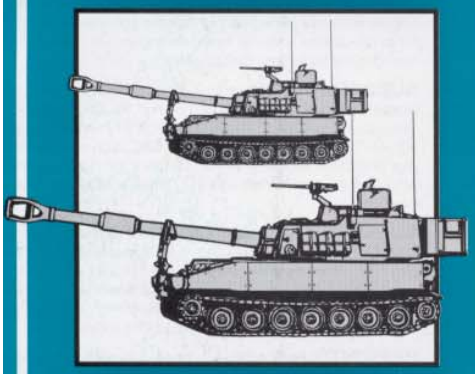
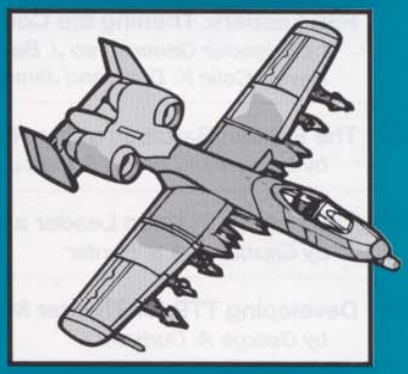
Field Artillery

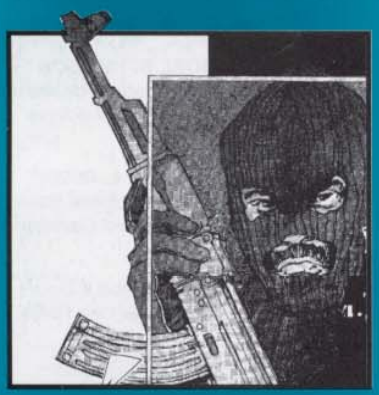
A Professional Bulletin for Redlegs

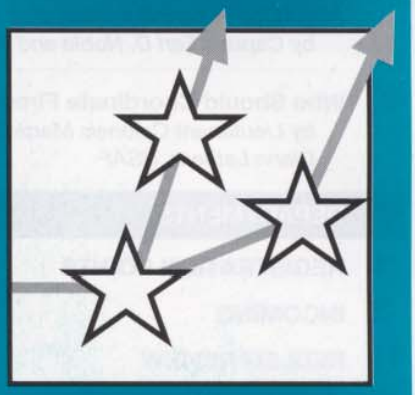
September-October 1995





TTP





Approved for public release; distribution is unlimited.

HQDA PB6-95-4

Field Artillery

A Professional Bulletin for Redlegs

September-October 1995 HQDA PB6-95-4

INTERVIEW

ARTICLES: Fire Support TTP

ARTICLES

DEPARTMENTS

Editor's Note: *To move our bimonthly publication dates each one month earlier*, **Field Artillery** *only will publish five editions in 1995.*

Front Cover: Windows on fire support tactics, techniques and procedures (TTP).

PURPOSE (as stated in the first ***Field Artillery Journal*** in 1911): To publish a journal for disseminating professional knowledge and furnishing information as to the Field Artillery's progress, development and best use in campaign; to cultivate, with the other arms, a common understanding of the power and limitations of each; to foster a feeling of interdependence among the different arms and of hearty cooperation by all; and to promote understanding between the regular and militia forces by a closer bond; all of which objects are worthy and contribute to the good of our country.

OFFICIAL DISTRIBUTION: Distribution (free) is to US Army and Marine Corps Active and Reserve Components FA units; seven copies to corps artillery, division artillery and brigade headquarters; 13 to battalions; and seven to separate batteries. In addition, readiness groups, recruiting commands, state adjutant generals, Army and Marine Corps libraries and schools, liaison officers and other Department of Defense agencies working with FA or fire support issues or materiel may request a free copy by writing to the Editor (see "Submissions").

SUBSCRIPTIONS: May be obtained through the US Field Artillery Association, P.O. Box 33027, Fort Sill, OK 73503-0027. Telephone numbers are DSN 639-5121/6806 or commercial (405) 355-4677 or FAX (405) 355-8745 (no DSN). Dues are $18.00 per year ($35.00 for two years and $52.00 for three years) to US and APO addresses. All others add $12.00 per subscription year for postage.

SUBMISSIONS: Mail to Editor, ***Field Artillery,*** P.O. Box 33311, Fort Sill, OK 73503-0311. Telephone numbers are DSN 639-5121/6806 or commercial (405) 442-5121/6806 or FAX 5127 with DSN or commercial prefixes. Material submitted for publication is subject to edit by the ***Field Artillery*** staff; footnotes and bibliographies may be deleted due to space limitations.

REPRINTS: ***Field Artillery*** is pleased to grant permission to reprint articles. Please credit the author and ***Field Artillery***.

POSTMASTERS: Second-class official mail postage is paid by the Department of the Army at Lawton, OK 73501. Send address changes to ***Field Artillery***, P.O. Box 33311, Fort Sill, OK 73503-0311.

Field Artillery School Hotlines

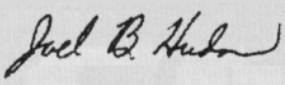
Redleg: DSN 639-4020
(405) 442-4020

Tactical Software: DSN
639-5607 (405) 442-5607

By Order of the Secretary of the Army:

DENNIS J. REIMER
General, United States Army
Chief of Staff

Official:



JOEL B. HUDSON
Acting Administrative Assistant to the Secretary of the Army
00377

RANDALL L. RIGBY
Brigadier General, United States Army
Field Artillery School Commandant

Editor:
Patrecia Slayden Hollis

Art Director:
Bob T. Coleman

Assistant Editor:
Joanne Alexander Brown

REGISTRATION POINTS

BRIGADIER GENERAL RANDALL L. RIGBY
Chief of Field Artillery

Ernie Pyle, the most respected and widely read news correspondent in World War II, wrote the following story about the death of a company commander during the mountain campaigns in Italy. Pyle possessed an unparalleled ability to capture in words the most important element of combat—the human element. This story says more about leading, leadership and the relationship between commanders and soldiers than anything else I have read in my career. I offer it for your professional development.

The Death of Captain Henry Waskow

In this war I have known a lot of officers who were loved and respected by the soldiers under them. But never have I crossed the trail of any man as beloved as Captain Henry T. Waskow of Belton, Texas.

Captain Waskow was a company commander in the Thirty-sixth Division. He had led his company since long before it left the States. He was very young, only in his middle twenties, but he carried in him a sincerity and a gentleness that made people want to be guided by him.

"After my father, he came next," a sergeant told me.

"He always looked after us," a soldier said. "He'd go to bat for us every time."

"I've never known him to do anything unfair," another said.

I was at the foot of the mule trail the night they brought Captain Waskow down. The moon was nearly full, and you could see far up the trail and even partway across the valley below.

Dead men had been coming down the mountain all evening lashed onto the backs of mules. They came lying belly-down across the wooden packsaddles, their heads hanging down on one side, their stiffened legs sticking out awkwardly, bobbing up and down as the mules walked.

The Italian mule skinners were afraid to walk beside dead men, so Americans had to lead the mules down that night. Even the Americans were reluctant to unlash and lift off the bodies when they got to the bottom, so an officer had to do it himself and ask others to help.

I don't know who that first one was. You feel small in the presence of dead men, and you don't ask silly questions.

They slid him down from the mule and stood him on his feet for a moment. In the half-light he might have been merely a sick man standing there leaning on the others. Then they laid him on the ground in the shadow of the stone wall alongside the road. We left him there beside the road, that first one, and we all went back into the cowshed and sat on water cans or lay on the straw, waiting for the next batch of mules.

Somebody said the dead soldier had been dead for four days, and then nobody said anything more about it. We talked soldier talk for an hour or more; the dead man lay all alone, outside in the shadow of the wall.

Then a soldier came into the cowshed and said there were some more bodies outside. We went out into the road. Four mules stood there in the moonlight, in the road where the trail came down off the mountain. The soldiers who led them stood there waiting.

"This one is Captain Waskow," one of them said quietly.

Two men unlashed his body from the mule and lifted it off and laid it in the shadow beside the stone wall. Other men took the other bodies off. Finally, there were five lying end to end in a long row. You don't cover up dead men in the combat zones. They just lie there in the shadows until somebody comes after them.

The unburdened mules moved off to their olive grove. The men in the road seemed reluctant to leave. They stood around, and gradually I could sense them moving, one by one, close to Captain Waskow's body. Not so much to look, I think, as to say something in finality to him and to themselves. I stood close by and I could hear.

One soldier came and looked down, and he said out loud, "God damn it!"

That's all he said, and then he walked away.

Another one came, and he said, "God damn it to hell anyway!" He looked down for a few last moments and then left.

Another man came. I think he was an officer. It was hard to tell officers from men in the dim light, for everybody was bearded and grimy. The man looked down into the dead captain's face and then spoke directly to him, as though he were alive, "I'm sorry, old man."

Then a soldier came and stood beside the officer and bent over, and he too spoke to his dead captain, not in a whisper but awfully tenderly, and he said, "I sure am sorry, Sir."

Then the first man squatted down, and he reached down and took the captain's hand, and he sat there for a full five minutes holding the dead hand in his own and looking intently into the dead face. And he never uttered a sound all the time he sat there.

Finally he put the hand down. He reached over and gently straightened the points of the captain's shirt collar, and then he sort of rearranged the tattered edges of the uniform around the wound, and then he got up and walked away down the road in the moonlight, all alone.

The rest of us went back into the cowshed, leaving the five dead men lying in a line end to end in the shadow of the low stone wall. We lay down on the straw in the cowshed, and pretty soon we were all asleep.

Brigadier General (Promotable) Randall L. Rigby became the Chief of Field Artillery and Commanding General of Fort Sill, Oklahoma, in June. Previously, he was Deputy Commandant of the Command and General Staff College at Fort Leavenworth, Kansas. (This piece by Ernie Pyle was reprinted with permission of Scripts Howard Foundation.)

Army Science Board: Maneuver Art versus FA Science

The article in the June edition, "Army Science Board: How Much Artillery is Enough?" [by John J. Todd and Lieutenant Colonel James M. Holt] discusses a recent study that looked at the age-old question of how much artillery we need. It provided a credible argument for something artillerymen have always known—that is, you can never have enough artillery, or put another way, more is always better than less. The importance of this study is evident by the fact that it justifies the increase in the allocation rule to two FA brigades per division and that it was instrumental in preventing the inactivation of Reserve Component [RC] FA brigades.

While I applaud the overall results of the Board's effort, I find their premise comparing artillery as a single-function "science" to the multi-function "art" of maneuver disturbing. The study uses this premise as a basis for asserting that RC FA brigades could be mobilized faster than RC maneuver brigades, considering the science of GS [general support] RC artillery compared to the art of DS [direct support] FA associated with maneuver brigades.

This notion of technical versus tactical or the science of fire support versus the art of maneuver has evolved throughout this century. While as a premise it certainly has been valid, the times are changing and we should not try to perpetuate it. It only serves to cause divisiveness in the combined arms effort; hopefully, as an idea, its days are numbered.

The way the FA fights is changing. While fighting artillery will continue to be highly technical (as will air and ground maneuver), artillerymen will increasingly look toward automation to solve traditional technical problems, thereby permitting them to hone their skills as tacticians and practitioners of the operational art. A major objective of digitization is to keep all members of the combined arms team on a common scheme of battle.

The fact is, artillery is more mobile. The shoot-and-scoot tactics of MLRS [multiple-launch rocket system], Paladin and our future Crusader are decreasing the need for prepared position areas. The shift in thinking from providing fires in a supporting role to fighting with fires will have a major impact on all artillerymen—active and Reserve, general or direct support.

The bottom line is that artillerymen must be as tactically proficient as the rest of the combined arms team. Consider a MLRS section chief or a platoon leader in the Michigan National Guard. He must know more than how to punch buttons on his computers. Rather, he must have a sound understanding of his immediate tactical situation, fully understand the commander's intent for fires and be thoroughly knowledgeable of his contribution to the overall combat power.

C. William Rittenhouse
Analysis Division
Directorate of Combat Developments
Field Artillery School, Fort Sill, OK

The Problem with the OPAREA

I'm concerned about our MLRS [multiple-launch rocket system] doctrine and terrain management. My experiences as a MLRS battalion commander, Div Arty XO [division artillery executive officer], Div Arty S3, and M109A2 battalion S3 have convinced me that our doctrinal dispersion, especially in MLRS and Paladin units, doesn't recognize the reality of dealing with a maneuver commander and S3 on a battlefield. There's not as much room out there as we want.

In the following paragraphs, I roughly analyze the MLRS problem. However, the issues discussed apply to cannon (in particular, Paladin) units as well, but to a lesser degree. I've spent a lot of time trying to find a piece of ground to sit on.

MLRS doctrine as published in *FM 6-60 Multiple Launch Rocket System (MLRS) Operations* provides one basic type of position employment for all tactical situations: that is the three-kilometer-by-three-kilometer operational area (OPAREA). While the OPAREA works well as a survivability technique, it's seriously flawed as a positioning system. It demands too much land, it virtually destroys a platoon's ability to defend itself and it hinders command and control. The OPAREA should be one of several position or maneuver techniques available for the MLRS commander.

The OPAREA demands too much land. Each platoon OPAREA requires nine grid squares (three kilometers by three kilometers) with nine firing points. Assuming only a separate battery is supporting a division, a maneuver brigade should expect from one to three platoons in its sector, depending on METT-T [mission, enemy, terrain, troops and time available]. This means from nine to 27 grid squares should be available for MLRS in the brigade's sector.

While someone might say we can coutilize ground, that's really only a dream. No one wants to be anywhere around us when we're firing. The threat of counterfire is perceived to be too great, and the flames and debris thrown around by the rocket backblast are obviously dangerous. SPLLs [self-propelled launcher-loaders] basically consume the OPAREA's nine grid squares with the nine firing points due to the surface danger area described in Appendix E of FM 6-60 (just under 400 meters to the front, rear and the flanks rearward). There's so little safe area left in a grid square that there's no way to manage the terrain so we can share it with a unit occupying mutually supporting positions.

For example, let's assume the brigade defensive sector is 15 kilometers wide. SPLLs firing rockets must occupy positions in the forward battalion sectors. The rear of the OPAREAs should be no more than 10 kilometers from the forward line of troops (FLOT) to ensure that about two-thirds of the rocket range is forward of the FLOT. The maneuver battalion sector available for use is 80 square kilometers (eight by 10). The brigade area available is 150 square kilometers (15 by 10).

The table clearly depicts the problem. Our OPAREA "prices us out of business." Maneuver commanders won't give

	Maneuver Battalion (8 x 10 Kilometers)			Maneuver Brigade (15 x 10 Kilometers)		
MLRS Unit	Land (Sq Km)	MLRS (Sq Km)	MLRS Percent	Land (Sq Km)	MLRS (Sq Km)	MLRS Percent
Platoon	80	9	11.25%	150	9	6%
Battery	80	27	33.75%	150	27	18%
2 Batteries	80	54	67.50%	150	54	36%
Battalion	80	81	101.25%	150	81	54%

MLRS Doctrinal Terrain Requirements in Square Kilometers (Sq Km)

us the land our doctrine demands. We "make do" with what we receive.

My complaint is that MLRS doctrine, as printed in FM 6-60, provides a detailed description of only one option; the platoon OPAREA. Without a doubt, a situation might allow us to use the OPAREA. A brigade with only one platoon in its sector (the secondary effort in a standard two up, one back defensive position?) may be able to devote six percent of its ground to MLRS. A platoon that's firing ATACMS [Army tactical missile system] from deep in the division or corps rear (not depicted in the table) also may be able to get enough ground to use the OPAREA. Therefore, USAFAS [US Army Field Artillery School] should not kill the OPAREA concept. But other positioning options requiring less space should join it in FM 6-60.

Platoon dispersion in an OPAREA hinders its ability to defend itself. If there's not enough room for the OPAREA, then we need a tighter position requiring less space. The size of an OPAREA coupled with the number of personnel in the individual elements—three per SPLL, three per POC [platoon operations center] FDC [fire direction center] without headquarters personnel and two per ammunition HEMTT [heavy expanded-mobility tactical truck]—results in a platoon that can't defend itself effectively. The dispersion of these small elements precludes mutual support in the event of a ground attack.

If the lack of land calls for a contraction or elimination of the doctrinal OPAREA, perimeter defense is enhanced through reduced dispersion once the platoon elements are close enough to support one another. This really argues for a platoon position with a defined perimeter. By necessity, firing positions would have to be outside the perimeter so the platoon position wouldn't be within the surface danger area.

Dispersion in the nine grid squares inhibits command and control (C^2). Radio communication is required for the platoon leader, platoon sergeant and POC to maintain contact with subordinate elements. When radios fail due to maintenance problems, terrain or operator error, reestablishing C^2 may require personal visits. Delivering food, mail, etc. also may require such visits routinely. It shouldn't happen, but it's possible to lose a HEMTT, or even a SPLL, for hours in the fog in Germany when radio communication fails. That could mean a soldier's life in combat.

Although we must be careful not to prepare for the last war instead of the next. Desert Storm sheds some interesting light on the subject. Even in the great expanse of the Saudi Arabian and Iraqi desert, finding nine-plus square kilometers for MLRS units was difficult. Finding cannon battalion and battery positions that didn't interfere with maneuver operations was also a challenge. Coupling that with concern about maintaining C^2 over a long move while employing units that could defend themselves to some degree resulted in Field Artillery units (cannon and MLRS) occupying battery and battalion positions and formations. After-action reports and periodical articles are filled with example after example of these formations. Basically every soldier had at least a captain to lead him on the battlefield. Ensuring massed firepower available immediately upon request also led to large Field Artillery formations and positions.

Conclusion. These concerns over maintaining C^2 and providing for perimeter defense won't go away. They argue strongly for a position smaller than the OPAREA concept allows. Also, the nonlinear battlefield of the future demands 6400-mil self-protection. The OPAREA can't meet this need. A platoon (or larger) position with a defined perimeter would enhance C^2 and provide better unit defense.

FM 6-60 should include platoon, battery and battalion positions and formations. The doctrinal limitation of only using the OPAREA blinds us to problems MLRS leaders face in the field. We won't receive the amount of land we want. Our soldiers may die because they can't defend themselves. Except for special situations such as a raid, asking for maneuver help is pointless—infantrymen and tankers have full plates already.

We must expand our thinking and accept that we can't dictate all battlefield actions to revolve around counterfire survivability; too many other factors are at work. MLRS doctrine must expand to provide leaders the flexibility to meet the situations they'll face so we'll continue as the King of Battle.

LTC John M. House, FA
Former Cdr, 6-29 FA (MLRS)
1st Armored Division, Germany

Major General Joseph E. DeFrancisco, Commanding General of the 24th Infantry Division (Mechanized)

FA Fighting Forward:
Paladins in the Victory Division

Interview by Patrecia Slayden Hollis, Editor

Q *The 24th Infantry Division is the first division to be fielded Paladin. Recognizing the division only has had three Paladin battalion rotations at the NTC [National Training Center, Fort Irwin, California], what do you see as initial lessons learned?*

A Paladin gives us a *tremendous* advantage; continuous fire support. With Paladin's increased range and mobility and its ability to lay itself and to fight dispersed, we can move howitzers freely and quickly around the battlefield and mass fires more rapidly than before. Paladin, essentially, is never out of action.

Paladin can shoot, move immediately, shoot, move immediately and continue that process for as long as the crew can sustain itself. The limitations of the system are human, not the howitzer's. The crew is going to have to rest sometime, but until it needs rest, it can continue to shoot and move.

Another advantage is that the supported brigade battlespace is extended. Because we're positioning Paladins as far forward as possible, the system is redefining the brigade commander's deep battlespace—he can influence the battle deeper than in the past. More than ever, he must ensure his key maneuver players understand how to use artillery. One thing we're doing is increasing our call-for-fire training for the maneuver leaders—including company and battalion commanders.

Paladin mitigates the effects of enemy counterfire—its ability to fight dispersed is what we dreamed about for survivability against the Soviets back in the early 80s. Now we can disperse throughout the brigade zone, greatly increasing survivability, and still mass when we need to (within the limitations of Paladin's range).

Enemy counterfire can be made virtually ineffective—Paladin doesn't have to stay in position to shoot repeated missions; it can fire, move and fire again—be ready to fire within two minutes. Some of our crews are ready to fire after moving in less than two minutes. In fact, our ready-to-fire time standard for survivability moves is 75 seconds.

The Paladin battery doesn't fight or move as a single entity. We keep the howitzers in pairs for a lot of reasons—mutual support, mutual security, primarily—but the pairs don't have to move in concert with other pairs. Each can move when the pair is ready to move. It would be very hard to target those Paladins and virtually impossible to knock out a Paladin battery.

We don't even know how good Paladin is yet. The more we use Paladin, the more we find out about its capabilities. Paladin is like the Apache—we knew the Apache was good when we got it, but until we used it, we really didn't know how good. Paladin is much more than a better howitzer. Its ability to survive and sustain accurate fires against deeper targets yields far more flexible and lethal fire support for the maneuver commander.

Q *What are the operational challenges associated with Paladin?*

A With the advent of Paladin, there's a learning curve for both fire supporters and maneuver commanders. Now it's even *more* important for the maneuver commander to be well-versed in fire support techniques. His direct support [DS] artillery battalion competes more rigorously for positions in his battlespace. His FA battalion no longer comes in a "neat package"—based on METT-T [mission, enemy, terrain, troops and time available], he has artillery weapons systems spread throughout his area.

Paladin depends on movement and dispersion to survive, and its ability to fight dispersed causes some space management challenges. Our artillery now moves every bit as much as our maneuver forces. The NTC is the only place we've had the space to truly exercise Paladin dispersion in the brigade's battlespace. We've found that with one Paladin battalion supporting a two-maneuver-battalion brigade, the NTC doesn't provide much space. It gets crowded out there.

So, we need more space to take full advantage of the Paladin battalion's capabilities. It makes no sense to keep Paladin back; we want to push those howitzers as far forward as possible in order to cover as much of the brigade zone of action as possible while maintaining continuous fires for a moving force.

Consequently, the brigade commander must ensure his tankers and Bradley crewmen

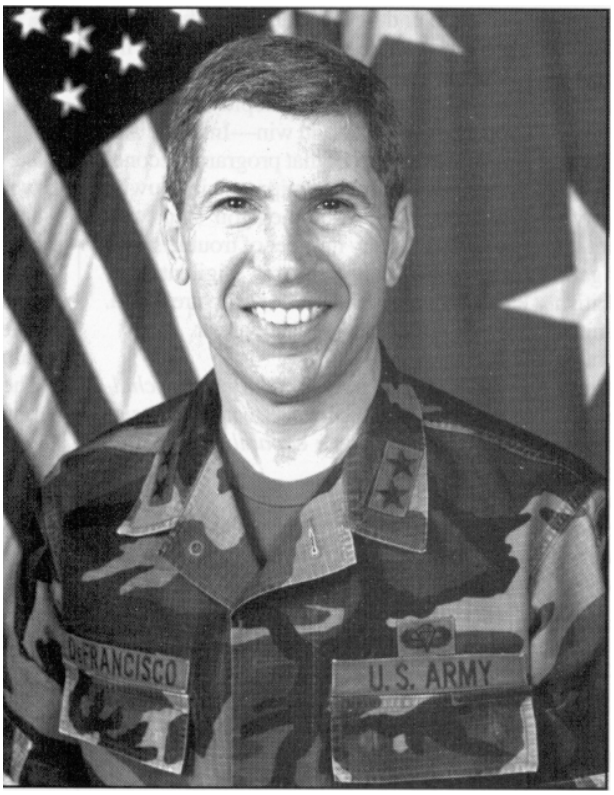
> ***"Paladin is much more than just a better howitzer. Its ability to survive and sustain accurate fires against deeper targets produces far more flexible and lethal fire support for the maneuver commander."***

understand that artillery will fight throughout the brigade area of operations and that they recognize those systems as friendly. Tankers and Bradley crewmen aren't necessarily used to seeing their artillery so far forward. We need to be careful to avoid fratricide, especially at night.

Fire support is a system of systems. The brigade must combine Paladin's capabilities with other new fire support improvements. For example, we're increasing the number of COLTs [combat observation lasing teams] in our DS battalions. These assets must be incorporated into the brigade commander's reconnaissance and counterreconnaissance fight and his overall scheme of maneuver.

With Paladin come some resupply challenges. Paladins operate in pairs controlled by platoons; each battery has four pairs moving and firing continuously. Resupply in Class III [Petroleum, Oil and Lubricants, or POL] and Class V [Ammunition] is a challenge. We're getting some relief in Class V resupply with the increased capabilities of the PLS [palletized load system] newly fielded in our artillery battalions.

As time goes on and we employ the system more, I'm sure we'll see other changes to how we do business.



Q *Crusader is scheduled for fielding in the year 2005 and will increase artillery capabilities significantly—fire 10 or more rounds per minute to a range of 40 or more kilometers with more lethality, mobility and survivability than Paladin. What have you learned about Paladin that should affect how we develop Crusader?*

A The important words in your question are that Crusader "will increase artillery capabilities significantly." Paladin is great, but it's an interim step. It bridges the gap between our old friend, the basic M109 howitzer originally built in the 1950s, and Crusader—a new weapon system for the 21st century. Paladin will make that transition much, much easier.

There's a danger here, in that Paladin is such an improvement over other M109 howitzers that some may want to push the fielding of Crusader further into the future. We, in the 24th Division, considered that possibility. But I think that would be a mistake; Paladin is truly just an interim system.

Now, because we've had experience with Paladin, the jump to Crusader operations—TTP [tactics, techniques and procedures], logistical challenges and the like—will be easier. We'll be more effective more quickly with Crusader.

Q *In October 1994, the 24th Division redeployed forces to the Gulf in Operation Vigilant Warrior to deter Iraqi aggression against Kuwait. How fast did you deploy what size force?*

A We deployed fast—very fast. The official N-Hour [notification hour] was 2000 on 8 October. By 1500 the next day, a Sunday, we had lead elements of a battalion task force in the air on the way to Kuwait. We were ready to deploy well within our 18-hour standard. Even with 17 hours of flying time and an eight-hour time change, we had a battalion task force with it's equipment and ammunition in the Kuwaiti desert—ready to fight—by the 12th of October.

The N-Hour order was for three companies of armor and three companies of Bradleys (later, increased to four each). We shaped the requested force into a viable fighting unit, initially one battalion task force followed by a second battalion task force. In the deployment, we interspersed a brigade headquarters and the combat support elements necessary to field a brigade combat team.

A direct support artillery battalion, 1st Battalion, 41st Field Artillery, went with that package. The battalion deployed one battery at a time interspersed with the armor and Bradley companies.

An interesting aspect of this deployment is that we fell in on prepositioned equipment stored in Kuwait (later, we also fell in on equipment prepositioned on ships). The FA battalion that went first had just finished Paladin NET [new equipment training]. But the artillery equipment stored in Kuwait was the older M109A3 howitzer. So when the battalion arrived, the soldiers had to quickly readjust themselves to the old methods.

Fortunately, one of the requirements for Paladin training is to continue to train on the M109A3 in what is called the "degraded mode." So 1-41 FA was ready to fire quickly with the older model howitzers similar to those it had just turned in at Fort Stewart.

The entire deployment process happened very rapidly. By the 12th of October, the first battalion task force was in the desert to be joined by the rest of the brigade combat team in just a few days.

Part One of Vigilant Warrior was to deploy to Kuwait rapidly, draw equipment and deter Iraqi aggression. We no sooner showed up in the desert with equipment, than the Iraqis began to withdraw. The National Command Authority [NCA] temporarily halted our deployment to reassess the situation and then decided to demonstrate US resolve and our Army's capabilities by continuing the deployment. So, by NCA directive, we flowed troops into Kuwait and, at the same time, sent forces to Saudi Arabia to draw equipment prepositioned onboard ships already on the way to the Port of Ad Dammam. We sent another brigade combat team to Saudi

Arabia, including its DS artillery battalion: 4-41 FA. Later, one of the battalion's batteries moved to Kuwait to participate in a brigade exercise as part of a tank battalion task force.

