCs sent a BAMOUN on TACFIRE to the battalion, and the HEMTT returned to the CT.

After six empty HEMTTs arrived at the CT, a leader with a radio-equipped HEMTT would lead the six HEMTTs to the ammunition transfer point (ATP) for resupply. The resupplied HEMTTs returned to the CT to wait for their next missions. The battalion ammunition officer and his NCO-in-charge (NCOIC) were the "honest brokers" who visited the TOC twice daily to ensure ammunition counts were accurate.

We were successful in ammunition resupply but realized it was the toughest management challenge we had; we "worked it hard" all the time, knowing that "nothing stays fixed."

Although we had no battle casualties, we had our share of injuries. The casualty processing system the battalion surgeon, 1SG, BCs and S1 developed couldn't have been better. This, like other systems, evolved from one FTX to the next. We finally settled on a MEDEVAC 2 1/2-ton truck with a medic, eight litters and water in each firing battery trains, with two such trucks in the CT.

The CT also had the BAS. The BAS consisted of one 2 1/2-ton medical supply cargo truck, the HMMWV ambulance and an M109 van. The medics built up the M109 van to accommodate the most used and critical medical supplies with chests on one wall and a gurney on the opposite side. The M109 van allowed the doctor exceptionally good light to work on patients without violating light discipline. It also facilitated occupation and displacement because there was little to set up—everything the doctor needed to operate with was on wheels.

Our system for processing casualties required firing batteries to bring injured soldiers to the BAS. The MEDEVAC truck in each firing battery was to care for and transport mass casualties, which fortunately, never was necessary. Usually, the 1SGs brought injured soldiers to the BAS in their HMMWVs. The doctor



Left to Right: the 75th FA Brigade Executive Officer and S3 and 5-18 FA Commander watch the brigade mass fires at a Saudi Arabian range.

treated the soldiers and, if necessary, sent them by helicopter or ambulance to a casualty collection point. "Dust-off" (helicopter transport) was usually available.

Each soldier had a casualty feeder report in his first aid pouch that his section chief or other battery leader filled out and sent back to the CT if he was injured. The CT forwarded the report to the ALOC in the FT, which made a copy and provided other necessary information through personnel channels.

The toughest "nut for us to crack" was the treatment of contaminated casualties. We finally devised a system to displace the BAS from the CT to a noncontaminated area. We used stakes with red flags or red chemlites to alert in-bound contaminated MEDEVAC trucks where to unload their patients for decontamination and triage before treatment (see Figure 3). Decontaminated patients were then treated upwind from the contaminated site and, if necessary, evacuated.

Although we never had to use this system, we practiced it frequently, and it was simple to implement.

Of course the nuclear, biological and chemical (NBC) threat was a great concern. We trained like everybody else, using M11 and M13 operator spray-down procedures, weathering, etc. Fortunately, we had the two Sanators, which allowed us to practice hasty decontamination. We put each on a HEMTT with two 500-gallon water blivets and would have dispatched another HEMTT with three 500-gallon water blivets to our hasty

decontamination sites if it had become necessary.

Our biggest NBC concern was availability of water. With the limited water we could carry, we could only conduct a hasty decontamination for one or two platoons; the others would have had to have gone through divisional decontamination sites or simply stayed in mission-oriented protective posture level four, (MOPP 4) gear and allowed weathering to remove contamination.

After reading an NBC white paper written at Fort Leavenworth, Kansas, we realized the best way to train to operate and decontaminate in an NBC environment was to truly understand when decontamination was necessary. We adapted the various "tanker" vignettes in the white paper to situations we thought our FA battalion might encounter. Then we took each section through drills to ensure it knew how to react and why. The drills were like an NBC leader's reaction course. This not only facilitated understanding, but also made the leaders and soldiers feel much more confident they could accomplish their mission in an NBC environment.

Keeping soldiers healthy was always a concern. When we first arrived, the temperature usually soared over 100 degrees each day. As soon as the sun came up, the "solar-powered" flies came out as did other disease-infested bugs.

We learned we had to pay very strict attention to hand washing. We ensured that if we used nonpotable ice to cool our water that we washed off the water container bottles before drinking, but we still had some diarrhea problems. The good news was that most diarrhea was bacterial, and our doctor had the antibiotics that could cure almost anybody in 24 hours or less.

Perhaps the greatest concern for most commanders was sustaining morale. During Desert Shield, keeping soldiers productively occupied was the key. We, like several units, balanced training and maintenance with time for personal activities and sports.

We tried to build competition into all our training and recognize winners at monthly formations. We continued "Soldier of the Month" boards, promotion boards and competitions for best mechanic (winners went to see Bob Hope), Top Gun, FDC operations, HEMTT crane operations, etc. We had several double-elimination tournaments in touch football, volleyball, horseshoes and basketball. (This last sport took our best carpenters a week to build the wooden court in between FTXs, but they finally completed it on Christmas Day.) We even had two nonalcoholic beer hails (no farewells) for the officers, courtesy of the field grades.

All leaders pushed for consistent quality chow, mail delivery, newsletters, bulletin boards, a public address system, TVs with nightly videos and, finally, access to telephones to make life as pleasant as possible as we waited for the ground war to start. Additionally, our higher headquarters arranged for soldiers to take three- to four-day breaks by the ocean near Dhahran once every six weeks or so. This, plus live-firing and keeping soldiers informed, helped keep morale on a fairly even keel.

Our experience in Desert Shield and Storm will live with us forever. We certainly didn't have "a corner" on all the good ideas, but we found several that worked for us. Our procedures—devised, refined and practiced in Southwest Asia—allowed us to fight on a winning team and helped bring everybody in the battalion home.

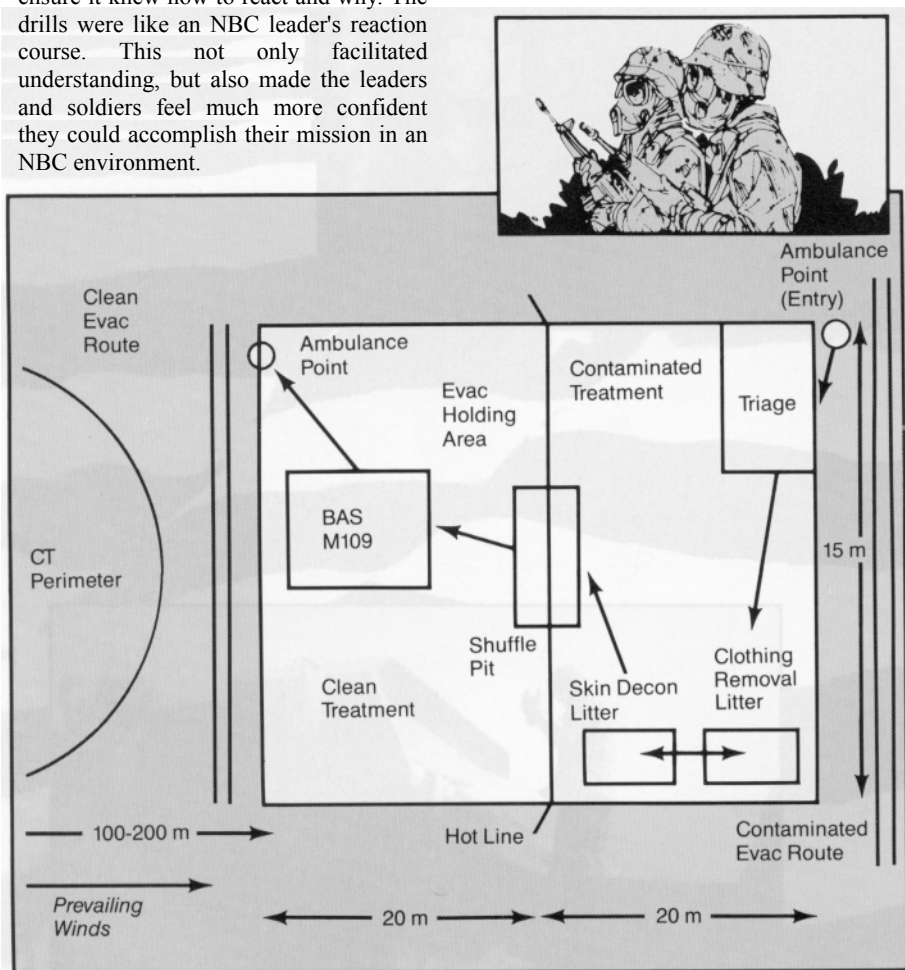
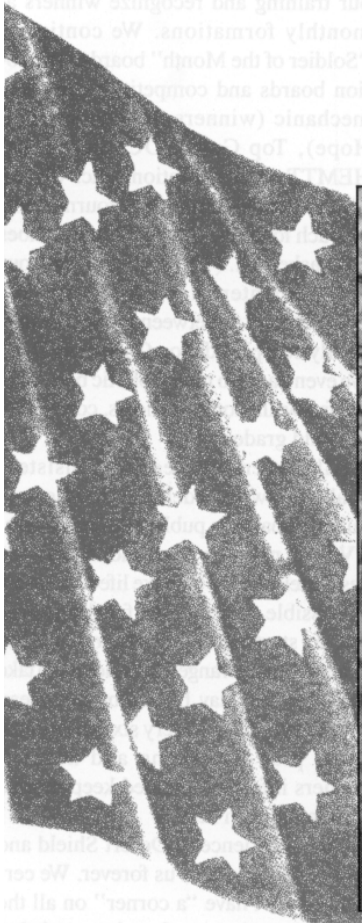


Figure 3: Patient Decontamination Station. To treat NBC contaminated casualties, the 5-18 FA displaced the BAS from the CT. Stakes with red flags or chemlites marked the area for MEDEVAC trucks or ambulances to drop off contaminated casualties for decontamination, triage and treatment.