The brigade combat team in Kuwait went into the desert and conducted training for six weeks—some very intensive, meaningful coalition training, a lot of which was for artillery units. The brigade trained with the Kuwaitis, some British light forces and soldiers from the United Arab Emirates. The training incorporated British light howitzers and their meteorological system, Kuwaiti howitzers and several other systems to work interoperability issues. The brigade had several live-fire exercises with the fire support assets of four different countries. Lieutenant Colonel Don Browne, commander of 1-41 FA, with his Div Arty [division artillery] commander, Colonel Bill Lennox, orchestrated the coalition training in the desert, which was quite successful.

Q *What did you learn in Vigilant Warrior?*

A We confirmed beyond a shadow of a doubt that, as advertised, the United States Army is indeed a trained and ready strategic force capable of deploying rapidly to ensure decisive victory. We deterred Iraqi aggression—when we arrived in Kuwait, the Iraqis turned around and went north. We count that as a decisive victory.

In Vigilant Warrior, we also validated the concept of prepositioning Army equipment ashore and afloat. In a matter of days, we put a significant number of forces with a significant amount of combat power on the ground in Southwest Asia—in the desert with equipment drawn and ammo uploaded, ready to fight.

Additionally, we validated the Army's training exercise program. In this case, the exercise is Intrinsic Action, a recurring one in Kuwait. Our forces had just completed Intrinsic Action—re-stored their prepositioned equipment in Kuwait at the end of August. In October when the order came to deploy, we sent back many of the same troops who had just put that equipment away. So those troops drew equipment they knew and operated on terrain and with people they knew. Intrinsic Action significantly contributed to the success of Vigilant Warrior.

At the end of the Gulf War, the Army decided to take two actions. First, we instituted the exercise program in Southwest Asia emphasizing deployability and readiness to fight and win—Intrinsic Action is a big part of that program. Second, we prepositioned equipment in Kuwait and put other equipment on ships that could sail to any number of trouble spots, including Southwest Asia. Vigilant Warrior validated that both concepts are sound. They probably prevented a war.

Q *What are some of the training challenges associated with maintaining your division's capability to deploy rapidly?*

A The short answer is that maintaining the ability to deploy rapidly is a lot of hard work and increases the division's OPTEMPO [operational tempo]. There can be no room for error when you are on the XVIII Airborne Corps exacting time line that says you must have the first airplane in the air in 18 hours, the entire battalion task force-minus ready to fly within 48 hours and a brigade ready to sail within 72 hours. It's too late to start training when the bell rings. Therefore, units must be able to perform at a very high standard at all times; their leaders must insist on excellence in everything they do. It's a total team effort.

To stay ready, we conduct exercises such as Intrinsic Action and Bright Star and take advantage of operations such as Vigilant Warrior to refine TTP. We have an EDRE [emergency deployment readiness exercise] every month at Fort Stewart. We conduct those exercises monthly because the skills erode and because of our personnel turnover—probably our biggest single challenge. We're constantly getting new soldiers and leaders.

The high turnover gets translated down to the crew level. We'll win or lose wars depending on the skills and cohesion of our individual crews and sections—our tank and Bradley crews. Paladin and Avenger sections and so forth. Those crews must be qualified and follow standard gunnery procedures.

And we have to keep those crews together. When crews break up, we must requalify the new ones immediately. Keeping those crews qualified at all times, ready to deploy, is very demanding—its our biggest training challenge.

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

A My message to Field Artillerymen, be they Army or Marine, is that you have two challenges as we move toward Force XXI. One is to be bold and push forward with new techniques and equipment. Even as you experience growing pains, you have to stay open to the possibilities and potential advantages of new equipment and procedures.

The second challenge is that as you embrace these information-age capabilities, you can't lose sight of the basics. Regardless of the weapon system, precision gunnery remains critical, as do the precepts of fire support. It doesn't matter if you have an M109A3, Paladin or Crusader, you'll still need to follow the basic principles of fire support—provide adequate support to committed units, weight the main effort, position to facilitate future operations, etc. Those principles won't change—how we accomplish them may change, but the principles, themselves, won't.

So, stay wedded to the basics but don't be afraid to expand and achieve those basics with new equipment and techniques using advanced technology. Delivery of fires and fire support coordination have been critical to success on the battlefield in the past and will remain so into the next century.

Major General Joseph E. DeFrancisco commands the 24th Infantry Division (Mechanized) and Fort Stewart, Georgia. He came to the Victory Division from Korea where he served as Assistant Chief of Staff, C3/J3/G3, United Nations and Combined Forces Command. Prior to his tour in Korea, he was the Assistant Division Commander, also in the 24th Division. Other assignments include serving as the Executive Officer to the Secretary of the Army in the Pentagon; commanding the 7th Infantry Division (Light) Artillery at Fort Ord, California, participating in Operation Just Cause in Panama; and serving as Chief of the War Plans Division and then Deputy Director for Planning in the Directorate of Strategy, Plans and Policy, both in the Office of the Deputy Chief of Staff for Operations and Plans at the Pentagon.

Training the Core Competencies

by Brigadier General Leo J. Baxter and Lieutenant Colonels Colin K. Dunn, Michael T. Hayes and James T. Palmer

Running a brigade or task force fire support element (FSE) demands juggling a multitude of complex tasks simultaneously in a confusing, hostile environment against an unforgiving enemy. The FSE must expend maximum effort to help commanders meet the toughest standard of combat: massing fires at the decisive time and place of battle.

All the Combat Training Centers (CTCs)—National Training Center (NTC), Fort Irwin, California; Combat Maneuver Training Center (CMTC), Hohenfels, Germany; and Joint Readiness Training Center (JRTC), Fort Polk, Louisiana—demonstrate that there's no "magic bullet" for training the FSE to fight to standard. No single skill ensures fires will be effective. FSE leaders must be competent in every aspect of planning, preparing and executing fires.

Our purpose is to provide commanders a guide for training the core competencies of brigade and battalion fire support officers (FSOs), targeting officers and fire support NCOs (FSNCOs). These competencies include advising the combined arms commander, integrating fire support planning with the combined arms staff and preparing for battle.

For a commander's fire support training program to be successful, it first must build on the fundamental skills leaders learn at the US Army Field Artillery School (USAFAS) at Fort Sill, Oklahoma; second, meld with the division's combined arms training program; and last, train the competencies by focusing on the most critical fire support tasks that units execute at the CTCs.

Building on the Foundation. The start point for training the core competencies is found in the Field Artillery Officer Advanced Course (FAOAC), Warrant Officer Basic (WOBC) and Advanced Courses (WOAC) and Advanced NCO Course (ANCOC). USAFAS emphasizes teaching the fundamental skills of fire support—the skills required for FSE leaders to master the core competencies (see Figure 1 on Page 8). Successful training programs build on this foundation.

The Tactical Decision Making/Fire Support Planning Process. Officers, WOs and NCOs are well-trained in the fundamentals of the staff process. They know the basics of how brigades and task forces develop a tactical plan. They understand how top-down fire planning and bottom-up refinement fits into the process. Staff planning skills, however, are perishable and need constant refresher training and improvement through collective training with the combined arms staff.

Intelligence Preparation of the Battlefield (IPB) and the Targeting Processes. These indispensable skills are taught in FAOAC, WOBC and WOAC. Unit programs reinforce these skills by focusing training on the threats that units face at the CTCs. Currently, NCOs don't get the same emphasis on training on these skills in ANCOC as officers and WOs. So unit training will have to spin-up NCOs in the IPB and targeting processes.

Doctrinal Terms and Operational Graphics. These comprise the language of the professional fire supporter. At USAFAS, all are taught to "speak it" with discipline and precision. Commanders only have to sustain this knowledge in unit training.

Clearance of Fires. USAFAS graduates learn this fire support planning requirement as well. The commander clears fires to preclude fratricide and, simultaneously, ensure fires strike enemy targets at precisely the right time and place with the effects that support his intent. Fire supporters help the commander plan, prepare and execute fires to this standard. This task must be sustained in every aspect of fire support training.

Radar Employment. Officers and WOs know the tactical employment of Firefinder

Fire Support Element Leader	Tactical Decision Making/Fire Support	Clearance of Fires	Radar Employment	Intelligence Preparation of the Battlefield/Targeting	Doctrinal Terms/Operational Graphics	Training with Simulation
Fire Support Officer	Improve	Sustain	Improve	Improve	Sustain	Improve
Warrant Officer	Improve	Sustain	Improve	Improve	Sustain	Train
Fire Support NCO	Improve	Sustain	Train	Train	Sustain	Train

Figure 1: Brigade/Battalion FSE Leaders' Basic Skills Training Matrix. Unit training programs train or build these skills.

finder radars. They understand how to employ radar zones and use them to increase the responsiveness of counterfire operations. They understand that cueing guidance is a crucial part of counterfire planning. NCOs, on the other hand, don't receive detailed instruction in counterfire planning and must be trained to manage radars in the unit.

The radar skills of all FSE leaders must be improved through combined arms staff training. After all, counterfire is not an artillery duel—it's an integrated part of the combined arms fight and a critical task for protecting the force.

Planning, Preparing and Executing in Janus. FAOAC students learn how to train using the Janus constructive simulation. Commanders should exploit their knowledge of simulation training in unit training programs. Simulations, such as Janus, are indispensable means of sustaining and improving the integration of fire support into combined arms operations.

Integrating Training. Turning USAFAS graduates into competent fire supporters is a responsibility division and brigade commanders and their fire support coordinators (FSCOORDs) all share. The division commander maps out the combined arms training strategy while his FSCOORD, the division artillery (Div Arty) commander, establishes the first training gate—validating fundamental fire support skills. The Div Arty commander must establish a program that ensures FSE leaders are proficient and ready to participate in collective, combined arms training.

Brigades and battalions build on the division's efforts. They work hand-in-hand with the Field Artillery direct support (DS) battalion commander, honing FSE leader skills through collective staff training. Together, brigade, battalion and DS commanders drive the guts of the program—teaching detailed tactics, techniques and procedures (TTP) and training to precise standards.

The division commander and his chief fire support trainer, the Div Arty commander, complete the training cycle by implementing the last training gate—evaluating brigade and battalion FSEs during a stressful, realistic combined arms training event before the unit's CTC rotation. Units must validate that their core competencies are trained to standard under CTC-like conditions before crossing the line-of-departure at the CTCs.

Training Critical Fire Support Tasks. This is where victories are born—brigade, battalion and DS commanders' train the core competencies. There's no panacea for accomplishing this training. It's a challenge—as demanding as fighting and winning battles at the CTCs. We recognize that few commanders have the time and resources to train every task to standard. Commanders should use their most complex mission-essential tasks—the ones requiring the most training and coordination with the combined arms staff—as vehicles to train FSE leaders' core competencies.

To illustrate how commanders train core competencies, we've selected a difficult fire support task commonly found on unit mission-essential task lists—providing fires in support of a deliberate task force breach. Core competencies are trained by working through the elements of planning, preparing for and executing the operation as a combined arms team.

Planning. The advice given in *FM 6-71 Tactics, Techniques and Procedures for Fire Support for the Combined Arms Commander*—an indispensable manual for every commander—is on target. It states that war gaming is the most important step in synchronizing fire support. A prioritized list of critical fire support tasks and their purpose evolves out of this process. The staff identifies the high-payoff targets (HPTs) and determines when, where and how they'll be attacked and which commanders will find and attack

Briefing the Plan in Operation Desert Storm. When the time comes, FSE leaders must know how to plan and integrate fires for combined arms operations.

them. The commander's standard should be that at the end of the war game, the FSE has a fully developed scheme of fires that's integrated into the maneuver plan.

As commanders drive this staff process, they focus on training two FSE leader core competencies: advising the combined arms commander and integrating with the combined arms staff. FA commanders begin by ensuring FSE leaders know the appropriate doctrine. In the case of breaching, that's *FM 90-13-1 Combined Arms Breaching Operations* and *FM 71-123 Tactics, Techniques and Procedures for Combined Arms Heavy Forces*.

Maneuver commanders then train the core competencies by making FSE leaders apply TTP to meet the commander's end state. The standard is uncompromising—FSE leaders must tell the commander what fires can and can't do to achieve the results he wants. Advising the commander what fires can reasonably achieve is not a one-time task that ends when the commander issues his intent and guidance for fire support. It's a dynamic process that matures as the staff war-games.

For example, in support of deliberate breaching operations, commanders would want to use artillery to achieve every task in Figure 2. Developing this list, however, is only the first step in the war-gaming process.

In a perfect world, a 155-mm FA battalion can fire 10 massed (i.e., battalion three-round) "killer missions" per hour. In battle, however, as at the CTCs, the world is never perfect. Artillery can only apply fires decisively at a handful of points in a single battle—a fact planners must consider. They also must balance the requirements for killer missions with other fire support tasks (e.g., obscuration fires, etc.) that don't require massed fires.

During the war-game stage, the FSE has the challenge of matching all missions with limited means. FSE leaders must master the battlefield calculus of weighing the requirements of each task against the resources available in time and space.

In the breaching example when the task force commander orders the objective obscured (Task 3 of Figure 2), the FSE leader performs a task analysis, following the steps listed in Figure 3. FSE leaders scrutinize every fire support task to the level of detail shown in Figure 3.

Finally, armed with this task analysis, the FSE works with the commander and his staff to find the optimum balance of resources and requirements to achieve the commander's end state.

Preparing. In training the preparation phase, commanders continue to emphasize integrating fire support planning with the combined arms staff. In addition, they train FSE leaders to prepare for battle.

Task	Purpose
1. Execute proactive counterfire against the regimental artillery group (RAG).	Deny the RAG from reinforcing fires in the enemy's kill sack in front of the point-of-penetration.
2. Prep the northernmost motorized rifle platoon (MRP).	Deceive the enemy as to the location of the point-of-penetration.
3. Obscure observation of the point-of-penetration from the motorized rifle company (MRC) from when the breach force crosses Phase Line (PL) Hammer until the assault force is through the breach.	Deny observed direct and indirect fires at the point-of-penetration.
4. Suppress the mounted and dismounted weapons in the southern and center MRP from firing on the breach and assault force until they clear the breach.	Protect the breach and assault force from direct fire from the southern MRP.
5. Plan a supporting target east of the center MRP.	Delay repositioning forces until the assault force consolidates on the southern MRP.
6. Destroy anti-tank weapons systems located on the south side of the objective.	Protect the support force.

Figure 2: Critical Fire Support tasks for a Deliberate Task Force Breach

Step 1: The FSE leader ensures he clearly understands the fire support task and its purpose.

For Task 3 in Figure 3 ("Obscure observation of the point-of-penetration from the MRC from when the breach force crosses PL Hammer until the assault force is through the breach"), the FSE leader must know the answers to the following questions before proceeding:

- What triggers the smoke?
- How long must the obscuration last?
- What must be obscured? Line-of-sight between the MRC and the breach? Other places?
- What if smoke obscures the MRC from the assault by fire positions?

Step 2: The FSE leader plans to handle all contingencies associated with the fire support task.

For Task 3, he must plan smoke for the following:

- Between the enemy and the breach site.
- North of the MRC, if winds are blowing north to south; or south of the MRC, if winds are south to north.
- On top of the platoons to be obscured in unfavorable wind condtions

Step 3: The FSE leader applies encyclopedic knowlege of enemy and friendly capabilities to each fire support task and examines it in detail.

For Task 3, he must know that an MRC covers roughly a 1,500 by 500-meter area and that he'll need about 1,000 meters of smoke coverage to obscure the enemy's direct fire systems. In examining Task 3 in detail, he asks the following questions:

- Can the FA provide a 1000-meter smoke screen?
- How many rounds will it require?
- How many minutes of smoke are available for that size target? Is that enough?
- How long will it take to build and sustain the smoke?
- Can the mortars or mechanized smoke augment the artillery or do the job alone?
- If I'm supporting a light force, do I know the best way to maximize the capabilities of the 81-mm and 60-mm mortars?

Figure 3: FSE Leader's Critical Fire Support Task Analysis

In the deliberate breach example, FSE leaders work the integration between the S2's reconnaissance and surveillance (R&S) plan and the fire support plan. The FSE and the S2 work hand-in-hand to refine the S2's situational template of the motorized rifle company (MRC). Armed with the targets plotted by the FSE on the S2's template of likely enemy locations, scouts and combat observation lasing teams (COLTs) well-schooled in infiltration techniques can approach enemy positions and provide accurate grids of vehicle and dismounted emplacements. Together, these assets are the primary means to confirm or deny the templated positions and provide refined target locations. They also can report the wind speed and direction at the breach site and observe fires on the targets.

In addition to employing COLTs, the S2 and the FSE must sort out other targeting responsibilities, integrate their plans to accomplish all tasks and provide redundancy in execution while avoiding needless duplication of effort.

During the preparation phase, another essential duty of FSE leaders is to supervise the implementation of the fire support plan and the bottom-up refinement of targets. The fire support execution matrix (FSEM) is as an excellent staff supervision tool. FSE leaders can use the FSEM as a checklist to see if COLTs, subordinate FSEs and FISTs cover all their tasks in back-briefs and brief-backs. FSEs also should have a reporting system for completed preparations or refinements. The FSE can check off tasks completed or ready for execution on a copy of the FSEM.

During the preparation phase, the combined arms rehearsal is critical. A key technique is to rehearse the subordinate parts of the plan *first*. FSE leaders should ensure that subordinate fire supporters rehearse before the combined arms rehearsal. All too often, commanders and FSCOORDs show up at the combined arms rehearsal without having rehearsed the execution of fires at any level. This is comparable to actors showing up for the dress rehearsal before they've memorized their lines.

For a deliberate breach, the standard should be that supporting, breach and assault force commanders and their FSOs and observers rehearse their responsibilities for target execution before the task force and brigade rehearsals.

Executing. During execution, commanders train FSE leaders how to fight. This training must focus on three leader tasks. The first is battle tracking. This task is essential for clearing fires rapidly and ensuring fires stay focused on supporting the commander's intent. In the deliberate breach, for example, battle tracking is particularly critical for alerting FSE leaders when to shift fires to support each step of the operation.

The second FSE leader task is determining where the FSO should be positioned during the battle. As FM 6-71 states, the FSO positions himself where he can best support the commander's intent. While executing a deliberate task force breaching operation, the FSO probably will position himself with the breach force commander (usually the S3).

The standard here should be that the FSO must determine where he belongs *before the battle*. If he waits until the battle starts to figure out where he should be, he'll never get there in time. FSOs then should practice fighting from that station during the combined arms rehearsal.

The third leader task is assisting the commander in decision making during battle. One technique to train this skill is to use situational training exercises (STX) or "what if" drills. For example, the task force commander sets the situation where the support force encounters an unexpected obstacle en route to its support position. He orders the team to conduct an in-stride breach. The commander then turns to each of his staff and says, "OK, what are your actions in support of my decision?" The FSO would cover his hasty fire planning responsibilities in support of an in-stride breach. He also might discuss how he'll shift the priority of fires and smoke to the support team and adjust the radar's critical friendly zone (CFZ) to cover the actual breach zone.

Executing fires to standard is tough. It's the combined arms commander's responsibility to fight with fires, but he can't do the job without the synchronized efforts of his staff and subordinate commanders.

In this article, we covered training a crucial part of the team that helps synchronize fires—FSE leaders. If trained in the core competencies of fire support under stressful, realistic conditions, they'll be confident, disciplined tacticians and leaders who can help the commander focus his fires at the critical time and place—not only at the CTCs, but on any future battlefield.

Brigadier General Leo J. Baxter is the Assistant Commandant of the Field Artillery School and Deputy Commanding General for Training of the Field Artillery Center, Fort Sill, Oklahoma. In October, he becomes Director of the Officer Personnel Management Directorate, Total Army Personnel Command, Alexandria, Virginia. Among other assignments, he served as Assistant Division Commander for Support of the 3d Infantry Division (Mechanized) and Commander of the 3d Infantry Division (Mechanized) Artillery, both in Germany.

Lieutenant Colonel Colin K. Dunn until recently was the Senior Fire Support Observer/Controller (O/C) at the Combat Maneuver Training Center in Germany. Among other assignments, he was Commander of the 2d Battalion, 3d Field Artillery, 1st Armored Division, also in Germany; Editor of *Field Artillery* and S3 of the 101st Airborne Division (Air Assault) Artillery at Fort Campbell, Kentucky.

Lieutenant Colonel Michael T. Hayes until recently was the Senior Fire Support Trainer at the National Training Center, Fort Irwin, California. He has served as Commander of the 1st Battalion, 14th Field Artillery in the 2d Armored Division and Deputy Fire Support Coordinator (DFSCOORD) for the 3d Infantry Division (Mechanized), both in Germany.

Lieutenant Colonel James T. Palmer until recently was the Senior Fire Support O/C at the Joint Readiness Training Center at Fort Polk, Louisiana. His assignments include commanding the 1st Battalion, 7th Field Artillery and serving as DFSCOORD for the 10th Mountain Division (Light Infantry) at Fort Drum, New York.

Lieutenant Colonels Dunn, Hayes and Palmer are all students at the Army War College, Carlisle Barracks, Pennsylvania.

Steel Wind: Colonel Georg Bruchmueller and the Birth of Modern Artillery

Praeger Publishers, Westport, Connecticut: 1994, 197 Pages.

Lieutenant General (Retired) David E. Ott in his August 1994 interview "Massing Fires—Our Enduring Imperative" with *Field Artillery* stressed that massing fires is the fundamental principle all artillerymen must hold dear as we move into the 21st century. Massing of fires, he added, hinges upon centralized control, synchronization of all battlefield dynamics and the application of technology. All these key elements of our contemporary artillery doctrine are rooted in the work and vision of an obscure German artilleryman who radically changed the tactics, techniques and procedures (TTP) of the German artillery over the course of World War I.

Steel Wind: Colonel Georg Bruchmueller and the Birth of Modern Artillery is written by Colonel David T. Zabecki, a US Army Reserve Field Artilleryman. He captures in detail the overnight transformation of the German artillery in the first world war. Using his first-place article in the US Field Artillery Association's 1990 History Writing Contest ("Der Durchbruchmueller," published in August 1990) as the blueprint for his book, Zabecki expands on the fascinating life and amazing contributions of Georg Bruchmueller to the development of modern German artillery tactics.

Bruchmueller Tactics and Legacy

Zabecki begins with an overview of the relatively simple employment of artillery at the outset of the Great War and the ensuing stalemate along both fronts. He quickly moves to 1917 and shows how retired Lieutenant Colonel Georg Bruchmueller, a 30-year veteran of foot artillery, was called from retirement and played an instrumental role in breaking the war's two-year stalemate with the overwhelming effects of his massed fires in the Riga Campaign. By arguing for centralized control, creeping barrages and synchronizing fire and maneuver, Bruchmueller quickly earned his nickname "der Durchbruchmueller," a clever play on words mixing his name with the German word for "breakthrough."

The heart of *Steel Wind* for any artilleryman surely must be Zabecki's chapter on Bruchmueller's tactics. Breaking Bruchmueller's system into six categories, Zabecki discusses at length his innovative approaches to neutralization fires, centralized command and control, preparation of the battlefield, combined arms synchronization, operational security and surprise, and fire support planning. Following Bruchmueller's integration of these into German artillery doctrine and his application of them in the last campaigns of the war offers a glimpse into the roots of many key elements of our own doctrine.

Zabecki next looks at the legacy of Bruchmueller. Ironically, as the German Army shed many of Bruchmueller principles in favor of its new blitzkrieg tactics and as a result of the heavy artillery restrictions of the Versailles Treaty in the post-World War I years, its former and future enemies, particularly the Soviet Union, adapted many of his principles for its own use. Russian, English and French translations and studies of Bruchmueller writings during the 1920s and 1930s reflect his worldwide influence as armies modernized.

Author's Conclusions

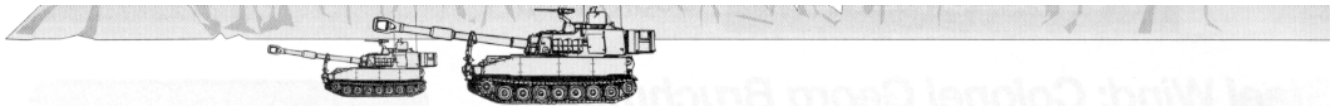
Artillerymen may find themselves at odds with some of Zabecki's conclusions in his final chapter. The US Army's move to the platoon concept in cannon artillery, for example, will not necessarily result in a trade-off of massing fires for the ability to engage more targets as he argues. By affording greater survivability and providing two additional howitzers per battery, the platoon concept ultimately enhances our ability to mass fires. As the author himself states, it is not the massing of guns, but rather the massing of fires that achieves battlefield successes.

End notes handily located at the end of each chapter show the extensive research undertaken by Zabecki in a wide range of materials, including German, French and Russian primary sources. *Steel Wind* is replete with maps, diagrams, photographs and tables to illustrate Bruchmueller's influence on the evolution of modern artillery tactics.

As we move toward Force XXI amidst technological changes of the scale experienced at the turn of this century, Bruchmueller's perseverance and methods in applying new technology and TTP to maximize massing fires may give us insight into the course we pursue.

Steel Wind will make a superb addition to any artilleryman's professional library. But consumers beware: at $64.95 hardcover and $19.95 paperback, *Steel Wind* comes at platinum prices. Go paperback.

LTC Russell E. Quirici, FA
Commander, 2-80 FA
FA Training Center, Fort Sill, OK



The Paladin Battalion at the NTC—
A Commander's Perspective

by Lieutenant Colonel Robert J. Fronzaglia

The 3d Battalion, 41st Field Artillery (3-41 FA) Battlekings have been kept busy at Fort Stewart, Georgia, this year: deployments to Somalia, Haiti and almost to Kuwait with our sister battalions. However, our biggest challenge was to undergo one of the most intensive force modernizations in cannon battalion history—one that will revolutionize direct support (DS) battalion operations.

The Paladin battalion's maneuver and firing capabilities are causing us to relook how we think, train and fight as both artillerymen and fire supporters. This statement is based on a comparison of rotations at the National Training Center (NTC), Fort Irwin, California—3-41 FA's M109A2 rotation in 1993 and the first-ever M109A6 Paladin battalion rotation in January 1995. During a recent quarterly training briefing, Colonel R. Stephen Whitcomb, the 2d Brigade Commander, summed up the impact of his new Paladin battalion: "I now have *four* maneuver battalions."

Paladin is user-friendly. 3-41 FA converted to Paladin in August 1994, had a two-week battalion field exercise in November and then fought the system at the NTC in January. The Field Artillery School's Paladin New Equipment Training Team (NETT) out of Fort Sill, Oklahoma, did a tremendous job—key to our success at the NTC.

I must qualify my discussion of initial tactics, techniques and procedures (TTP) in this article by first reminding readers there are areas in any battalion's NTC rotation that need fixing or refining, regardless of the type of battalion. In addition, this discussion is based on the first (but only one) Paladin NTC rotation. By December, the 24th Infantry Division Artillery will have completed four Paladin rotations, to include one focused rotation. So a lot of TTP will be emerging during the next year.

Integration of Systems. A Paladin battalion is more than just the M109A6 howitzer. Concurrently with the Paladin, we fielded FA ammunition support vehicles (FAASVs), palletized loading system (PLS), initial fire support automation system (IFSAS), precision lightweight global positioning system receiver (PLGR) and M88 tracked recovery vehicles. The multiple fieldings proved to be a big challenge as we struggled to integrate these systems and deal with their consolidated impact on the battalion.