Lieutenant Colonel Stephen J. Arntz commanded the 5th Battalion, 18th Field Artillery, 75th Field Artillery Brigade, III Corps Artillery, Fort Sill, Oklahoma, from December 1988 to May 1991. He deployed with the battalion to Southwest Asia in October 1990 and participated in Operations Desert Shield and Storm, redeploying in April 1991. Starting in August, he'll be a student at the National War College, Washington, D.C. He commanded a firing battery in the 3d Battalion, 6th Field Artillery, 1st Infantry Division (Mechanized), Fort Riley, Kansas. Lieutenant Colonel Arntz holds a master's degree from Syracuse University, New York.

To Redlegs in Operation Heroes One

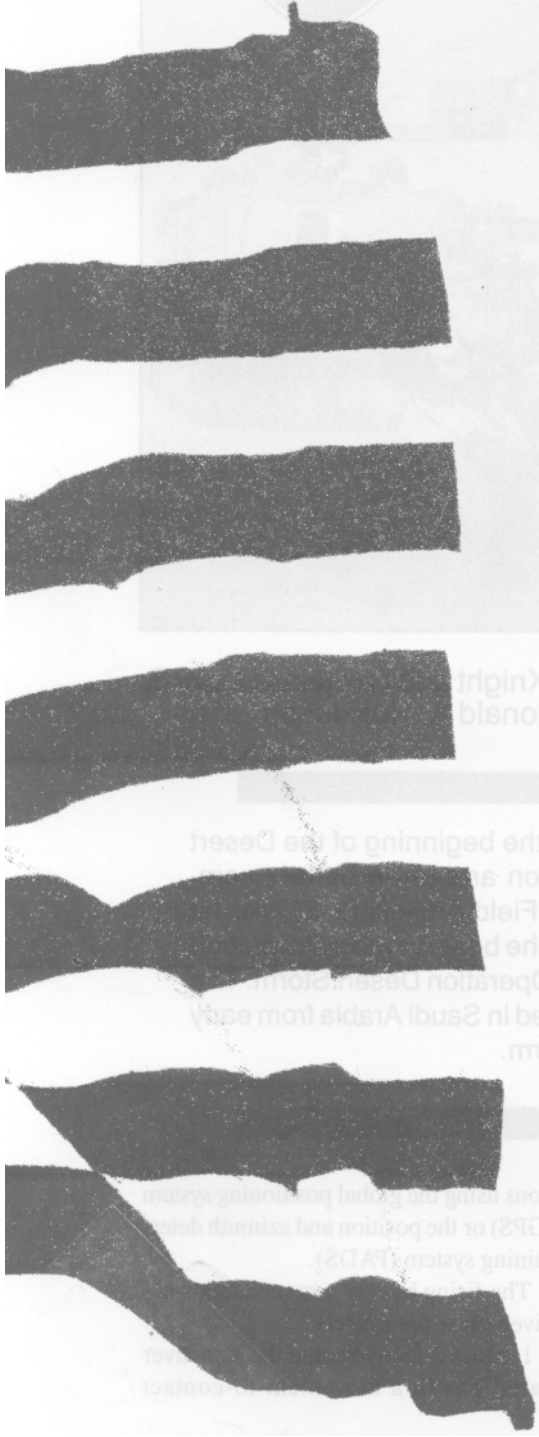


James Murati



MSgt. Michael Brown

Desert Storm— and All



The effectiveness of the air war in the Persian Gulf followed by the phenomenal success of the ground war to decisively defeat Saddam Hussein will be dissected and digested by military historians for decades to come. The combined efforts of the XVIII Airborne Corps, VII Corps, the US Marine Corps and Coalition Ground Forces brought the Iraqi forces to their knees faster than we thought. The Army combat tested and demonstrated for America and the world our long-rehearsed Air-Land Battle Doctrine and, again, proved we could execute complex plans precisely.

Army and Marine Field Artillerymen, Active and Reserve Components, you were a significant part of that history-making victory. In concert with our joint and combined forces in Southwest Asia, you brought awesome volumes of firepower to bear in support of the ground commander. Your rapid movement over hundreds of kilometers to occupy positions and deliver precision fires in the most demanding of circumstances was unprecedented. As recipients of your firepower and also professional admirers, the Iraqi enemy prisoners of war spoke of the terrible, pervasive "Steel Rain" of your cannons and rockets.

From the Redleg in the rear coordinating vital ammunition or working with our sister services and allies. . . to the cannoneer up front with the lead task force pulling the lanyard. . . to the host of fire supporters in between—well done! You were the lightning and thunder of the Desert Storm!

But the entire Field Artillery Community shares in the credit for the resounding victory in Operation Desert Storm—not only our heroes who were in the sand. We have heroes who never went to the desert. You soldiers, Marines and civilians who stayed behind and worked long hours and "the good ole boy" system to quickly get the massive amounts of equipment and supplies to the Gulf share in the glow of America's euphoria over her Armed Forces' successes. You also supported and assisted the families of the combat soldiers and Marines' left behind—support absolutely critical for the combatants to be able to concentrate on the tasks at hand with confidence their loved ones were well cared for. You trainers across our country who filled the training seats to overflowing and trained around the clock are also heroes. And to the units, you continued your Field Artillery missions around the world as you sent materiel, specialists and replacements to Southwest Asia. As surely as if you had pulled the lanyards or fired the rockets, you all helped win the war.

All of you stand tall as contributors to the Desert Storm victory and America's renewed patriotism and pride in her military that the victory has brought. I salute you and your comrades fallen in the Storm. They, too, are heroes, and we won't forget them.

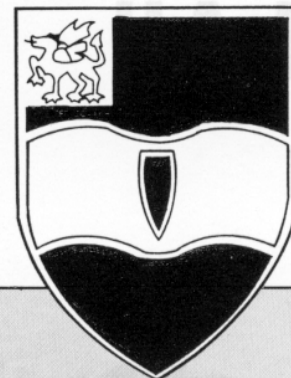
In just 100 short hours, you all reaffirmed Field Artillery's right to the title *King of Battle*.

**Congratulations Redleg
Heroes all!**

RAPHAEL J. HALLADA
Major General, US Army
Chief of Field Artillery

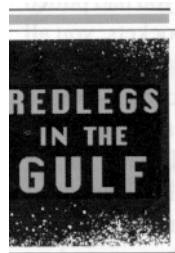
Movement-to-Contact

"Red Dragons" in Operation Desert Shield



Line of Departure Time 0600—The 2d Brigade (Blackjack), 1st Cavalry Division, crosses the line in a movement-to-contact with three task forces abreast in a brigade wedge formation. Expected enemy heavy contact is 80 kilometers away.

The brigade moves out on time at a very calculated 10 miles per hour. The speed, dictated by the brigade commander, enables all combat systems and key combat service support vehicles in the brigade battle task force to keep in formation. The 3-82 FA Red Dragons, the brigade's DS [direct support] artillery battalion, moves tucked behind the brigade's combat vehicles.



An hour later, brigade scouts suddenly report contact with an enemy screening force. The brigade continues to move as the situation develops. The screening force

becomes what appears to be a battalion-sized security force.

The brigade comes to a halt as the commander orders a task force to maneuver on the enemy force. The FSCOORD [fire support coordinator], collocated with the brigade commander in his M113, orders the Red Dragons to halt immediately and occupy firing positions.

"Red Dog, Red Dog, azimuth of fire 6200" goes out simultaneously over the battalion command net and voice fire net. Every key leader in the battalion knows the battalion is stopping to fire. In less than 10 minutes, all firing batteries are occupied on common direction and are massing accurate, predicted fires on an enemy tank battalion.

If necessity is the mother of invention, then Saudi Arabia is the place with the



by Lieutenant Colonel Kenneth R. Knight and Captains Henry S. Larsen, Allen W. Batschelet and Ronald A. Hoskinson

This article was written before the beginning of the Desert Storm ground war by the battalion and three battery commanders in the 3d Battalion, 82d Field Artillery (3-82 FA), 1st Cavalry Division, who developed the battery wedge formation concept for artillery movement in Operation Desert Storm. The 3-82 FA Red Dragons were deployed in Saudi Arabia from early October 1990 through Desert Storm.

"needs." For the 3-82 FA, the mission is unchanged—provide DS artillery fires in support of an armored brigade. What has changed are the parameters the battalion operates under. Those have, in turn, caused us to alter our methods of fire support, including occupation of positions

using the global positioning system (GPS) or the position and azimuth determining system (PADS).

The firing battery commanders were given these parameters:

1. Move directly behind the maneuver battalions in a movement-to-contact

scenario. Be prepared to occupy and fire on contact.

2. Move with platoons in wedges, battery in column (see Figure 1). Sustain a rate of speed of 10 miles per hour over long distances. Be able to sprint short distances at 20 miles per hour.

3. For command and control purposes, occupy as a battery and be prepared to deliver accurate, predicted fires in less than 10 minutes. Included in this time is safety verification and establishing survey control.

4. Batteries A and C each had a PADS vehicle attached. B Battery had a survey team equipped with the GPS AN/VSN-8.

Movement

A brief note on navigating in Saudi Arabia: the majority of the area is rolling sand dunes without the wadis found at the National Training Center (NTC), Fort Irwin, California. The few terrain features usually aren't on the map.

the one exception to this are man-made features. The way to navigate is by measuring distance and direction.

To help navigate, battery commanders have a long-range aid to navigation (LORAN) device. This off-the-shelf item is an excellent navigational aid that gives longitude and latitude to a location and also provides direction and distance to the next location of travel. Using the LORAN, the Red Dragons determined longitude and latitude for templates used to quickly obtain a six-digit grid reading from a military map. But the LORAN doesn't have the degree of accuracy needed to shoot artillery.

The batteries caught on quickly to moving in wedge formations. The fire direction officers (FDOs) in the M577 fire direction center (FDC) tracks controlled their platoon wedges using standard hand and arm signals, flags and AN/PRC-127 radios. The battery commander controlled the battery formation

and issued directional guidance to the lead FDC, as needed. The second platoon followed in the first platoon's tracks, minimizing vehicle risk if it encountered a minefield.