Our main effort in preparation for the NTC was to create a seamless digital-voice link from our fire support teams (FISTs) through the fire support elements (FSEs), battalion fire direction center (FDC), battery FDCs and, finally, to the guns. We learned early that what a forward observer (FO) puts into his forward-entry device (FED) directly affects a Paladin battalion's ability to deliver the right fires at the right place and time. We analyzed every type of mission for both digital and voice processing, and the result was a division artillery standing operating procedure (SOP) we used during our external evaluation (EXEVAL) and NTC rotation. The procedures listed in Figure 1 for immediate fire missions and Figure 2 for a time-on-target missions are the results of our efforts and part of the SOP.

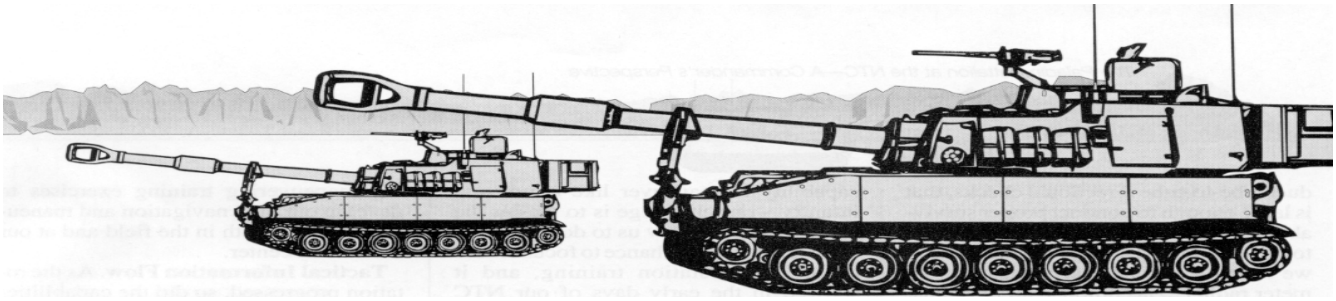
After we integrated the systems, we quickly discovered the flexibility of a Paladin battalion. The tactical interface among PLS, FAASVs and PLGRs is one example. The PLS is not unique to a Paladin battalion, and like other units, we used combat-configured loads and rearmed

Step	Agency	Action
1.	FIST	• Initiates call-for-fire by voice as one transmission—for example, "Battalion FDC, this is Observer; immediate supression/smoke, Grid 123456, Altitude 123, Over."
2.	TF FSE	• Monitors mission request. Calls the battalion FDC over the quick fire (QF) voice net and announces either "Grid cleared" or "Grid not cleared."
3.	Battalion FDC	• Answers call-for-fire. Sends voice fire order to designated POC. Sends message to observer on QF net.
4.	POC	• Listens for the fire order, completes the FM;CFF and transmits HOW;MSN to the Paladin howitzers.
5.	Paladin Section	• The AFCS automatically computes and displays the firing solution. Howitzer crews execute the mission, sending SHOT, RDCOMP to the POC by voice. The POC sends SHOT, SPLASH and RDCOMP by voice on the QF net.
6.	FIST	• Sends EOM and refinement data by voice.

Legend:

AFCS	= Automatic Fire Control System	HOW;MSN	= Howitzer;Mission
EOM	= End of Mission	POC	= Platoon Operations Center
FDC	= Fire Direction Center	RDCOMP	= Rounds(s) Complete
FIST	= Fire Support Team	SHOT	= Round(s) Fired
FM;CFF	= Fire Mission;Call-for-Fire	SPLASH	= Round(s) Impacting in about 5 Seconds
		TF FSE	= Task Force Fire Support Element

Figure 1: Paladin Battalion's Immediate Fire Mission Procedures



with ease, both before and during our battles. The FAASV has been around for a while, and its value is widely known. What makes these integrated systems so valuable is the independence they allow the FAASV—the vehicle is no longer tied to its gun. Equipped with PLGRs, radios and crew-served weapons, it now works in tandem with, but independent of, its gun.

The FAASV is run by an ammunition team chief (ATC) who is a key leader and plays a critical role in delivering fires. An ATC is responsible for managing the ammunition on his vehicle (numbers and lots). His additional responsibilities include providing security for his FAASV and howitzer and ensuring his FAASV is always available to rearm its Paladin.

During one live-fire movement-to-contact, four FAASVs at varying locations received a message to rearm. Using their PLGRs to navigate, they arrived at a designated grid to link up with a PLS, reloaded in less than 20 minutes and rejoined their platoon that had continued firing throughout the rearming operation.

Our young sergeants and senior specialists have responded well to these new responsibilities, and we are finding the ATC to be a good position to develop the leader skills needed for future Paladin commanders.

Suitable Terrain for Pairs. As we progressed through the rotation, a number of Paladin lessons surfaced at the battery level and below. As advertised, Paladin can be ready-to-fire in a matter of minutes. The biggest challenge in achieving these times is using terrain effectively as a Paladin pair. It wasn't until we got to NTC and away from the small, flat firing points at Fort Stewart that our chiefs could experience what it meant to choose terrain for tactical employment.

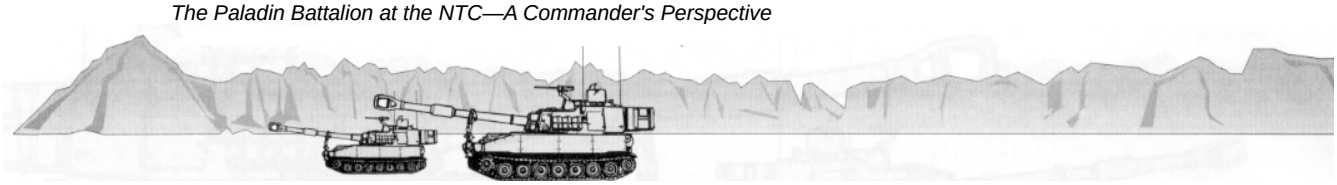
Paladin commanders quickly learned they couldn't rely on map spots or grids given to them by their FDCs. Rather, they had to develop the skills to find suitable terrain and be aggressive in recommending changes to their platoon leadership. Selecting terrain that allows a pair to conduct

Step	Agency	Action
1.	FIST	• Sends FREETEXT: "TOT follows GRID AB123456" to the TF FSE.
2.	TF FSE	• Reviews and clears mission. • Adds "Clear" to message from the FIST and transmits it to the appropriate battalion FDC.
3.	Battalion FDC	• Receives message and transmits it to the POC(s).
4.	Forward Observer (FO)	• Sends FR;GRID specifying AMC/FFE to the battalion FDC. • Specifies H-Hour to the battalion FDC by hour and minutes (HH/MM). - HH/MM based on all units using the AN/PSN-11 GPS time to synchronize SINCGAR radios, AFCSs, LCUs and FEDs. - FO verifies the time hack with the battalion FDC.
5.	Battalion FDC	• Reviews FM;CFF and adds TOT in the method of engagement subfield and enters the H-Hour in the time subfield. • Transmits the FM;CFF to the appropriate POC(s). • Verifies the time hack with the POC(s).
6.	POC	• Executes the FM;CFF. • Transmits the data to the guns (no earlier than three minutes before TOT time). • Verifies the POC LCU time with all Paladin howitzers' AFCS times.
7.	Paladin Section	• The section chief already has input TOT response time into the AFCS in increments of 30 seconds (the standard). • The mission arrives and is automatically stored in AFCS. The AFCS automatically computes a solution to the mission and determines the time-of-flight. The AFCS adds the time-of-flight to the TOT response time to determine when to display the mission to the howitzer crew. • The AFCS automatically displays the mission to the howitzer crew as an AMC mission, giving the crew 30 seconds to be safe and ready. • The AFCS automatically displays the command FIRE, taking into account the time-of-flight to ensure the rounds land exactly at H-Hour. • The section chief sends SHOT digitally to the POC.
8.	POC	• Sends SHOT by voice (over the quick-fire net) to the FO. - First POC to fire announces by voice "[Call sign], SHOT, TGT [number]. Over" to observer. - All other POCs report RDCOMP to the battalion FDC digitally.
9.	FIST	• Replies to SHOT, SPLASH and RDCOMP. • Sends EOM to the battalion FDC.
10.	Battalion FDC	• Relays EOM to the POC(s).
11.	POC	• Sends EOM to the guns.

Legend:

AMC	= At-My-Command	GPS	= Global Positioning System
FEDs	= Forward-Entry Devices	LCUs	= Lightweight Computer Units
FFE	= Fire-for-Effect	SINCGARS	= Single-Channel Ground and Airborne Radio System
FREETEXT	= Plain Text Message Format		
FR;GRID	= Fire Request;Grid	TOT	= Time-on-Target

Figure 2: Paladin Battalion's Time-on-Target Mission Procedures



tube-to-tube directional checks, that is large enough to conduct proper survivability moves and that is defensible is tough business. Through trial and error, we found a pair needed at least a 500-meter radius to accomplish all missions.

Maintaining dispersion and meeting ready-to-fire standards became a real challenge in the desert at night. One technique developed by our Paladin commanders to facilitate night occupations was to use white lights and night-vision goggles to conduct tube-to-tube directional checks.

Mastering Maneuvering. One area that readily became apparent to everyone throughout the brigade was the enhanced maneuvering capability of a Paladin battalion. Artillery units are no longer tied to "ducks in a row" or the "desert wedge" movement techniques. We now have the capability to maneuver like armor and infantry—our challenge is to master the techniques that allow us to do so.

We had not had a chance to focus on this during home-station training, and it showed in the early days of our NTC rotation. However, as leaders grew more comfortable with their Paladins, they began to experiment with different techniques and formations for both movement and firing. As a result, moving as part of a maneuver force in a forward passage-of-lines was no longer a major issue as we could occupy and fire as needed.

Tank commanders are trained to fire, move and fire from a different location. Paladin commanders use the same concept as they rove around a position area conducting survivability moves. At Fort Stewart, the division artillery is developing maneuvering training exercises to develop our land navigation and maneuvering skills, both in the field and at our simulation center.

Tactical Information Flow. As the rotation progressed, so did the capabilities of our leaders at all levels to fight—not just move and fire. A key component of this was improving the flow of tactical information down to the soldier.

To take full advantage of a Paladin battalion's capabilities, we had to provide leaders—to include Paladin commanders—a greater situational awareness of the battlefield before and during each operation. During planning, they needed to know likely enemy avenues of approach, where to expect chemical strikes and the location of friendly mine fields and passage points. During execution,

The Paladin Platoon Leader at the NTC

The M109A6 Paladin platoon leader supervises a more mobile and dispersed platoon than other M109 platoons. He operates more autonomously and has increased responsibilities. What follows are thoughts of a Paladin platoon leader with the 3d Battalion, 41st Field Artillery after a rotation at the National Training Center (NTC), Fort Irwin, California.

POC Operations. The platoon operations center (POC) is the hub of activity for the platoon and mirrors the battalion tactical operations center (TOC). It includes the fire direction center (FDC) and platoon leader's vehicle, when available. Generally, the fire direction officer (FDO) focuses on tactical and technical fire direction from within the M577 vehicle while the platoon leader maintains tactical awareness, often from the M577's tent extension. He monitors the fire direction nets and, by remoting the radio from his vehicle, the battalion command net. The platoon leader's primary focus is his status/ammunition board and the maneuver board.

The platoon leader no longer walks the "line of metal" during tactical operations; he maintains communications with the sections through the platoon internal voice net. The platoon and gunnery sergeants conduct inspections, verify databases and develop the platoon defense.

During offensive operations at the NTC, we often modified the POC layout to facilitate rapid setup and breakdown, especially in movements-to-contact. One technique was to place the status and maneuver boards next to the M577 (without the tent extension). Another option might be to mount the boards in the platoon leader's vehicle to eliminate setup time. However, one must remember the POC also must have access to information on the boards.

Platoon Guidance. With all positions in the platoon undergoing some transformation, the platoon leader must give clear and concise orders to the platoon leadership. The section chiefs have greater responsibility as the senior leaders on the forward line. The POC will be at least 200 meters to the rear, preferably in a hide area.

The platoon leader must be able to conduct troop-leading procedures (TLPs) over the radio. His initial warning order (WARNO) must be clear enough for each section chief to prioritize and accomplish his tasks before crossing the line-of-departure (LD).

The platoon leader must see the gunnery sergeant before or immediately after the WARNO to focus his reconnaissance. Recon considerations include: the sections' ability to move within a large fire area, routes into and around the position, whether it conflicts with maneuver elements, communications to the TOC, a potential POC position and center grids for each pair's fire area. Although the gunnery sergeant no longer prepares the position, he still must have the vision to see how the platoon could occupy it.

The platoon leader keeps tabs on the platoon's "pulse" with the platoon sergeant ensuring the sections complete their tasks. The platoon sergeant has the time-consuming task of conducting most inspections; the platoon leader will choose some to conduct.

The platoon leader makes a tentative plan. He then briefs the section chiefs and gives each section maneuver graphics (at a minimum) to post and maintain. The graphics are essential because the sections will maneuver on the battlefield autonomously and need to know where boundaries are and where they can expect friendly maneuver elements.

SFC Charles Golden

With Padadin's increased range, improved ready-to-fire times and maneuvering capability, the NTC seemed to shrink.

they needed to know the actual locations of chemical strikes, enemy mine fields and enemy and friendly forces. Our Paladin commanders need this information to operate autonomously and take the initiative,

maximizing the fighting capabilities of their Paladins.

Battery Orders Process. One area we struggled with and will continue to focus on during home-station training is a battery-platoon orders process and troop-leading procedures. Our FA manuals have very little TTP in this area, and our officer and NCO courses don't focus on it. The NTC observer/controllers have seen this weakness in several units and guided us to the *Ranger Handbook* and maneuver manuals. In addition, the article "Troop-Leading Procedures for the Battery Orders Process" by Captains Scott A. Westley and Thomas L. Kelly, both observer/controllers at the NTC, that appeared in the June edition is helpful. To truly "fight" Paladin, our battery commanders, platoon leaders and NCOs, like their maneuver counterparts, must master these procedures.

Land Management. At the battalion level, many challenges are the same as those found in an M109A2 unit but with a different twist. For example, land management became a bigger challenge as we tried to find space to emplace our Paladin pairs, especially during brigade operations. With our increased range, improved ready-to-fire times and maneuvering capability, the NTC seemed to shrink as we attempted to coordinate land with maneuver headquarters.

Maneuver staffs had been used to us requesting a limited number of well-defined position areas. With Paladin, we were asking to operate in large sectors or along an axis of advance. We compromised. At one point, we had Abrams, Bradleys and Paladins all collocated and live firing—the *ultimate* combined arms team experience.

By the end of the rotation, we had employed land management sectors, limits-of-advance by phase, position areas and anything else that fit the situation. The key is that our maneuver counterparts began to see us everywhere and realized we wouldn't interfere with their operations.

Paladin FDO Challenges. A Paladin battalion fire direction officer (FDO) faces the same challenges as his M109A2 counterpart—but, again, with some twists. The FDO's biggest challenge is knowing how many guns truly are available at any one time to determine the proper volume of fire. An M109A2 platoon or battery normally occupies a position and is ready to fire as a group. Paladin platoon combat power builds two guns at a time, and

Next, the platoon leader sets times for movement and fire direction rehearsals, if possible. At the movement rehearsal, at least the section chiefs, gunnery sergeant, platoon sergeant and FDO should be present. Ammunition team chiefs (ATCs) should participate if the operation calls for the ammunition carriers to be in an overwatch area. The FDO runs the fire direction rehearsal with the targeting information available, so each section chief can verify his database, expected ammunition expenditure and any special missions.

Combat Service Support (CSS). Coordinating and supervising CSS for the platoon is a challenge. During a movement-to-contact, the first sergeant could be several kilometers away with recovery and maintenance assets in the battery trains. The platoon leader must know how to contact the first sergeant quickly, as necessary. He also must work with the battery motor sergeant before an operation to ensure repair part needs are anticipated.

Additionally, the platoon leader stays in constant contact with the sections to anticipate their needs for Class III Petroleum, Oil and Lubricants (POL). In 24-hour operations, the section that will need the most POL is the POC. The FDC chief and the platoon leader must be aware of the POC's consumption of motor gas, allowing enough time to travel to and from the combat trains.

Finally, the platoon leader tackles ammunition management. He reconnoiters the ammunition upload site and coordinates with the battalion ammunition officer or his representative. There he verifies his platoon's upload. Then he briefs the section chiefs and the ATCs on their basic load. Before the ATCs leave the site, the platoon leader should verify, once again, each section's upload. This all happens in about 30 minutes—one of several reasons the ATCs must be very competent soldiers.

The platoon leader ensures the POC has the correct count for each section as reported by the section chiefs through the database. Paladin operations increase ammunition management challenges for the section chief; he must have an accurate count of the ammunition on his gun and his ammo carrier, even though his carrier may be hundreds of meters away.

Conclusion. Essentially, the platoon leader's job remains the same no matter what the weapon system is: he leads soldiers to survive and win on the battlefield. The Paladin upgrades our technology to match the skills and capabilities of our outstanding Redlegs.

CPT Kirk S. Hunter, FA
Former Platoon Leader, 3-41
FA 24th ID (Mech), Fort Stewart, GA

although the guns are capable of quick ready-to-fire times, there are other reasons that can cause them to be unavailable (i.e., bad terrain, loss of communications, poor ammunition management, etc.).

A second challenge is that Paladin's flexibility can result in an FDO's trying to do too much at one time. In several instances during live firing, one platoon was firing illumination, another was firing family of scatterable mines (FAS-CAM) while still another was firing rocket-assisted projectiles and high-explosives in both the counterfire and close support roles. This variety of actions in one battalion is possible (we did it), but it's a real challenge for the battalion FDO to keep up with the required volume of fire with killer munitions.

Ammo Management. Even with the increased agility offered by our new systems, ammunition management was a continuous challenge throughout the battalion. At any one time, we had guns and FAASVs spread out over several kilometers. This required the battalion to have a very accurate count to select the best battery, platoon or, in some cases, pair to execute a mission. While planning didn't get easier, the inherent capabilities of our systems allowed us to overcome inadequate planning or unforeseen events during execution. One battle illustrates this best.

We had war-gamed Alpha Battery shooting a FASCAM mine field with white-bag powder charge as the brigade conducted a forward passage-of-lines. The battle didn't go as planned, and we found ourselves needing to shoot the FASCAM from red-bag range. The battalion FDO knew that Charlie Battery had the most red-bag charges, but the battery would have to move forward seven kilometers, occupy a position and begin firing, all within 20 minutes. Charlie Battery moved, occupied and fired within 20 minutes, but the battery commander soon notified the FDO that he was short 15 red-bag powders. The Bravo Commander overheard the conversation, rounded up some red-bag powders and sent them via FAASV to Charlie Battery so it could finish the mission. The FASCAM mine field was fired and emplaced to standard in 18 minutes.

The Brigade Fight. The Paladin battalion dramatically alters a brigade commander's fight. Armed with Paladin, he can fight and destroy enemy forces out to 30 kilometers, meaning he can set the conditions for success for the close battle much earlier than with an M109A2 battalion.

My brigade commander's one standing critical fire support task was to limit the impact of opposing forces (OPFOR) artillery on friendly forces. Between ourselves and 4-82 FA of the 142d FA Brigade, our M109A2 reinforcing battalion from Fort Polk, Louisiana, we successfully accomplished this mission.

This was a dramatic improvement over our M109A2 NTC rotation two years ago. Then it seemed I only had two decisions: (1) keep the artillery alive through constant movement—but never be able to provide timely fires, or (2) provide fires—but take heavy losses. I never faced this dilemma during the Paladin rotation.

While Paladin improved the brigade commander's ability to fight enemy artillery early, we weren't as successful in attacking OPFOR maneuver forces at Paladin's maximum range. We emplaced scouts and combat observation lasing teams (COLTs) deep to develop both named areas of interest (NAIs) and target areas of interest (TAIs), but we were always hindered in execution because of inadequate communication systems. Specifically, we did not have the long-range communications (digital or voice) to allow the brigade commander to fight his Paladin battalion throughout the depth of the battlefield. We tried various techniques to solve this problem, to include using relays and creating additional retransmission capabilities from internal assets, but with limited success.

Final Thoughts. I've highlighted some of our Paladin experiences to give you a feel for what's on the horizon. Other areas that we're working on include, battery defense techniques, mass casualty evacuation procedures, battle tracking down to the section level and command and control.

As a Paladin battalion commander, I found my thought processes quite different while fighting the battalion at the NTC. In our 1993 M109A2 NTC battles, I was continually concerned about achieving the five factors for accurate, predicted fires while facing unpredictable ready-to-fire times, being out of range or being outrun by friendly maneuver forces. Too often, I had to be concerned with the mechanics of delivering fires.

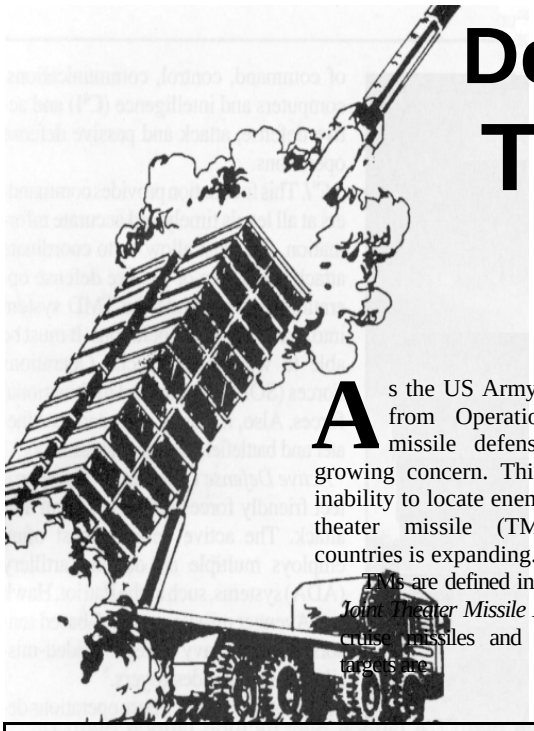
As we gained experience with our new Paladin systems at the NTC in 1995, it became apparent the battalion could handle those challenges routinely. The battalion's ability to deliver fires, not unlike that of an Abrams- or Bradley-equipped battalion, had become a "given"—fire support had my full attention. During a fight, battle command became my entire focus. I had my first taste of what it must be like to be a "maneuver" commander—it was *great*.

One last note. The Paladin howitzer is only as good as the soldiers who use it. We finally have a cannon system that allows us to leverage the leadership and warfighting capabilities of our soldiers.

On our last day at the NTC, the brigade defeated the OPFOR regiment during a movement-to-contact. Artillery played a key role in the battle as we had in a successful brigade live-fire night defense a few days earlier. At the end of the day, I saw one of my Paladin commanders, a veteran of several NTC rotations. I asked him how his rotation went...he said, "We were always in position and ready to fire; we lived, the enemy died and we never had to run. We won some battles—it was a 'done deal.'"

The challenge is to build on this warfighting spirit and take advantage of the revolutionary changes Paladin and its associated new systems allow.

Lieutenant Colonel Robert J. Fronzaglia until recently commanded the 3d Battalion, 41st Field Artillery, 24th Infantry Division (Mechanized), Fort Stewart, Georgia. The unit was one of the first direct support battalions to be fielded Paladins and the first to rotate to the National Training Center at Fort Irwin, California. Currently, he's a Program Budget Officer in the Office of the Assistant Secretary of the Army (Financial Management and Comptroller) at the Pentagon. He served as the S3 for the 2d Battalion, 17th Field Artillery, III Corps Artillery, in the Gulf during Operations Desert Shield and Storm and as the battalion's Executive Officer, at Fort Sill, Oklahoma. He commanded two batteries in the 4th Infantry Division (Mechanized) at Fort Carson, Colorado.



Developing TTP for Theater Missile Defense

by George A. Durham

As the US Army reflects on lessons learned from Operation Desert Storm, theater missile defense (TMD) has become a growing concern. This concern is based on our inability to locate enemy Scuds at a time when the theater missile (TM) threat in third-world countries is expanding.

TMs are defined in *Joint Pub 3.01.5 Doctrine for Joint Theater Missile Defense* as "...ballistic missiles, cruise missiles and air-to-surface missiles whose targets are within a given theater of operation."[1] The TM threat is based on the assumption that future opponents will choose to acquire inventories of TMs readily available (see Figure 1). The proliferation of these weapon systems are a result of the demise of the Soviet Union and the increased military export capability of the third world.

TMs, which are capable of carrying weapons of mass destruction, are an unacceptable force multiplier for a threat with whom the United States may find itself engaged. Picture the build-up phase during

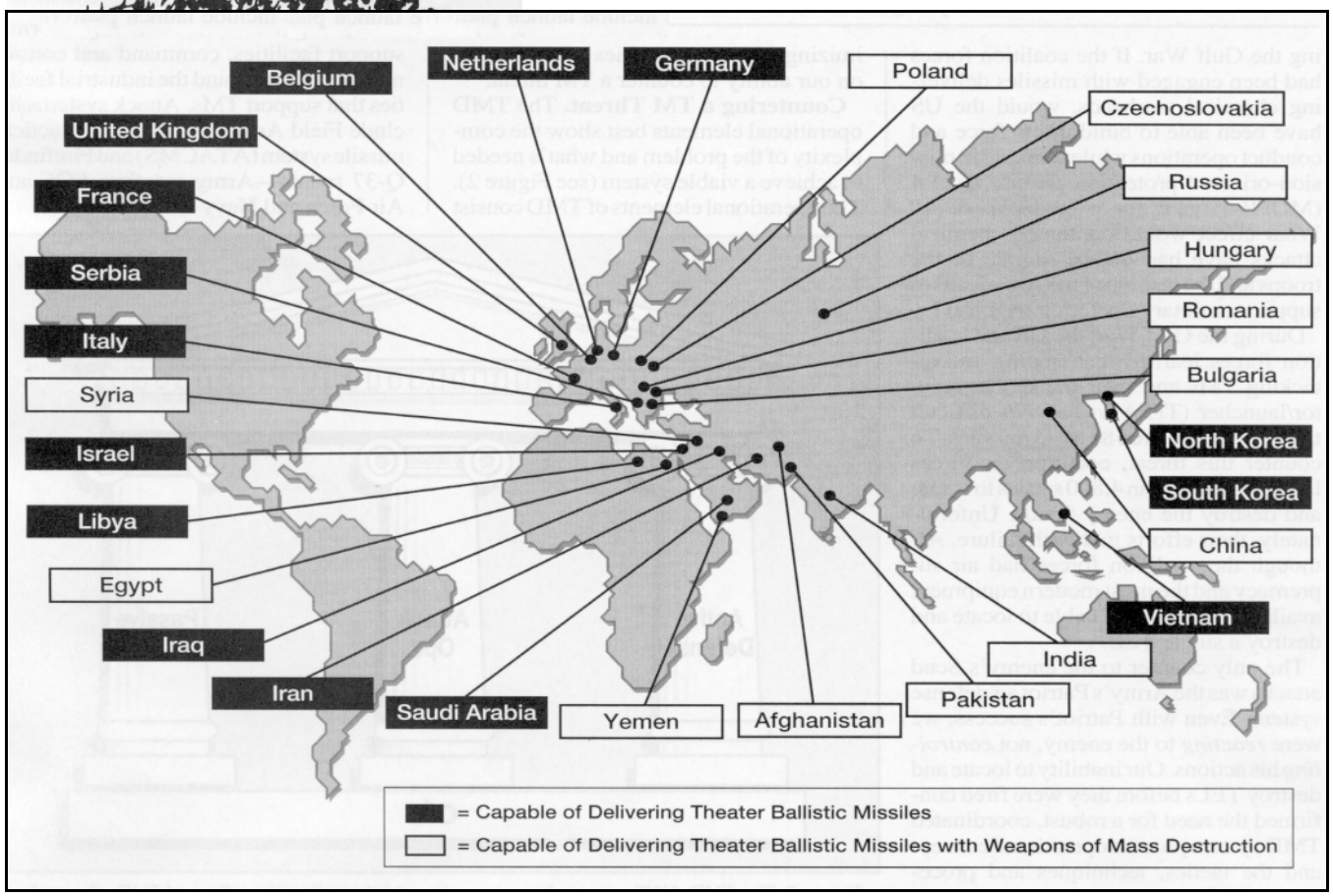


Figure 1: The TM Threat. This figure shows the worldwide proliferation of theater missile capabilities with the countries shown in the white boxes capable of delivering weapons of mass destruction in their missiles: nuclear, biological or chemical agents.