Because of the need to move at 10 to 15 miles per hour, the M577 couldn't tow a trailer in soft sand. The M577s averaged 15 miles per hour maximum speed with trailer and 20 miles per hour without trailer in soft sand. This caused the FDC sections to cross-level their combat loads with the howitzer sections in their platoon. The FDCs' B-Bags and a majority of their food and water were stored throughout the platoons.

The Red Dragons brought the M332 ammunition trailers to Saudi Arabia, which can be towed behind an FA ammunition support vehicle (FAASV) at rates of 25 to 30 miles per hour. The M332 ammunition trailer hauled the three-day supply of water and rations and 50 percent of the section's cots, a necessity in the desert.

The soft sand also caused the tracked vehicles to lose some of the fuel range they usually had on hard surfaces. In the sand, they get about two-thirds of their listed vehicle range. The formation consisted entirely of tracked vehicles and high-mobility multipurpose wheeled vehicles (HMMWVs).

The battery maintenance contact team had an M578 recovery vehicle and a HMMWV. Prescribed load lists (PLL) were cross-leveled on the FAASVs, and locator cards told the motor sergeant where to find parts, such as gun radiators and fan towers.

The battery first sergeant controlled the battery trains, which were consolidated at the battalion level under the senior firing battery first sergeant. Because of the M35 2 1/2-ton truck's extremely poor performance in the soft sand, the battery trains had to link up with the battery using the road network and contact points.

The 3-82 FA innovations began primarily with the battery occupation.

Occupation with GPS

When the maneuver forces made enemy contact, the batteries received orders from the brigade fire support coordinator (FSCOORD) or battalion S3 to occupy immediately (see Figure 2). Unlike hipshoots at home station, there's no better location or terrain for immediate occupation than the Saudi

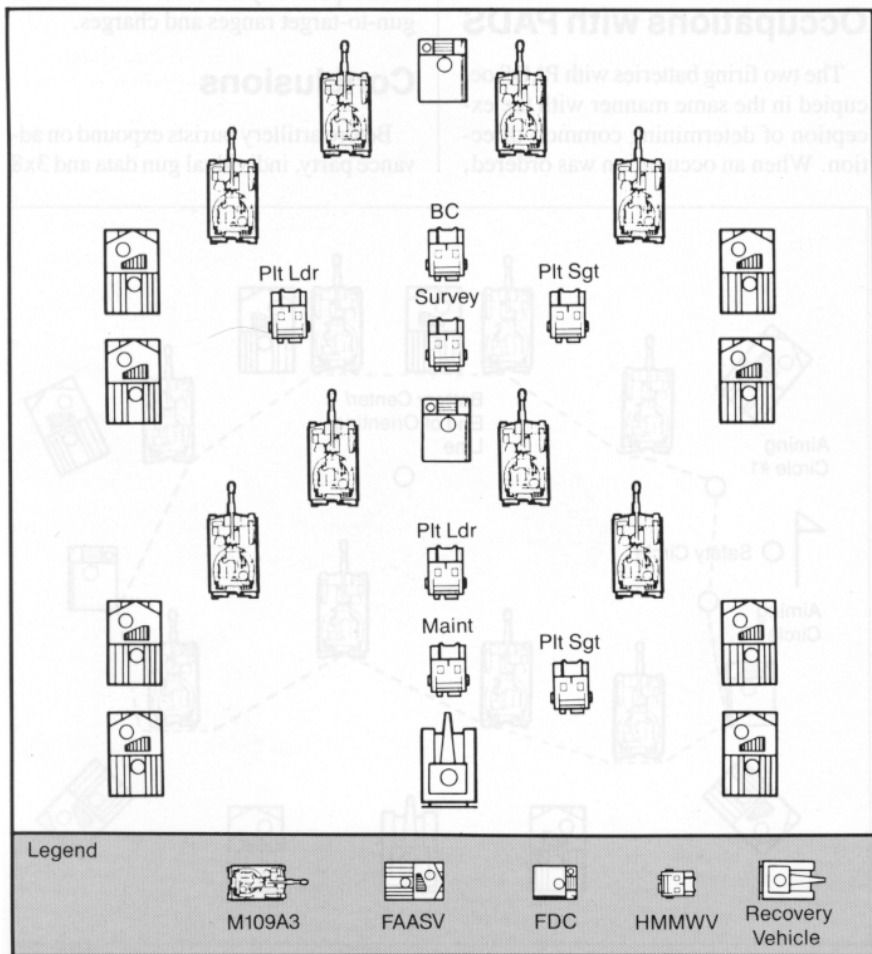


Figure 1: Movement in Wedge Formation. The platoons moved in wedges with the battery in column, all tucked behind the maneuver brigade's combat vehicles.

desert—the terrain is the same for miles. The platoons occupied positions 150 to 200 meters apart in their wedge formations with the trail platoon behind the lead platoon along the azimuth of fire.

As shown in Figure 2, the two gunnery sergeants, first platoon leader and battery commander moved to the left side of the formation, centered between platoons. The first platoon gunnery sergeant set up aiming circle #1 magnetically and laid the second aiming circle (#2). At the same time, the second platoon leader, FDOs and platoon sergeants guided the guns into position with M2 compasses. The FDCs swung to opposite sides of the battery.

A "hot loop" was run from gun to gun with guns 4 and 8 running wire to the lay circles. The two lay circles then laid their platoons using PRC-127s as the primary means of communication and the hot loop as a secondary means. Howitzers were easily identified by 8-inch luminous numbers painted on the inside of the gunner's door, which were visible during occupations.

The first platoon leader set up and magnetically oriented the safety circle over the orienting station (ORSTA) grid established by the GPS. The safety circle bumped with lay circle #1 and conducted a simultaneous observation (SIMO) with the battalion's master station or either A or C Batteries—GPS doesn't provide an accurate azimuth to the end of orienting line (EOL). For the SIMO, the battery commander's driver acted as radiotelephone operator (RTO) while the platoon leader's driver marked the EOL.

Once the SIMO was complete, the battery commander compared the survey azimuth to the magnetic azimuth and adjusted the azimuth in the battery computer system (BCS), using the right add, left subtract (RALS) method. The battery wasn't relaid. The safety circle was marked with a green flag to enable gunners to easily identify it. The survey team, using GPS, determined the battery center and data to one of the guns to be used as the adjusting piece.

Immediately after being laid, each gun obtained a referred deflection to the safety circle and sent a runner to the safety circle to get checked out as safe. This procedure reduced transmissions over the radio and wire nets and cut down the total ready-to-fire time significantly.

Each platoon leader or his platoon sergeant monitored the gun line to ensure

a smooth occupation. The battery commander gave both FDC representatives ORSTA location data, data to battery center and adjusted azimuth of fire and then designated the hot FDC that would control the battery. The FDCs reported READY: X with the battery center to the tactical fire direction system (TACFIRE) at battalion and computed the base-piece gun data and average battery muzzle velocities before the battery was laid and safe.

During night occupations, the three circles each were marked with three unique colored lights. Each platoon's howitzer sections also had their own unique color to identify the section.

Because one platoon FDC controlled the battery during fire missions, the "cold" FDC monitored the platoon's ammunition count and tracked the fire missions. The cold platoon FDC could immediately pick up control of the battery if the hot FDC had any problems.

Occupations with PADS

The two firing batteries with PADS occupied in the same manner with the exception of determining common direction. When an occupation was ordered,

PADS established an ORSTA where the safety circle was positioned and an EOL at the battery center.

The battery was laid by the lay circles that were set up in the same manner as mentioned previously. The safety circle bumped with the lay circle and followed the lay of the battery, recording the referred deflections to each piece. The safety circle compared the magnetic lay azimuth with the survey data from PADS, and the azimuth of fire was adjusted (again using the RALS formula) and given to both FDCs for input into the BCS and backup computer system (BUCS).

Both the GPS and PADS occupation procedures were tested during live fire at ranges in Saudi Arabia. These procedures for occupying as a battery take between six to nine minutes to get accurate, predicted fire down range, including conducting the SIMO. Good effects on target and battery sheafs have been reported by the observers at various gun-to-target ranges and charges.

Conclusions

Before artillery purists expound on advance party, individual gun data and 3x8

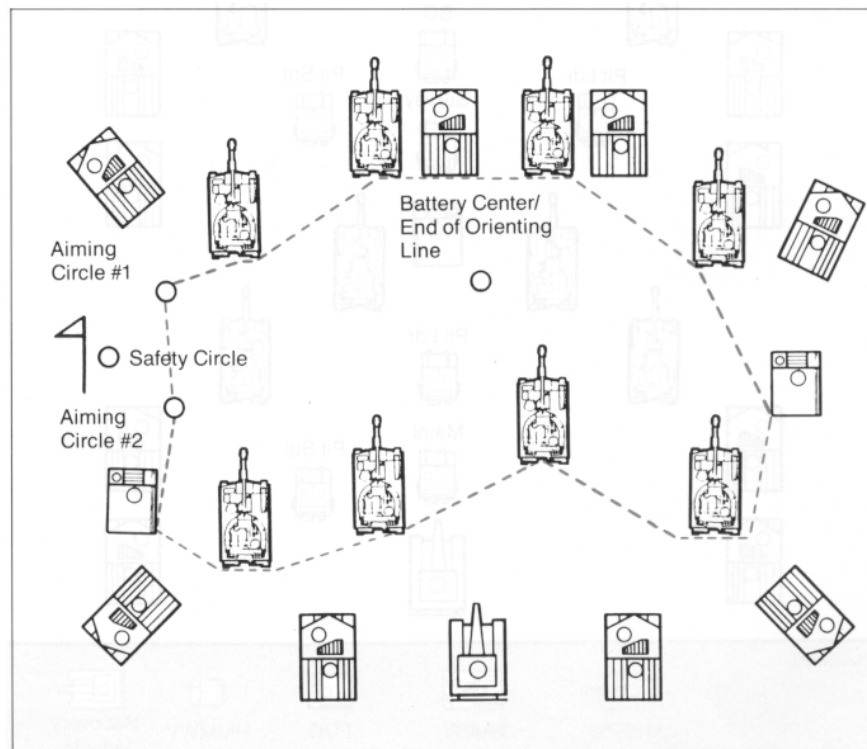


Figure 2: Movement-to-Contact Occupation. When the brigade makes enemy contact, the batteries occupy positions immediately. The platoons occupy 150 to 200 meters apart in their wedge formations with the trail platoon behind the lead platoon along the azimuth of fire.

platoon concepts, remember the parameters of the mission. During a movement-to-contact with firing batteries immediately behind the maneuver forces, if we had used advance parties, they would have been in soft-skinned vehicles positioned with M1A1 Abrams tanks and M2 Bradley infantry fighting vehicles. Their survivability would have been doubtful, and the firing platoons would have been in their area before they could have completed any substantial preparations. Pre-planned firing positions were almost impossible to determine over the estimated long distances.

Getting individual gun data is important and is something to strive for when time is available to get subtense and vertical interval to each piece. Then you enter this information into the BCS, compute terrain gun position corrections (TGPCs) and wait for the gun display units (GDUs) to tie in with the FDCs. We followed these steps if the battery remained in position long enough.

The platoon-based portion of 3x8 doctrine has its place in many scenarios. But the battery wedge formation increased our responsiveness to the maneuver

elements and positioned the battery's senior officer in the critical place to command and control his unit during the fluid movement-to-contact mission.

The mission, enemy, terrain, troops and time available (METT-T) our battalion faced in Operation Desert Shield dictated the parameters under which we operated. Operation Just Cause in Panama, December 1990, called for different operational parameters. And, perhaps, a future contingency someplace else in the world will call for yet another set of parameters.

Regardless, Field Artillerymen must be technically and tactically competent and *flexible* to provide lethal, accurate fires—on time, anywhere their mission takes them.



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the 1st Battalion, 10th Field Artillery, both in the 3d Infantry Division (Mechanized), Germany.

Captain Henry S. (Skip) Larsen commands B Battery, 3d Battalion, 82d Field Artillery. He previously served in direct support battalions in the 4th and 8th Infantry (Mechanized) Divisions, Fort Carson, Colorado, and Germany, respectively. Captain Larsen is a graduate of the Infantry Officer Advanced Course, Fort Benning, Georgia, and the Combined Arms and Services Staff School, Fort Leavenworth, Kansas.

Captain Allen W. Batschelet commands A Battery, 3d Battalion, 82d Field Artillery. He previously served in a direct support battalion in the 1st Armored Division, Germany. Captain Batschelet is a graduate of the Armored Officer Advanced Course, Fort Knox, Kentucky, and the Combined Arms and Services Staff School.

Captain Ronald A. (Andy) Hoskinson commands C Battery, 3d Battalion, 82d Field Artillery. He previously served in a direct support battalion in the 3d Infantry (Mechanized) Division. Captain Hoskinson is a graduate of the Infantry Officer Advanced Course.

VIEWS FROM THE BLOCKHOUSE

FROM THE SCHOOL

Combined-Arms Training Strategy

The Army is developing a Combined-Arms Training Strategy (CATS) that identifies training events, their frequency of occurrence and the supporting resources. At the Army level, it'll allow senior leaders to justify resources based on how units train. At the unit level, it'll give commanders a recommended method for attaining their training goals.

Why are we doing this?

CATS is the result of guidance from the Chief of Staff of the Army (CSA) in December 1988. The CSA wanted an efficient plan to chart our force training effort through 2007. This plan also would serve as the justification for the FY 92-97 Program Objective Memorandum (POM) for the budget and future programming and planning documents.

To provide the justification for force

training, CATS had to portray unit training and associated resources in a succinct, standard format. Because the format is succinct, it also can function as a training management tool.

How will it affect me?

CATS won't fundamentally change how units train. It'll simply provide an additional tool for a commander to use to manage his unit's training program. A unit's mission essential task list (METL) and an assessment of training will identify "what" needs to be trained. CATS will provide the commander a recommendation of "when," "how" and "with what" to train. It does this by identifying the events, the frequency of occurrence, and the resources needed to train the event for a particular type of unit. The identification of available training aids, devices, simulators and simulations (TADSS) also will give the

commander training alternatives.

What does it look like?

As part of the CATS development process, the Training and Doctrine Command (TRADOC) developed a format to depict unit training strategies. The strategies (battalion and below) have two major components—gunnery and maneuver. The matrix used to display each component will look similar to an annual training calendar. The columns across show training events while the rows down show the unit echelons (crew through battalion) and resource categories (operational tempo resource, ammunition, TADSS, training land, training range and unique requirements).

The goal of the gunnery component is to successfully demonstrate the artillery team's ability to perform all delivery of fire METL tasks and related non-firing tasks. Several nodes make up the artillery team: weapon; target acquisition (TA);

command, control and communications (which includes fire direction); and sustainment. This component is ammunition-intensive.

To support this component, the Field Artillery School, Fort Sill, Oklahoma, is developing artillery tables (ATs), to be staffed with the field during FY 91 (see Figure 1). They include "dry-fire" training and certification tables for crew through battalion levels and live-fire qualification tables for platoon through battalion levels. Training and certification will be done using TADSS, when available.

Figure 2 shows a sample 155-mm battalion gunnery training strategy matrix. The events listed on the matrix are the ATs, external evaluations (EXEVALs) and combined-arms live-fire exercises (CALFEXs). These events are listed sequentially across the matrix (e.g. AT #4 before AT #5) and progressively larger by unit down the matrix (e.g. crew level before platoon level). The resource categories also run down the side of the matrix. The frequency of occurrence, critical gates and associated resources are shown under each event in the same row. But commanders aren't bound to sequence, frequency of occurrence or resources if commanders determine they aren't required or find a better way to accomplish the training objective.

Here's an example of how the matrix works using Figure 2. As you move across the matrix from left to right, focus on one event—AT #5, Platoon Gunnery Qualification—Live-Fire. In the same row as AT #5, AT #2 Crew Certification and AT #4 Platoon Gunnery Certification are listed as critical gates. This means the

unit needs to perform to standard AT #2 and AT #4 before graduating to AT #5. (The "certification" here is dry fire.) Continuing down the same row, you see the recommended frequency for both

Active Component (AC) and Reserve Component (RC) units. In this example, Active Component units will perform AT #5 twice annually and Reserve Component units once annually.

155-mm Howitzer Battalion (3x8) Divisional Gunnery Training Strategy															
Crew	AT #1 Tng	AT #2 Cert													
Squad															
Platoon			AT #3 Tng	AT #4 Cert	AT #5 Qual										
Battery/Company/Troop						AT #6 Tng	AT #7 Cert	AT #8 Qual	EXEVAL	CALFEX					
Battalion/Squadron											AT #9 Tng	AT #10 Cert	AT #11 Qual	EXEVAL	CALFEX
Critical Gate				AT #2 AT #4			AT #2 AT #7						AT #2 AT #10		
Requirements															
Active	2	2	2	2	2	3	3	3	18mo	1	3	3	3	18mo	1
Reserve	1	1	1	1	1	3	3	3(1)	48mo	1	1	1	1(1)	48mo	1
Resources															
OPTEMPO M109 Base Equipment					40			60	35	20			60	45	20
Ammunition (3)					380			594 (2)	190	190			795	265	265
TADSS	CLASS ADFT (4,5,7)	CLASS ADFT (4,5,7)	CLASS (4,5,7)	CLASS (4,5,7)	(6)	CLASS (4,5,7)	CLASS (4,5,7)	(6)	(4,5,6)	(6)	CLASS (4,5,7)	CLASS (4,5,7)	(6)	(4,5,6)	(6)
Tng Land (8)					2x16			4x16	4x16	4x16			15x18	15x18	15x18
Tng Ranges (9)								Direct Fire Range							

Figure 2: Sample Gunnery Team Training Strategy. The artillery tables (events), EXEVALs and CALFEXs are listed progressively across the matrix with the organization size, frequency requirements and resources necessary to execute the event listed down the matrix. (Note: For an explanation of acronyms used in this matrix, see the chart below; numbers in parentheses refer to the footnotes listed in Figure 3.)

AT #1	Crew Gunnery Training—Howitzer, Fire Direction Center (FDC), TA
AT #2	Crew Gunnery Certification—Howitzer, FDC, TA
AT #3	Platoon Gunnery Training
AT #4	Platoon Gunnery Certification
AT #5	Platoon Gunnery Qualification—Live-Fire
AT #6	Battery Gunnery Training
AT #7	Battery Gunnery Certification
AT #8	Battery Gunnery Qualification—Live-Fire
AT #9	Battalion Gunnery Training
AT #10	Battalion Gunnery Certification
AT #11	Battalion Gunnery Qualification—Live-Fire

Figure 1: List of artillery tables being developed by the Field Artillery School as part of the gunnery component of CATS.