Soldiers of the 11th Air Defense Artillery Brigade set up a Patriot.

the Gulf War. If the coalition forces had been engaged with missiles delivering chemical warheads, would the US have been able to build up its force and conduct operations while working in mission-oriented protection posture level 4 (MOPP-4) gear for extended periods? What effect would continued chemical attacks have had on the morale of the troops and the resolve of the Americans to support a military operation overseas?

During the Gulf War, the US and coalition forces learned that finding and attacking TMs and their transporter/erector/launcher (TEL) was a very difficult task. The Iraqis fired 88 Scud missiles. To counter this threat, coalition air forces launched more than 4,800 sorties to locate and destroy the enemy Scuds. Unfortunately, their efforts met with failure. Although the coalition forces had air supremacy and the most modern equipment available, they weren't able to locate and destroy a single TEL.

The only counter to the enemy's Scud attacks was the Army's Patriot air defense system. Even with Patriot's success, we were *reacting* to the enemy, not *controlling* his actions. Our inability to locate and destroy TELs before they were fired confirmed the need for a robust, coordinated TMD system plus the operational concept and the tactics, techniques and procedures (TTP) to execute it. In future conflicts, the ability of the Army to defeat an enemy swiftly and decisively while minimizing friendly casualties could depend on our ability to counter a TM threat.

Countering a TM Threat. The TMD operational elements best show the complexity of the problem and what's needed to achieve a viable system (see Figure 2). The operational elements of TMD consist of command, control, communications, computers and intelligence (C^4I) and active defense, attack and passive defense operations.

C^4I. This foundation provides commanders at all levels timely and accurate information. C^4I must allow us to coordinate attack and active or passive defense operations and integrate the TMD system into overall combat operations. It must be able to work with Special Operations Forces (SOF) and joint and multinational forces. Also, it must give us accurate theater and battlefield damage assessments.

Active Defense Operations. These protect friendly forces and assets from TM attack. The active defense most often employs multiple air defense artillery (ADA) systems, such as the Patriot, Hawk and Avenger missiles; ground-based sensors; and the Navy's Aegis guided-missile cruisers and destroyers.[2]

Attack Operations. These operations destroy the enemy's capability to launch TMs. Targets include launch platforms, support facilities, command and control nodes, stockpiles and the industrial facilities that support TMs. Attack systems include Field Artillery—the Army tactical missile system (ATACMS) and Firefinder Q-37 radars—Army aviation, SOF and Air Force and Navy attack systems.[3]

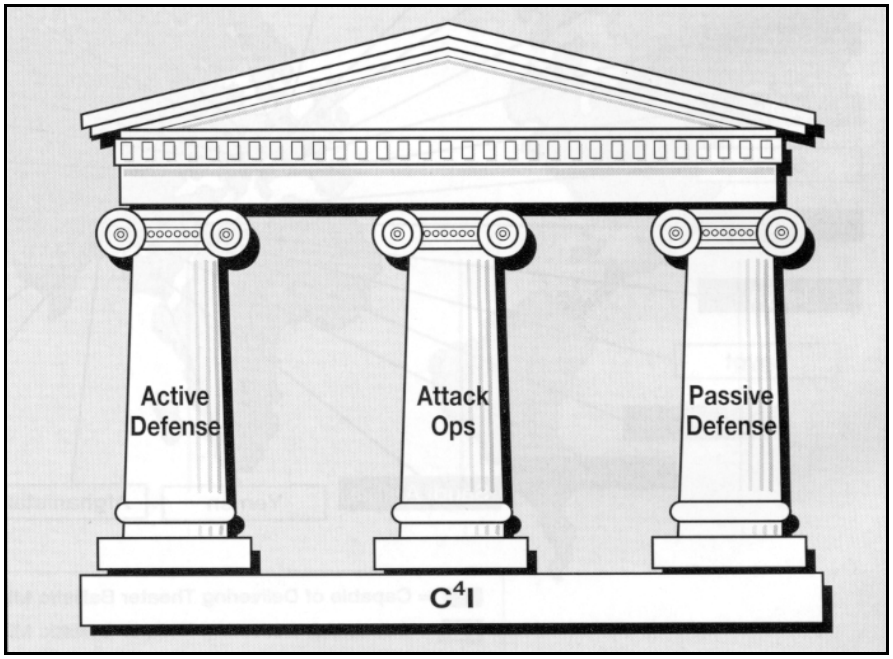


Figure 2: The TMD-AWE was an Army experiment integrating the pillars of TMD, shown here grounded on the fourth pillar, command, control, communications, computers and intelligence (C^4I).

Passive Defense Operations. These operations reduce the friendly force's vulnerability, minimize the effects of TM attacks on the tempo of operations and enable the force to recover and reconstitute after an attack. Countermeasures using nuclear, biological and chemical (NBC) reconnaissance units; biological integrated detection systems (BIDS); multipurpose integrated chemical agent detectors (MICAD); and NBC reconnaissance systems alert the force to the TM threat and provide early warning of an attack.[4]

Developing TMD Capabilities. TMD is inherently a joint mission. Given the complexity of the mission and the ranges of the various threat systems, the problem is how to use all means available to locate a TM and assign the best weapon to attack and kill the system. Past efforts in TMD had been "stove-piped," with each service—even branches within the Army—developing separate approaches to accomplishing TMD operations.

To address the issues of TMD from the Army perspective, a "Manhattan Project" style study was implemented in April 1994. Its purpose was to assess the Army's TMD status and capabilities, identify gaps and validate the need for a TMD advanced warfighting experiment (AWE). The result was a TMD-AWE conducted 28 April through 10 May at Fort Bliss, Texas, and White Sands Missile Range, New Mexico.

The TMD-AWE will culminate with the presentation of three products to the Chief of Staff of the Army in October, The products are the TMD Concept for Force XXI Operations, an Army TMD TTP manual and an integrated TMD assessment. The latter product identifies TMD capabilities and shortfalls—the doctrine, training, leadership, organizational design, materiel and soldier solution sets needed to support TMD now and by 2001 and a strategy for investment in technology and equipment to improve TMD operations.[5]

The TMD-AWE used a multi-tiered approach to achieve its objectives. First, a force and threat laydown was developed based on current and projected US and threat force structures. Second, an analysis was conducted using models and simulations to integrate all elements of TMD and gain insights on current and programmed force structures. Third, the TMD-AWE leveraged off Exercises Roving Sands and Optic Cobra to gain insights on TMD issues and solutions. Fourth, the live exercise results in Optic Cobra were fed back to the modeling and simulations process to refine the outputs.[6]

The TMD-AWE was organized with the Director of the Depth and Simultaneous Attack Battle Lab at Fort Sill, Oklahoma, as the integrator and the Commanding General of the Air Defense School at Fort Bliss as executor. It was executed in conjunction with the largest air defense exercise in the world: Roving Sands. There were more than 24,000 participants from the US Army, Marines, Navy and Air Force as well as Germany and the Netherlands.

Within Roving Sands, four concurrent but transparent experiments were conducted with TMD AWE. This allowed TMD-AWE planners to share resources and plan exercises to gain operational insights into the TMD operational elements (Figure 3). The concurrent exercises were Joint Project Optic Cobra (JPOC), a Commander-in-Chief experiment focused on joint TMD attack operations; Operational Concept Demonstration (OCD), an US Air Force attack operations and command and control experiment; Special Project Night Vector (SPNV), a US Navy project to link various joint and national intelligence programs; and the US Army's TMD-AWE.

Two objectives of the TMD-AWE were to assess the joint forces' capabilities to execute TMD operations in accordance with joint doctrine and the Army's capabilities to execute its draft TMD operational concept. It was a live, free-play exercise linked to constructive simulations to create a synthetic theater of war (STOW) environment. While much of the exercise was simulated, the live players included Central Command (CENTCOM); 3d Army; III Corps Artillery; the 11th, 35th and 108th Air Defense Artillery Brigades;

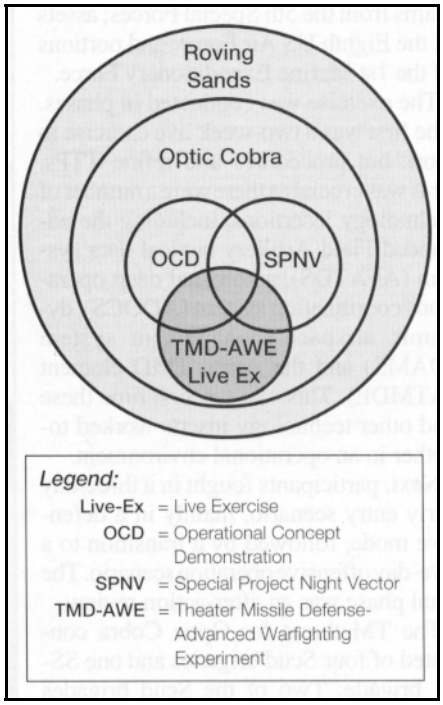


Figure 3: The TMD-AWE leveraged resources from Roving Sands, an integrated air defense live exercise, and Joint Project Optic Cobra, a program focusing on joint TMD attack operations.

The Army TMD Element's (ATMDE's) Force Projection Tactical Operations Center (TOC) during the TMD-AWE

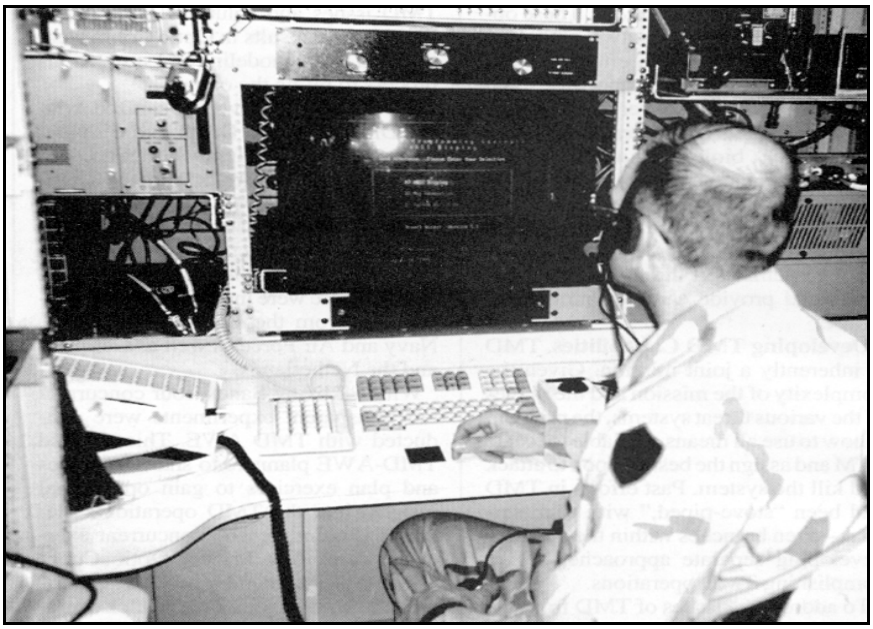
teams from the 5th Special Forces; assets of the Eighth US Air Force; and portions of the 1st Marine Expeditionary Force.

The exercise was conducted in phases. The first was a two-week live exercise to work out procedures and refine TTPs. This was crucial as there were a number of technology insertions, including the advanced Field Artillery tactical data system (AFATDS), automated deep operations coordination system (ADOCS), dynamic airspace management system (DAMS) and the Army TMD element (ATMDE). This was the first time these and other technology inserts worked together in an operational environment.

Next, participants fought in a three-day early entry scenario, mainly in a defensive mode, followed by a transition to a five-day offensive operation scenario. The final phase was an after-action review.

The TM threat for Optic Cobra consisted of four Scud brigades and one SS-21 brigade. Two of the Scud brigades were simulated while the other two were a combination of simulated and actual equipment. Operational threat equipment used included 15 TELs, 19 decoys, 18 command and control and logistical vehicles, four SA-6 surface-to-air missile batteries and eight ZSU 234 surface-to-air guns. The SS-21 brigade, two TELs and some of the command and control and logistical vehicles were manned.

Learning About TMD. The initial analysis of the AWE shows that, overall, the TMD-AWE was a success. Although we still have much to learn, this exercise taught us a great deal about TMD operations and TTP.



Soldiers of the Army Space Command work inside the Force Projection TOC.

ATMDE. This element was developed by the Army Space Command and made its operational debut in the AWE. It provides C^4I for TMD and is designed to be flexible enough to support early entry or theater-level operations for the land component commander (LCC). The ATMDE has 20 personnel who operate out of five high-mobility multipurpose wheeled vehicles (HMMWVs) with shelters that contain state-of-the-art communications and automation equipment.

The ATMDE demonstrated its ability to plan, coordinate and execute TMD activities. During the AWE, the element successfully tracked simulated incoming Scud missiles, alerted air defense units, warned friendly units in the predicted impact area and coordinated Army and Air Force missions against Scud launchers and resupply bases. In addition, the ATMDE provided the LCC an early entry TMD capability.

As the AWE changed its focus to offensive operations, the ATMDE was assigned additional attack assets. In conjunction with the corps deep operations coordination cell (DOCC) and the Army G3, it generated missions to attack TMD targets by passing updated intelligence reports to the aviation brigade, which diverted helicopters en route for a mission to an on-order TMD target.

Special Operations Forces. The TMD-AWE validated the use of SOF teams to locate Scud missile launchers and resupply base. SOF teams infiltrated enemy territory and located and passed targeting data on Scud launchers. The result was that targets were destroyed before they were able to launch their missiles.

In the early entry stage of the exercise, the SOF team provided targeting data and gathered priority intelligence requirements in support of the intelligence preparation of the battlefield (IPB) process.

An Apache helicopter from 3-6 Cavalry pulls maintenance during the TMD-AWE.

Photo by SFC Richard Glynn, Fort Bliss PAO

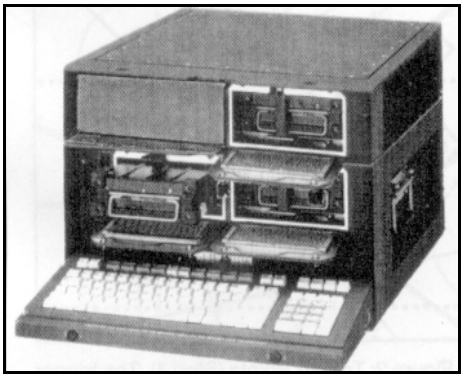
The Russian-made Hind-F helicopter played in the TMD-AWE as part of the threat force.

Photo by CPT Thomas Collins, Fort Bliss PAO

An SS-21 surface-to-surface missile launcher conducts a fire mission in the TMD-AWE.

Unmanned Aerial Vehicles (UAVs). The TMD-AWE also validated the use of UAVs to locate and target enemy missile launchers. The Predator UAV provided intelligence used by both Army and Air Force attack systems to destroy missiles prior to their being launched.

Firefinder Radar. The Q-37, manned by soldiers from III Corps Artillery, proved highly accurate and reliable for detecting the launch of enemy ballistic missiles in less than 30 seconds. Various communications protocols were used during the exercise to determine the most beneficial method of reporting launch detections to both attack operations headquarters and active defense units. The Firefinder proved to be the only system on the battlefield capable of simultaneously reporting TMD-related information to active and passive defense and attack operations units within the time standards and accuracy necessary to affect the TMD fight.



The new AFATDS allowed exercise participants to process data rapidly for short-dwell enemy launchers.

AFATDS/ADOCS. These two systems demonstrated the capability of automated systems to process and pass data to engage short-dwell, high-payoff targets.

Army Weapons. Apache helicopters and ATACMS made significant contributions to attack operations and demonstrated the Army's ability to contribute to the defeat of TM targets out to a range of 300-plus kilometers.

Continuing TMD Developments. There's still much work to do. The services need to develop and adopt joint airspace coordination procedures and a common target numbering system and to refine TMD and joint fire support TTP at the corps and echelons-above-corps levels.

The Army must continue its efforts to provide early warning to units affected by TMs. Very short-range ballistic missiles and free-flight rockets are a threat, and we must refine the means to detect and destroy them.

From World War II to the present, land forces and the civilian population have been at the greatest risk from missile and rocket attack. In World War II, the rockets fired against London brought terror to the civilian populace. As witnessed in the Iran-Iraq war, TMs coupled with weapons of mass destruction cause thousands of casualties.

To counter the growing TM threat, we must continue our efforts to produce a TMD operational concept to support Force XXI and devise and refine TTP to implement that concept. Then, together with our sister services, we must stay combat ready to counter any TM threat.

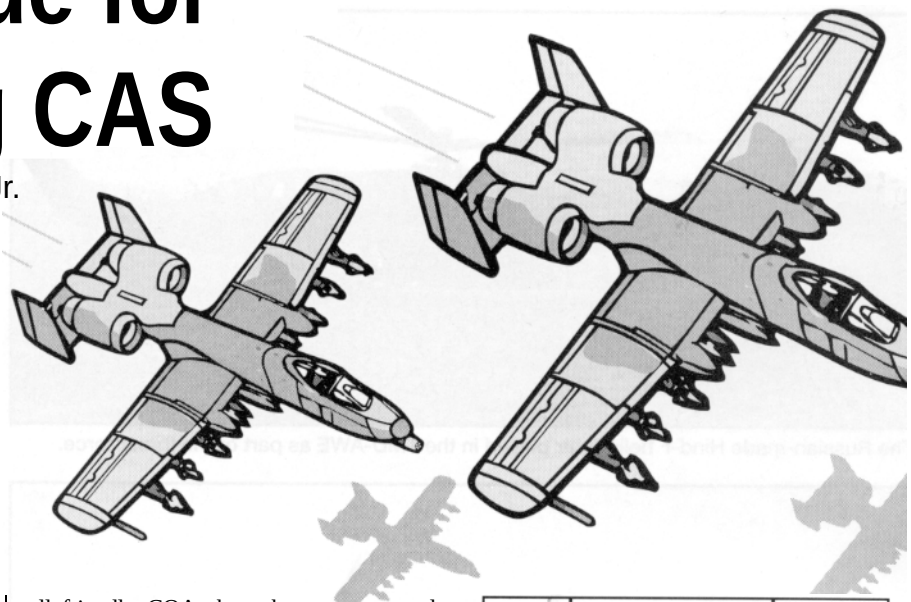
Notes:

1. Joint Chiefs, *Joint Pub 3.01.5 Doctrine for Theater Missile Defense* (Proposed Publication) (Washing ton, DC; 17 March 1994), 1-3.
2. U S Army Training and Doctrine Command (TRADOC), "Theater Missile Defense Advanced Warfighting Experiment Information Booklet" (Fort Bliss, Texas; n.d.), n.p.
2. Ibid., n. p.
3. Ibid., n. p.
4. Ibid., n. p.
5. US Army, TRADOC, "Theater Missile Defense Advanced Warfighting Experiment 1995 Final Live-Exercise Report" (Draft) (Fort Bliss, Texas: 25 May 1995), 2.
6. Ibid., 2.

George A. Durham has been the Deputy of the Depth and Simultaneous Attack Battle Laboratory at Fort Sill, Oklahoma, since May 1992. His previous assignment was as Director of the Soviet Artillery Effects Program, Directorate of Combat Developments (DCD), part of the Field Artillery School at Fort Sill. George Durham was Executive Officer for a Department of the Army Special Action Team for Corps Support Weapons Systems developing the Army tactical missile system (ATACMS). Before retiring from the Field Artillery as a Major, he served as Executive Officer of the 4th Battalion, 4th Field Artillery, III Corps Artillery at Fort Sill and commanded two batteries: Service Battery, also in the 4th Battalion, 4th Field Artillery; and B Battery, 1st Battalion, 8th Field Artillery, 25th Infantry Division (Light), Schofield Barracks, Hawaii. He's a graduate of the Command and General Staff College, Fort Leaven-worth, Kansas.

A Technique for Employing CAS

by Captain Samuel R. White, Jr.



The availability of close air support (CAS) to the maneuver brigade offers the commander an extremely effective means to project combat power beyond the range of direct fire weapon systems. CAS—together with Field Artillery, electronic warfare (EW) and engineer efforts—forms the backbone of the brigade's deep operations. These operations can set favorable conditions for the decisive close fight.

CAS affords the brigade significant flexibility and lethality in conducting deep operations that, when used in concert with other deep attack systems, can have a devastating effect on the enemy. Sadly, the full effects of CAS are rarely achieved during a campaign at the National Training Center (NTC), Fort Irwin, California.

Throughout a campaign, a brigade's efforts to employ CAS are routinely thwarted by a number of factors: too many target grids generated from a variety of sources; ineffective airspace deconfliction; lack of suppression of enemy air defenses (SEAD), both lethal and non-lethal; and lack of qualified air controllers at the right place and time. Gradually, integrating CAS into the operation becomes viewed as "too hard."

In actuality, CAS *is* too hard with little or no planning. Generally, the brigade intends to employ CAS but doesn't plan to employ CAS. The transition from intent to planning is obviously the key to success.

Precious few tactics, techniques and procedures (TTP) exist to assist the brigade plan CAS employment. This article explains TTP developed at the NTC for employing CAS.

Step 1: The targeting team determines where CAS is to be targeted during the operation. The determination begins during analysis in course of action (COA) development and continues through hasty war gaming with the "where" synchronized with other fire support during the deliberate war gaming session. It isn't within the scope of this article to cover the war-gaming session; *CGSC Student Text (ST) 101-5 Staff Decision Making Process* outlines the process in detail. When all friendly COAs have been war gamed against all enemy COAs and branches and sequels have been identified, there will be many potential CAS targets across the area of operations.

Step 2: Graphically portray the potential CAS targets on an overlay. A standard target symbol (+) can be used; however, this target symbol must be distinguishable from an artillery target. A different color (blue, for example) may be used, or CAS may be annotated in the upper right quadrant of the target symbol.

Step 3: Construct a CAS target box (CTB) around the CAS target. The CTB is the area around the target in which the particular enemy formation could be found, based on the one COA for which the target was developed. The CTB defines the area within which (1) we can expect to find the enemy, (2) we have the capability to engage the enemy and (3) we can achieve the desired effects on the enemy. Each CAS target will have only one CTB. The CTBs should be numbered on the overlay for reference. (See Figure 1.)

Step 4: Graphically portray the triggers or decision points (DPs) for each CTB on the overlay. The trigger or DP is the point the enemy formation reaches that activates a particular CTB for engaging the formation. (See Figure 2.) The trigger or DP must be far enough from the CTB to allow sufficient time to execute the variety of events associated with attacking into the CTB—for example, the nine-line mission brief, SEAD, flight time from the initial point (IP), etc. These triggers or DPs are numbered to correspond

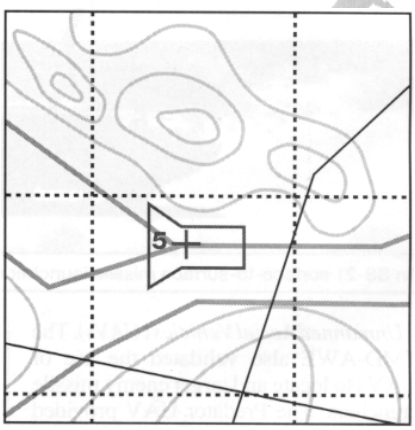


Figure 1: CAS Target Box, or CTB (Step 3). Each CAS target has a CTB, which is numbered for reference.

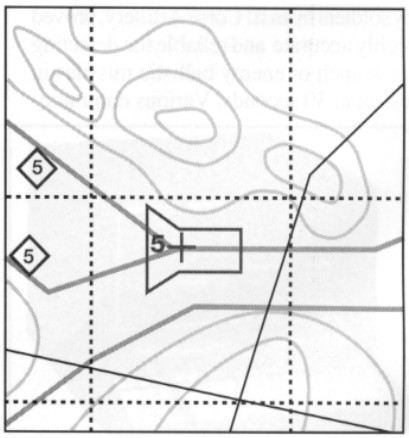


Figure 2: Trigger Points (Step 4). The trigger points are diamond-shaped and have the same number for the CAS target they reference.

with the CTB. The trigger or DP also should be included on the fire support execution matrix (FSEM) and the brigade decision support matrix (DSM) and its template or brigade synchronization matrix.

An example of a completed CAS overlay (Steps 1 through 4) is shown in Figure 3.

Step 5: Construct CTB cards for each CTB. These 5x8 cards contain vital information regarding a CAS mission on a specific target at a specific CTB (Figure 4). Each CTB has its own card. The CTB card is a tool for detailed CAS planning, serving as the checklist for a particular engagement. The obvious benefit is that the details—such as airspace coordination areas (ACAs), SEAD, control and the like—are addressed during planning, not execution.

The CTB card in Figure 4 is for the CTB introduced in Figure 1. In this example, CTB Card #5 is for CAS to engage an enemy moving armor battalion. Thus, when the target is acquired at Trigger 5, the fire support officer (FSO) announces CTB 5 is activated; all fire supporters simply refer to that card for the coordinating data. The controlling tactical air control party (TACP), RAVEN 18, knows he'll control; and the FSE, intelligence and EW support officer (IEWSO) and fire direction center (FDC) know the ACA and intent for SEAD. The nine-line CAS briefing can be completed by extracting data from the card.

The card's line-row reference system permits efficient updates at any phase: planning, preparation or execution. For example, using the reference "Line 3B of CTB Card #5," it's easy to change the line from "Bn 2 DPICM" (battalion, 2 rounds of dual-purpose improved conventional munitions) to "Bn 1 HE/VT" (battalion, one round of high-explosive munition/variable-time fuze). The artillery battalion and all FSEs should receive copies of the CTB cards.

This article has explored one set of TTP for rapidly employing CAS on the battlefield with minimum confusion. CAS overlays and CTB cards offer a way to systematically walk through the planning and execution of close air support. Regardless of the steps used, thorough planning is the only way to ensure success with CAS.

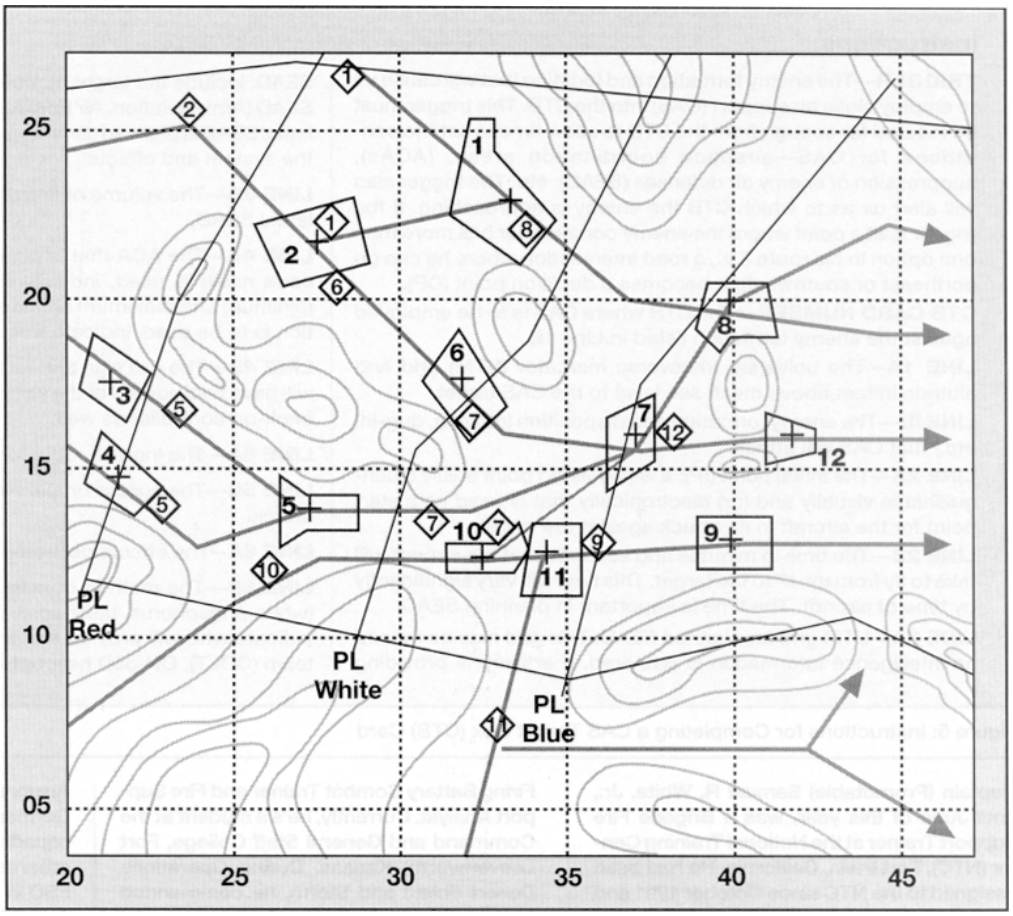


Figure 3: A Completed CAS Overlay

TRIGGER ◇5		CTB CARD # 5
LINE	**A**	**B**
1	**TARGET GRID** NK 272139 **TARGET ALT** 3014 MSL	**TARGET DESCRIPTION** Moving Armor Battalion
2	**IP** X-RAY	**TIME-IP TO TGT** 2 min 37 sec.
3	**SEAD TGT** AJ 0117 **NON-LETHAL:** Jam ADA	**VOLUME** BN (2) DPICM
4	**ACA** EAGLE	**CONTROL** RAVEN 18 **ALTERNATE:** SILKY 20
5	**INGRESS** (W) along ridge stay (N) of E-W road	**EGRESS** (E) along ridge stay (S) of E-W road
6	**EFFECTS** Destroy 3 BMPs	**MARKING** Laser COLT 2 PRF 226

Legend:
ADA = Air Defense Artillery
BMPs = Soviet-Made Tracked Infantry Combat Vehicles
DPICM = Dual-Purpose Improved Conventional Munition
PRF = Pulse Repetition Frequency

Figure 4: A Completed CAS Target Box (CTB) Card. (See Figure 5 on Page 24 for instructions on how to complete this card.)

Instructions:

TRIGGER—The enemy formation and location that will cause us to employ close air support (CAS) into the CTB. This trigger must be located far enough from the CTB to allow time to set the conditions for CAS—airspace coordination areas, (ACAs), suppression of enemy air defenses (SEAD), etc. The trigger also will alert us as to which CTB the enemy is approaching. If the trigger is at a point where the enemy commander has more than one option in his route (i.e., a road intersection where he can go northeast or southwest), it becomes a decision point (DP).

CTB CARD NUMBER—The CTB where CAS is to be employed against the enemy formation listed in Line 1B.

LINE 1A—The universal transverse mercator (UTM) grid and altitude in feet above mean sea level to the CAS target.

LINE IB—The enemy formation and disposition (moving, dug-in, etc.) that CAS will attack.

LINE 2A—The initial point (IP): a well defined point easily distinguishable visually and (or) electronically that is used as a start point for the aircraft in its attack against the target.

LINE 2B—The time in minutes and seconds that the aircraft will take to fly from the IP to the target. This time will vary significantly by type of aircraft. The time is important in planning SEAD.

LINE 3A—UTM grid for planned SEAD. This grid may be refined as intelligence information is gathered. If artillery is providing SEAD, include the target number. If another system is providing SEAD (Army aviation, Air Force, etc.), indicate the system. If non-lethal SEAD is planned (jamming, electronic warfare, etc.), indicate the system and effects.

LINE 3B—The volume of fire/ordnance and delivery system for lethal SEAD.

LINE 4A—The ACA that is planned for this particular CTB. If a code name is used, indicate the name. Include all grids and minimum and maximum altitudes, if appropriate. If time separation is to be used, indicate this on the card.

LINE 4B—The call sign and location of the individual team that will have final control of the aircraft during the attack. Include the back-up controller as well.

LINE 5A—The ingress route for the aircraft for this attack.

LINE 5B—The egress or exit route for the aircraft following the attack.

LINE 6A—The effects desired on the target from this attack.

LINE 6B—The method of marking the target that will be used (white phosphorus, laser spot, etc.). If laser spot is to be used, indicate who will provide the spot—combat observation lasing team (COLT), OH-58D helicopter, etc.—and the laser code.

Figure 5: Instructions for Completing a CAS Target Box (CTB) Card

Captain (Promotable) Samuel R. White, Jr., until June of this year, was a Brigade Fire Support Trainer at the National Training Center (NTC), Fort Irwin, California. He had been assigned to the NTC since October 1991 and also served as the Service Battery and then Firing Battery Combat Trainer and Fire Support Analyst. Currently, he's a student at the Command and General Staff College, Fort Leavenworth, Kansas. During Operations Desert Shield and Storm, he commanded the Howitzer Battery of the 2d Squadron, 2d Armored Cavalry Regiment out of Bamberg, Germany, the same in which he served as the squadron Fire Support Officer (FSO). Among other assignments, Captain White was a troop FSO in the 3d Armored Cavalry Regiment at Fort Bliss, Texas.

Check Fire!—

Change in Senior Fire Support Conference Dates

The dates for the Senior Fire Support Conference have been moved to 11 through 15 March 1996 at the Field Artillery School, Fort Sill, Oklahoma. Topics for discussion include the role of fires in Force XXI and fire support issues in doctrine, materiel development, training, force development and joint operations.

Invitations to the conference will be sent to all Army corps and Marine expeditionary force (MEF) commanders; Reserve Component (RC) and Active Component (AC) Army and Marine division commanders; selected retired general officers; Training and Doctrine Command school commandants; AC and RC Field Artillery brigade, division artillery and Marine regimental artillery commanders and their command sergeants major; and US Field Artillery Association corporate members.

Corporate members and other companies also may have displays at the conference.

If units or individuals have questions or need more information, they should contact the G3 of the Training Command at Fort Sill: DSN 639-5460/4203 or commercial (405) 442-5460/4203.

A Force Protection Package for **Friendly Artillery Forward**

by Lieutenant Colonel Stuart G. McLennan II

231830 Jan 9X

Losses were staggering. As units moved to cross the line-of-departure, situation reports poured into the division tactical command post. Earlier, enemy indirect fires had inflicted severe losses on multiple-launch rocket systems (MLRS) trying to execute the corps counterbattery program. Enemy dismounted forces attacked several MLRS units and prevented them from occupying suppression of enemy air defense (SEAD) firing positions. With the SEAD plan in jeopardy, the division canceled that night's deep attack. The enemy continued to engage MLRS units with indirect fires.

The mood in the corps main command post was sour—conditions for crossing the line-of-departure were still not set. Infiltrating enemy units and special purpose forces (SPF) armed with rocket-propelled grenades destroyed several artillery radars. Reeling from the loss of friendly artillery and unable to mass fires to defeat the enemy artillery pummeling the division's cavalry squadron, the division assumed a hasty defense.

Reaching a crescendo, enemy rocket and cannon fires continued to wreak havoc in depth across the division zone.

This account is fictitious. It may be a feasible Battle Command Training Program (BCTP) Korean scenario for some—but not for the 4th Infantry Division (Mechanized), Fort Carson, Colorado. During two recent BCTP exercises, the 4th Infantry Division succeeded in defeating the world-class opposing forces (OPFOR) and in protecting its own artillery: MLRS self-propelled launcher loaders (SPLL), MLRS command posts, AN/TPQ-36/-37 Firefinder radars and Class V (Ammunition) caches.

This article defines the threat to friendly artillery in Korea and the protection package that allows our artillery to survive. The division tested this protection package during many simulation exercises and in the division's BCTP in April 1994 and I Corps' BCTP in October 1994.

The Threat. The North Korean Peoples Army (NKPA) is an artillery army. The NKPA's 240-mm multiple-rocket launchers (MRLs) and 170-mm (Koksan) self-propelled guns are especially lethal against friendly cannon artillery. With the enemy's lack of sophisticated signals or imagery intelligence (SIGINT and IMINT), his practiced use of sound-flash detection and human intelligence (HUMINT) pose greater threats to MLRS and Q-36/37 radars.

His primary HUMINT sources are SPF, infiltrating sniper and light infantry brigades and bypassed enemy forces. SPF specialize in direct-action and the control of indirect fires. Infiltrating forces interdict routes and attack high-payoff targets (HPTs)—our artillery systems. Bypassed enemy forces execute passive envelopment, which consists of allowing lead combat units to pass and then engaging trailing artillery, combat support and combat service support units.

During offensive and defensive phases of fire, 240-mm MRLs and Koksan guns mass to destroy artillery. The effects of these fires can quickly reduce a friendly units from "green" (80 percent or higher operational strength) to "black" (40 percent or lower operational strength) statuses.

Friendly MLRS/Q-36/37 Operations. The 4th Infantry Division masses intelligence and electronic warfare (IEW) platforms, close air support (CAS) and air interdiction sorties, attack helicopter deep operations and MLRS fires to defeat NKPA division artillery groups (DAGs), corps artillery groups (CAGs) and corps

reactive artillery groups (CRAGs). To succeed, MLRS and Q-36/37s must accomplish three critical missions: SEAD, proactive fires and counterbattery.

SEAD. The reinforcing Field Artillery brigade's MLRS battalions fire SEAD. A normal SEAD plan includes 60 to 70 targets. Two MLRS rockets are fired per ingress/egress target per turn. The divisional MLRS battery—in this case C/10 FA—is the "designated shooter" to fire reactive SEAD on targets that appear after the SEAD plan is formulated.

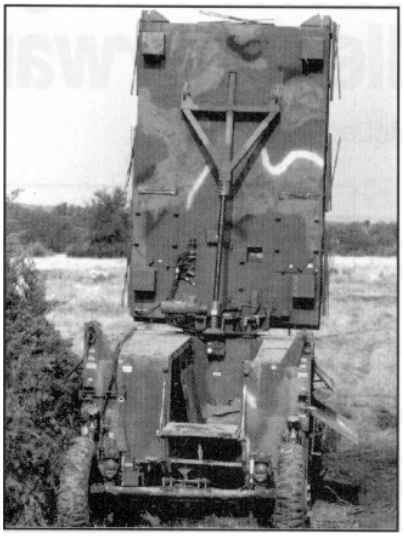
Proactive Fires. Proactive fires desynchronize enemy phases of fire by defeating artillery HPTs before they can mass fires against friendly forces. Intelligence feeds are consolidated at the division main command post where the fire support element's (FSE's) intelligence/fire support analysis team uses Warrior to generate targets. The division then brings the entire suite of its fire support assets to bear to defeat these targets.

Proactive fires comprise the cornerstone of the 4th Infantry Division's ability to defeat NKPA artillery. (For more information on how the division prosecutes proactive fires, see the article, "Proactive Fires: Leveraging Technology to Defeat Artillery High-Payoff Targets," April 1995, by Colonel Alan D. Johnson, Lieutenant Colonel Charles J. Berlin III and the author.)

Counterbattery. The division artillery synchronizes the counterbattery fight. Operating on continuous cueing, Q-36/37s provide detection reports and allow commanders to share a common view of the battlefield. The reinforcing FA brigade's MLRS battalions and the divisional MLRS battery attack the CRAGs, CAGs and DAGs, normally beyond the common sensor boundary. Direct support and reinforcing cannon battalions attack the regimental artillery groups (RAGs) and mortars, normally short of the common sensor boundary.

To accomplish these three missions, the commanding general assumes risk by echeloning MLRS well forward—often three to five kilometers from the forward-line-of-own-troops (FLOT). Because of their range, Q-36/37s are positioned 10 to 15 kilometers behind the FLOT.

In the offense, an MLRS battery is integrated into each maneuver task force. This ensures that the launchers are in position and ready to fire before maneuver units engage the enemy in direct fire.



Q-37 Firefinder Radar

The 4th Division also executes cross-FLOT MLRS raids to desynchronize enemy plans by attacking his artillery. (See Lieutenant Colonel Jerry C. Hill's article, "Beyond Doctrine: 'Pushing the Envelope' with MLRS," August 1994.)

To lessen the risk of positioning MLRS and Q-36/37s forward, the division commander directed that they be protected. Initially, brigade commanders did not want to "sacrifice" combat power to protect the artillery. After experimenting with several combinations, the 4th Division settled on a protection package consisting of mechanized infantry, engineer, military intelligence (MI) and air defense artillery (ADA). These assets were dedicated to the mission of protecting friendly artillery with task organization occurring before they moved forward from the tactical assembly area.

MLRS *Photo courtesy of LTV Missile and Electronics Group*

The 4th Infantry Division protects assigned and reinforcing FA brigade MLRS and Q-37s—usually two MLRS battalions, one MLRS battery and two Q-37 radars. Maneuver brigades use the division's Q-37 template to protect supporting Q-36 radars.

The Protection Package. Each MLRS battalion receives mechanized infantry support in attachment. MLRS battalions each receive a company, and the divisional MLRS battery receives a platoon. The mech companies—each having a dismounted infantry squad and each having 13 M2 Bradley fighting vehicles (BFVs)—provide route security during movement, secure MLRS firing positions and protect MLRS command posts. A BFV section (two M2s) guards each MLRS Class V cache, as required. Equipped with thermal sights, BFVs are especially effective against dismounted forces at night. (During the BCTP exercises, the division used its four infantry battalion antitank companies for this mission. These companies inactivated in December 1994.)

Each Q-37 receives mechanized infantry, engineer, ADA and MI support in attachment. A BFV platoon (four M2s) provides security. A dig team (two bulldozers from the supporting engineer group) provides survivability support. A Stinger section (three Stinger teams) provides point coverage. A ground surveillance radar (GSR) section (two M113-carried AN/PPS-5Bs) provides early warning.

The division artillery retains control of selected ADA and engineer assets. A direct support Avenger battery is positioned to provide protection along the most likely enemy air avenue of approach. An attached mobility team (two M9 armored combat earthmovers, called ACEs) is task-organized to assist MLRS units encountering obstacles.

MLRS firing positions, Q-36/37 sites and routes are selected based on a G2 overlay produced during the intelligence preparation of the battlefield (IPB) process. This overlay predicts likely ambush

Avenger ADA

sites, landing zones and chokepoints. The division used this overlay extensively in the past two years and found it very accurate.

The corps provides logistical support for divisional protection assets attached to the reinforcing FA brigade. A forward logistics element (FLE) provides Class I Subsistence; Class III Petroleum, Oils and Lubricants; Class V Ammunition; Class IX Repair Parts; and personnel replacements. Military Police protect MLRS Class V convoys moving from the corps rear to the FLE.

The Results. During the April 94 BCTP, the 4th Infantry Division conducted a successful penetration and exploitation before assuming a hasty defense. MLRS and Q-36/37s were rated "green." Successful air interdiction, corps and division deep operations, proactive fires and counterbattery annihilated the NKPA artillery.

As a result, NKPA mechanized brigades were piecemealed into the division's engagement area without artillery support. The division massed direct and indirect fires to defeat these forces in detail.

The BCTP exercises included many occurrences that reinforced the decision to protect friendly artillery positioned forward. BFVs destroyed an enemy infantry platoon while conducting reconnaissance of an MLRS platoon firing position and repulsed an enemy SPF's night attack on an MLRS battery. A BFV section successfully defended an MLRS Class V cache from an SPF

Bradley Fighting Vehicle

attack. Integrated BFV/GSR operations defeated a dismounted Defeated a dismounted attack on a Q-37 site and destroyed an SPF team attempting to attack a Q-37 with an rocket-propelled grenade.

ADA and engineer assets also proved to be critical. A Q-37 survived observed artillery fires because it was dug-in and the BFV platoon destroyed the enemy observer. A mobility team allowed an MLRS battalion to breach a point obstacle and occupy a position from which to fire SEAD in support of a deep attack. A Stinger team destroyed a Hind helicopter attempting to engage a moving MLRS platoon.

In sum, the 4th Infantry Division Artillery losses were minimal during two BCTP exercises. We lost only one Q-37, and that was at the start of an exercise (STARTEX). No MLRS were lost to SPF, infiltrating units or bypassed enemy forces. Equally noteworthy, MRL fires caused significantly fewer losses to MLRS than cannon artillery.

The efficacy of dedicating maneuver assets to protect friendly artillery becomes evident when the survival of maneuver forces and their ability to accomplish the overall mission is linked to the artillery's

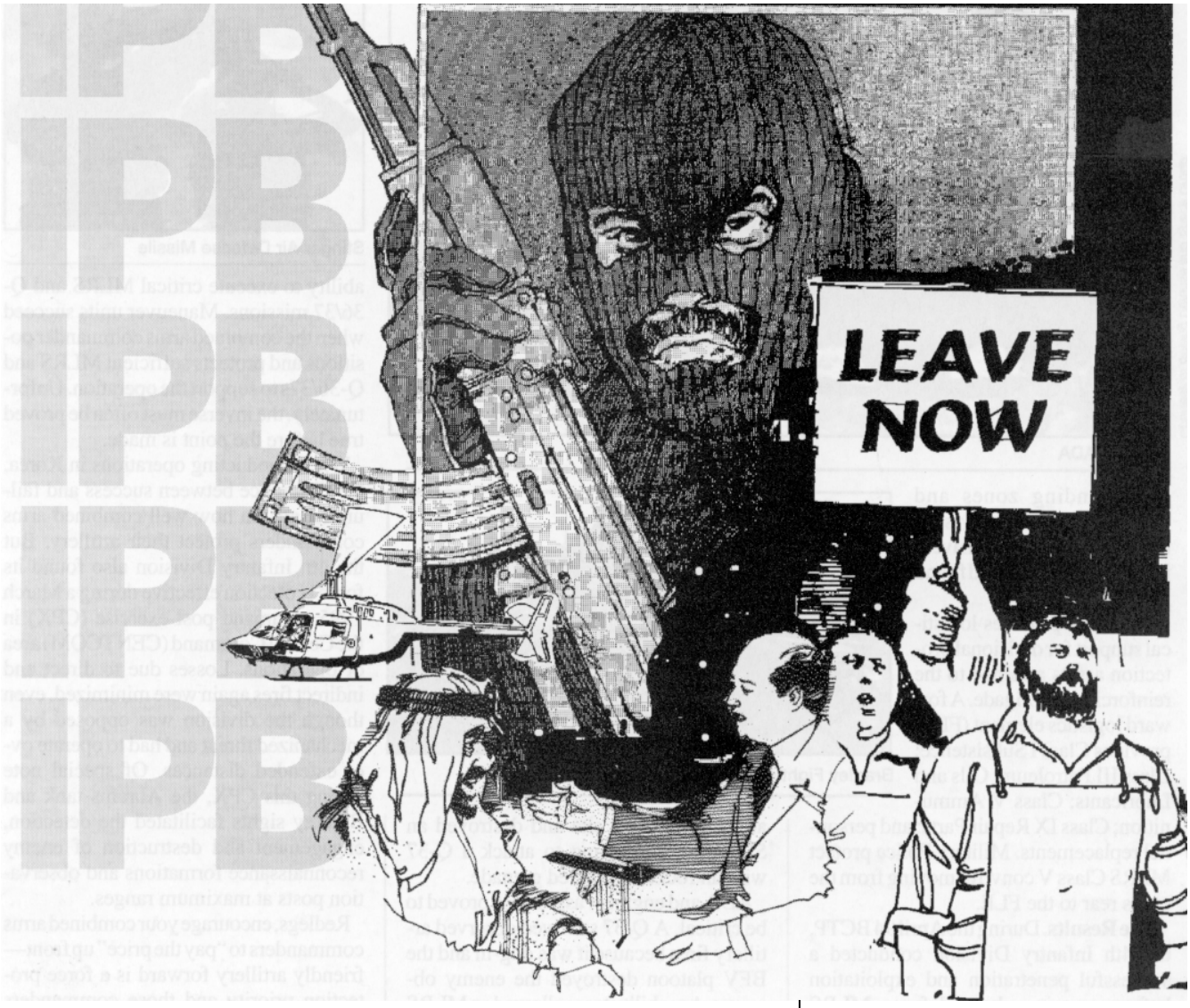
Stinger Air Defense Missile

ability to execute critical MLRS and Q-36/37 missions. Maneuver units succeed when the combined arms commander positions and protects sufficient MLRS and Q-36/37s to support the operation. Unfortunately, the inverse must often be proved true before the point is made.

When conducting operations in Korea, the difference between success and failure hinges on how well combined arms commanders protect their artillery. But the 4th Infantry Division also found its force protection effective during a March 1995 command post exercise (CPX) in the Central Command (CENTCOM) area of operations. Losses due to direct and indirect fires again were minimized, even though the division was opposed by a mechanized threat and had to operate over extended distances. Of special note during this CPX, the Abrams tank and Bradley sights facilitated the detection, engagement and destruction of enemy reconnaissance formations and observation posts at maximum ranges.

Redlegs, encourage your combined arms commanders to "pay the price" up front—friendly artillery forward is a force protection priority and those commanders must dedicate assets to this mission.

Lieutenant Colonel Stuart G. McLennan III is the Deputy Chief of Staff of the 4th Infantry Division (Mechanized) at Fort Carson, Colorado. In previous assignments also with the 4th Infantry Division, he was S3 of the Division Artillery; Executive Officer of the 3d Battalion, 29th Field Artillery; and Assistant Fire Support Coordinator. Among other assignments, Lieutenant Colonel McLennan served as the Assistant Chief of Staff, G3-Plans, of the 1st Infantry Division (Forward) in Germany and Commander of B Battery, 2d Battalion, 34th Field Artillery, part of the 75th Field Artillery Brigade at Fort Sill, Oklahoma.



The IPB Process for Operations Other Than War

by Captain Tamara L. Morris, MI

The "old Red threat" just ain't what it used to be, and we no longer can afford to have a "Sovietologist" mindset. In military operations, we must ask who the threat is and how we can use one of our most valuable tools, the intelligence preparation of the battlefield (IPB), to defeat him.

The IPB was developed to analyze the enemy, weather and terrain of a particular area of operations (AO) and area of interest (AI). It determines options unavailable to the enemy and highlights courses of action (COAs) that would be the most likely, most dangerous and least likely for the enemy to adopt.

IPB is a process that stimulates thought on the application of doctrine to a particular, sometimes unique, situation facing a commander. It supports the commander's decision making during any operation. The principal difference between IPB for a conventional battlefield situation, such as one with the former Soviet Union, and operations other than war (OOTW), such as those recently conducted in Somalia or Haiti, is the focus and degree of detail required.

IPB takes on increased importance in a force projection army. The deployment of units into undeveloped theaters and their subsequent employment against ambiguous threats makes IPB planning and intelligence dissemination critical.

Following IPB methodology reveals the threat capabilities, vulnerabilities and methods of operations. The steps found in *FM 34-130 Intelligence Preparation of the Battlefield* remain constant, regardless of the mission, unit, staff section or echelon. They include defining the mission and battlefield environment, describing the battlefield's effects, evaluating the threat and determining the enemy's COAs.

(1) Define the Mission. The IPB process always starts with the mission. The commander drives the intelligence cycle, and the IPB must be responsive to his needs and desires. The goal of the IPB is to integrate threat doctrine (if known and applicable) and threat operational patterns with weather and terrain data.

The IPB for OOTW includes information on political, economic and social situations with great emphasis on the demographics of the indigenous population. Some situations that are unique and intelligence-intensive are operations where there's a threat of terrorism and those involving ethnic diversity and a changing threat. Each of these situations is demanding and makes it more difficult to ensure the commander has all the intelligence he needs to make sound and timely decisions.

(2) Define the Battlefield Environment. The AO is defined by higher headquarters. The very nature of operations against an unconventional threat requires the intelligence officer expand his area of interest (AI). All military or paramilitary groups, third-country nationals or non-government organizations (NGOs) that may interact with US troops and all political groups, media and third-country nationals supporting terrorist groups must be included in the analysis.

The S2 often includes in his analysis terrain that's on the other side of an international border marking the boundary of his AO. This cross-border area is within his AI when the threat is receiving support from units or people in that area, which must be analyzed just as thoroughly as the friendly force's AO.

The terrain should be analyzed along with infrastructure. Critical areas that should be identified include energy sources, transportation systems, construction supplies (and sources) and communication capabilities. All man-made features that could have an impact on operations should be examined, including military garrisons, airfields, ports, rail yards, bridges, tunnels, power and telecommunications facilities and petroleum, oil and lubricant (POL) complexes. Unique to unfamiliar threat AOs is the requirement to analyze water sources, perimeter fences, animal grazing sites, religious monuments or places of worship, local gas stations, telephone exchanges, hospitals and boat ramps, among other things.

Also critical are the rules of engagement (ROE) established for the forces operating in a theater of operations. These rules not only affect friendly options, but can influence threat COAs as well—if he learns of their nature.

In OOTW, the scale of maps will be different. The scale should show much more detail—1:25,000 or 1:12,500, if possible, rather than the 1:100,000 or 1:50,000 scales.

An in-depth analysis of the host nation and any factors that could affect friendly operations is required. These factors will vary, depending on the area of operation. They include analysis of host nation population (health, religious and political loyalties, tribe or clan loyalties, etc.); ethnic backgrounds, languages and holiday observances; monetary systems and currencies; and any black-market activities conducted in the AI.

(3) Describe the Battlefield's Effects. You must consider the impact of demographic and social data on the overall population and friendly operations. The motivations of terrorist or political groups and any issues or external influences increasing tensions in the region should be identified and addressed. What would have to happen to bring peace to the region? How do these factors effect the COAs of both friendly and enemy?

Analyzing terrain in OOTW gives the commander valuable information to make decisions on points of entry, infiltration and exfiltration routes and command and control measures for the operation. The AO, particularly urban areas, should be divided into zones of control, using clan, group, religions or other established terms of reference. For other terrain considerations impacting battlefield effects, see Figure 1.

A key requirement in OOTW is a demand for demographic analysis. Population becomes the key to terrain because the side that holds the respect of the people will be more likely to succeed. Accordingly, the S2 prepares a population status overlay identifying pockets of the population that support relevant causes or are neutral. This overlay depicting the population's political sympathies helps determine enemy COAs.

The weather and environment may be potential threats. For example, the heat could be so intense that the friendly forces' ability to perform their mission is degraded or the prevalence of diseases could cause friendly troops to become ill. The indigenous threat personnel, who are conditioned to the heat or hardened by repeated exposure to the diseases, are less likely to be affected by them and have the advantage.

Using historical data, the intelligence officer can analyze topography, hydrography, climate and weather and the weather's effects or predicted effects on mobility, traffic or visibility. By evaluating and analyzing these factors, the commander will know what to expect in the way of degradation due to extreme climates, availability of suitable drinking water or the likelihood of troops being unable to perform their mission due to diseases.

(4) Evaluate the Threat. In evaluating threat capabilities, you analyze order of battle for considerations unique to the OOTW. These include differences in the types of threat, strategy, modus operandi and tactics as well as weapons, equipment, materiel and personnel.