List of Abbreviations Used in Figures 2, 3, 4 and 5	
ADFT - Artillery Direct-Fire Trainer.	JTX -Joint Training Exercise (FM 25-101).
BBS - Brigade/Battalion Simulation.	LCX - Logistics Coordination Exercise (FM 25-101).
BCS-ITS - Battery Computer System-Interface Training Simulator.	LITR - Low-Noise, Indirect-Fire Training Round.
BLTM - Battalion-level training models, source of historical OPTEMPO mileage.	MAPX - Map Exercise (FM 25-101)
CELL STFF SECT TNG - Cell Staff Section Training (Combined-Arms Center—Training, Fort Leavenworth).	OPTEMPO - Operating Tempo, given in miles or hours; for artillery done in miles per base vehicle (in this case, M109).
CFX - Command Field Exercise (FM 25-101).	SAWE-RF-GPS - Simulated Area Weapons Effects-Radio Frequency-Global Positioning System.
CLASS - Closed Loop Artillery Simulation System (in concept development).	STAFX - Staff Exercise (Combined-Arms Center—Training, Fort Leavenworth).
CPX - Command Post Exercise (FM 25-101).	STRAC - Standards and Training Commission (DA Pam 350-38), source for ammunition allocations in gunnery strategy.
CTX - Combined Training Exercise (FM 25-101).	STX - Situational Training Exercise (FM 25-101).
DEPX - Deployment Exercise (FM 25-101).	TEWT - Training Exercise Without Troops (FM 25-101).
FCX - Fire Coordination Exercise (FM 25-101).	TOCX - Tactical Operations Center Exercise (Combined-Arms Center—Training, Fort Leavenworth).
FTX - Field Training Exercise (FM 25-101).	TSFO - Training Set, Fire Observation.
GUARDFIST II - Guard Unit Armor Device Full-Crew Interactive Simulation Trainer.	
HGSS - Hellfire Ground Support System.	
JANUS - Computer-generated battle simulation of conventional warfare at the battalion/company levels.	

Footnotes:	
(1) When EXEVAL is done, it's in lieu of one AT qualification.	event. Unit of measure is kilometers. Live-fire exercises (qualification, EXEVAL and CALFEX) also will require an impact area in addition to the training land. Specifications and restrictions for impact areas are contained in TC 25-8, dated January 1991, and in local directives. (9) Requirements and characteristics of the listed ranges are contained in TC 25-8, dated January 1991, and in local directives. Ranges for individual and crew-served weapons used by this type of unit are contained in the training strategy for that particular piece of equipment.
(2) Includes 3 rounds/tube for direct-fire training (3x8 = 24).	
(3) IAW DA Pam 350-38, dated September 1990.	
(4) TADSS: M823 Copperhead Training Round.	
(5) TADSS: M455 Nuclear Training Round.	
(6) TADSS: Low-Noise Indirect-Fire Training Round (LITR).	
(7) TADSS: BCS-ITS.	
(8) IAW TC 25-1, dated Jan 91. Box size is for the largest unit indicated under the	

Figure 3. Footnotes referred to (numbers in parentheses) in the Sample Gunnery Team Training Strategy, Figure 2. (Note: for an explanation of acronyms used in this matrix, see Page 46.)

155-mm Howitzer Battalion (3x8) Divisional Maneuver Training Strategy														
Events	Drill	MAPX	TEWT	CELL STFF	TOCX	STAFX	CPX	FCX	STX	LCX	CFX	DEPX	FTX	EXE-VAL
Level	Drill	MAPX	TEWT	SECT TNG	TOCX	STAFX	CPX	FCX	STX	LCX	CFX	DEPX	FTX	CTC
Crew	AC 12													
	RC 4													
Section	AC		4 FSO				4 FSO	2 FSO				4 FSO	5 FSO	
	RC		8 FIST (3) 1 FSO 2 FIST				4 FIST (3) 1 FSO 1 FIST	4 FIST (3,8) 1 FSO 2 FIST				4 FIST (3) 1 FSO 1 FIST	10 FIST (3) 3 FSO 6 FIST	
Platoon	AC							5 (3,10) 3						
	RC							2 (3,9) 1	3*					3*
Btry/Co/Trp	AC		2											
	RC													
Bn/Sqdn	AC	1	4	Wkly	12(1)	12(1)	4(1)		3*	4(1)	3(2)	1	3*(11)	1
	RC	1	1	4	1	1	1		1	1	1	1	.25	1(2)
Critical Gate							TEWT						Drill CPX	FTX
Resources														
OPTEMPO								17			69	10	240	105 (12)
M109 Base Equip														
Ammo	(4)													
TADSS	CLASS ADFT (13,15)		JANUS (15)			BBS	JANUS BBS (15)	HGSS JANUS CLASS (13,15)	(5,13,14)			(18)	(6,13,14)	(7,13,14)
Tng Land (16)	2x16						3x2		15x18		8x9		15x18	15x18
Tng Ranges (17)								Sub-Cal Range						
*Events may be conducted simultaneously														

Figure 4: Maneuver Strategy Matrix as the Maneuver Component of CATS. Performing the events listed across the matrix by the type of organization and at the annual frequency listed down the matrix and using the resources, also listed down the matrix, FA units integrate training with maneuver in a complete "slice." (Note: for an explanation of acronyms used in this matrix, see Page 46; numbers listed in parentheses refer to the footnotes listed in Figure 5.)

Finally, the resources needed to accomplish the number of iterations of the event are listed by category. Any numbers in parentheses on the matrix indicate there is information contained in a table of footnotes accompanying the matrix (see Figure 3). In our example of AT #5, 40 operating tempo (OPTEMPO) miles (calculated by 20 miles per event times two iterations), 380 rounds of 155-mm ammunition (190 rounds per event times two iterations), a mixture of low-noise indirect-fire training rounds (LITR) and a 2x16 kilometer training area with an impact area are needed for this event.

The maneuver component is similar to its gunnery counterpart. The goal of the component is to demonstrate combined-arms tactical proficiency. The plan requires each maneuver strategy matrix be integrated "horizontally" with maneuver forces (Infantry, Armor, etc.) and integrated "vertically" with higher headquarter strategies to ensure "slice" training is closely coordinated.

Trainers use the maneuver strategy matrix (Figure 4) like the gunnery strategy matrix. Standardized events are listed across the top. These events are discussed in *FM 25-100 Training the Force* and *FM 25-101 Battle Focused Training*. At the intersection of organization level (crew, platoon, battery, etc.) and event (Drill, MAPEX, TEWT, etc.), the matrix shows the frequency (on an annual basis) for both AC and RC units. Resources are listed in the same manner as the gunnery strategy matrix. The event frequency and associated resources will vary based on major command (MACOM) training environments and METL. Numbers in parentheses refer to footnotes the same as on the gunnery matrix (see Figure 5 on Page 48).

When will CATS affect me?

Gunnery and maneuver strategies and artillery tables will appear in unit training products soon. The constraints that drove the CATS initiative will soon affect unit training. The Field Artillery School developed draft strategies in January 1991. Combined-Arms Center—Training at Fort Leavenworth, Kansas, packaged these and other proponent strategies into brigade-, division- and corps-sized units (light and heavy). These packages were sent to the field for input during March through this month. Feedback from units is being considered and

modifications begin this month. These revised strategies will be published in mission training plans (MTPs) as soon as possible.

Conclusion

The Field Artillery School will soon provide commanders a recommended method to achieve their training goals—CATS. Gunnery and maneuver strategies should help commanders identify training opportunities, necessary resources and training alternatives to consider when developing their own unit training strategies. We want to make training more efficient while maintaining the current high level of training readiness. Given the anticipated resource constraints the Army is facing, this efficiency is more important than ever.

If units have questions about CATS, call the Unit Training Branch, Individual and Unit Training Division, Directorate of Training and Doctrine, Field Artillery School at AUTOVON 639-4420 or 5004 or commercial (405) 351-4420 or 5004.

OPTEMPO: [Does not include CTC, JTX, CTX or CFX miles]
 Gunnery: 280
 Maneuver: 267
 Total: 547

Footnotes:

- (1) Events may be conducted simultaneously.
- (2) May be conducted in lieu of FTX.
- (3) Conducted with maneuver forces training.
- (4) IAW DA Pam 350-38, dated September 1990.
- (5) TADSS: TSFO, HGSS, CLASS, MILES II.
- (6) TADSS: GUARDFIST II, CLASS, TSFO, MILES II.
- (7) TADSS: MILES II, SAWE-RF-GPS, HGSS.
- (8) FSO for two battalion FCX, FIST for two battalion and two company-level maneuver FCX.
- (9) Battery FDC, Platoon FDC and two guns for each battalion FCX.
- (10) Platoon FDC and one gun for each company-level FCX.
- (11) Battalion FTX supports one maneuver brigade FTX and one division artillery FTX.
- (12) Rotation to CTC is normally 14 days. This equals approximately three battery FTX or two battery/one battalion FTX OPTEMPO miles.

- (13) TADSS: M823 Copperhead training round.
- (14) TADSS: M455 nuclear training round.
- (15) TADSS: BCS-ITS.
- (16) IAW TC 25-1, dated January 1991. Box indicated is for the largest unit indicated under the event. Unit of measurement is kilometers. Land requirements in support of maneuver forces, e.g., FCS, would be the same as indicated for that event on the maneuver model.
- (17) Requirements and characteristics of the listed ranges are contained in TC 25-8, dated January 1991 and local directives. Ranges for individual and crew-served weapons used by this type of unit are contained in the training strategy for that particular piece of equipment.
- (18) Includes equipment associated with training air, rail and sea loading operations. Such equipment includes various types of tiedown equipment; air, sea and rail transloading facilities; pallets, etc.

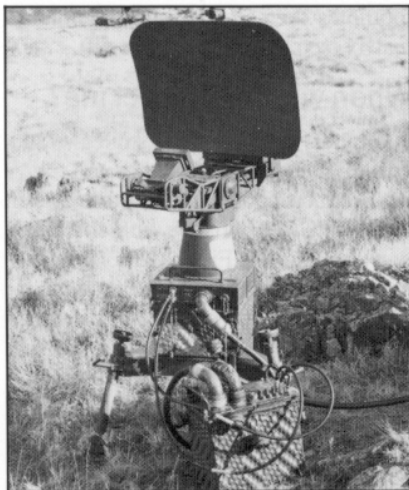
Nuclear training conducted at battery/battalion four times a year. Assembly training at platoon/battery 12 times a year. Use M455 nuclear trainer for assembly operations. Unfortunately, a standard Army-wide matrix not yet adapted to include this information.