The IPB should document if the environment is permissive, semi-permissive or hostile to US Forces. If the population supports US Forces, is that support contingent on some form of material compensation

Urban Areas

- Street Layouts
- Key Terrain—High-Rise Balconies and Rooftops
- Subways, Boat Ramps, Rail Yards and Airfields
- Underground Sewer Systems and Water Systems
- Electrical Facilities and Power Lines
- Communications Facilities

Rural Areas

- Narrow Foot Paths or Mountain Trails
- Nomadic Trade Routes
- Alternate Roadways, Paved or Hard Surface
- Small Wadis
- Narrow Stream Beds
- All Types of Vegetation, Desert Escarpments and Jungle Thickets
- Elevations Above 50 Meters on a Desert Floor (Observation Advantage)

Figure 1: Terrain Features Impacting Battlefield Effects in an IPB for OOTW

(food, water, shelter or weapons) as in Somalia, or is it based on some type of emotional and protective support, as in Haiti?

It's critical to identify the dissident groups that will publicly support, but clandestinely oppose, US Forces. Any terrorist groups present, thought to be present or that have access to the AO should be identified and watched carefully for indications of activities. Are the terrorists state supported or directed? Where does their money, equipment and motivation come from? Can the US neutralize the terrorist threat by enforcing economic or other sanctions on an outside supporter of the terrorists?

Keeping track of local personalities (leaders, trainers and key group members) and developing psychological profiles on the decision makers may be necessary. They can be tracked on a matrix depicting key leaders' alliances, recent sightings and activities (see Figure 2).

The analyst must examine the organization and structure of the hostile and terrorist organizations, including their stated and underlying philosophies. A terrorist group's motivation is the key to the type of terrorism it will attempt. The hostile forces' morale, will to resist, strengths of alliances and logistical sustainment capabilities, and the impact of its operations on neutral parties all affect their ability to commit terrorist acts and the friendly force's ability to thwart such acts.

Analysts also should identify the enemy's tactics and modus operandi (ambush techniques, sniper attacks, locations of weapon caches and methods of resupply, etc.). Figure 3 is a doctrinal template

Legend: ● Confirmed ○ Possible ◉ Probable

Remarks	Christian Reform Party [Good Guys]	Society for the Preservation of Order or SPO [Right Wingers]	Farmer's Alliance [Unknown Peasant Group]	People's Democratic Society [Peaceful Moderate]	Insurgent Company	New Liberation Movement [Political Front for N.M.E.]	N.M.E.	Name of Individual	Town
Leader in the insurgent company. Possible platoon or company commander.					●	●	●	Johnston, S.D. alias "The Red"	Bardolph
Possibly linked to death squad activities.	●	○						Garra, N.A.	
Mayor, ineffective due to war-torn town.	●							Mulvihill, P.	
Possible platoon leader.	○		●	◉	○	○		Daniels, P.	
Regional governor.	○	○	◉	●				Jenkins, T.L.	Macomb
Tactical genius, principal trainer of insurgent company.					●	●	○	Cormier, J.	
			○		○	○	○	Webb, C.	
				◉	○	○		Seipel, B.	
Leader in the insurgent company. Platoon leader or executive officer.			○		○	○	◉	Trollinger, L.	Beardstown
Possible head of intelligence.					○	●	●	Ahearn, E.	
Probable platoon leader.					◉	○		Timoney, J.	
Warrant					●	●		Thompson, J.	
Warrant — Probable heavy weapons platoon leader.					●	○	●	Bridgeford, R.	
Possible liaison between insurgent company and the N.M.E.			○	○	○		○	Halbleib, M.	Bushnell
"Doctor of Death"—leads the SPO.	●	●	○	○				Mueller, H.	
Warrant					●	○	○	Martinez, E.	

Figure 2: Key Leaders Activities Matrix (FM 34-130)

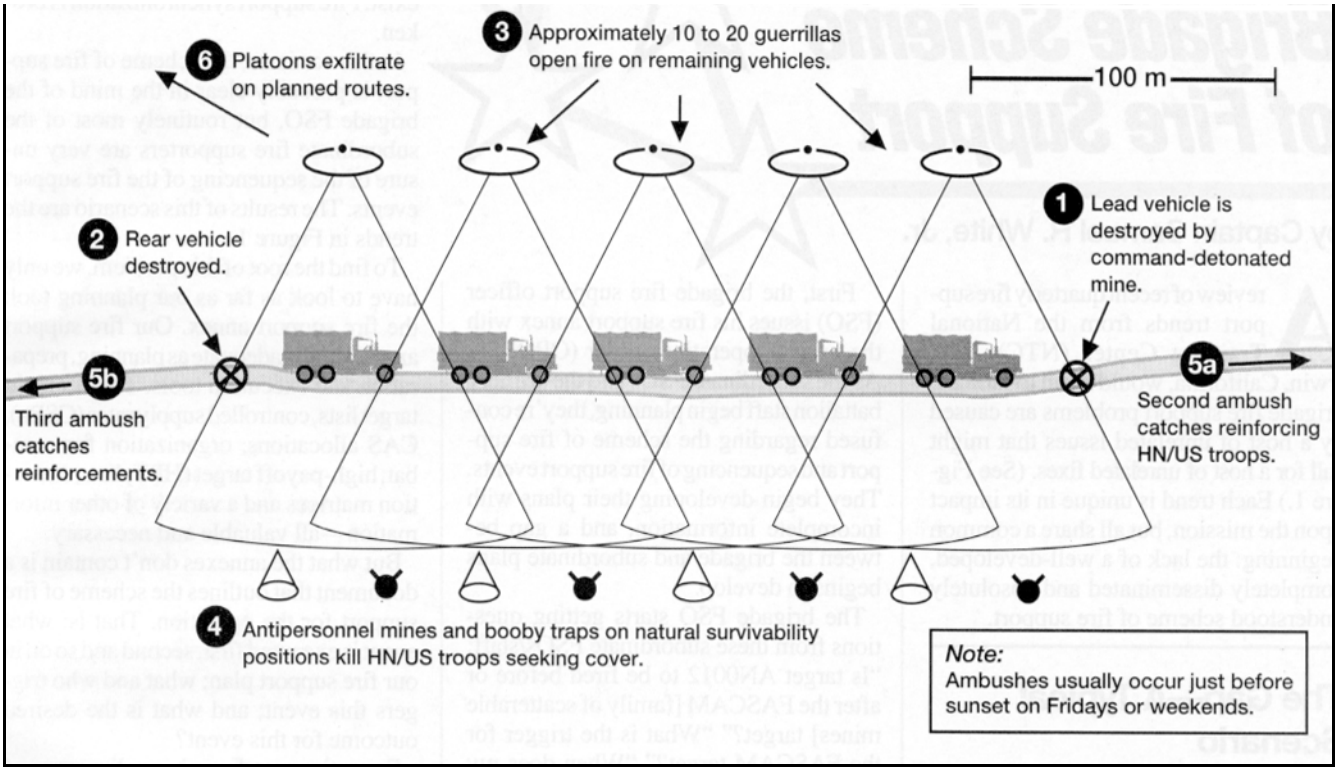


Figure 3: Doctrinal Template for the Enemy's Preferred Ambush Tactics (FM 34-130)

depicting the enemy's preferred tactics for conducting an ambush, a likely act of terrorism in operations other than war our forces could face.

(5) Determine Threat COAs. This step in the process is the culmination of the analysis of the battlefield, ROE or legal mandates in effect and hostile forces involved. By integrating the IPB products depicting population status and other considerations, the S2 can develop a situation template. The template depicts likely targets for the enemy and the most likely areas for ambushes.

Threat COAs are determined using the following five steps. First, the S2 develops doctrinal and situational templates, where appropriate, on terrorist and hostile group activities. Next, he develops COA models depicting the response of these groups to US entry and presence. In the third step, he analyzes the reactions of the local populace to friendly COAs. He then analyzes the reactions of the host nation government and military to friendly COAs in the fourth step. And, finally, he war games terrorist and hostile force actions.

The S2 develops the situation templates showing all COAs available to the enemy. These will be war gamed against the friendly COAs developed by the S3.

The S2 depicts named areas of interest (NAIs) on an event template. The NAIs are placed where the enemy would move to if he followed a COA. Intelligence collection assets focus on the NAIs to confirm or deny the enemy has adopted a particular COA.

The battle staff uses the initial set of IPB products to complete the decision-making process. As planning for an operation continues, the S2 refines and updates his IPB products, based on new intelligence that confirms or denies his initial evaluations. The staff reevaluates its plans as needed, based on new intelligence information.

Given the nature of the potential threat to US forces in OOTW, it will be difficult to obtain much of this information without an interagency approach to the IPB. Early liaison with local police, militia, NGOs, etc., will facilitate acquiring the type of information needed to complete the IPB.

Commanders require a contemporary, innovative version of IPB in situations where the threat is ambiguous or unique to US forces. The application of IPB to an OOTW can be difficult, but careful application of the IPB methodology with some modification to suit the environment will provide information the commander needs to make timely, sound decisions.

Captain Tamara L. Morris, Military Intelligence (MI), was a Instructor/Writer for two years in the Targeting Branch, Warfighter Division, Fire Support and Combined Arms Operations Department of the Field Artillery School at Fort Sill, Oklahoma. Currently, she commands B Battery, 3d Battalion, 321st Field Artillery (Basic Training) in the Field Artillery Training Center at Fort Sill. Previous assignments include serving with the 513th MI Brigade out of Fort Monmouth, New Jersey, as S2 of the 202d MI Battalion; Platoon Leader of the 164th MI Company (Counterintelligence), also in the 202d Battalion; Operations Officer of the 164th MI Company while deployed to the Gulf during Operation Desert Storm; and Commander of the Operation Support Detachment at Fort Monmouth. The author's sources for this article were *FM 34-130 Intelligence Preparation of the Battlefield, FM 34-7 Intelligence and Electronic Warfare Support to Low-Intensity Conflict* and several Training Support Packages (TSPs) on Operations Other Than War published by the US Army Intelligence Center, Fort Huachuca, Arizona.

Developing the Brigade Scheme of Fire Support

by Captain Samuel R. White, Jr.

A review of recent quarterly fire support trends from the National Training Center (NTC), Fort Irwin, California, would seem to indicate brigade fire support problems are caused by a host of unrelated issues that might call for a host of unrelated fixes. (See Figure 1.) Each trend is unique in its impact upon the mission, but all share a common beginning: the lack of a well-developed, completely disseminated and absolutely understood scheme of fire support.

The Gap—A Typical Scenario

The following is a typical scenario at the NTC. It shows a gap developing between the brigade's fire support plan and those of it's subordinate units until the gap is so large the plans no longer match in form or execution.

1. Fire support rehearsals that are conducted don't ensure the brigade fire support plan is understood and synchronized.
2. The effects that fire support is to achieve are rarely addressed in detail. The method that brigades employ to determine effects don't result in missions for fire support that ensure success for the brigade.
3. The brigade deep fight quickly becomes ineffective after the first deep engagement with the enemy.
4. The transition of the fire support fight from deep to close to rear either does not take place or takes place at a time and (or) location that's unplanned.
5. Close air support (CAS) is not effectively integrated into the brigade fire support plan.
6. Staff supervision of the brigade fire support plan isn't conducted with a keen eye toward ensuring subordinate organizations' planning and preparation result in success for the brigade.

Figure 1: Recent NTC Quarterly Fire Support Trends (Brigade)

First, the brigade fire support officer (FSO) issues his fire support annex with the brigade operations order (OPORD). As the subordinate FSOs and the artillery battalion staff begin planning, they're confused regarding the scheme of fire support and sequencing of fire support events. They begin developing their plans with incomplete information, and a gap between the brigade and subordinate plans begins to develop.

The brigade FSO starts getting questions from these subordinate FSOs/staff: "Is target AN0012 to be fired before or after the FASCAM [family of scatterable mines] target?" "What is the trigger for the FASCAM target?" "When does my task force get priority of fires?" "Is CAS [close air support] attacking the MRC [motorized rifle company] before or after the obscuration fires—which ACA [airspace coordination area] will be in effect?"

By this time, the brigade FSO is overwhelmed with questions his annex doesn't cover and he isn't prepared to answer. He puts all the callers "on hold" and attempts to develop and record a scheme of fire support. The subordinates, however, continue planning with their questions unanswered. The gap widens.

The brigade FSO completes a rudimentary scheme of fire support, usually written on a yellow legal pad. Unfortunately by this time, the subordinate fire supporters have completed planning and have issued their OPORDs. The brigade FSO talks the subordinates through the scheme of fire support and all soon realize there are grave differences between the brigade plan and each subordinate plan. Each tries to adjust his plan. But the time until execution is too short, and many deficiencies go uncorrected. The gap is now a complete break between the brigade and subordinate plans.

As the brigade prepares to execute the mission, there's still no consolidated brigade scheme of fire support. Valuable preparation time needed for briefing and rehearsing the scheme of fire support was used developing the scheme of fire support, but a quality product still doesn't exist. Fire support synchronization is broken.

In this scenario, the scheme of fire support is probably clear in the mind of the brigade FSO, but routinely most of the subordinate fire supporters are very unsure of the sequencing of the fire support events. The results of this scenario are the trends in Figure 1.

To find the root of this problem, we only have to look as far as our planning tool: the fire support annex. Our fire support annexes are inadequate as planning, preparation and execution tools. They contain target lists, controlled supply rates (CSRs), CAS allocations, organization for combat, high-payoff target (HPT) lists, execution matrices and a variety of other information—all valuable and necessary.

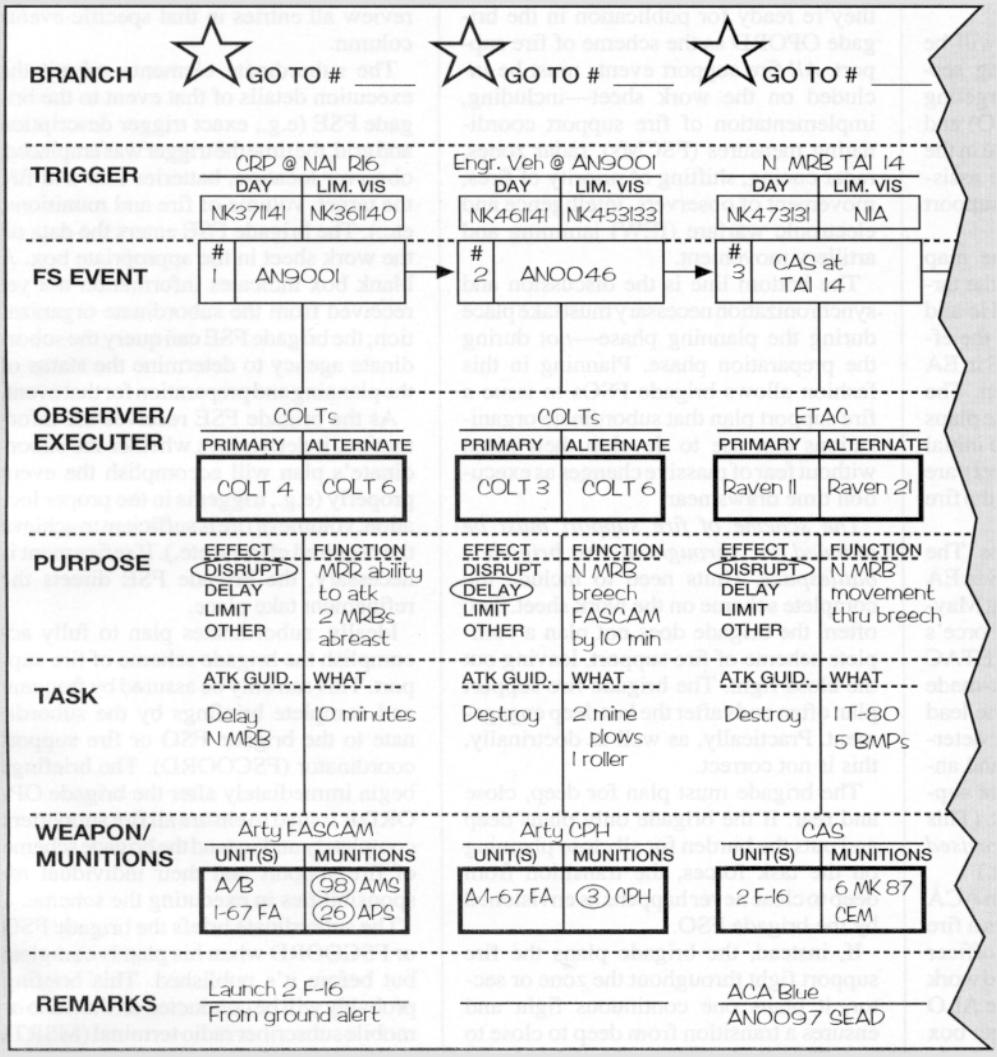
But what the annexes don't contain is a document that outlines the scheme of fire support for the operation. That is: what event is executed first, second and so on in our fire support plan; what and who triggers this event; and what is the desired outcome for this event?

Execution matrices give only groups of events that take place during a period, not specific events that take place at specific times. Target lists give us descriptions of the targets; the HPT list tells us which targets to attack; and our attack guidance matrix (AGM) tells us when and how to attack them. Thus, our fire support annex, though packed with information, contains no document that provides "one-stop shopping" to help plan fire support and then prepare for, rehearse and execute that plan.

Solutions—Synchronizing the Plans

A scheme of fire support must be developed during planning and published with the brigade OPORD. This scheme can either be written in paragraph form or outlined on a work sheet. An effective scheme of fire support work sheet is shown in Figure 2.

The work sheet issued at the brigade OPORD briefing must reflect how the brigade fire support plan will be executed. To be able to execute this work sheet, it should be initiated during course-of-action (COA) development. The fire support events determined at that stage will be very general—for example, "employ CAS in EA [engagement area] Red," "artillery



Legend:

ACA	=	Airspace Coordination Area
AMS	=	Anti-Materiel Short
APS	=	Anti-Personnel Short
BMPs	=	Soviet-Made Infantry Fighting Vehicles
CAS	=	Close Air Support
CEM	=	Combined Effects Munitions
CFL	=	Coordinated Fire Line
CFZ	=	Critical Friendly Zone
COLTs	=	Combat Observation Lasing Teams
CPH	=	Copperhead
CRP	=	Combat Reconnaissance Patrol
DP	=	Decision Point
DS	=	Direct Support
ETAC	=	Enlisted Tactical Air Controller
FASCAM	=	Family of Scatterable Mines
FSE	=	Fire Support Element
FSO	=	Fire Support Officer
LD	=	Line-of-Departure
MRB	=	Motorize Rifle Battalion
MRR	=	Motorized Rifle Regiment
NAI	=	Named Area of Interest
PL	=	Phase Line
SEAD	=	Suppression of Enemy Air Defenses
TAI	=	Targeted Area of Interest
TF 3-5 AR	=	Task Force 3-5 Armor

Instructions:

BRANCH—Completed only if the execution of this or another fire support event is tied to a decision point. If this is the case, the DP number is written inside the star and the alternate fire support event number is noted in the space after "Go To."

TRIGGER—The trigger for the fire support event. The brigade determines the trigger, which is written across the top line—for example, "MRB at NAI 14" or "TF 3-5 AR crosses LD," etc. The executor of the event provides the entries in the box, which will be the grid and type of trigger for day and limited visibility operations.

FIRE SUPPORT (FS) EVENT—The actual event that's to be executed. Examples—"Activate CAS Target Box 5," "Activate CFZ 1," "CFL to PL Blue," "Priority of Fires to TF 3-5 AR," etc. The fire support event also should be numbered for reference. The number should be in sequence for ease of use and understanding.

OBSERVER/EXECUTOR—The individual or unit charged with executing the fire support event. The brigade's initial assignment is written across the top line (e.g., "TF 3-5 AR"). This subordinate FSE provides the brigade the entries for the box when it has subassigned responsibility for execution—for example, "A Mechanized FSO primary, C Tank FSO alternate."

PURPOSE—The reason this event is being executed. Circle the "Effect" desired on the associated enemy formation. When stating the "Function," be very specific in determining the enemy function you wish to interdict. This block is a good double check to ensure the commander's guidance is included in the scheme as the guidance is issued in the same basic Effect/Function format.

TASK—The task associated with the event. Again, be very specific in defining the task. Statements such as "Neutralizing the forward detachment" aren't specific enough. "Destroying 3 BMPs from the forward security element" is much more specific. The task must support the purpose: "Destroy 3 BMPs from the forward security element," (the task) to "Disrupt the forward security element's ability to fix TF 3-5 AR" (the purpose).

WEAPON/MUNITIONS—The system that will accomplish the task. The brigade allocates the asset across the top line. The organization responsible for the asset provides the brigade the information for the box. For example, if the brigade FSO has determined that artillery will be used for this event, he notes "Arty" across the top line. After conducting it's initial planning, the DS artillery battalion selected (e.g., 1-23 FA) determines, for example, that A and B Batteries will engage the enemy by firing three rounds of DPICM as noted in the box: "A/B 1-23 FA" and "3 DPICM."

REMARKS—Any other information that should be included for clarification and synchronization.

Figure 2: Brigade Fire Support Work Sheet

engages MRB [motorized rifle battalion] in EA Green," etc.

The "meat" of the work sheet will be developed during the war-gaming session. This will require the FSO, targeting officer, fire support NCO (FSNCO) and air liaison officer (ALO) participate in the session. (During war gaming, the assistant brigade FSO runs the fire support element, or FSE).

The FSO should be around the map board interacting with the rest of the targeting team during war gaming. He and the targeting team will war-game the effects desired and timing of the CAS in EA Red and the artillery in EA Green. The targeting officer and FSNCO (in the plans tent with a map board, overlay, the initial work sheet and a clean work sheet) are doing the detailed work to develop the fire support plan and the work sheet.

Here's an example of the process. The targeting team determines the CAS in EA Red will be four aircraft employing Maverick missiles controlled by the Air Force's Enlisted Tactical Air Controller 1 (ETAC 1) to destroy six BMPs (Soviet-made infantry fighting vehicles) from the lead MRB. The targeting officer then determines the target grid in EA Red and annotates all the information as a fire support event on the clean work sheet. (This clean work sheet becomes the *revised* scheme of fire support work sheet.)

If the targeting team determines an ACA is required for the CAS, it becomes a fire support event, and the targeting officer enters the information on the revised work sheet. The targeting officer and the ALO coordinate and fill out a CAS target box (CTB) card, if used. (For an explanation of a CTB card, see my article "A Technique for Employing CAS" also in this edition.) If artillery suppression of enemy air defenses (SEAD) is required, it's listed as another fire support event on the work sheet.

This same process is followed for artillery engagements of the enemy. If the targeting team determines artillery fires in EA Green are still required, the team develops effects and timing (synchronization). The FSNCO develops the actual six-digit target on his map board and overlay, and then the targeting officer enters the information on the revised work sheet.

This process continues until the entire plan—all fire support events with branches and sequels—have been war-gamed. The result is the fire support scheme work sheets are completed at the end of the wargaming session. The work sheets may need to be rewritten for legibility, but they're ready for publication in the brigade OPORD as the scheme of fire support. *All* fire support events must be included on the work sheet—including, implementation of fire support coordinating measures (FSCMs), radar zones, radar cueing, shifting of priority of fires, movement of observers, intelligence and electronic warfare (IEW) jamming and artillery movement.

The bottom line is the discussion and synchronization necessary must take place during the planning phase—*not* during the preparation phase. Planning in this fashion allows brigade FSOs to issue a fire support plan that subordinate organizations can use to develop their plans without fear of massive changes as execution time draws near.

The scheme of fire support must be planned for throughout the brigade's battlespace. Units need to include the complete scheme on the work sheet. Too often, the brigade does not plan a complete scheme of fire support, leaving out the close fight. The brigade fire support plan often ends after the last deep engagement. Practically, as well as doctrinally, this is not correct.

The brigade must plan for deep, close and rear. If the brigade only plans deep and puts the burden for all close planning on the task forces, the transition from deep to close never happens as envisioned by the brigade FSO.

If, instead, the brigade plans the fire support fight throughout the zone or sector, it plans one continuous fight and ensures a transition from deep to close to rear. The plan is integrated and developed by one headquarters, as opposed to trying to paste together three plans (deep, close and rear) developed by three headquarters (brigade, task force and forward support battalion).

The brigade FSE develops the fire support plan—subordinate FSEs refine it. The scheme of fire support work sheet facilitates this planning and refinement. In transitioning from deep to close to rear, the brigade is not handing off fires to subordinate headquarters, it's handing off responsibility for executing the brigade fire support plan to subordinate headquarters.

Conduct complete and thorough staff supervision of the plan. The crux of this function is the techniques and procedures necessary. The scheme of fire support work sheet provides an excellent staff supervision document. If fire support events are assigned to subordinate elements for execution, the brigade FSE can review all entries in that specific events column.

The subordinate elements submit the execution details of that event to the brigade FSE (e.g., exact trigger description and grid, the time the trigger was emplaced, observer location, batteries that will fire the target, volume of fire and munitions, etc.). The brigade FSE enters the data on the work sheet in the appropriate box. A blank box indicates information not yet received from the subordinate organization; the brigade FSE can query the subordinate agency to determine the status of the planning and preparation for that event.

As the brigade FSE receives the information, it determines whether the subordinate's plan will accomplish the event properly (e.g., trigger is in the proper location, volume of fire is sufficient to achieve the required effects, etc.). If refinement is necessary, the brigade FSE directs the refinement take place.

Ideally, subordinates plan to fully accomplish the brigade scheme of fire support. This can only be assured by frequent and complete briefings by the subordinate to the brigade FSO or fire support coordinator (FSCOORD). The briefings begin immediately after the brigade OPORD is issued to ensure all fire supporters completely understand the brigade scheme of fire support and their individual responsibilities in executing the scheme.

The subordinate briefs the brigade FSO or FSCOORD when his plan is complete but before it's published. This briefing probably will be conducted on the radio or mobile subscriber radio terminal (MSRT) and is extremely important to ensure that flaws in the subordinate's plan are discovered *before* the plan is issued. Periodic briefings to the brigade FSE during the preparation phase should be required (triggers, observer locations, battery locations, etc.).

The branch plans developed by the staff must be completely supported by fire support and have a scheme of fire support for each branch plan. (See Figure 3 for examples of potential enemy avenues of approach calling for branch plans.) The scheme of fire support work sheet reflects branches to the plan (Figure 4).