Figure 5: Footnotes Referred to in the Maneuver Strategy Matrix in Figure 4. (Note: for an explanation of acronyms used in this Figure, see Page 46.)

TOE Update

MTLRs Deleted from TOE

The moving target location radars (MTLRs) will be deleted from all Field Artillery (FA) tables of organization and equipment (TOEs), effective in consolidated TOE update (CTU) 9108. Major commands (MACOMs) will direct units to turn in radars as appropriate.



TPS-58 MTLR

MACOMs have been directed to adjust modification TOEs (MTOEs) to reflect loss of personnel and equipment. The deletion of these radar spaces will allow an additional fire support specialist (13F10) billet in each battalion fire support section in heavy divisions and heavy separate brigades (for a total of three additional 13F10s in each artillery battalion). These changes also will be published in CTU 9108.

New Radio Remote Control Units not Compatible with TACFIRE Shelters

The program executive officer (PEO) for communications systems has advised the secureable remote control unit (SRCU), also called the control receiver-transmitter (C11561(C)/U), isn't compatible with existing tactical fire direction system (TACFIRE) shelter configurations. Specifically, the PEO advises "with respect to TACFIRE two-wire integration requirements, the SRCU is not compatible with existing configurations. However, in the absence of a modification to the TACFIRE shelter, the

AN/GRA-39 [old radio remote system] as currently installed will accommodate the SINCGARS [single-channel ground and airborne radio system] radio." In this regard, there are no plans to modify TACFIRE shelters to allow interoperability with the battery computer system (BCS), variable format message entry device (VFMED), fire support vehicle (FSV) or digital message device (DMD).

When the SRCU is fielded, MACOMs should take appropriate steps to have units keep enough GRA-39s to remote radios from their TACFIRE shelters. All other GRA-39s should be turned in as the SRCUs are issued.

If you need more information about this or other TOE changes, contact the Documentation Branch, Systems Integration and Priorities Division, Directorate of Combat Developments, Field Artillery School, by calling AUTOVON 639-2726 or 5879 or writing to the following address: Commandant, US Army Field Artillery School, ATTN: ATSF-CSI-D, Fort Sill, Oklahoma 73505-5600.



Operation Desert Shield from an FDO's Perspective

by Captain Todd R. Lietha

Preparing for combat in the deserts of Southwest Asia has caused leaders to come to grips with a myriad of new challenges: moving over wide open areas with long-range fields of view. . .traversing terrain that ranges from loose sand to sharp, jagged rocks. . .conducting operations with inaccurate or, in some cases, no maps.

The 3d Battalion, 82d Field Artillery (3-82 FA, Red Dragons) the direct support (DS) artillery battalion for the 2d Brigade (Blackjack), 1st Cavalry Division, addressed these challenges as they applied to fire support and providing timely, accurate fires.

From a fire direction officer's (FDO's) perspective, this article discusses methods the 3-82 FA developed to meet two challenges we faced. The first was to provide battalion fire direction in support

of a maneuver brigade conducting a movement-to-contact. The second challenge was to use the tactical fire direction system (TACFIRE) effectively to plan a subsequent battle while fighting the current one.

Fire Direction

A maneuver brigade conducting a movement-to-contact in deserts such as those in Saudi Arabia covers extremely long distances. Commanders frequently discuss distances in the 100- to 200-kilometer range.

The rate of movement must not outrun the brigade's fire support umbrella. The artillery battalion that moves by bounding fire units, or even battalions leaping each other, tightly constrains

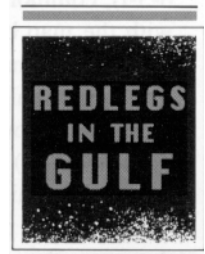
the brigade's rate of movement. This constraint is alleviated by keeping all artillery moving until large, decisive targets are identified.

Movement

To take advantage of the open terrain, our firing platoons moved in battery wedge formations. The battalion, tucked up behind the lead task force, also moved in a wedge (see Figure 1). The units occupied as batteries, and each had one platoon fire direction center (FDC) control the battery's fires. The other platoon FDC followed the missions and picked up control, if necessary.

While tracked artillery vehicles and high-mobility multipurpose wheeled vehicles (HMMWVs) have little problem maintaining the rate of march, the 2 1/2- and 5-ton trucks (e.g., TACFIRE prime movers) quickly become stuck or fall behind the battle. The 3-82 FA developed a method for providing tactical fire direction when the battalion's TACFIRE system and mutual support unit (MSU) battalion's TACFIRE were left behind.

During a movement-to-contact, the battalion was controlled from a jump tactical operations center (JTOC). The JTOC consisted of three HMMWVs: the battalion S3's, the battalion communications-electronics staff officer's (CESO's) and the battalion's retransmission vehicle (Retrans). The JTOC's personnel were the battalion S3, battalion FDO, CESO, chemical officer (CHEMO) targeting officer, S2 NCO-in-charge (NCOIC) and the vehicle drivers. During Operation Desert Storm, the S3's HMMWV was replaced with a fire support vehicle (FSV).



FDO Tools

To conduct tactical fire control, the battalion FDO carried some very important items. The first was a fire control attack matrix. (See Figure 2 for an unclassified example of an attack matrix, using fictitious values.) This matrix allows the FDO to quickly determine the number of rounds required to engage a

target, based on the commander's attack criteria and target type, size and strength.

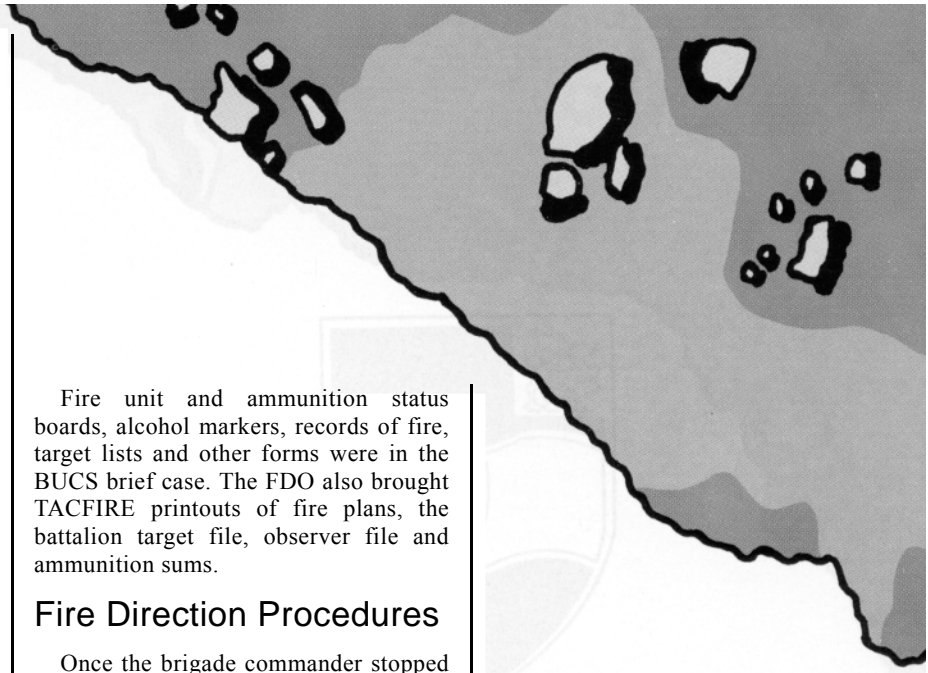
TACFIRE develops the matrix by firing missions; therefore, Joint Munitions Effectiveness Manual (JMEM) data is used to derive the values. The attack criteria is set to the appropriate percentage of effects desired, and the target size and ammunition vary as the missions are processed.

Another important item the battalion FDO carried was a modified map board. Due to the length of the battlefield, using a map board with standard map sheets was too cumbersome and time-consuming. Instead, we cut a sheet of 1:25,000 chart paper in half and drew lines to make the scale 1:50,000. We then mounted the gridded sheet on a board and put a piece of plexiglass over it.

Once the battalion stopped, the battalion FDO numbered the grid lines on the map board, writing on the plexiglass with an alcohol marker. When doing this, the FDO considered the fire unit locations and direction of the battle. The battalion S3 maintained a map with the current graphics and forward line of own troops (FLOT).

We kept a range protractor (GTA 6-5-1), commonly called a whiz wheel, with the map board. Additional maximum range marks were made on the range arm for high explosive (HE), dual-purpose improved conventional munitions (DPICM) and Copperhead rounds for green, white and red bag powder charges. The protractor was used to determine the azimuth of fire and check ranges.

The battalion FDO also had a backup computer system (BUCS) with a survey module and the appropriate howitzer modules. We frequently used long-range aid to navigation (LORAN) devices in the Saudi Arabian desert for both self-location and navigation, which is an instrument that expresses locations in latitude and longitude. The battalion FDO used the survey module to convert latitude and longitude to grid. The howitzer modules provided the ability to do technical fire direction, should it become necessary.



Fire unit and ammunition status boards, alcohol markers, records of fire, target lists and other forms were in the BUCS brief case. The FDO also brought TACFIRE printouts of fire plans, the battalion target file, observer file and ammunition sums.