The key to successfully executing branch plans are well-developed decision support products. Although the scheme of fire support work sheet is not meant to replace a decision support matrix (DSM), it's designed to supplement it. The work sheet gives the FSCOORD and FSO an additional decision-making tool. Just as

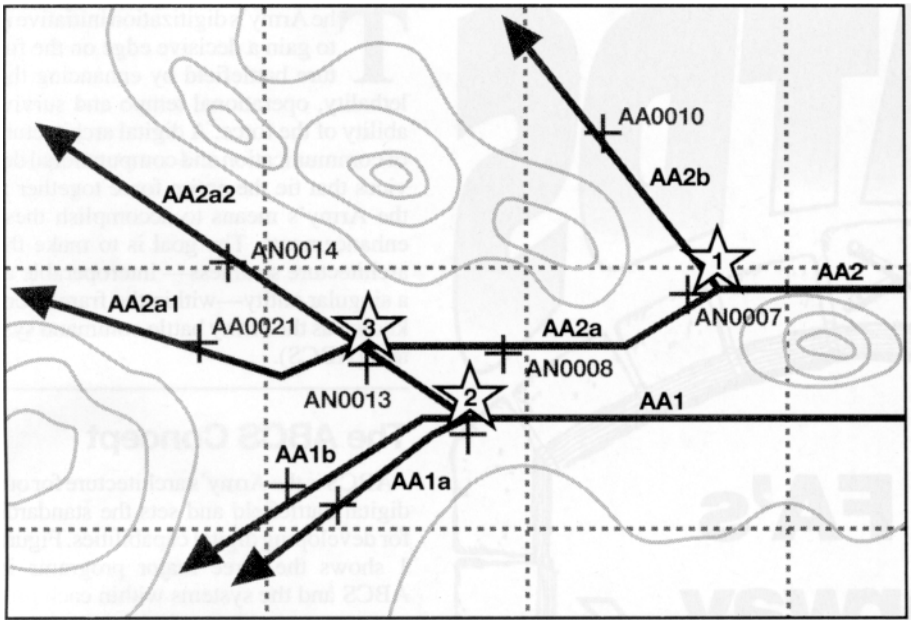
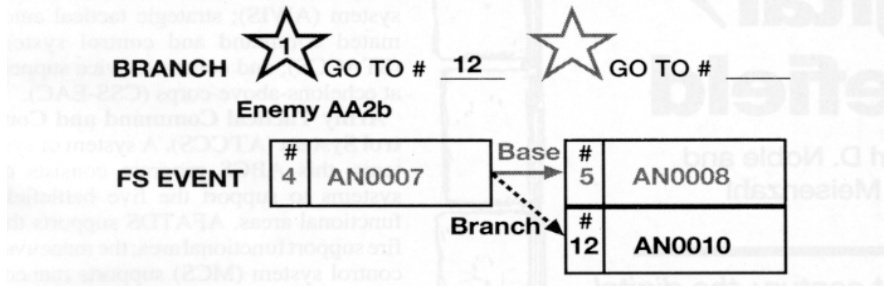
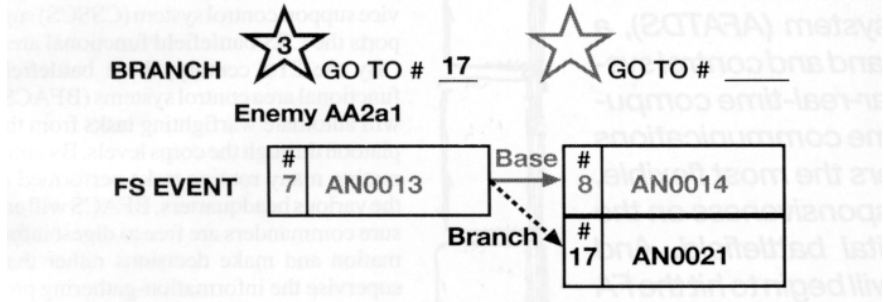


Figure 3: Potential Enemy Avenues of Approach. The plan in this movement-to-contact is based on the enemy attacking along AA2 to AA2a to AA2a2. We have branch plans we'll execute if the enemy attacks along any other avenue of approach. Decision points (DPs)—as defined on our decision support matrix and template (DSM/DST)—outline the options available to the commander in choosing to execute a branch plan.



As the enemy attacks along AA2, he reaches DP1 (see Figure 3). If he turns north (AA2b), we'll execute a branch plan and jump into the work sheet at Event 12 (AN0010), which is the first event in the branch plan. If the enemy stays south (AA2a), we'll continue to execute the base plan at Event 5.



Further along the scheme of fire support, the enemy reaches DP3 (Figure 3) and can proceed as we planned initially (AA2a2) or go south (AA2a1). If he goes south, we jump to Event 17 (AN0021); otherwise we continue on to Event 8.

Figure 4: Developing Branch Plans on the Work Sheet

the DSM reveals to the commander the array of options available, the scheme of fire support work sheet shows the range of fire support options available based on different enemy or friendly situations and decisions already made.

Conclusion

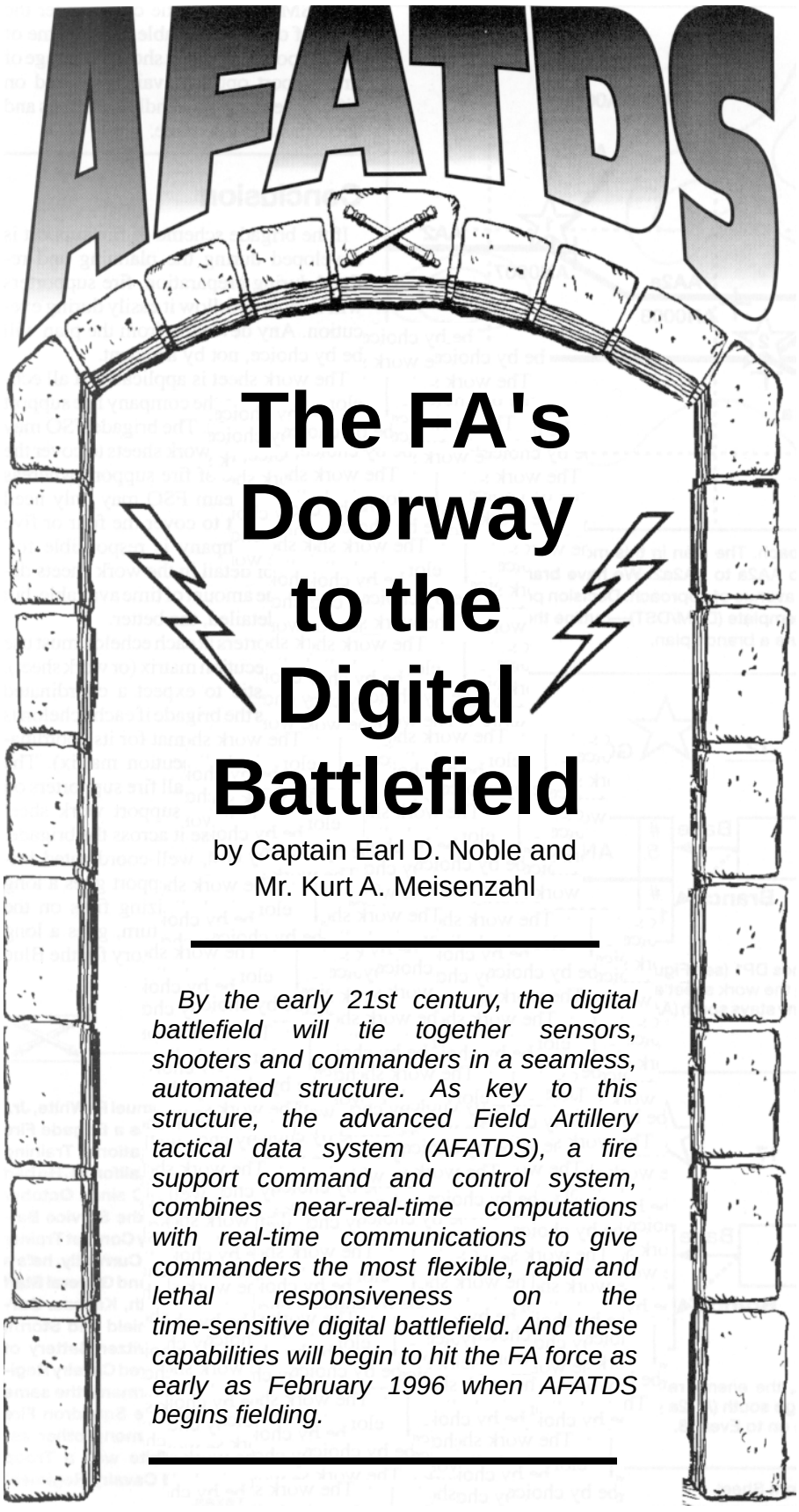
If the brigade scheme of fire support is developed during the planning and refined during preparation, fire supporters will be able to follow it easily during execution. Any deviation from the plan will be by choice, not by accident.

The work sheet is applicable at all echelons, including the company fire support team (FIST) level. The brigade FSO may need six or seven work sheets to cover the brigade scheme of fire support, whereas the company/team FSO may only need one work sheet to cover the four or five events his company is responsible for. The level of detail in the work sheets depends on the amount of time available, but the more detailed, the better.

Fire supporters at each echelon must use the same execution matrix (or work sheet). It's unrealistic to expect a coordinated effort across the brigade if each echelon is using a different format for its coordination document (execution matrix). The brigade should train all fire supporters on the scheme of fire support work sheet *before* trying to use it across the brigade.

A well-planned, well-coordinated brigade scheme of fire support goes a long way toward synchronizing fires on the battlefield—which, in turn, goes a long way toward assuring victory for the Blue Forces.

Captain (Promotable) Samuel R. White, Jr., until June of this year, was a Brigade Fire Support Trainer at the National Training Center (NTC), Fort Irwin, California. He had been assigned to the NTC since October 1991 and also served as the Service Battery and then Firing Battery Combat Trainer and Fire Support Analyst. Currently, he's a student at the Command and General Staff College, Fort Leavenworth, Kansas. During Operations Desert Shield and Storm, he commanded the Howitzer Battery of the 2d Squadron, 2d Armored Cavalry Regiment out of Bamberg, Germany, the same in which he served as the Squadron Fire Support Officer (FSO). Among other assignments, Captain White was a Troop FSO in the 3d Armored Cavalry Regiment at Fort Bliss, Texas.



The FA's Doorway to the Digital Battlefield

by Captain Earl D. Noble and
Mr. Kurt A. Meisenzahl

By the early 21st century, the digital battlefield will tie together sensors, shooters and commanders in a seamless, automated structure. As key to this structure, the advanced Field Artillery tactical data system (AFATDS), a fire support command and control system, combines near-real-time computations with real-time communications to give commanders the most flexible, rapid and lethal responsiveness on the time-sensitive digital battlefield. And these capabilities will begin to hit the FA force as early as February 1996 when AFATDS begins fielding.

The Army's digitization initiative is to gain a decisive edge on the future battlefield by enhancing the lethality, operational tempo and survivability of the force. A digital architecture of communication and computational devices that tie the entire force together is the Army's means to accomplish these enhancements. The goal is to make the architecture seamless—interoperable as a singular entity—within the framework known as the Army battle command system (ABCS).

The ABCS Concept

ABCS is the Army's architecture for our digital battlefield and sets the standards for developing digital capabilities. Figure 1 shows the three major programs in ABCS and the systems within each program.

Army Global Command and Control System (AGCCS). This first program links battlefield command and control systems at the strategic level using three major components: Army worldwide military command and control information system (AWIS); strategic tactical automated command and control system (STACCS); and combat service support at echelons-above-corps (CSS-EAC).

Army Tactical Command and Control System (ATCCS). A system of systems, this ABCS program consists of systems to support the five battlefield functional areas. AFATDS supports the fire support functional area; the maneuver control system (MCS) supports maneuver; the forward area air defense command, control, communications and intelligence system (FAAD C^3I) supports air defense; the all-source analysis system (ASAS) supports the intelligence and electronic warfare area; and the combat service support control system (CSSCS) supports the CSS battlefield functional area.

By the 21st century, these battlefield functional area control systems (BFACS) will automate warfighting tasks from the platoon through the corps levels. By automating many routine tasks performed at the various headquarters, BFACS will ensure commanders are free to digest information and make decisions rather than supervise the information-gathering process.

Linking the five BFACS is a suite of common hardware and software (CHS) supplemented by additional government-provided items, such as tactical communications systems and common communication

protocols and message formats. This commonality of hardware and software ensures the BFACS can easily pass information among each other, thus enhancing the capabilities of the individual systems and creating a more powerful network of information. For example, AFATDS will be able to display combined obstacle overlays generated by ASAS and maneuver or ammunition reports from the CSSCS.

Commanders will not only be freed from manually collecting information, but also receive more timely, reliable and immediately usable (graphical) information than under the existing system.

Force XXI Battle Command Brigade and Below (FBCB^2). This third program in ABCS (commonly called the "applique program") extends digitalization to the individual soldier by providing him the means for receiving and disseminating information digitally. The program builds on capabilities such as those found in the intervehicular information system (IVIS) used on the M1 Abrams tank.

The initial applique devices will be mounted in fighting vehicles. Later versions will be man-portable. The applique combines a radio, positioning device and tactical computer into a single unit. An applique-equipped vehicle or soldier will maintain constant communications with the rest of the ABCS community. Thus, the common picture of the battlefield and broad-based communications extend to the lowest level possible.

Within the fire support community, the benefits of the applique will include increased automation (and, thereby, more effective coordination) with supported maneuver units at all echelons and a reduction in the processing time for fire missions.

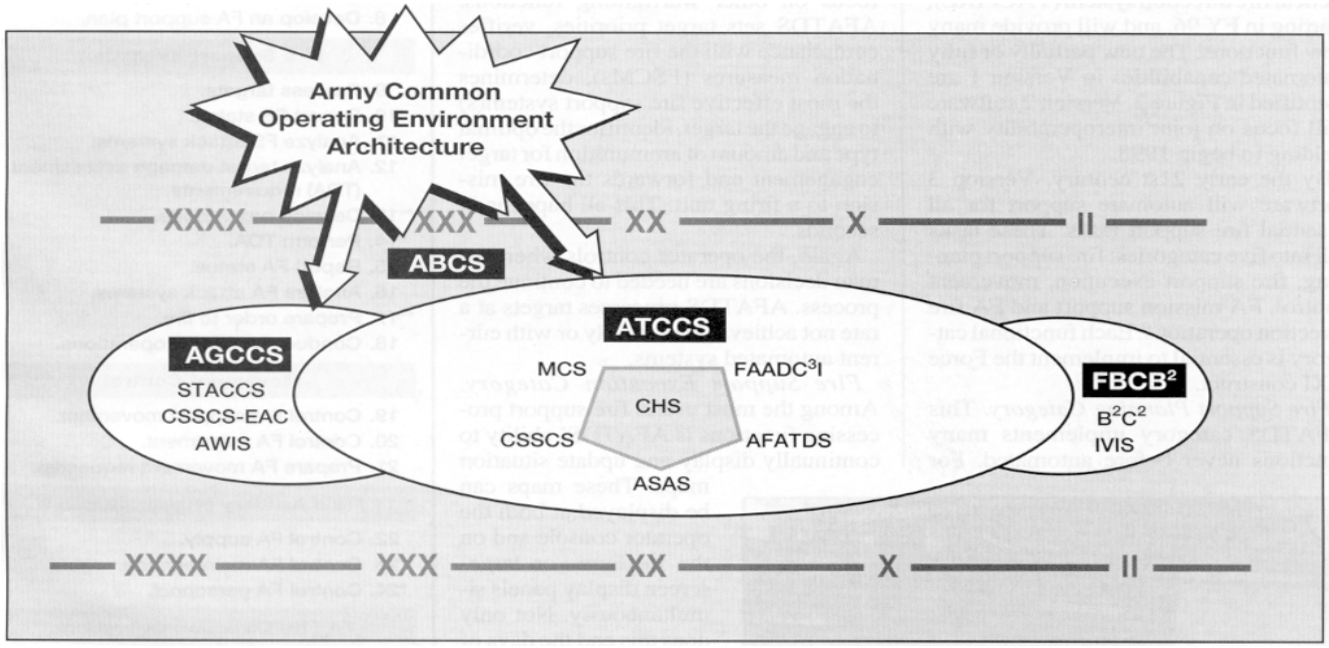
Because each BFACS communicates with all the others, fire supporters only need access to one to tap the capabilities of the others. Thus, AFATDS will provide a gateway to all command and control functions above the platoon level.

Implementing the common operating environment (COE) throughout ABCS will simplify passing data among the systems and sharing a common picture of the battlefield. COE is a compilation of several commercial off-the-shelf and government-developed software modules that form a foundation for ABCS components.

The COE modules are being developed within the standards and guidelines established by the Department of Defense. The standardization provided by the COE will simplify system testing and training and significantly improve the ability of FA units to interoperate with our sister services.

Extending the Envelope

As the command and control system for fire support, AFATDS is a cornerstone in supporting today's commanders and the Army's evolution into the digitized battlefield and Force XXI. As with any complex



Legend:

AFATDS	= Advanced Field Artillery Tactical Data System	CSSCS-EAC	= Combat Service Support Control System-Echelons Above Corps
AGCCS	= Army Global Command and Control System	FAADC^{3}I	= Forward Area Air Defense Command, Control, Communications and Intelligence
ATCCS	= Army Tactical Command and Control System	FBCB^2	= Force XXI Battle Command Brigade and Below
ASAS	= All-Source Analysis System	IVIS	= Intervehicular Information System
AWIS	= Army Worldwide Military Command Information System	MCS	= Maneuver Control System
B^{2}C^2	= Brigade and Below Command and Control	STACCS	= Strategic Tactical Automated Command and Control System
CHS	= Common Hardware and Software		

Figure 1: The Army Battle Command System (ABCS) Structure

system, an itemization of key features of the system inevitably fails to identify its full capabilities. Several facets of AFATDS warrant elaboration.

AFATDS is a fire support system—not just an FA system. This means AFATDS will support the totality of roles assigned to combat leaders. All fire support means—mortars, cannons, rockets, missiles, air attack assets and Naval gunfire—are incorporated into the system's capabilities to process missions and determine the optimum means of engagement.

AFATDS supports the full range of operations likely to be encountered during combat operations. Figure 2 lists the 27 major functions AFATDS will perform. As AFATDS' software develops, its capabilities will grow. The plan calls for fielding three versions of AFATDS software. Version 1 will replace the capabilities of the initial fire support automation system (IFSAS) and tactical fire direction system (TACFIRE), starting in FY 96, and will provide many new functions. The new partially or fully automated capabilities in Version 1 are identified in Figure 2. Version 2 software will focus on joint interoperability with fielding to begin 1998.

By the early 21st century, Version 3 software will automate support for all essential fire support tasks. These tasks fall into five categories: fire support planning, fire support execution, movement control, FA mission support and FA fire direction operations. Each functional category is essential to implement the Force XXI construct.

Fire Support Planning Category. This AFATDS category implements many functions never before automated. For example, the commander's concept of the operation and fire support guidance will be placed in the AFATDS data base. AFATDS will compile and organize information from target acquisition sources. This information, coupled with tools such as the target management matrix and high-payoff target list, will enable AFATDS to automatically assess and prioritize targets and initiate their engagement in a manner dictated by the commander.

In defining the commander's criteria, the operator also will dictate the conditions under which the computer can automatically transmit information or fire missions to another operating facility. Conversely, the operator can specify the conditions under which human intervention is required for an action.

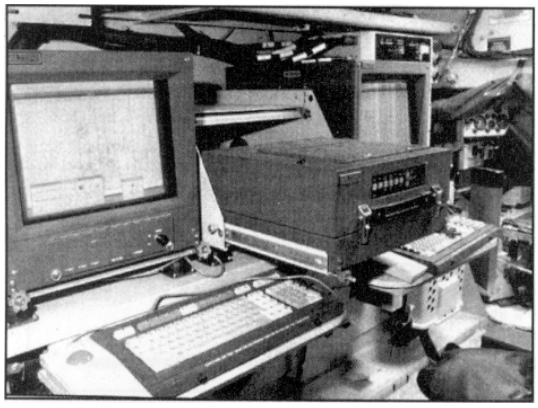
By automating target prioritizing, AFATDS gives the commander greater flexibility in using his resources. This frees the soldier from time-consuming manual tasks and allows him more time to focus on other warfighting functions. AFATDS sets target priorities, verifies compliance with the fire support coordination measures (FSCMs), determines the most effective fire support system(s) to engage the target, identifies the optimal type and amount of ammunition for target engagement and forwards the fire mission to a firing unit. This all happens in seconds.

Again, the operator controls when human decisions are needed to continue the process. AFATDS processes targets at a rate not achievable manually or with current automated systems.

Fire Support Execution Category. Among the most useful fire support processing functions is AFATDS' ability to continually display and update situation maps. These maps can be displayed at both the operator console and on the medium- or large-screen display panels simultaneously. Not only does this end the days of soldiers' continually setting up and marking bulky map boards, but it also ensures all headquarters have a current and accurate common picture of the battlefield.

Additional fire support processing capabilities will free soldiers from labor-intensive tasks, such as generating, transmitting and receiving the many written plans used by the operations and intelligence (O&I) section.

Movement Control Category. The movement control tasks AFATDS automates include requesting and coordinating convoy movement plans for FA units. Anyone who has manually computed start,



AFATDS. This system starts fielding in February 1996.

AFATDS Functions

	Fire Support Planning
1.	Develop fire support planning guidance.
2.	Develop the fire support plan.
3.	Determine the FA commander's concept of operations.
*4.	Develop the FA logistic support plan.
5.	Determine the target acquisition support capability.
6.	Conduct meteorological operations.
7.	Coordinate survey support.
8.	Develop an FA support plan.
	Fire Support Execution
9.	Process targets.
10.	Report FS status.
11.	Analyze FS attack systems.
12.	Analyze target damage assessment (TDA) requirements.
**13.	Develop order to fire.
*14.	Perform TDA.
15.	Report FA status.
16.	Analyze FA attack systems.
**17.	Prepare order to fire.
18.	Conduct FA sensor operations.
	Movement Control
19.	Control fire support movement.
20.	Control FA movement.
21.	Prepare FA movement request(s).
	Field Artillery Mission Support
22.	Control FA supply.
*23.	Control FA maintenance.
*24.	Control FA personnel.
	FA Fire Direction Operations
25.	Determine firing unit capability.
26.	Process fire missions.
**27.	Report fire mission status.

* To be automated in Versions 2 and 3.
**Fully automated in Version 1 software. (Except as otherwise indicated, all other functions are partially automated in Version 1.)

Figure 2: The 27 Functions Performed by AFATDS

checkpoint and release times for a typical convoy knows this task consumes both time and computation resources. Using their AFATDS, subordinate FA units may automatically receive and print the movement order.

FA Mission Support Category. Through this function, AFATDS provides logistical support. This includes tracking the status of maintenance and resupply as well as managing ammunition.

Also, FA mission support maintains a link with CSSCS to provide a constant flow of information between higher headquarters. This broad base of communications greatly reduces the tremendous amount of paperwork typically associated with logistics issues. Increased automation ensures faster processing as well.

Fire Direction Operations Category. While some firing platforms—Paladin and the multiple-launch rocket system (MLRS)—can compute their own technical firing solutions, other systems cannot. The ultimate objective of the FA fire direction operations functional category is to compute all technical firing data for all FA systems in AFATDS, but the initial software versions of AFATDS will continue to use the cannon battery computer system (BCS) and the MLRS fire direction system (FDS).

AFATDS will exchange information electronically throughout the joint and combined battlefield. In addition to the other BFACS and the appliques, AFATDS will communicate with all current FA joint and allied fire support systems. For the FA, these systems include the BCS, TACFIRE, FDS, digital message device (DMD), Firefinder radar, Paladin, IFSAS, light TACFIRE (LTACFIRE) and forward entry device (FED). AFATDS also will communicate with the Air Force's joint surveillance and target attack system (JSTARS) and other sister services' systems as well as allied fire support systems—Germany's ADLER, Britain's BATES, and France's ATLAS.

Of particular note, AFATDS is a multi-service program; the Marine Corps is helping to develop AFATDS for use in their corps-level fire support units.

With AFATDS' ability to exchange information across the battlefield, it will be able to use a wide range of communications systems, including radios, land lines and satellites.

AFATDS has been "human engineered" to be user friendly. Those who have had to maintain proficiency on TACFIRE without an embedded trainer will appreciate AFATDS. The embedded trainer makes AFATDS easier to use and reduces the time required for sustainment training.

AFATDS dramatically improves maintenance and system mobility/transportability. Movement to a theater of operations with vans full of antiquated and heavy equipment is a thing of the past. Massive 1980-vintage computers requiring expansible vans are being replaced by the transportable computer unit (size of a personal computer) and the lightweight computer unit (size of a lap-top).

These smaller computers have been integrated into the standardized integrated command post system (SICPS) vehicles—the high-mobility multipurpose wheeled vehicle (HMMWV), tracked vehicles and five-ton expansible vans. AFATDS will be more mobile, survivable and maintainable than any command and control system fielded to date.

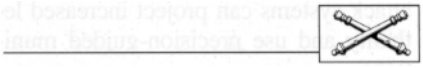
Development and Fielding

While the AFATDS development continues on schedule, the current maturity of the system allows for its participation in many of the Army's warfighting experiments (AWEs). This includes Focused Dispatch, a heavy forces AWE at Fort Knox, Kentucky, held in August; Warrior Focus, a light forces AWE at the Joint Readiness Training Center, Fort Polk, Louisiana, in November; Task Force XXI, an AWE with the Experimental Force (EXFOR), the 2d Armored Division, at Fort Hood in early 1997; Division XXI, also with the EXFOR but in early 1998; and Corps XXI scheduled for early 1999 with the AWE participants yet to be determined. These experiments will verify AFATDS' capabilities and provide immediate feedback on training, functional performance, message handling, screen design and the like.

To date, AFATDS' performance has been excellent in the 1994 Atlantic Resolve— formerly the return of forces to Germany (REFORGER) exercise—and Phantom Saber IV, a III Corps exercise at Fort Hood, Texas. Soldiers found the system easy to use, and commanders appreciated the flexibility and functionality designed into AFATDS.

The initial operational test and evaluation (IOTE) with the 1st Cavalry Division (the testing and developing division) at Fort Hood in August validated that AFATDS Version 1 software meets operational requirements. By the third quarter of FY 96, AFATDS will be fielded to the 2d Armored Division at Fort Hood. Fielding to both Active and Reserve Components units will continue through the year 2007.

AFATDS allows the commander to automate his guidance on how to fight the battle and digitizes his ability to rapidly and efficiently place deadly fires where they'll be most effective. AFATDS is truly a system that's essential for the implementation of Force XXI. With it, we have a lightning fast, digital killer on the next century's battlefield.



Captain Earl D. Noble is a member of the Software Development Team for the Training and Doctrine Command (TRADOC) System Manager-Advanced Field Artillery Tactical Data System (AFATDS) in the Field Artillery School, Fort Sill, Oklahoma. He's a member of the Army Acquisition Corps and holds a master's degree in Computer Engineering from Clemson University, Clemson, South Carolina, He commanded Headquarters, Headquarters and Service Battery of 6th Battalion, 37th Field Artillery (Multiple-Launch Rocket System), 2d Infantry Division in Korea and served in cannon and rocket units in the 1st Cavalry Division at Fort Hood, Texas.

Kurt A. Meisenzahl is a member of the Software Development Team for the TRADOC System Manager-AFATDS. He has spent the past 10 years in the Directorate of Combat Developments of the Field Artillery School and has been involved in the Tactical Fire Direction System (TACFIRE) and Firefinder Radar programs. Before retiring from the Army in 1983 as a Major, he commanded artillery batteries in Germany and Vietnam and served as a battery fire direction officer (FDO) in a "manual" fire direction center (FDC) in Vietnam. He holds a master's degree in Business Management from Webster University in St. Louis, Missouri.

The authors wish to acknowledge the contributions of the members of the Product Manager-AFATDS Team, both at Fort Sill and Fort Monmouth, New Jersey.

Who Should Coordinate Fires in the Battle Interdiction Area?

by Lieutenant Colonels Martin L. Vozzo, James E. Rentz, QM, and Diann Latham, USAF

Technology has enhanced the military services' deep strike battle interdiction capabilities, which is significantly influencing joint operational plans. Each service now has acquisition and attack systems that can service targets at greater depths. The majority of these attack systems can project increased lethality and use precision-guided munitions.

The joint force commander's (JFC's) objective for deep strike battle interdiction is no longer to merely hit the enemy with as many explosives as possible, but rather to project precise fires to achieve specific results on specific enemy targets. Consequently, a single individual should coordinate, integrate and synchronize all battle interdiction operations for the JFC.

The topic of who should coordinate deep interdiction fires is mired in controversy, predominantly between Army and Air Force senior leaders. Many in the Air Force strongly believe the joint force air component commander (JFACC) should be the single manager of battle interdiction operational fires, while many Army senior leaders believe it should be the joint force land component commander (JFLCC). The premise of this article is that the JFLCC should be the deep strike battle interdiction coordinator for the joint task force (JTF)—and joint doctrine supports that premise.

This article examines the subject by discussing service and joint doctrine and analyzing the architecture of the joint battle-space. But as background, we first discuss the capabilities of the services' battle interdiction assets and the definitions of key terms.