Fire Direction Procedures

Once the brigade commander stopped the artillery to engage targets (with the

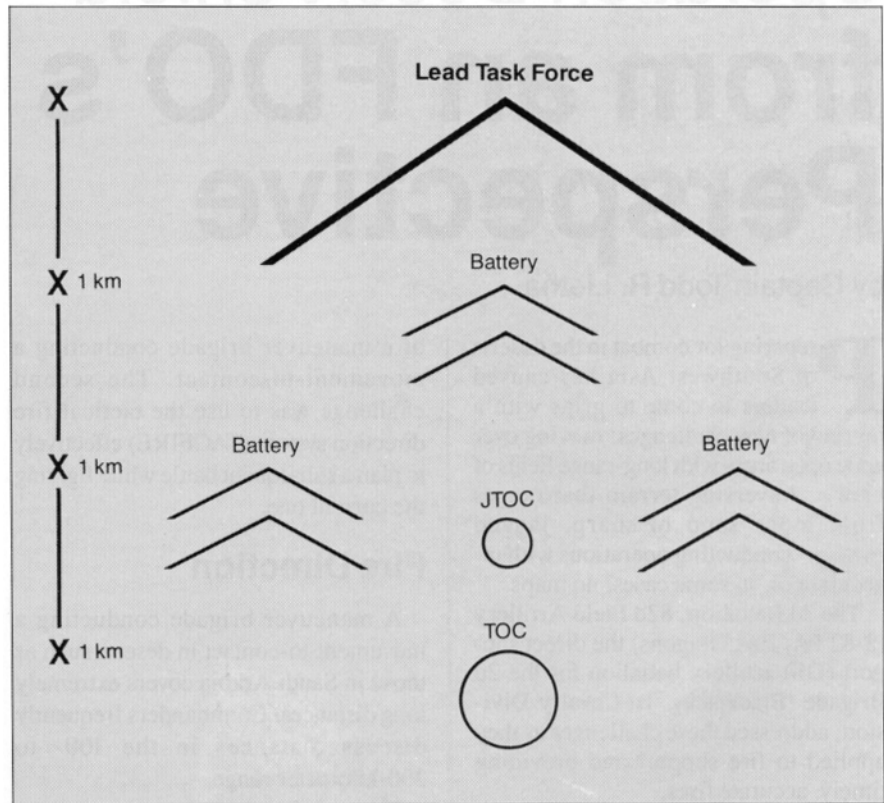


Figure 1. Battalion Wedge Formation. To take advantage of the open terrain, the artillery battalion moves in a wedge formation tucked up behind the lead task force. Within the battalion, the firing platoons also move in battery wedge formations.

advice of the DS battalion commander), the battalion FDO labeled the grid lines on his map board and plotted fire unit and observer locations as they were received. He also updated the FLOT.

A fire mission was called to the FDO over the voice fire net from a task force fire support officer (FSO). All fire units recorded the call-for-fire and began processing the data while the units continued to emplace.

At the same time, the battalion FDO checked the range and determined the unit(s) to fire and type and amount of ammunition to fire; the battalion S3 checked the target location for violation of fire support coordination measures and the FLOT.

If everything checked out, the FDO issued the message-to-observer (MTO). The MTO also served as the battalion fire order. Units assigned to fire by the MTO then acknowledged receipt of the mission.

All this took place in the eight to 10 minutes it took to emplace the battalion.

When possible, the JTOC collocated with a non-controlling platoon FDC. This added two radio nets to the JTOC and a digital link to the division artillery and (or) the other organic fire units. Once the TOC was operational, the JTOC merged with the TOC.

The battalion FDO operated on three nets. The first was the battalion voice fire net where he talked to the DS battalion commander, brigade FSO, task force FSOs and the DS battalion fire unit FDCs. Task force FSOs sent calls-for-fire on this net. The second net was a division artillery voice net for division artillery mass fire missions.

The third net, as applicable, was a voice fire net with a reinforcing battalion. This required the battalion FDO to issue fire orders to the reinforcing battalion and repeat other critical information. If the

reinforcing fire units transmitted over the DS battalion's voice fire net, it added additional radio traffic to an already full net.

Once the battalion's TACFIRE system caught up (if it caught up), fire mission processing was passed back to the digital world.

TACFIRE Planning

Planning for the movement-to-contact as well as planning and executing other types of tactical operations are intensive operations in the TACFIRE shelter. The procedural trap that many have fallen into is to plan, fight, purge and then begin inputting the plan for the next battle.

History shows that in combat, battles have sporadic peaks and valleys of activity. We can't count on having the time to regroup after the "purge" to begin planning the next battle. We can't expect to have the relative breaks between battles like those at the National Training Center (NTC), Fort Irwin, California. Inputting data into TACFIRE for a subsequent battle while fighting the current battle requires a formal, practiced method of naming and using the computer's files.

Fire Plan Categories

The 3-82 FA categorized its fire plans into three types: groups, series and on-call target lists. The on-call target lists included targets from the groups and series.

There's a distinct difference between the targets in an on-call target list and targets in an on-call group or series. On-call targets are fired individually when called for from the target list. Targets in an on-call group or series are fired as scheduled within the group or series, but the execution time (H-Hour) of the group or series is on-call.

The on-call target list was input first. Because the list covered the entire battlefield, it may have needed to be split into more than one fire plan to include all fire units associated with each target. In this case, range-to-target was the determining factor. Once the on-call target list was input, the groups and (or) series were input.

Because the target list was input into on-call target files, the battery computer system (BCS) could receive, store and update target list data. We couldn't have done this using only the battalion target file.

#Rounds/Battalion Volleys								
Target	Size**	10% Effects*		20% Effects		30% Effects		Prefered Shell/Fuze
		HE/VT	DPICM	HE/VT	DPICM	HE/VT	DPICM	
Armored Medium	100	24/1	24/1	-----	24/1	-----	24/1	DPICM/TIB
	200	48/2	48/2	-----	48/2	-----	48/2	
	300	72/3	72/3	-----	72/3	-----	72/3	
	400	-----	96/4	-----	96/4	-----	96/4	
Armored Personnel Carrier	100	24/1	24/1	24/1	24/1	24/1	24/1	DPICM/TIB
	200	48/2	48/2	48/2	48/2	48/2	48/2	
	300	-----	72/3	-----	72/3	-----	72/3	
	400	-----	96/4	-----	96/4	-----	96/4	
Armored Light	100	24/1	24/1	24/1	24/1	24/1	24/1	DPICM/TIB
	200	48/2	48/2	48/2	48/2	-----	48/2	
	300	-----	72/3	-----	72/3	-----	72/3	
	400	-----	96/4	-----	96/4	-----	96/4	
Arty Medium	100	24/1	24/1	24/1	24/1	24/1	24/1	HE/VT
	200	72/3	72/3	72/3	72/3	72/3	72/3	
	300	-----	-----	-----	-----	-----	-----	
	400	-----	-----	-----	-----	-----	-----	
ADA Missile	100	12/	12/	12/	24/1	24/1	24/1	DPICM/TIB
	200	24/1	24/1	24/1	48/2	48/2	48/2	
	300	48/2	48/2	48/2	72/3	72/3	72/3	
	400	72/3	72/3	72/3	96/4	96/4	96/4	
Veh Light Wheeled	50	12/	12/	12/	12/	12/	12/	DPICM/TIB
	100	24/1	24/	24/1	24/1	24/1	24/1	
	200	48/2	48/2	48/2	48/2	48/2	48/2	
	300	72/3	72/3	72/3	72/3	72/3	72/3	
Veh Recon	50	12/	12/	12/	12/	12/	12/	DPICM/TIB
	100	24/1	24/1	24/1	24/1	24/1	24/1	
200	48/2	48/2	48/2	48/2	48/2	48/2	48/2	

* The values in this table are for example only. Actual values are computed using JMEMs and are classified.
 ** TACFIRE and JMEMs use target size instead of strength for determining the number of rounds to engage a target with.

Figure 2. The 3-82 FA Fire Control Attack Matrix. This matrix allows the FDO to quickly determine the number of rounds required to engage a target, based on the commander's attack criteria and target type, size and strength.

Fire Unit Volleys

When inputting a fire plan, it's important to keep in mind the concept of fire unit volleys as it applies to TACFIRE. A fire unit may be a platoon or a battery, depending on how the battalion is operating at the time. This can be determined by looking at an AFU;UPDATE (ammunition and fire unit) to see if a unit is entered as a platoon or a battery. The UNIT field and WPNSTR (weapons strength) field give the best indicators.

It's important to remember a fire unit volley doesn't equal a battalion volley. If the battalion is operating by platoons, it takes *six* fire unit volleys to equal one battalion volley. If the battalion is operating by batteries, it takes *three* fire unit volleys to equal one battalion volley. The required fire unit volleys for a target and the MAXVOL (maximum number of volleys to be fired) set in the computer are two critical items in massing the battalion on a target.

When determining and inputting a future plan into the TACFIRE system, you must consider the number and type of fire units available, the number of rounds required and available, and the timing of the plan's execution (see Figure 3).

Planning Files

To input the plan in TACFIRE, you must create a number of additional files, and file maintenance becomes critical. Once future plans become current, you must purge old plans and data. We used three categories of files to build from:

1. **Default.** These files have preset default values and don't change.

2. **Current.** These files have the data that's currently being used by the computer to do its tactical fire control.

3. **Planning Files.** These files have data applicable to future operations. At the appropriate time, they may become the current files.

In coordination with the battalion FDC, the brigade FSO breaks down the battlefield into segments for AFU planning purposes (see Figure 4). These segments are most easily delineated by phase lines (PLs). The planning segments and file names for NNFP (non-nuclear fire plan), AFU and SPRT (support) planning files are published in the fire support annex of the brigade operations order (OPORD).

The FM;MOD (fire mission; modification) and NNFP;MOD files contain, in addition to other items, the commander's attack criteria and MAXVOLs. In many cases, the criteria and, therefore, the MOD files don't change from one battle to the next. In such cases, you don't input the NNFP planning file.

NNFP planning files are named Z1, Z2, Z3, etc., as needed. You make the NNFP;MOD planning files current when the data they contain becomes applicable.

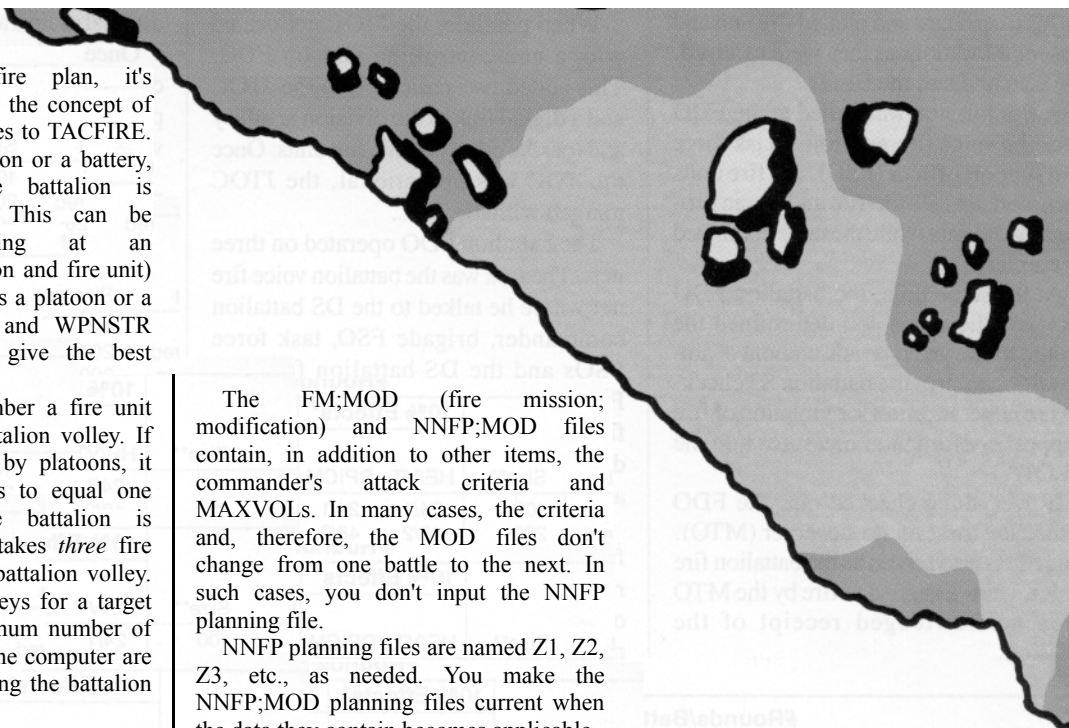
Using current AFU data when inputting fire plans for a future battle can cause capabilities (e.g., range), ammunition and (or) scheduling exceptions. The battalion FDC inputs one AFU planning file for each planning segment designated by the brigade FSO.

Fire units for each battalion are input at the same grid. This won't effect the actual firing data because the fire units recompute the fire plan based on their locations. Ammunition levels are increased to projected resupply levels.

When building a fire plan, the fire support element (FSE) does its AFU;BUILD (build means create a new file from existing ones) from the AFU planning file for the battlefield segment in which the planned targets are located. AFU planning files are named X1, X2, X3, etc., as needed. You never make AFU planning files current because the fire unit locations and ammunition reports they contain are only projections.

Battlefield geometry for future battles is input into a support planning file. The basic "rule of thumb" for inputting planned geometry is the agency that establishes it inputs it. There's usually only one SPRT planning file per battle, but you may need more, depending on contingency plans.

Some geometry from the current battle may be applicable to the future battle.



Fire Units Availability

1. Is there a reinforcing battalion or just a DS battalion?
2. Are any fire units reserved from fire planning for other missions?
3. Are fire units input as platoons or batteries? What's the tube strength of each available unit?

Ammunition

1. How many rounds will it take to meet the commander's attack criteria for the target types expected to be engaged at each target?
2. Is there enough ammunition on hand to meet the requirements?
3. If not, can ammunition be prepositioned to meet the requirements?

Time

1. Is H-Hour explicit or on-call?
2. If H-Hour is on-call, at what point in the battle might it be executed?
3. Are there H + times for targets in a series?

Figure 3: TACFIRE Future Planning. Considerations of the number and types of firing units, the number of rounds needed and available, and the timing of execution are particularly important when inputting future plans in TACFIRE.

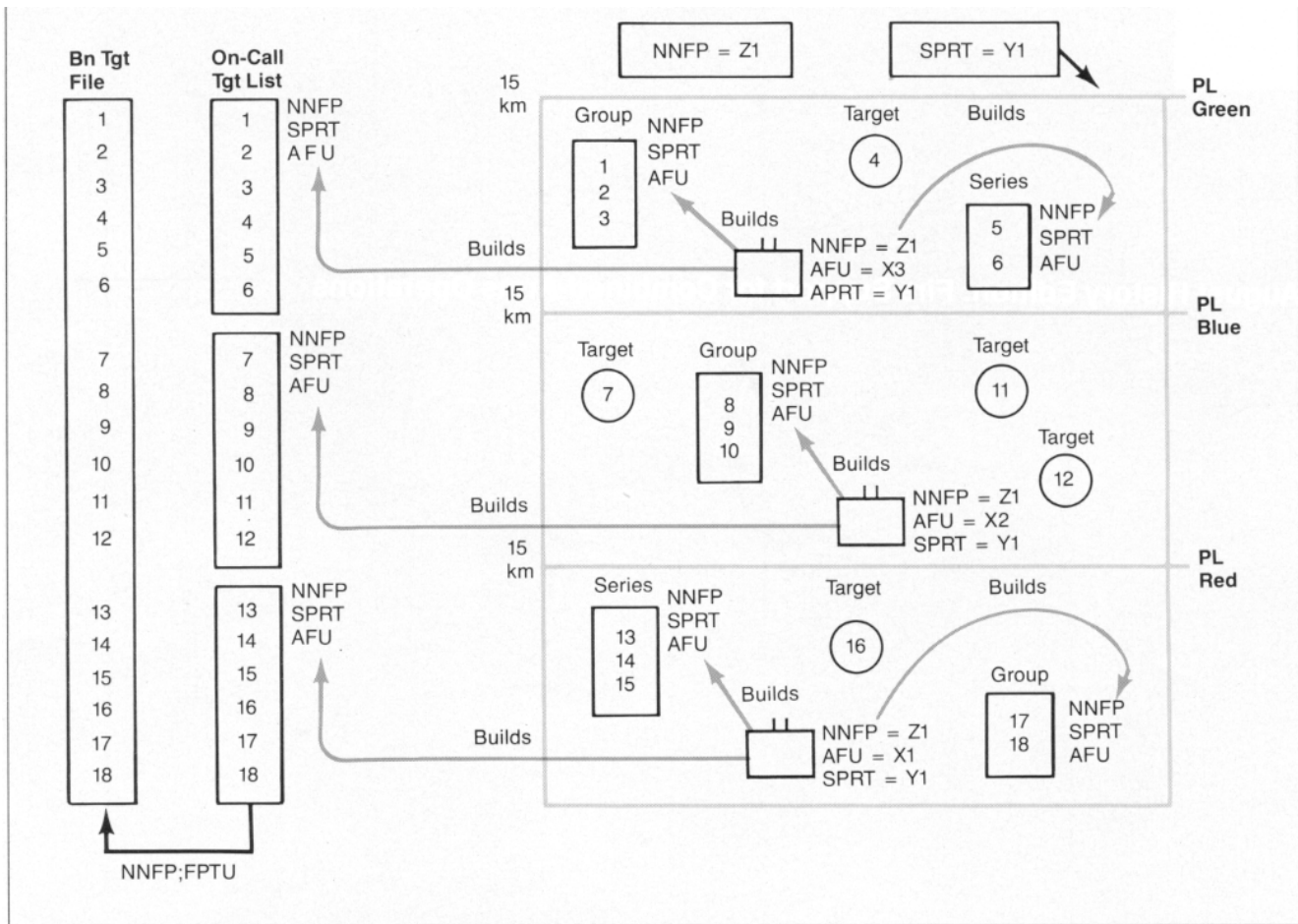


Figure 4. Brigade Battlefield Fire Plans for a Subsequent Battle. In coordination with the battalion FDC, the brigade FSO breaks down the battlefield into segments for AFU planning purposes. The segments are most easily delineated by phase lines (PLs).

Use the SPRT;BUILD format with the following entries to build those particular pieces of geometry into the SPRT planning file:

- NEWPLAN—Planning file a piece of geometry is to be brought forward into.

- NAME—Name of piece of geometry to be brought forward.

- ZON (Zone), RFA (Restricted Fire Area), RFL (Restricted Fire Line), etc.—Enter X as appropriate.

- SPRT planning files are named Y1, Y2, Y3, etc., as needed. You make the SPRT planning file current when the data it contains becomes applicable.

You build the fire plans using standard procedures, inputting on-call target lists first followed by the groups and series. The targets in the on-call target list are entered using the NNFP;FPTU (fire planning target update) format and recorded in the battalion

target file. You then can build groups and series from the targets in the battalion target file.

You name groups and series according to doctrine. But you give on-call target lists unique names. For example, our brigade target lists were BDOC01, BDOC02, etc.; Task Force 1-5 (Mech) target lists were 1-5M01, 1-5M02, etc.

The battalion FDO must discuss these concepts and procedures with the FSEs face-to-face. The most effective method for training these procedures is to have the FSE personnel use the operations and intelligence (O&I) variable format message entry device (VFMED) for a day and input a number of plans. This allows the FDO to make on-the-spot corrections. It also makes answering questions and addressing misunderstandings easier.

The procedures to provide fire direction for a brigade conducting a movement-to-contact and to use TACFIRE

to plan a subsequent battle while fighting one require dedicated training to implement. But once in place, they effectively overcome some of the challenges presented by combat in a large, desert environment.



Captain Todd R. Lietha has been the Battalion Fire Direction Officer (FDO) for more than a year for the 3d Battalion, 82d Field Artillery, 1st Cavalry Division, which deployed to Saudi Arabia in early October 1990. He also has served as a Platoon FDO, Platoon Leader, Company Fire Support Officer and Assistant S4 and Support Platoon Leader for the 4th Battalion, 3d Field Artillery, 2d Armored Division (Forward), in Germany. Captain Lietha is a graduate of the Tactical Fire Direction Officers Course, Fort Sill, Oklahoma, and the Armor Officer Advanced Course, Fort Knox, Kentucky.