Deep Strike Systems

Before Operation Desert Storm, battle interdiction was limited to assets that could acquire and strike deep targets. Because the Air Force had the preponderance of assets that could engage targets deep, it was given the freedom to strike beyond the fire support coordination line (FSCL) into the battle interdiction area.

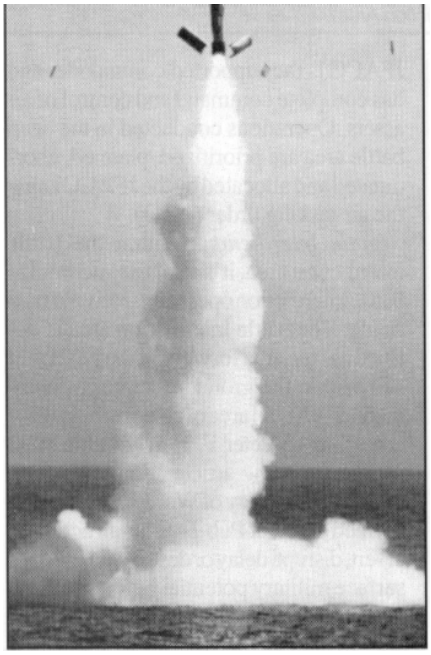
Today, modern Army weapon systems have the range and lethality to acquire and strike deep targets. By using precision-guided systems, such as the Army tactical missile system (ATACMS) and attack helicopters, the JFLCC can attack targets quickly and with devastating effects.[1] During Desert Storm, these long-range systems, especially ATACMS, brought the problem of coordinating deep fires to the fore.

ATACMS

Although at times successful, the JFACC's use of the FSCL during Desert Storm has stirred a raging debate over control of battle interdiction operations. The two services' different approaches to warfighting was evident in the conflict between the VII Corps Commander and the JFACC during the Gulf War. The JFACC believed the FSCL should be the primary control measure with regards to air-ground operations and defined it as a restrictive fire support coordinating measure (FSCM) vice a permissive one as the Army defines it.[2] Although there were procedures for the JFLCC to notify the JFACC when he intended to strike a high-payoff target (HPT) beyond the FSCL, the JFACC routinely required more than three hours lead time to ensure all subordinate elements were notified. With this delay, the JFLCC was able to attack only seven of his 14 targets successfully.[3]

Today, the battlefield is a much smaller place because of new weapons with increased ranges, joint resources and the speed at which maneuver forces can operate.

Air Force F-16 Falcon



TLAM (Submarine Vertical Launch)

Navy and Marine F/A-18 Hornet

Navy A-6 Intruders

All services have assets that can play a role in battle interdiction.

Army Deep Attack Assets. Technological advances in acquisition and attack systems give the Army a new capability to strike deep with organic systems. With the joint surveillance and target attack radar system (JSTARS), ATACMS and the AH-64 Apache helicopters, the Army can detect and attack targets at greater depths.[4] By integrating these capabilities, the JFLCC can precisely project fires into the battle interdiction area.

JSTARS provides accurate location data for targeting by Army, Navy and Air Force weapons. Accurate and timely intelligence allows the ground commander multiple options in selecting the appropriate weapons and delivery systems.[5]

ATACMS and Apaches provide the range to engage high-priority targets deeper. Currently, ATACMS is a precision-guided missile that can strike targets in all weather conditions at a range out to 165 kilometers; the ATACMS Block IA, to be fielded in 1998, will kill targets out to 300 kilometers. The Apache helicopter can acquire targets and lethally attack them at depth, giving the JFLCC a system with capabilities that overlap those of the Air Force.

Naval Deep Attack Assets. The Navy has several responsive weapons systems used for attacking targets in the battle interdiction area, such as the Tomahawk land attack missile (TLAM). This highly lethal missile on combatant ships and attack submarines has an extremely accurate target-locating system and can engage enemy targets at ranges in excess of 700 miles.[6]

Complementing the TLAM is the F/A-18 Hornet and the A-6 Intruder aircraft that can strike in the battle interdiction area in support of the Navy and Marines. These fixed-wing aircraft provide a day, night and, in the case of the A-6, an all-weather capability for locating, identifying and striking targets. Both aircraft are armed with precision-guided missiles and self-designated lasers.[7]

Air Force Deep Attack Assets. The F-16 Falcon and F-15E Strike Eagle aircraft enhance air-to-surface combat effectiveness for the JTF commander. The F-16 is a compact, highly maneuverable, dual-role fighter that operates at altitudes above 20,000 feet and employs lethal munitions with a circular error probable (CEP) of approximately seven meters against point targets. The F-15E is an all-weather, extremely maneuverable fighter/bomber capable of employing munitions accurately day or night in the battle interdiction area.

One can readily see that the services all have the capabilities to engage enemy targets across the operational continuum. But these joint deep strike assets must be coordinated to accomplish the JFC's intent most effectively.

Joint Definition of Terms

It's a challenge for the JFC to integrate his joint forces to operate on a seamless battlefield while rapidly identifying and exploiting enemy weaknesses.[8] To begin with, all services must talk the same language to coordinate fires.

The FSCL. This is a permissive fire support control measure used by the JFLCC. *Joint Pub 1-02 Department of Defense Dictionary of Military and Associated Terms* defines the FSCL as "A line established by the appropriate ground commander to ensure coordination of fires not under the commander's control but which may affect current tactical operations. The FSCL is used to coordinate the fires of air, ground or sea weapons systems using any type of ammunition against surface targets. The FSCL should follow well-defined terrain features. The establishment of the FSCL must be coordinated with the appropriate tactical air commander and other supporting elements. Supporting elements may attack targets forward of the FSCL without prior coordination with the ground force commander, provided the attack will not produce

adverse surface effects on or to the rear of the line. Attacks against surface targets behind this line must be coordinated with the appropriate ground force commander."[9]

Joint Pub 3-0 Doctrine for Joint Operations basically agrees with the definition in Joint Pub 1-02. But Joint Pub 3-0 gives the establishing commander of the FSCL, the JFLCC, the added responsibility of synchronizing operations on either side of the FSCL "out to the limits of the land forces' boundary."[10]

The battlefield geometry as shown in the figure sets the stage for further discussions in this article. According to Joint Pub 3-0, the primary objective is to allow the operational commander to nearly simultaneously interdict the enemy the depth of the battlespace, striking the full array of his capabilities/sources of strength and centers of gravity.[11] This is referred to as simultaneity and depth.

Simultaneity. The asymmetrical nature of operational warfare allows interdiction to occur simultaneously across the battlespace, accomplishing each component commander's objectives while helping to accomplish the overall operational objective.[12] That means fires can be executed simultaneously in the close, deep and interdiction battle areas.

Close Battle. Within the close battle area, the JFLCC controls the use of close air support (CAS) through a forward air controller (FAC). CAS is "Air action against hostile targets in close proximity to friendly forces which require detailed integration of each mission with the fire and movement of those forces."[13] While CAS is not specifically mentioned in the FSCL definition, the Army and Air Force generally accept that air support inside the FSCL is CAS.

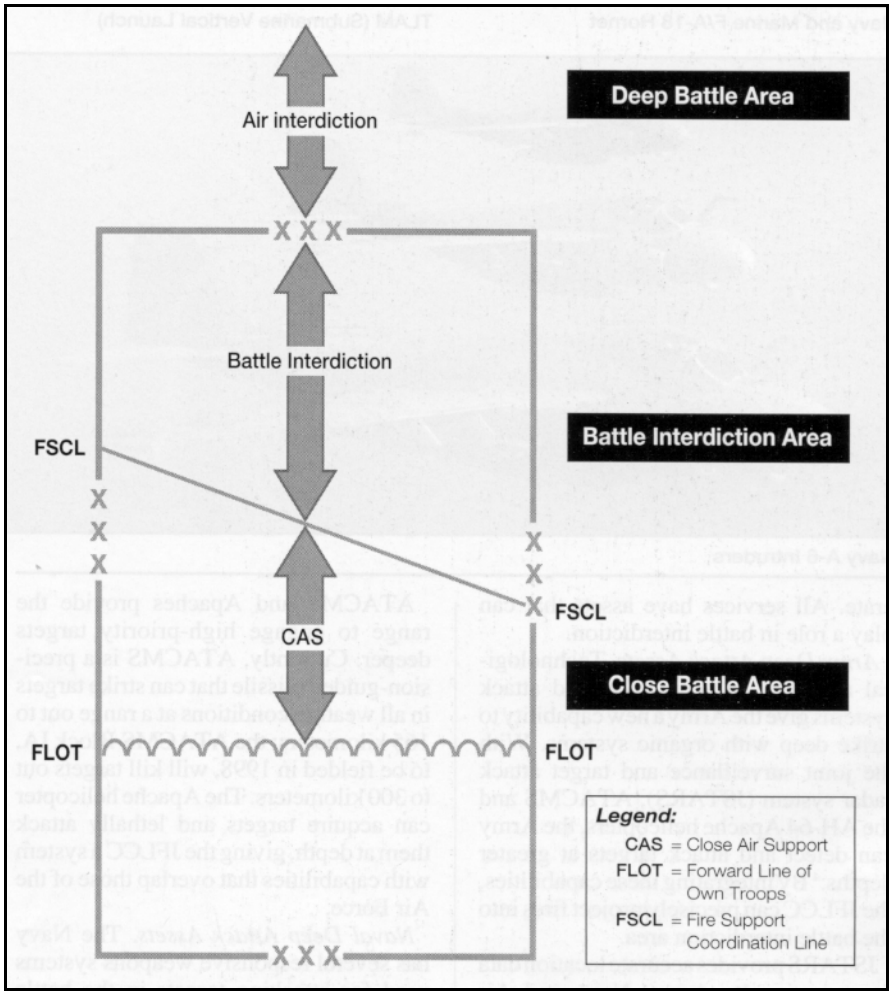
Deep Battle. The area forward of the land forces' boundary is referred to as the deep battle area. Within this area, air interdiction (AI) is the primary operation conducted. AI is defined by Joint Pub 1-02 as "Air operations conducted to destroy, neutralize or delay the enemy's military potential before it can be brought to bear effectively against friendly forces at such distance from friendly forces that detailed integration of each air mission with the fire and movement of friendly forces is not required."[14]

The portion of the battlespace in which AI occurs is the only area where close coordination between the JFLCC and JFACC is not required. In this area, the JFACC is the supported commander and has complete command and control of air assets. Operations conducted in the deep battle area are prioritized, planned, coordinated and allocated by the JFACC using the air tasking order (ATO).

Battle Interdiction. Within the battle interdiction area, it's vital to synchronize battle interdiction operations to avoid fratricide. The battle interdiction area is defined as "the area forward of the FSCL but still within the ground component commander's AOR [area of responsibility]"—according to Peter F. Herrly in his 1992 *Military Review* article "Joint Warfare, the American Way of War."[15] Interdiction defined by Joint Pub 1-02 is "an action to divert, disrupt, delay or destroy the enemy's surface military potential before it can be used against friendly forces."[16]

Synthesizing Herrly's definition of a battle interdiction area and Joint Pub 1-02's definition of interdiction, we defined battle interdiction: an action to divert, disrupt, delay or destroy the enemy's surface military potential beyond the FSCL but still within the ground component commander's AOR before it can be used effectively against friendly forces. No definition of this term appears in joint publications.

The Army's capstone manual for fire support, *FM 6-20 Fire Support in the AirLand Battle*, establishes the Army's framework for employing fire support in battlespace. Technological advances increased the Army's abilities to engage targets in the battle interdiction area with AH-64 helicopters, ATACMS and multiple-launch rocket system (MLRS) weapon



Because the joint force land component commander (JFLCC) must shape and influence his battlespace, he must prioritize the sequence of enemy forces and capabilities that are attacked throughout the depth of his area of responsibility—including coordinating all battle interdiction operations for the joint task force (JTF).

systems. The Army's increased deep-target precision and lethality has resulted in the need to re-examine the use of the FSCL on the battlefield.

The FSCL no longer needs to be close to the forward line of own troops (FLOT) to prevent fratricide. The primary consideration for the FSCL is to locate it beyond the area in which the corps commander intends to shape the battle.[17]

The Air Force's doctrine doesn't address fire support control measures. *Air Force Manual (AFM) 1-1 Basic Aerospace Doctrine of the United States Air Force* states, "...the theater commander should make the JFACC responsible for controlling the overall interdiction effort when aerospace forces provide the preponderance of interdiction capability."[18] The introduction of precision munitions and weapon systems with enhanced strike ranges (i.e., attack helicopters, ATACMS and MLRS) has resulted in the Army and Air Force's disagreeing on the command and control of fires within the battle interdiction area.

Desert Storm provides a great example of the confusion that can occur when services disagree over command and control. The JFC violated existing joint doctrine when he allowed the JFACC, the Central Air Force (CENTAF) Commander, to command and control the area beyond the FSCL via the use of the ATO.

Both the Navy and Marine Corps doctrinal interpretations are similar to those found in Army doctrine. Navy and Marine Corps doctrine don't require any coordination of fires forward of the FSCL with the JFLCC. Naval doctrine states that the normal fire support planning process will ensure that air and naval gunfire are not delivered on the same target unintentionally.[19] Because the Marine air ground task force (MAGTF) commander has organic ground and air forces, the process is simplified by his fire support coordination center (FSCC) coordinating and synchronizating those assets.[20]

While Army, Air Force, Navy and the Marine Corps tactics, techniques and procedures (TTP) may differ regarding battle interdiction operations, all services agree that fire support must be integrated as a unified force. Yet joint and intraservice doctrinal statements about the control of fires are, at times, incomplete and often contradictory. The overlapping capability of each service to deliver fires within the battle interdiction area necessitates the synchronization of those fires.

JFLCC as Battle Interdiction Coordinator

After conducting extensive research using joint and service resources, we concluded the JFLCC should be the deep strike battle interdiction operations coordinator for the JTF. Joint doctrine supports this position.

Joint operational campaign planning and execution can be characterized as "...seamless operations from the air, land, sea and space operating with overwhelming force from every conceivable dimension and direction to shock, disrupt and rapidly defeat opponents."[21]

The JFC is charged with synchronizing every component of the campaign plan in the theater of operations. Now, more than ever, he must be concerned with advances in technology that make it possible for air, land and sea forces to work together to achieve synergy—a state in which the total military impact exceeds the sum of each service's contributions.

To provide a common battlespace framework for all warfighting participants, the JFC establishes operational boundaries within the theater for the conduct of operations. The size, shape and positioning of the land force boundaries are based on the JFC's concept of operations and the JFLCC's requirements for the depth to facilitate rapid maneuver and to attack enemy targets at extended ranges.[22]

The JFC holds the JFLCC responsible for all operations within the JFLCC's boundaries—including those within the battle interdiction area. Former Chairman of the Joint Chiefs of Staff, General Colin Powell, author of the 1992 *A Doctrinal Statement of Selected Joint Operational Concepts*, states that "...within this boundary, the land forces commander will be designated the supported commander and will be responsible for the synchronization of maneuver, fires and interdiction through target priority, effects and timing of interdiction operations...the commander of the supported force will have the authority to exercise general direction for the supporting effort...which includes designation of targets, timing and duration of supporting action and other instruments necessary for coordination and efficiency."[23]

Thus, the JFLCC is responsible to the JFC for collectively coordinating and integrating all theater operating systems within the battle interdiction area.

The JFLCC as a single manager of operations in the battle interdiction area facilitates overall operational success. The JFLCC must shape and influence the entire battlespace to support his concept of operations. To accomplish this task, he must be concerned with the disposition of enemy forces and capabilities that can most readily affect his close battle operations. Hence, when it comes to employing a combination of sophisticated fixed- and rotary-wing attack aircraft. ATACMS, TLAMs and naval gunfire assets, he must have the authority to prioritize enemy targets and set the timing for their attack throughout the depth of his AOR.

This battlespace coordination also is needed to preclude the services from wasting limited resources and avoiding conflicting, redundant attack or acquisition operations. The situational awareness of duplicated efforts is especially important when attacking forces are employing wide area munitions or munitions with delaying effects that could cause harm to friendly ground forces if the munitions' locations are not coordinated or known.

As the battle interdiction coordinator, the JFLCC will articulate his vision of maneuver operations to all supporting commanders—including the JFACC and the joint force naval component commander (JFNCC)—so they can project coordinated, synchronized battle interdiction operational fires within specified boundaries to attack selected high-payoff targets that support the JFC's objectives.

General Powell states that the "...supported commander should provide supporting commanders as much latitude as possible in the planning and execution of operations....upon understanding what the supported commander wants to accomplish and what they want to avoid, interdiction-capable commanders can normally plan and execute their operations with only that coordination requested with supported commanders."[24]

The roles of the supported commander, the JFLCC and supporting commanders, the JFACC and JFNCC, are very clearly defined. The JFLCC should be the individual responsible for coordinating and synchronizing all combat assets in the battle interdiction area.

The commander who establishes and adjusts the FSCL within his boundaries should be responsible for all operations within his boundaries. Joint Pub 3-0 states, "...the synchronization of operations on either side of the FSCL is the responsibility

of the establishing commander out to the limits of the land force boundary."[25] Thus, the individual who has the authority to establish and update the location of the FSCL—based on the JTF concept of operations, location of enemy forces, anticipated rates of movement and weapons capabilities—should, by doctrine, be the coordinator of all warfighting activities in the battle interdiction area.

Joint Pub 3-0 further states, "...the land force commander adjusts the location of the FSCL as required to keep pace with operations....he transmits the change to higher, lower, adjacent and supporting headquarters to ensure attack operations are appropriately coordinated by controlling agencies."[26] Again, joint doctrine specifies that the JFLCC coordinate and synchronize all theater operating systems in the battle interdiction area.

The component commander controlling the preponderance of responsive weapon systems used for battle interdiction should be the overall coordinator. All three services have an arsenal of the most sophisticated, technologically advanced weapon systems in the world. However, due to the long planning time for ATOs allocating preplanned sorties, coupled with the small percentage of sorties allocated for immediate employment, Air Force and Naval fixed-wing fire support assets are not as responsive as the Army's ATACMS or Apaches. (The ATO scheduling process is not used to employ Apaches during battle interdiction operations.)

Certain periods of the day and night incur atmospheric, weather and visibility restrictions precluding Air Force, Navy and Army aircraft from supporting a synchronized attack at a time and location. Another consideration is the "limited" amount of ordnance that a single Air Force, Navy or AH-64 aircraft can carry. Planners must consider these factors when trying to allocate attack weapons systems for targets.

ATACMS is an Army battle interdiction weapon system that's extremely responsive for preplanned targets and targets of opportunity. ATACMS can provide continuous, 24-hour-a-day, all-weather fire support. Perhaps most importantly, ATACMS can precisely project massive volumes of operational fires to attack selected high-payoff targets. Consequently, because the JFLCC controls the preponderance of the most responsive weapons systems used in the battle interdiction area, he should be the single coordinator of all theater operating system activities.

Recommendations

The subject of this article continues to be contentious; but based on our research, the JFLCC should be the battle interdiction operations coordinator for the JTF. Joint doctrine identifies the JFLCC as the single manager charged with collectively coordinating and integrating all theater operating systems within the battle interdiction area. Leaders at all levels need to understand and comply with published joint doctrine. Furthermore, the services need to modify their TTP to fully support joint doctrine.

We also recommend the services modify joint doctrine in two ways. First, they should incorporate our definition of battle interdiction and accompanying sketch into updates of pertinent joint publications. Currently, this definition is not in any joint doctrinal publication.

Secondly, the definition of the FSCL should be modified to incorporate the notion of the JFLCC's being responsible for synchronizing all operations on both sides of the FSCL, as outlined in Joint Pub 3-0. This change would eliminate the confusion over who should be the JTF's coordinator for battle interdiction operations.

And clearly, the JFLCC should.

Lieutenant Colonel Martin L. Vozzo is a Force Structure Analyst in J8 of the Joint Staff at the Pentagon. His previous assignment was as the S3 of the 25th Infantry Division (Light) Artillery at Schofield Barracks, Hawaii, the division artillery in which he also served as a Brigade Fire Support Officer and Battalion S3.

Lieutenant Colonel James E. Rentz, Quartermaster Corps, is a Transportation Staff Officer in the J5 Directorate of the Transportation Command, Scott AFB, Illinois. He previously served as Chief of the Division Materiel Management Center and as S3 of the Division Support Command for the 1st Infantry Division (Mechanized) at Fort Riley, Kansas.

Lieutenant Colonel Diann Latham, US Air Force, is a Surveillance Officer in the J3 Directorate of the Joint Staff at the Pentagon. Previously, she was Command Manager and Program Element Monitor of the Consolidated Space Operations Center at Peterson AFB, Colorado.

The authors wrote this article while students together at the Armed Forces Staff College, Norfolk, Virginia.

Notes:

1. Jon C. Schreyach. "Fire Support for Deep Operations." *Military Review* (August 1989), 30.
2. US Air Force, *Joint Force Air Component Commander (JFACC) Primer* (Washington, DC: August 1992), 11.
3. David H. Zook, *The Fire Support Coordination Line: Is It Time To Reconsider Our Doctrine?* (Fort Leavenworth, KS: US Army Command and General Staff College, 1992), 139.
4. William B. Carlton. "Fire Support Coordinating Measures on Future Battlefields." *Field Artillery* (August 1992), 35-38.
5. *Jane's Weapon Systems, 1988-89* (Alexandria, VA: Jane's Information Group, 1988), 110.
6. *Jane's Strategic Weapon Systems* (Alexandria. VA: Jane's Information Group Limited, 1992). 78.
7. Ibid., 899.
8. Joint Chiefs, *A Doctrinal Statement of Selected Joint Operational Concepts* (Washington, DC: Joint Chiefs of Staff, November 1992), 1.
9. *Joint* Chiefs *Joint Pub 1-02 Department of Defense Dictionary of Military and Associated Terms* (Washington, DC: Joint Chiefs of Staff, March 1994), 146.
10. Joint Chiefs, *Joint Pub 3-0 Doctrine for Joint Operations* (Washington, DC: Joint Chiefs of Staff, September 1993), III-48.
11. Ibid., III-14.
12. "The Art of Operational Warfare," *1S30-Joint Theater Organization and Command Relationships-Volume III, Part 1 of 4* (June 1994), 85.
13. Thomas G. Runge, *Firepower and Follow-on Forces Attack: Making Every Round Count* (Maxwell AFB, AL: Air University Press, 1991), 9.
14. Joint Pub 1-02, 16.
15. Peter F. Herrly, "Joint Warfare, The American Way of War," *Military Review* (February 1992), 14.
16. Joint Pub 1-02, 192.
17. US Army, *FM 6-20-30 Fire Support for Corps and Division Operations,* (Washington, DC: Department of the Army, October 1989), F-3.
18. US Air Force, *AF Manual 1-1 Basic Aerospace Doctrine of the United States Air Force,* (Washington, DC: Department of the Air Force, March 1992), 163.
19. Zook, 55-56.
20. Ibid., 53-54.
21. Herrly, 10.
22. *A Doctrinal Statement of Selected Joint Operational Concepts*, 16.
23. Ibid., 8 and 16.
24. Ibid., 17.
25. Joint Pub 3-0, III-48.
26. Ibid., III-50.

USAFAS Curriculum Revisions

The US Army Field Artillery School (USAFAS), Fort Sill, Oklahoma, is moving into the 21st century, keeping pace with new technology and concepts and, more importantly, the needs of the field. USAFAS recently held a curriculum review to update and refine instruction to fit in the total integrated training concept, preparing Redlegs for Force XXI. The following are the key revisions to the USAFAS curriculum.

Automated Fire Direction. In October, USAFAS will focus more on automated fire direction as we transition from the tactical fire direction system (TACFIRE) to the initial fire support automation system (IFSAS) and, ultimately, the advanced FA tactical data system (AFATDS), Version 3 software. Manual gunnery will still be taught at all levels, but the depth of the instruction will vary, depending on the student's future duty assignment.

For example, enlisted fire direction personnel in advanced individual training (AIT) and the Basic NCO Course (BNCOC) will receive complete instruction on manual fire direction. Officers attending the FA Officer Basic Course (FAOBC) will continue to receive a good portion of manual gunnery focused on the fundamentals of fire direction, ballistics, non-standard conditions, manual as a backup and safety procedures. The FA Officer Advanced Course (FAOAC) will receive instruction on the art of manual gunnery, troubleshooting procedures, fire direction principles and theory—all of which help ensure first-round accuracy when massing firing units.

BackUp Computer System (BUCS). Another big change is the deletion of BUCS training in FAOBC and FAOAC. The production line for BUCS software and hardware stopped in 1991. BUCS' technical solution doesn't line up with the current battery computer system (BCS), Version 10.

USAFAS will continue to provide BUCS training to enlisted fire direction personnel in BNCOC and AIT until FY 97. Job aids and self-paced practical exercises will be provided to officer students until FY 97. Further use of the BUCS will be at the commander's discretion.

As a survey computer, the BUCS with Revision 1 random operating memory chips is still useful for hasty survey as a means of determining direction through celestial observation. The gun laying and positioning system (GLPS) will replace BUCS for hasty survey. Students will receive instruction on the hasty survey capabilities of BUCS along with training on the precision lightweight global positioning system (GPS) receiver (PLGR). BUCS also continues to be a useful calculator for the survey party to complement the forward entry device (FED).

USAFAS will teach BCS safety computations to compensate for the lack of BUCS safety training. The instruction will use the automated range safety system (ARSS).

FAOBC Field Training. More field training will enhance survivability skills, leadership opportunities and field maintenance training. FAOBC will have more integrated instruction—for example, teaching single-channel ground and airborne radio system (SINCGARS) and BCS as a total system. The time saved allows us to teach more in the field. Finally, more senior leaders and contemporary guest speakers will reinforce instruction and provide useful tactics, techniques and procedures (TTP).

FAOAC Revisions. The basic two-phase format of one large and one small group will remain. However, FAOAC will focus more on new technology—IFSAS, Paladin, multiple-launch rocket system (MLRS)—and increase practical exercises in the small groups. Additionally, the battery command block is expanding to allow more time in both the "art" and "science" of command. Similar to FAOBC, the FAOAC will receive integrated instruction to demonstrate the total system and see an increase in the use of Janus, an interactive computer simulation model, to enhance fire planning operations.

PreCommand Course (PCC). The PCC has made some azimuth corrections with instructional goals now focusing on the first few months of battalion command. The brigade and division artillery command designees will share their expertise. Students still will receive specific "tracks" of instruction on weapons systems and tactical missions but have more time for exchanging ideas and concerns.

As the Army moves into the 21st century, USAFAS is ensuring Redlegs receive the type and quality of instruction that will make them assets to any Force XXI unit.

Lieutenant Colonel Mark A. McGuire, FA
Major Daniel J. Conn, USMC
Formerly of Cannon Div. Gunnery Dept.
Field Artillery School, Fort Sill, OK

Paladin Doctrine: An Update

The Paladin new equipment training team (NETT) recently compiled all recommended changes to *Special Text (ST) 6-50-60 Paladin Tactics. Techniques and Procedures* (TTP) into a Coordinating Draft of FM 6-50-60, effective in October.

After two years and five battalion fieldings, the Gunnery Department of the Field Artillery School, Fort Sill, Oklahoma, formed a working group with officers and NCOs from two of the Paladin-equipped battalions; the observer/controller group at the National Training Center, Fort Irwin, California; and Paladin NETT to analyze proposed changes. The major changes in the coordinating draft are simplified occupation procedures, specifically, on the automated fire control system (AFCS); movement techniques; troop-leading procedures; and defensive perimeter techniques.

The original ST 6-50-60 remains a good document with sound TTP and should be used until the coordinating draft hits the field. The FM is scheduled for distribution in the fourth quarter of FY 96.

For more information, contact Paladin NETT of the Gunnery Department at DSN 639-4418 or commercial (405) 442-4418.

CPT Walter S. Savoy, FA
Paladin NETT, Gunnery Department
Field Artillery School, Fort Sill, OK